WORLD CONFERENCE ON DROWNING PREVENTION MALAYSIA 2015

Bridging communities to prevent drowning

Program and Proceedings
Bridging communities to prevent drowning
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This program and proceedings book was developed with financial assistance from Royal Life Saving Society - Australia.

Editor: Justin Scarr

Editorial Assistance:
- Alison Mahony
- Kristal Grainger
- Craig Roberts
- Chris Groneman
- Amy Peden
- Monique Sharp

Design: www.jimmytoo.com.au
Foreword – International Life Saving Federation

On behalf of the International Life Saving Federation [ILS] it gives me great pleasure to welcome all the participants to the World Conference on Drowning Prevention 2015 [WCDP 2015] in Penang Malaysia.

Drowning is a global health issue, bigger than many accept, and is almost entirely preventable.

The vision for the International Life Saving Federation [ILS] is

“A World free from drowning”

The ILS is a World authority on drowning prevention, and leads, supports and collaborates with national and international organisations engaged in drowning prevention, water safety, water rescue and lifesaving.

One of the ILS strategic priorities is to provide leadership in the global effort to prevent drowning with an emphasis on reducing drowning of children, indigenous and other marginalised communities at risk, in developing countries and regions with high drowning mortality.

The WCDP 2015 brings together the ILS member organisations and the world’s leading practitioners, researchers and policy makers in drowning prevention, rescue, lifesaving and water safety, for exchange, debate and review of the latest progress on drowning prevention.

The ILS is extremely proud that the WCP 2015 is co-sponsored by the World Health Organisation [WHO]. The co-sponsorship of the WCDP 2015 by WHO, marks a significant step in the joint effort by ILS and WHO to raise global, regional and national awareness of drowning and its prevention.

This will be the first time that the drowning prevention community has met since the publication by WHO of the “Global report on drowning: preventing a leading killer” in November 2014. The report is the first WHO has undertaken that is dedicated exclusively to drowning to target and identify a global strategic prevention effort.

A key recommendation of the report is that a global partnership for drowning prevention should be established in order to serve, implement and lead communities, to address the issue of drowning prevention. ILS embraces the WHO conclusions and recommendation to support the establishment of a global partnership and collaboration in the efforts to prevent drowning.

Key themes arising from the Global report on drowning will be explored during plenary sessions, symposia and parallel session papers delivered by over 200 presenters from 50 nations. Symposia investigating the use of lifejackets, child-drowning prevention measures, identifying and responding to drowning data gaps, and CPR protocols will all feature at WCDP 2015.

On behalf of ILS, I would like to thank the Life Saving Society Malaysia, its President Lim Chien Cheng and the organising committee for hosting the World Conference on Drowning Prevention 2015.

The WCDP 2015 provides a significant opportunity to make a difference and advance the cause of the global reduction of drowning.

We express our sincere gratitude to everyone attending the World Conference on Drowning Prevention 2015 in Penang Malaysia and I look forward to meeting all the participants at the conference.

Mr Graham Ford
President
International Life Saving Federation
Foreword - Life Saving Society Malaysia

The Life Saving Society Malaysia (LSSM) is honoured to host the World Conference on Drowning Prevention 2015 (WCDP 2015) as a co-sponsor with the International Life Saving Federation (ILS) and the World Health Organization (WHO). On behalf of LSSM, I wish to acknowledge our appreciation to the Malaysian Government and the State Government of Penang for supporting our bid to have the conference here in Penang, Malaysia.

This conference is an important event to the ILS and to WHO as a biennial forum for discussing drowning prevention activities on a global basis. LSSM had made a bid in Potsdam, Germany, in 2013 to host WCDP 2015 in Malaysia with the hope that the conference here will establish a legacy for drowning prevention activities in our country and the region.

LSSM believes that discussions at the conference will be instructive to the Malaysian Government and to regional authorities in their respective efforts to reduce drowning. In this regard, LSSM is hopeful that the Malaysian Government will agree to coordinate drowning prevention activities in Malaysia under a national Water Safety Council that will soon be formed, comprising government authorities, the Malaysian National Institute of Safety and Health and NGOs. It is also hoped that regional authorities will look closely at the Malaysian Water Safety Council and share in its developments.

We are certain that international participants of this conference will find Malaysia affordable, interesting and easily accessible. There are myriads of tourism products in Malaysia and particularly in George Town, Penang, a UNESCO-listed heritage city. Malaysia is a multi-religious, multi-cultural and multi-ethnic country, and these are expressed in its architecture, languages and ethnicity, and variety of food. As hosts, we will ensure that participants experience our city and our country.

I am proud to announce that as at the date of this address, WCDP 2015 has attracted more than 400 delegates from over 50 countries, all foremost experts in their own country and in their own field in drowning prevention, rescue, lifesaving, and water safety and water sports. Each participant in this conference will hear from more than 200 speakers on various related topics over three days, and will have the opportunity to share their knowledge and exchange their ideas on the latest developments on drowning prevention activities with each other.

The conference will be discussing WHO’s Global report on drowning: preventing a leading killer published in November 2014, which revealed that drowning claims the lives of 372,000 people each year and is among the ten leading causes of death for children and young people in every region. Globally, over half of all drowning deaths are among those aged under 25 years, and more than 90% of drowning occurs in low and middle income countries, with nations in the African, South East Asian and Western Pacific regions having the highest rates.

WCDP 2015 will highlight effective drowning prevention strategies for Malaysia and the ASEAN region, and populations at risk throughout the world. For the stakeholders in water safety in the region, this conference is a good time to leverage on the knowledge of world experts, all gathered here at one conference, without having to travel far and wide to hear them.

I wish to thank my committee, who worked hard over the last two years to see that the conference proceedings will be smooth, the ILS, WHO, and everyone involved in the planning and organising of WCDP 2015. In particular, I wish to acknowledge and thank the RLSSA for advising and guiding LSSM in organising this conference.

Lim Chien Ch’eng
President
Life Saving Society Malaysia
Program and Thematic Review Committees

The World Conference on Drowning Prevention 2015 scientific program was developed after two calls for abstracts, an extensive review process by the Thematic Chairs and reviewers. These groups reviewed abstract, guided program development and were given opportunities to recommend keynotes, symposiums and workshops. Following the evaluation of papers and speakers, the WCDP 2015 program was developed.

WCDP 2015 Program Committee

The WCDP 2015 program was guided by the following people:

Justin Scarr - Program Committee Chair
Dr David Meddings - Program Committee Co-chair
Dr Ana Catarina Queiroga - Prevention Theme Co-Chair
Barbara Byers - Prevention Theme Co-Chair
Dr Richard Franklin - Data Theme Co-Chair
Dr David Szpilman - Data Theme Co-Chair
Dr Peter Wernicki - Treatment Theme Co-Chair
Anthony Bradstreet - Disaster Theme Co-Chair
James Vaughan – Disaster Theme Co-Chair
Dan Graham - Rescue Theme Co-Chair
Amy E Peden - Program Coordinator
Norman Farmer - Program Coordinator

Abstract Reviewers

We wish to acknowledge the following people for reviewing WCDP 2015 abstracts:

Dr Shayne Baker  Dr Lyndal Bugeja
Dr Stephen B Beerman  Mr Tom Mecrow
Ms. Elizabeth Bennett  Mr Martin O’Sullivan
Ms Barbara Byers  Ms Amy E Peden
Mr Norman Farmer  Dr Linda Quan
Dr Richard Franklin  Dr Ana Catarina Queiroga
Mr Peter George  Dr Aminur Rahman
Mr Daniel Graham  Mr Justin Scarr
Mr Jeffrey Hoedt  Dr David Szpilman
Ms Joanne Vincenton  Mr James Vaughan
Mr Job Kania  Dr Peter Wernicki
Mr William Koon
WCDP 2015 Scholarship Program

World Conference on Drowning Prevention 2015 organisers established the WCDP2015 Scholarship Program as a strategy to ensure that the conference is accessible to those from nations in greatest need but without the resources required to attend an international conference of this type. Contributions to the fund assisted in areas such as subsidising registration, travel and accommodation.

The organisations that have contributed to the Scholarship Program included:

- **World Health Organization - Western Pacific Regional Office**
  Funded 20 injury focal points on a full scholarship basis from nations including: Fiji, Mongolia, Cambodia, Laos, Vietnam and Philippines.

- **World Health Organization**
  Funded 13 places on a full scholarship basis from nations including; Kenya, Uganda, Sudan, Bangladesh and Sri Lanka.

- **Princess Charlene of Monaco Foundation**
  Funded 13 places on a full scholarship basis from nations including; Sudan, Tanzania, Kenya, Bangladesh, Philippines, Thailand, Vietnam, Cambodia, Sri Lanka.

- **International Life Saving Federation**
  Funded registration costs for all WHO delegates

- **Royal National Lifeboat Institution**
  Funded the participation of delegates to the RNLI Leadership program

- **Royal Life Saving Commonwealth**
  Funded the participation of delegates to the RLSS leadership development program

- **Surf Life Saving Australia**
  Contributed financial support to a range of delegates

- **Royal Life Saving Society – Australia**
  Contributed financial support to a range of delegates

The management of the Scholarship Program was provided by Staff and volunteers of the Royal Life Saving Society – Australia on an in-kind basis.
KEY FACTS

372,000 people die from drowning EVERY YEAR

OVER HALF of all drowning deaths are among those aged UNDER 25 YEARS

MALES ARE TWICE AS LIKELY to drown as females

Drowning is one of the 10 LEADING CAUSES OF DEATH for people aged 1-24 years

DROWNING RATES

Data not available
Not applicable

A LEADING KILLER OF CHILDREN

Number of deaths for children under 15 years

<table>
<thead>
<tr>
<th>Disease</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUBERCULOSIS</td>
<td>69,648</td>
</tr>
<tr>
<td>MEASLES</td>
<td>125,813</td>
</tr>
<tr>
<td>DROWNING</td>
<td>140,219</td>
</tr>
<tr>
<td>HIV</td>
<td>199,071</td>
</tr>
<tr>
<td>MENINGITIS</td>
<td>217,580</td>
</tr>
</tbody>
</table>
RISK FACTORS

LIVING AROUND WATER
Wherever there is water, there is the threat of drowning

<table>
<thead>
<tr>
<th>Place</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ditch</td>
<td>26%</td>
</tr>
<tr>
<td>Pond</td>
<td>43%</td>
</tr>
<tr>
<td>Container</td>
<td>13%</td>
</tr>
<tr>
<td>Lake</td>
<td>7%</td>
</tr>
<tr>
<td>River</td>
<td>5%</td>
</tr>
<tr>
<td>Other</td>
<td>6%</td>
</tr>
</tbody>
</table>

Place of drowning of Bangladeshi children under 5 years

YOUNG CHILDREN
The highest drowning rates are among children aged 1-4 years

FLOOD DISASTERS
Extreme rain fall, storm surges, tsunamis or cyclones

TRANSPORT ON WATER
Especially on overcrowded or poorly maintained vessels

PREVENTIVE ACTIONS

Install BARRIERS controlling access to water

Provide SAFE PLACES (for example, a crèche) away from water for pre-school children, with capable child care

TEACH school-age children basic SWIMMING, WATER SAFETY AND SAFE RESCUE SKILLS

TRAIN bystanders in SAFE RESCUE AND RESUSCITATION

Set and enforce safe BOATING, SHIPPING AND FERRY REGULATIONS

IMPROVE FLOOD RISK MANAGEMENT locally and nationally

© World Health Organization 2014
**Program and Abstracts**

Abstracts are included for all presentations received by 2 October 2015 and are listed under the themes as outlined in the conference program. Within each theme abstracts are listed by Oral and Poster Presentation. The presenting author is highlighted in bold text. Authors and their abstracts are also referenced via the index of abstracts at the end of this booklet.

**Disclaimer**

The Conference Program and Abstracts were correct at the time of printing however presentations and/or presenters may change due to circumstances beyond the control of the organisers, which may necessitate substitutions or alterations to the conference program. Information presented in this document does not necessarily reflect the views of the International Life Saving Federation or those of the organising committee.

**Program Snapshot**

Please find the Program Snapshot following. The complete program will be available as a supplement at conference registration.

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<td>11.00–12.30</td>
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<td></td>
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<td>13.30–15.00</td>
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<td></td>
<td>Prevention 1</td>
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<td>Data 1</td>
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<td>Swimming &amp; Water Safety 1</td>
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<td>Data 2</td>
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<td>Swimming &amp; Water Safety 2</td>
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<td></td>
<td>Methods, trials, models</td>
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<tr>
<td></td>
<td>Treatment 2</td>
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<tr>
<td></td>
<td>CPR, AEDs, First Aid</td>
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**Poster Session 1**

Posters on display from 9AM

**17.30**

WCDP2015 - Day One Close

**17.30–19.00**

ILS Asia-Pacific Forum

Open Forum for representatives from organisations from the ILS Asia-Pacific Region
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<td>Swimming and Water Safety 4 Water Safety Programs</td>
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<td>Symposium (2) Hypoxic Blackout</td>
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<td>15.30–15.00</td>
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<td>Data 5 Drowning Risk Factors</td>
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<td>Rescue 5 Coastal Risk Analysis</td>
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<td>Partnerships 3 Programs</td>
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<td>Swimming and Water Safety 5 Water Safety Programs</td>
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<td>WCDP2015 - Day Two Close</td>
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Please Note: Program is subject to change.
# PROGRAM SNAPSHOT

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<td>Prevention 8 Programs</td>
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<td>Symposium (3) Data Symposium</td>
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<td>Rescue 6 Aquatic Risk Mgt</td>
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<td>Symposium (4) Water Safety Plans</td>
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<td>Swimming and Water Safety 6 HIC Programs</td>
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<td>Disaster 2 Resilience &amp; Preparedness</td>
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<tr>
<td>10.30–11.00</td>
<td>Morning Tea</td>
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<tr>
<td>11.00–12.30</td>
<td>Session 10 - Free Papers</td>
<td>Prevention 9 At Risk Populations</td>
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<td>Prevention 10 Programs</td>
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<td>Rescue 7 Lifeguard Systems</td>
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<td>Rescue 8 Surfer and Beach Programs</td>
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<td></td>
<td>Rescue 9 Aquatic Safety</td>
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<td>12.30–13.30</td>
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<td>Exploring WHO's call for a Global Partnership to Reduce Drowning</td>
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<td>15.30–17.00</td>
<td>Session 12 - Closing Ceremony</td>
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<td></td>
<td>Poster Session 3</td>
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<tr>
<td>17.15</td>
<td>WCDP2015 - Day Three Close</td>
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## TIME: Saturday 7th November 2015

<table>
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<th>TIME</th>
<th>SESSION</th>
<th>Saturday 7th November 2015</th>
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</thead>
<tbody>
<tr>
<td>9.00–12.00</td>
<td>Drowning Data Workshop</td>
<td>An open scientific workshop focused on drowning data definitions for location and activity.</td>
</tr>
</tbody>
</table>

## Onsite Program – Mobile Portal

A mobile portal has been designed for conference attendees to easily view the Conference Program (Agenda) and Speakers Details at WCDP2015.

The portal can be added to any mobile device as per the following link: [https://royallifesaving.eventsair.com/world-conference-on-drowning-prevention-2015/event-info](https://royallifesaving.eventsair.com/world-conference-on-drowning-prevention-2015/event-info)

You will be able to view the Program, Search Speakers, View Abstracts, and create your own Agenda on your own device.
Malaysia
Stakeholders on Drowning in Malaysia: Who Are They and What They Do?

Dr Kulanthayan Mani1, 2
1 Safe Kids Malaysia, Selangor, Malaysia, 2 Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Selangor, Malaysia

Session 2 - Opening Plenary, Grand Ballroom, November 4, 2015, 11:00 AM - 12:30 PM

Introduction
The five (5) years Hospital Admission data (Health Informatics Center, Ministry of Health, 2013) shows that accidents which include drowning had been consistently listed as one of 10 principal causes of morbidity and mortality in Ministry of Health Hospitals and in 2012 it had shifted to sixth principal causes of death compared to seventh in year 2008. As other type of injuries, drowning is associated with tremendous public health burden. The non-fatal drowning incidents and immersion related injuries results in negative impact on the physiological, social and also economics aspect of the victims and the families. Thus a stakeholder meeting was organised to identify, gather and obtain information pertaining to drowning in the country. This will help in understanding the issues and mapping the way forward in drowning prevention in the country.

Methodology
This research studied a defined organisation based on a bounded system of organisation. A stakeholder meeting was held in October 2013 participated by 23 institutions from identified 50 organisations. Information and data for this study has been collected from the various sources on drowning events including government and non-governmental organization in Malaysia. The agencies that has been involved in providing the data to this study is Department of Statistics Malaysia, Ministry of Health Malaysia, Malaysia Maritime Enforcement Agency (MMEA), Fire and Rescue Department Malaysia and Civil Defence Department. The non-governmental organization which provided data was the Life Saving Society Malaysia (LSSM). The data was also derived from news report in local newspapers and also Internet search where the keyword ‘drowning’ was used.

Results
There are many agencies involved in drowning prevention both from the government and private sectors. Inline with it, there are many sources of drowning data collected by different agencies. An average of 296 deaths per year (Mean=296.4, SD=34.5) of children aged 0-19 years occur due to drowning in Malaysia. The average of drowning death rate is 2.92 per 100,000 children. The percentage of drowning death among children aged 0-19 years is about 47% from total all-age of drowning incidents for the past 10 year period (2002-2011).

The average ratio of drowning (male to female) was 4:1 and children aged 5-11 years were the most at risk. As for drowning morbidity, the average is about 2.10 per year and showed a higher number in children aged 1-4 years. This also deserves due attention as drowning morbidity would create a tremendous public health burden. Most locations of all-age drowning reported occurred in rivers and sea/beaches and most drowning cases took place in Kelantan, Johor, Selangor, Sabah and Terengganu.

Discussion
The discussion centered along data collection on drowning, need for a lead agency on drowning and proposals to run intervention programs to address drowning in the country. There were some suggestions blowing out from the discussion session:

i. Small survey to be carried out on drowning in Kelantan or Terengganu during monsoon season by stakeholders.
ii. To produce a yearly drowning incident report
iii. To implement a colour coding flags (like being implemented in foreign beaches)
iv. Increase number of Baywatch Tower (by Civil Defence Department)

v. Need to increase parent’s awareness and knowledge on drowning issues and prevention
vi. Focus prevention strategies at vital areas – sea and river

vii. Conduct key stakeholders meeting which includes Royal Malaysia Police (PDRM) – to ensure their contribution and cooperation especially on data collection for drowning incidents.
viii. SafeKids Malaysia UPM to take a lead in carrying out major intervention studies on drowning prevention among children in Malaysia.

Conclusion
The stakeholder meeting concluded with three recommendations:

i. To pilot a community based drowning intervention program in Kelantan, which has high drowning cases by Safe Kids Malaysia UPM with the help of Ministry of Health Malaysia.
ii. To re-suggest the establishment of a national database on drowning registry.

iii. To established a National Water Safety Council to coordinate water safety and drowning prevention in Malaysia.
Drowning In Malaysia

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Introduction
Injuries are a major cause of death in adults and older children. Drowning deaths are an area that has received insufficient attention as an important cause of mortality locally. The World Health Organization commissioned this study with the support of Ministry of Health Malaysia. The objective was to “To collaborate data on childhood drowning in Malaysia and review existing drowning prevention measures in place”.

Methodology
This was a cross-sectional study using secondary data obtained from various sources on drowning events. Sources included Government: Ministry of Health, Ministry of Education, Ministry of Sport, Police, Policymakers, Ministry of Transport, Department of Statistics and NGOs (Life Saving Society Malaysia, newspaper sources, Fire & Rescue Volunteers Malaysia). Drowning deaths data were collected from the year 2000 to 2007. Data obtained were then analysed to provide understanding of the epidemiology of drowning incidents in Malaysia, risk factors contributing to it and preventive measures that need to be drawn up or revision of current preventive measures in addressing this problem. Drowning outcome was divided into three categories: Death, Morbidity, No morbidity.

Results
Notified fatalities due to drowning amounted to between 600-700 per year for the year 2000-2007. Of these between 250-300 (44.5%) were children under 18 years. An additional 200 children drowned but survived. Hence the burden of drowning in children is approximately 500 yearly. The national average drowning fatality rate in children was 3.05 per 100,000 children over the 8 year period. The national average drowning rate (fatal and non-fatal) in children was 5.0 per 100,000 children. There was no reduction in drowning fatalities from 2000 to 2007. Drowning was 3 to 4 times more common in boys than girls and was most prevalent in the 10 to 14 years age group. Most prevalent sites of all-age drowning were seas and rivers. Children attempting to save children at recreational areas increases deaths. Limited water safety regulations or legislation are currently available in the country.

Discussion
The average Malaysian childhood drowning fatality rate was below the global rate as well as the Western Pacific Region LMIC rate and closer to the HIC region’s rate. This may be due to some underreporting, as data was based on reported sources. Very limited data was available on the drowning event and mechanisms of events are not generally available. This however is the first comprehensive national study in Malaysia on drowning in children and serves to highlight the magnitude of the problem.

Outcome of Study
1. Drowning is now recognised as the second commonest cause of death in children aged 1-8 years and an important cause of death in adults.
2. Findings of this study have been presented at a national inter-agency stakeholders meeting, as well as to senior Ministry of Health managers, clinicians and researchers.
3. The report has been widely circulate, published and presented.
4. Numerous attempts have been made to establish a national drowning registry as well as include health messages on drowning prevention to sensitise parents.
5. Data has been shared with the media to sensitisise public on the size of the problem and key prevention messages However there has been a limited response. This appears to be due to a failure to grasp the size of the problem, other health priorities seem to take precedence and the mind set towards injuries is one of “unpreventable accidents”.

Conclusion
Despite being a large contributor to mortality, drowning deaths continue to receive insufficient attention as an important cause of mortality locally.

Reference:
A National Water Safety Council for Malaysia

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1. Drowning in Malaysia
Each drowning death is a tragic event and avoidable. Since 2004, there have been about 600 to 700 deaths by drowning in Malaysia each year.

2. Background to Water Safety Councils in the Region
Presently, no national government body exists to promote water safety and the reduction of the incidence of drowning in Malaysia comprehensively.

Few countries have such a national body. Australia formed their Water Safety Council in 1998, through the efforts of NGOs. The Australian Water Safety Council remains an NGO and no government is involved. Singapore formed its Water Safety Council in 2007 and comprises representatives from various government ministries and NGOs. Each of their Water Safety Councils was formed after tragic drowning incidences.

There are no Water Safety Councils in Thailand, Indonesia, Philippines, Myanmar, Vietnam or the rest of South East Asia. In our view, promoting water safety and the reduction of drowning should be undertaken by a government organization together with representatives from NGOs.

3. Need to have evidence based policies to reduce drowning
Effective national policies to reduce drowning must be based on evidence. Presently, several government agencies such as the Department of Statistics, the Bomba, the Ministry of Health and the Police as well as LSSM gather statistics on drowning. But their statistics differ. No agency investigates drowning in detail or examines its exact causes, eg., how it occurred, possibility of preventing or rescue and to formulate policies appropriately.

4. Formulating national policies from the evidence
More young children drown than adults, therefore special focus should be given to the young. What are special circumstances which a young child faces?

There should be adequate warning signs denoting danger to the young child. Very young children often cannot read and signs have to be in symbols. There exists universal and international signage to denote danger in water that should urgently be adopted in Malaysia. Signage must be taught. They can be paid for by communities, corporate sponsors and advertisers.

Drowning at working ages, between 21 and 55, are also high and effort should be made to understand the causes of such drowning. Are they work related, and, if so, policies should address the hazards of a particular occupation, to improve work conditions and training, the need for safety equipment and the improvement in rescue methods. If the drowning is related to leisure, there should be continuous education and promotion of a safe water culture and employees should be taught to swim.

Survival skills should be taught, for instance, to save one self fully clothed. There should be no contact between a potential victim and a saver.

5. Need to promote a water safety culture nationwide
There is a need to promote a water safety culture so that each individual will adopt appropriate measures to avoid danger in water and take own precautions. Such a water safety culture is best adopted on a family basis and at the workplace and should involve the teaching of children and employees. Each family member and employee should be trained to swim, to safe others, perform CPR and to respond effectively when faced with life threatening situations in water.

Regulations may be required in certain instances, for example, to place child proof safety barriers around swimming pools.

6. Effective, vandal proof safety equipment
Malaysia can introduce effective flotation devices that no one would wish to vandalize or steal, eg., used plastic bottles strung together, bamboo poles, used ropes. They can be paid for by communities, corporate sponsors or advertisers.

To carry out these proposals will require intervention of authorities, for example, gathering of statistics by government agencies, placing of signage and water safety equipment on public land, teaching signage to children in schools, regulating safety measures on pools and theme parks.

The Council should comprise representatives from several ministries – Local Government and Housing, Education, Health, Tourism, Home Affairs as well as NGOs like NIOSH, LSSM, Hotel Associations, academics.

Cost will be low if the Council acts as a secretariat.
KEY FACTS

- **372 000** people die from drowning EVERY YEAR

- OVER HALF of all drowning deaths are among those aged **UNDER 25 YEARS**

- **MALES** are twice as likely to drown as **females**

- Drowning is one of the **10 LEADING CAUSES OF DEATH** for people aged 1-24 years

DROWNING RATES

- **DROWNING MORTALITY** < 1.3 PER 100 000

- **DROWNING MORTALITY** 1.3-3.9 PER 100 000

- **DROWNING MORTALITY** > 3.9 PER 100 000

Data
The Global report on drowning prevention: Challenges and prospects for global progress

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The Global report on drowning is the first World Health Organization report providing a global overview of this public health problem which accounts for an estimated 372,000 deaths a year despite being largely preventable. Over half of all drowning deaths occur among those aged under 25 years, and rates are highest among 1-4 year olds. Drowning is one of the 10 leading causes of death for people aged 1–24 years in every region of the world.

The report presents the evidence for a range of interventions that are effective at preventing drowning. Among others, these include strategic use of barriers controlling access to water, provision of safe places for pre-school children such as village based daycare, and safe teaching of basic swimming skills to school aged children. The report also calls for better and more integrated flood risk management, improved boating, shipping and ferry regulations, and development of national water safety policies.

Drowning is a multisectoral issue, and has important intersections with a range of major agendas, including climate change, multilateral cooperation around irregular movements of migrants and asylum seekers, and the child and adolescent health agenda. This multisectoral nature means progress must ensure that prevention efforts are better coordinated with other sectors and agendas. Positioning drowning more prominently on international agendas will require that the drowning community approach the issue in a strategic, and cohesive manner.
Drowning in a sea of publications:
The state of knowledge and gaps in the 2014 literature

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Introduction
2014 represented a watershed moment for drowning prevention with the World Health Organization (WHO) publishing the “Global report on drowning: Preventing a leading killer” report [1]. While this report identified, what is commonly known by those working in the field, that drowning is neglected public health issue and there are 372,000 drowning deaths per annum worldwide (excluding intentional and disasters related drowning deaths), its greater strength was in the proposal of ten strategies for drowning prevention. While this document provide a path forward for drowning prevention worldwide there is a need to increase the evidence base.

Current knowledge of drowning epidemiology, in combination with the availability of country specific data acts as a useful consolatory and confirmatory tool for the research community [1]. However such efforts ideally need to be supplemented with solidarity in the research community which is directed at consolidating and confirming knowledge, identification of knowledge gaps and translation of research for practical outcomes. In an effort to foster such a process, a review of peer reviewed drowning publications was undertaken to provide a recapitulation of research undertaken, taken as a proxy of knowledge and translation opportunities in this important public health issue.

Aim
The aim of this literature review is to critically appraise the peer review publications about drowning that were published in 2014 as a means to explore research topics, methodology and to solidify the extent of current knowledge regarding drowning and drowning prevention. It is anticipated that the research community will benefit from this summary and find that if the process continue as an annual offering it will help to shape future research direction.

Methods
A review was undertaken in Safety Lit, Scopus and PubMed for articles published in 2014 which featured the word ‘drown*’. Depending on the database search interface the search was restricted to ‘drown’ appearing as a text word and synonyms (Safety Lit), as a keyword in the title or abstract in article or review pieces (Scopus) or as a Mesh term or Mesh major topic (Pubmed). The inclusion criteria was that the articles were published in 2014, written in English or a translated version was available, the focus was on drowning (as defined by van Beeck) or drowning prevention and included primary data [2].

Results
The initial search obtained 277 articles from the three searches however when duplicates were removed and after applying the inclusion criteria 106 papers were kept. Preliminary results of the 106, 84 were new research (i.e. generated own data or analysed existing databases for new ways of looking at a problem), 17 were review articles (i.e. reviewing existing literature/policies) and five were opinion pieces. Of these 106 papers majority concerned the USA (n= 17) followed by: multiple countries (n=11), Australia (n=6), Bangladesh (n=6) and Japan (n=5). Majority of articles concerned unintentional drowning events and were primary (i.e. the focus of the paper was on drowning versus secondary where drowning was not the primary focus of the article for example. the article was about suicide methods). Secondary analysis will incorporate a consideration of the thematic groupings, lessons learnt and gaps in the research in 2014.

Conclusion
This presentation explores one year of the drowning peer-reviewed publications. The value of conducting such a review, even a basic analysis, highlights the type of research being collected and the knowledge generation process. This review was undertaken to explore how future offerings may occur. Coordination of this information with reference to the identified areas strategies areas and directional agenda is required.

References available upon request.
Methodological Challenges in Estimating the Global Economic Cost of Drowning Mortality

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Data 1, Ballroom 2, November 4, 2015, 1:30 PM - 3:00 PM

The WHO has estimated global drowning deaths of 372,000 per annum. The scale of this loss of life clearly has social and economic consequences.

To date there have been few attempts to produce credible estimates of the economic cost of lives lost to drowning in low and middle income countries. Robust estimates of the economic cost of drowning are likely to have two potential uses. Firstly, they may help to raise awareness of the issue of drowning amongst policy makers, governments and other NGOs. Secondly, they are likely to help inform the drowning community’s efforts to estimate the cost-effectiveness of prevention measures and inform appraisal of different interventions to prevent loss of life.

To raise the issue of improving understanding of the economics of drowning and the challenges in doing so. We will brief attendees on the development of this work, and the outcomes, which will be completed over the first half of 2015.

The RNLI has prioritised this project in the first year of its international research programme with the objectives of raising awareness of the issue amongst policy makers and to inform the drowning community’s appraisal of cost effective intervention objectives in mind. But it is also with a particular focus on building an evidence base which can open discussions with governments about the importance of taking a strategic approach to drowning prevention policy.

In this study, the RNLI and our partner Frontier Economics have explored the extent to which methods used to estimate the cost of the road traffic accidents can be applied to drowning fatalities. Previous analysis by the International Road Assessment Programme (IRAP) assessed the applicability to low income settings of the pre-existing Human Capital and Willingness to Pay approaches to calculating the value of a statistical life. The study settled on pragmatic ‘rule of thumb’ estimates based on a ratio of the value of a statistical life to a country’s GDP per capita. As the IRAP authors highlight, the advantage of this approach is that it is consistent across different countries.

The aim of this study has been to explore the feasibility of adapting the IRAP estimates to account for (i) the profile of drowning fatalities (particularly the over-representation of younger age groups and hence a greater economic loss) and (ii) the lower medical costs associated with drowning incidents.

The study found significant challenges to achieving usable estimates; firstly, the lack of primary research into local values of a statistical life and costs of drowning via willingness to pay surveys. Limited data on willingness to pay to avoid injury exists but is rarely specific to drowning. It is therefore difficult to confidently identify the adjustments that should be made to road-traffic fatality estimates in order to apply them to drowning.

Furthermore, taking a “human capital” approach to estimating the value of a statistical life neglects wider economic costs beyond the projected economic impact of an individual. Secondly national drowning mortality estimates are subject to variable levels of data quality. This presents challenges to producing credible estimates. Nonetheless, the authors recommend further research to refine estimates of the value of a statistical life in LMICs and that economists should work with epidemiologists to identify countries where drowning data is sufficiently robust to produce credible estimates.

The intended outcome is to build an evidence base which can open discussions with governments about the importance of taking a strategic approach to drowning prevention policy.

• An understanding of the possible approaches to estimating economic costs of drowning.
• What the practical and ethical challenges to producing credible estimates are.
Review on the use of the Utstein Style for Drowning (USFD) as a tool to study drowning: preliminary results

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Data 1, Ballroom 2, November 4, 2015, 1:30 PM - 3:00 PM

Introduction
Drowning is a leading cause of death. In the past, many definitions and terms describing drowning were used. This hindered comparison of drowning studies. In 2003 the Utstein Style for drowning (USFD) was created to provide researchers a consensus based template for drowning research. (1, 2) Since then, several studies have used the USFD to study drowning. The USFD is currently being revised. To investigate its potential as a research tool and to aid the revision of the USFD, a review of the use of the USFD was performed.

Methods
A search in Pubmed, Web of Science (WoS), Embase and the Cochrane Library was performed on studies that used the USFD between 2003 and March 2015. Eight USFD drowning studies were identified (3-10). Subsequently, a search in WoS was performed on all (n=104) publications that cited the original USFD article. This provided 3 additional USFD studies. (11-13) The 11 USFD drowning studies were compared with each other with regards to the results, the number of USFD parameters used and possible suggestions for improving the USFD. In this abstract, the preliminary results of the review process are described.

Results/Discussion
In total, 22 (n=41, 54%) USFD-parameters were used in 5 or more studies. The USFD studies identified the importance of several parameters, including witnessing the drowning event, bystander actions, the season the drowning occurred in, temperatures, the initial cardiac rhythm, time related parameters and neurological testing. Therefore the results show that the USFD is a usable research tool. The 11 USFD drowning studies provided several suggestions for adaptation of the USFD as well. This might help in further improving the USFD in the current revision process.

Conclusion
The USFD is a usable tool for the purpose of drowning research and the USFD based drowning studies provided valuable suggestions that might aid the revision of the USFD.

References
The Use of Non-Utstein Style Drowning Terms since 2010: a follow-up study

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Data 1, Ballroom 2, November 4, 2015, 1:30 PM - 3:00 PM

Introduction
In 2002, the World Congress on Drowning developed the following standard definition for drowning: the process of experiencing respiratory impairment due to submersion or immersion in a liquid. From this definition, following a Utstein style of reporting, 3 outcomes were defined: morbidity, no morbidity, and mortality. In addition, recommendations were made for discontinuing the use of modifiers such as near, wet, dry, active, passive, secondary, as these do not hold any clinical importance (1). Since the establishment of the standard definition, the use of incorrect definitions and modifiers has remained prevalent in the scientific literature. In 2010, we conducted a systematic review of the literature specific to the prevention, surveillance, and treatment of drowning, published since 2002, and found that 42.7% of the included articles included non-Utstein drowning term use (NDTU); these results were reported at the 2011 World Conference on Drowning Prevention (2). Our current study is a similar analysis of the literature published since July 15, 2010, to determine the trend in NDTU since our last report.

Methods
We utilized Pubmed and Web of Science to search all peer-reviewed articles from July 16, 2010 to July 16 2015. The following search terms were used: “drowning”, “drowned”, “near drowning”, “secondary drowning”, “active drowning”, “passive drowning”, “wet drowning”, and “dry drowning”, “submersion”, and “immersion”. Using RefWorks®, the titles and abstracts of the initial cohort were screened for duplication and exclusion/inclusion criteria. Inclusion criteria were as follows: articles relevant to public health, surveillance, treatment, pathophysiology, and prevention of drowning. Exclusion criteria were as follows: purely forensic or microbiologic studies, non-peer reviewed publications, letters and editorials, non-human studies, and inability to obtain full text or an English version. From the final cohort, the following elements were extracted: presence of NDTU and presence of any specific drowning definition.

Results
The initial literature search resulted in 708 articles. By reviewing the titles, 464 were initially excluded due to being irrelevant to study focus, leaving 244 articles for full review. Of these, 96 met exclusion criteria (39 abstracts, 29 editorials/letters, 15 non-English, 11 unavailable, and 2 irrelevant content) leaving 148 in the final cohort. Reviewing these articles found a NDTU prevalence of 30.4% (45/148); the NDTU terms present were “near-drowning” (45/45), “secondary drowning” (2/45), and “silent drowning” (1/45). Prevalence of a specific definition for drowning was 31.8% (47/148), with 83% of these articles (26.3% of total) displaying the correct standard definition.

Conclusions
Compared with our original study evaluating articles from 2001 to July 2010, our current study reveals an absolute reduction in prevalence of NDTU of 12.3%. Similar to our original study, the most common term associated with NDTU was “near drowning”, which was prevalent in all articles displaying NDTU. Further analysis found an absolute increase in prevalence of a specific definition for drowning of 15.8%; the proportion of these articles displaying the correct Utstein-style definition for drowning also increase (35% absolute increase) from our previous study. These results reveal a promising evolution towards the utilization of proper drowning terminology in the peer-reviewed literature.

References
The Royal Life Saving National Fatal Drowning Database: 
An Historical Overview to Date

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Background
For the past 20 years Royal Life Saving Society – Australia (RLS) has been producing an annual National Drowning Report [1], that at a minimum identifies the age, sex, geographic location, category of aquatic location and type of activity being undertaken immediately prior to unintentional fatal drowning in all Australian waterways.

Information is primarily gathered from coronial records via the National Coronial Information System (NCIS) [2]. Additional information about the drowning incident is drawn from a range of other sources including media reports and police reports.

Aims
The RLS National Fatal Drowning Database aims to:
- Record all unintentional fatal drowning deaths that occur in Australian waterways
- House data in one location with consistently applied coding across a range of variables that is regularly checked and updated against the NCIS
- Provide a dataset that can be easily interrogated to respond to enquiries in a timely fashion

Target(s)
The power of the database is that it can be used to translate drowning prevention research and advocacy in a range of different formats to a wide range of audiences including the general public, government, the media and aquatics industry among many others.

Implementation
Data collated through annual drowning reports is collected in the same format as the RLS Database in an SPSS database [3]. Once data is confirmed for each financial year it is fed into the Database. All cases in the RLS Database are checked against the NCIS on a regular basis and information is updated as cases close within the coronial system.

Once a case has been closed within the coronial system and all available information has been collated against the variables the case will not need to be checked again unless additional variables are added.

A coding manual has been developed that sits alongside the Database and guides the researcher in determining both how to code and the mechanics of entering the data into the database to ensure consistency across each variable collected for each case.

Results
As at January 2015 – the Royal Life Saving National Fatal Drowning Database has 12 financial years of data in it, amounting to over 3,500 individual cases. Each case has a maximum of 103 variables where data can be added. Variables record a range of information including country of birth, medical conditions, day of week of drowning incident, season, involvement of drugs and alcohol (including blood concentrations) and information that allows us to link the location of the drowning with the relevant local government authority among many others.

Discussion
Data is used in a wide variety of ways to target different audience groups. The database has been used to generate media releases, social media posts and video infographics to translate the issue of drowning and our advocacy efforts to the general public. Specific enquiries have been run to contribute to research (including long term reviews of fatal drowning within a particular age group or location), media enquiries and to substantiate submissions to government.

Data quality, electronic availability of data and timeliness of reporting do vary between State and Territory jurisdictions which can present challenges when conducting research on a national scale but the longevity of the National Fatal Drowning Database allows us to continually monitor and update data from across the jurisdictions.

Conclusion
The development of the Royal Life Saving National Fatal Drowning Database has been a valuable project and a legacy item for many years to come. It provides the basis for greater collaboration domestically and internationally on drowning data collection and drowning prevention research.

Acknowledgements
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References
Safety in Numbers: developing monitoring and evaluation frameworks for drowning prevention programmes

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The problem/issue
Lifesaving organisations often have a rigorous focus on ensuring their work contributes directly to their main purpose; reducing the number of deaths due to drowning. In pursuit of this goal, the link between ‘traditional’ lifesaving activities, such as Search and Rescue or the provision of lifeguards and lifeboats, and the saving of more lives is usually demonstrable and measured through operational reporting.

The equivalent link between preventative interventions or advice and the number of lives saved is far harder to establish. At the same time, the importance of prevention is being increasingly recognised by the drowning community, with an accompanying desire to understand which programmes are most effective.

Aim of the presentation
This presentation will introduce tools and frameworks that enable drowning prevention organisations to identify and plan intermediate outputs and outcomes that are outside the realm of traditional SAR activity.

It will also outline how these tools (such as logic models and theories of change) can inform strategic planning, programme monitoring and evaluation.

Solution
The presentation will draw on the lessons learnt by the RNLI in designing monitoring and evaluation frameworks for our domestic Coastal Safety activity and our International programmes. The development of a monitoring and evaluation framework for the charity’s domestic prevention work has led to a focus on four key outcomes for the people we help:

• Knowledge: do people have an improved understanding of risk and coastal safety?
• Attitude: have people changed their tolerance of risk?
• Behaviour: do people enjoy the coast in a safe way?
• Engagement: are people engaged with the RNLI’s safety activities?

RNLI campaigns, products and programmes and community activities are designed to contribute to one or more of these outcomes.

Organisational outcomes
The project provided RNLI staff with practical advice on; designing evaluations which are proportionate to programme size, managing monitoring data and reporting findings.

Learning outcomes for attendees
This presentation will reflect on the benefits and challenges of creating and adopting new ways of planning activity, as well as the difficulties faced when aggregating evidence and data from highly varied programmes.

It will also draw comparisons between the monitoring and evaluation requirements for the RNLI’s UK work and those for our programmes in low and middle income countries.
Drowning Science will benefit from research conducted by experienced lifeguards assisted by academics - Practical example

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Drowning science took a great fuel injection after ILS started to organize a world conference on drowning prevention (1). Since the first conference in San Diego (1998), the number and quality of papers submitted has increased sharply. Still, papers are predominantly from epidemiologists, health professionals and university swim teachers around the world with little to any submissions from lifeguards. The language has also been a barrier for experienced lifeguards to join the drowning science domain. These have been the main underlying reasons for the gap in papers with tangible impact and applicability on real lifeguarding situations. Therefore, there is a high demand to be fulfilled by professionals with practical experience, who know better what is happening in the field of drowning lifesaving world – the lifeguards. Our objective was to provide new strategies to support the development and implementation of research projects among lifeguards.

Methods
A partnership project between Brazil and Portugal to encourage and support new research from Portuguese-speaking lifeguards, targeting the World Conference on Drowning Prevention (WCDP), in Malaysia 2015, was developed and applied through IDRA – the International Drowning Research Alliance, founded by a group of drowning research scholars, with the main objective of developing and supporting drowning research. Financial support and partnership was raised by some of the members to hire 2 consultant experts on drowning research to motivate and assist lifeguards to: find a good research question based on their daily needs, structure a study protocol or research plan, exercise the possibilities, collect data, debate appropriately the issue and attempt to come up with a conclusion that may aid them during their duties. All the support was conducted in Portuguese and only after the agreement of all was the abstract translated to English by the consultants, the official language of the conference.

Results
Around 305 abstracts were submitted to the WCDP 2015 with 200 accepted for oral/poster presentation. The partnership Brazil-Portugal has submitted 37 papers to the first round and 36 were accepted. This represents 18.5% of all submitted abstracts. A total of 15 different authors and 35 different co-authors were involved and of those 17 participated for the first time in their lifeguard career in such a project. The abstracts subject was well distributed along the 5 conference topics presenting relevant questions, with 9 been raised for the first time.

Conclusion
Since the first scientific conference organized by ILS, a lot has been accomplished on drowning science moving from a solely medical perspective to a much more broad and inclusive content with topics ranging from prevention, rescue, partnership, alliances, psychological issues, to pre-hospital care and many other new questions regarding real lifeguarding world have been raised and answered. This new kind approach to assist drowning science lead by IDRA, with the support of SOBRASA (Brazil) and ISN (Portugal) has shown that a lot can be done to motivate lifeguards to work in their own language to develop and implement drowning research projects and opened a new and important door for many real questions regarding lifeguards’ daily needs.

References
1. Queiroga, A.C., “Trends in peer-reviewed drowning research: evidence of an uneven effort around the world” Lifesaving Foundation Drowning Prevention and Rescue Conference, 27th-29th September 2012, Carlow, Ireland
Capturing and using geographically distributed drowning event data: A best practice primer

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There has been an unprecedented surge in availability of low cost GPS enabled mobile devices, and desktop and server based Geographical Information Systems (GIS). Many of these systems and packages are freely available and are flexible in terms of scale and type of analysis in addition to presenting visually appealing mapped outputs. The availability of such equipment is facilitating easy capture and plotting of geographically referenced aquatic related death and injury events (including fatal drowning, non-fatal drowning, rescues and injuries). However there are a number of potential pitfalls when analysing these events.

Geographic Information Systems typically enable the storage, manipulation, visualisation and analysis of geographically referenced data. Geographically referenced aquatic related death and injury events are generally stored as paired XY coordinates. These are referred to as ‘point’ events when captured with just paired coordinate references. Events with attribute data attached to them are known as ‘marked point’ events. Marked points have available different analysis techniques to be undertaken compared with points without attribute data attached.

Public health and drowning prevention agencies eager to capitalise on newly acquired or digitized drowning event data, are able to use a number of analysis and statistical packages in which to explore datasets. It is commonplace for a number of once traditional statistical packages to now have the ability to analyze geographical datasets. As such, the divide between traditional statistical packages and modern GIS is lessening; however GIS typically offer better integrated data support, analysis and visualisation of geographical data.

There is a danger of the analysis of geographically distributed drowning events being undertaken to produce misleading results as a result of simply accepting the default analysis settings (i.e. input parameters) on many of these available contemporary GIS or statistical software packages. Other potential analytical errors are specific to inappropriate cartographic representations and data management (i.e. aggregating and transforming) requirements prior to undertaking analysis tasks.

Model and map representation mismatches can occur simply as a result of having no, or poorly designed research methods and objectives. A lack of analytical project objectives results in an adoption of technique-driven approaches (i.e. what can the GIS do) rather than addressing research questions pertaining to any expressed hypothesis and/or seeking to ascertain any event patterning or anomalies.

Those analysing drowning events can avoid these pitfalls by leveraging off techniques and model workflows from other application domain areas such as geographic epidemiology and disease mapping. These application areas as specialty domains gained critical acceptance in the 1950’s and 1960’s.

What has resulted as an outcome of years of method development and model testing and validation techniques are a myriad of robust spatial techniques. Many of these methods and models have been developed to address known application issues and limitations when analysing geographically distributed data. These issues and limitations include dealing with location-based analysis at various scales, problems associated with aggregation and ecological fallacy effects and issues specific to dealing with location-based event counts.

Although there are a significant number of structured methods, models and techniques available to be used and explore data with, many of them still require the analyst to use professional judgment and expertise when applying them. We will provide an overview of available methods, models and analytical techniques suitable for the analysis of geographically distributed drowning events. This overview is aimed at providing knowledge of how best to avoid misspecified outputs and map representations.
SEGMAR: a data collection system to follow as example of good practice

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Data 2, Ballroom 2, November 4, 2015, 3:30 PM - 5:30 PM

The collection and processing of statistical data is an essential tool for safety management, to assess the services’ quality standards and performance, making a consistent evaluation throughout time.

In this sense and to ensure the on-going suitability of the Information Systems’ operational needs, the Maritime Technique Safety Division (DTSM) created, in 2010, the SEGMAR platform. This platform compiles reports of accidents on the waterfront.

The conception of SEGMAR platform, aimed to simplify the procedures for collection and processing of data, making them available in real time, covering a larger number of rescue-related agencies, providing a centralized instrument for data recording and processing.

Operational Methodology
The reports of all accidents and incidents are delivered on paper, to the port authorities, by the agents of the sea and water rescue, which are then dispatched to the DTSM. Before sending the records, the port authorities feed the data into the platform. The processed information is made available to bodies and services of the Maritime Authority’s General Management, Maritime Police’s General, Regional and Local Command, which in turn disclose it to the press or to entities that request it.

Results
The data are presented in tables and graphs. These can be considered, among other ways, by geographic area, time period, type of accident.

From 2011 to 2014 the following occurrences in the public water area were registered: 511 deaths by drowning; 394 deaths from other causes; 78 people missing; 1434 injured; 2783 rescued uninjured; 87 dead swimmers; 15 missing swimmers; 33 dead swimmers in supervised beaches; 84 dead swimmers at unpatrolled beaches and 67 deaths by falling from bridges.

For the same period, and detailing the events recorded with vessels there were: 23 collisions; 8 vessel’s listings; 42 sinks; 1 catastrophic flooding; 7 progressive flooding; 110 malfunctions; 10 collisions with objects; 2 disappearances; 14 groundings with propulsion; 14 groundings without propulsion; 1 explosion; 1 steering gear failure; 23 failures of the propulsion system; 27 fires; 26 other accidents. As a result of such accidents there were: 379 uninjured victims; 28 deaths; 23 people missing and 87 injured. The types of vessels involved were: 172 fishing boats; 1 tugboat; 310 recreational; 8 sports; 29 auxiliaries; 2 local traffic and 19 trade.

Conclusion
The SEGMAR platform is a valuable tool because:
• It allows access to updated data, treated every 24 hours;
• The recording of data is easy to fill, automatically generating a report with all the uploaded information;
• The data is available in general but also detailed;
• It’s possible and easy to introduce new fields of registration.

As system weaknesses it should be noted that some of the information may be lost from the time of occurrence until the registration on the platform and that access to data and its dissemination is still restricted to many agencies.

We expect to improve the data collection system, making it more effective and extend it to as many entities as possible, hoping that hospitals and health centres will soon access the platform and, through a code assigned to the victim, be able to report what happened to the victim, after checking in at the health centres and/or hospitals.
Lifeguard drowning Incident report form.
From design to field-test and improvement

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Data 2, Ballroom 2, November 4, 2015, 3:30 PM - 5:30 PM

An incident report form is an essential assessment tool for all rescue and lifeguard practice. These documents provide a set of specific environmental and clinical facts, that, when passed along the rescue chain provide valuable information, thus allow for a superior and comprehensive patient care.

Forms are a means of communication, compromising a set of deciphered text, symbols and graphics, posing the same set of questions, providing distinctive answers about the environs and the victim’s condition. They combine the means of formal input that answer questions, and in a critical life-saving environment such questions can provide the difference between life and death treatment and ultimately accident prevention.

Throughout the world different rescue authorities and lifesaving bodies have recurred to similar approaches in organizing such information, however over the past few years, organizations have been upgrading the design of such forms sheet. Nevertheless these incident report forms lack a fast and objective resolve.

The research conducted over a period of 4 years, with a 3 year field test, during the 5 months lifeguard season in Portugal busiest beach, over 50,000 users on a weekend day, provided an exhaustive insight on operations and ultimately providing the statistics for research to improve and defining what valuable information could help lifeguards and emergency response teams in provide a improved rescue service.

The aim was to create a standard straightforward lifeguard incident form, which could be processed in less than 60 seconds, thus reducing the amount of time lifeguards needed to complete such forms, and provide significant typological, environmental and clinical data, rendering incidents and accidents and valuable assessment tool.
Exploring the Use of Internet Tools for Drowning Prevention, Rescue, and Treatment

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Data 2, Ballroom 2, November 4, 2015, 3:30 PM - 5:30 PM

Drowning is a global epidemic as the 3rd leading cause of non-intentional death worldwide. More than 90% of these deaths occur in low- and middle-income countries. Drowning affects people from all ages, ethnicities, and socioeconomic status, although certain groups, namely children, are more vulnerable than others. Many High-income communities have reduced their risk of drowning, but continue to struggle in making drowning prevention a public policy or community health priority. Although death by drowning is a known global public health issue, there are paramount challenges in the reliability and collection of data and implementation of large scale drowning prevention and lifesaving programs even in high-income countries.

Critical steps in the drowning community’s mission to save more lives include finding new and innovative ways to collect reliable drowning data, collaborate across social media, implement cost effective drowning prevention education initiatives, and leverage local governments and communities.

One of the hallmarks of this challenge is providing information and education on prevention, rescue and treatment at a low cost. In the digital age, the most powerful and cost effective way to deliver content is through online platforms. The sharing principle of the Internet allows the value of a single prevention program to be multiplied, increasing the benefit while maintaining low costs. Web programs and technologies also efficiently target young people, an age range that is at higher risk for drowning. Programs can tap into existing networks and trends that span across cultural and socioeconomic spectrums.

The authors propose a classification of the value and pitfalls of existing internet tools. Consideration is given to ease of use, time- and cost- effectiveness in relation to their impact in each performance category described below. Existing and future aspects of drowning prevention, rescue and treatment initiatives are explored.

Methodology
Case examples of Internet tools (Webpages, Blogs, Social Media [Facebook, twitter, and others], mobile communication applications [WhatsApp, Viber, Skype], Email, LinkedIn, and Research Gate) with content on drowning prevention, rescue, and treatment are categorized according to their functionability in 8 performance categories: Internal Administrative Communication, Internal Operations Communication, External Indirect Communication, Public Education Campaigns, Professional Education, Collaborative multi party communication, and Searchability.

All internet tools identified in the review are examined, categorized, and rated according to their effectiveness (financial cost, time commitment, and ease of use).

Results
A matrix is created to show the effectiveness of each tool in each performance category. There are varying degrees of use in many of these tools; many function in multiple categories with varying rank, and many have a free or paid option that vary significantly in cost. In performance categories associated with number of people reached, impact increases with financial cost. For other tools that relate to internal communication, free tools such as email and mobile applications are much more affected by time commitment than cost, but rate higher in ease of use/access. The results for different Internet tools and their value vary from region to region but not much, as certain technologies are more prevalent in some areas more than others. Real examples from the Internet are selected to demonstrate each categorized tool.

Conclusion
The Internet is an underutilized tool in the drowning field. By developing categorization and ranking of these technologies, drowning prevention organizations, research institutions, and rescue agencies will be able to implement more efficient education and rescue programs, collect better data, and better understand and address the complex issues of the global drowning epidemic. This may offer drowning prevention organizations in both high-income and low- and middle-income nations resources to decrease cost, increase quality of impact, and expand their mission.
Drowning hazards on rocky coasts: A new method for quantifying drowning exposure for microtidal rock platforms

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Data 2, Ballroom 2, November 4, 2015, 3:30 PM - 5:30 PM

Rock fishing has been described as one of the most hazardous sports in Australia. On average > 15 people drown each year while fishing on rock coasts after they are washed into the sea by waves. Reducing the number of these incidents is a priority for Surf Life Saving Australia. Following from the success of the Australian Beach Safety Management Program (ABSAMP), where beach geomorphology underpins a safety rating system, this research investigates the physical morphology of shore platforms and their associated wave dynamics in order to develop a quantitative index of exposure to waves. The aim of the research is to develop a simple methodology which can be used by managers worldwide to inform users of the potential risk when recreating on rock platforms and thereby direct life saving resources to areas of greatest hazard.

The seaward edge of a shore platform is the area where most wave energy is dissipated on a rocky shore. It is also where rock fishers most commonly stand. The elevation of a platform will strongly influence whether waves can wash across a platform. Platforms at lower elevations are more susceptible to wave overwash than those at higher elevations. The depth immediately offshore of a rocky coast also determines how much energy can reach the shore platform edge; the deeper the seabed immediately offshore of the platform, the higher the wave energy. The relationship between these two variables provides a mechanism for quantifying the likelihood of wave overwash and has been termed morphological exposure.

In this study we utilize airborne marine and terrestrial LiDAR from Victoria, Australia, in order to quantify the variation in morphological exposure along a 60 km long section of the Great Ocean Road. Morphological exposure was found to be highly variable along the coast and often varied significantly between sites in close proximity. The results highlight the site-specific nature of wave hazard. The results also show the utility of the method for rapid hazard assessments over wide spatial scales. The morphological exposure index therefore provides a critical first step in the development of a holistic coastal drowning strategy for rocky coasts.
Multicenter Drowning registry on epidemiological, prevention, rescue and life-support data

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International data severely underestimates the actual drowning figures. Even for high-income countries, epidemiologic data accounts for only 6% of the problem because death and statistics exclude many nonfatal drowning patients and drowning deaths due to disasters; and many death certificates register the consequence of drowning as the cause of death. Prevention, rescue and life-support activities services are typically provided by distinct agencies, which report their own data with no follow-up or data crosschecking among agencies. Also, definitions and terminology used by most institutions are still not the same and comparison leads to many biases and to an unproductive attempt to compare data. The first steps in addressing the underreporting of drowning have recently been taken; however, better and standardized data collection is needed.

An innovative concept on drowning arena has been taking shape since 2011 – the “Web-based multicenter agency Bulletin report on drowning” Project. Initiated then and presented at the 2013 ILS Medical Commission Meeting (Potsdam), aims to centralize, in an online platform, updated information from different agencies involved in all areas of drowning data collection, providing the possibility to compare data among agencies from across the globe.

Methods
A literature search for report systems used worldwide in similar fields and on drowning was conducted. Then a live and electronic debate was promoted among IDRA network to create a draft of the strategic development plan.

Results
There are many systems in medicine including pre-hospital or hospital attendance but few include both. We found a good reporting system for trauma used as good practice for this project. We’ve identified the relevant questions to be answered in order to create the proposed overarching reporting system for drowning.

What purposes should the project serve, in order of importance?// Who are the primary target audiences?// What are the strengths and gaps of presented systems?// Why do we need a registry drowning system?// What are the strengths and gaps of these systems?// Balance between dataset “essential to know” vs. “good to know”.

A second round of debate is aiming to determine:
- Definitions and terminology of all relevant data to collect; In which and how many topics data will be collected (epidemiological, prevention, rescue, life-support)?
- Who and how data will be collected?
- How to interconnect different timeline data on attendance in the same patient among different services?
- Different restriction levels of accessing the data on-line?
- How and which data will be of free access for the public and media?

A third round is being conducted involving an extended group of drowning experts, from practitioners to academics, (Delphi process) in order to set a core group of leaders, as well as to gather key areas of consensus around project’s strategic goals, operational plan, feasibility, performance indicators, and sustainability.

A fourth round will be to build a beta-version of the web-based drowning report and validate it by applying it to 3 different drowning services systems, preferentially in different countries.

A fifth round will be reevaluation of what’s being collected to improve the relevance of information provided to all interested.

Conclusion
During the WCDP2015, results of the first 3 rounds will be presented and a beta-version of the web-based platform discussed. We’re aiming to bring together a broader group of experts and stakeholders to discuss and establish the need and the format of such an online tool, available for use by all lifeguarding and medical emergency agencies towards mitigation of the burden of drowning by a uniform registry of drowning patients from across the globe.
Role of the International Journal of Aquatic Research and Education in World Drowning Prevention

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The estimated number of annual worldwide fatal drownings ranges from 350,000 (World Health Organization) to 800,000 (International Life Saving Federation). Moran proposed an “iceberg phenomenon” exists with a 10:1 ratio of non-fatal to fatal drownings suggesting the scope of all kinds of drownings probably ranges from 3.5 to 8 million individuals worldwide each year. International drowning prevention experts have proposed a wide variety of approaches for addressing the drowning pandemic including a variety of prevention strategies such as learning to swim and improved supervision as well as improved rescue procedures such as improved lifeguard training and CPR.

Regardless of the proposed preventative vs. rescue approaches, strong agreement exists that widespread public education is a critical component that must underlie any holistic approach to drowning prevention. The mission of the International Journal of Aquatic Research and Education (IJARE), a scholarly peer-reviewed quarterly publication from Human Kinetics, includes such a public education role through the publication of both evidence-based research as well as professional and educational articles such as position statements and reviews. A stated goal of IJARE is to serve as an international forum for the discussion of any and all non-competitive aquatic issues and topics including water safety and drowning prevention.

During its nine year history, in excess of 55% of the approximately 195 published articles have dealt directly or indirectly with drowning or drowning prevention which supports the argument that IJARE has served as a major venue for disseminating information and research on drowning prevention. Several major limitations exist that have restricted the impact of IJARE as a major source of drowning prevention education. The first is that a limited number of citation indices have been willing to index IJARE, reducing the awareness of the double-blinded publications. The second major limitation has been the fact that IJARE as a proprietary publication of Human Kinetics Publishers has required a subscription fee to access publications. Both of these limitations are being addressed by switching the online submission, review, and publication platform from ScholarOne’s Manuscript Central that requires an expensive subscription by the publisher to BePress’s ScholarWorks which is supported by University Libraries at Bowling Green State University.

By the end of 2015, the journal is switching from a print and online quarterly publication requiring a subscription to a solely online electronic open access publication. This switch means that past and future publications will now be searchable and accessible to any and all interested parties. It is estimated that despite not having a journal impact factor or inclusion in Medline or PubMed, all IJARE publications will be openly available to anyone with access to the internet. Authors will have access to the number of downloads for their publication which is a much more accurate and direct impact measure. The intended outcome of the change to the journal’s publication will be a much broader and extensive impact on the aquatic literature including drowning prevention publications. The editor and editorial board along with ScholarWorks will monitor the overall number of publication accesses compared to the average from the previous 9 years. We will publish the resulting statistics for public awareness and general consumption as well as for the information of individual authors.
Epidemiology of drowning among fishing communities on the shores of Lake Victoria in Uganda

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Introduction
Drowning is a major but neglected public health problem, particularly in low and middle income countries (1). A study of injury patterns in Uganda found that drowning was the leading cause of fatal injuries in a rural district, accounting for 27% of injury deaths (2). Despite frequent media reports of drowning incidents, the magnitude and nature of the problem are not well known.

Study objectives
To determine the drowning burden among the fishing communities in four districts on the shores of Lake Victoria in Uganda, to explore water safety knowledge, attitudes, and practices, and to evaluate utilization of life jackets.

Methods
Two urban and two rural landing sites along the Ugandan shores on Lake Victoria were purposively selected because of their large sizes. Interviews were conducted using a semi-structured questionnaire in June 2014. Individuals were eligible for inclusion in the survey if they were 18 years and above, and observed disembarking from a boat on the selected landing sites. Research assistants approached the disembarking passengers, explained the purpose of the survey, and requested for consent to participate in the study. Quantitative data were entered into EPIDATA V3 and imported into STATA V12 for analysis.

Results
544 respondents, 81% were male, 86.7% below 45 years, and 68.9% were either married or cohabiting. Over 90% had been to school, and 51% were either fishermen or fish traders. Others were general merchandise traders (15.3%), and boat crew (14.1%).

Over half (57.8%) of respondents reported having been on a boat that nearly capsized, and 21.7% on a boat that actually capsized. Of the latter category, nearly half reported that at least one person on that boat drowned. 38.9% reported that at least one member of their family had ever been in a life threatening event in water. More than two thirds of those family members (n = 141) drowned in the event.

The majority (91%) of drowning occurred either during transportation or fishing. The most frequently mentioned factors in the capsizing of the boats were stormy weather and overloading.

Less than half (48.7%) of the respondents reported being able to swim. Swimming ability did not appear related to the frequency of being on the lake.

One third (33.9%) of respondents reported owning a life jacket, and two thirds (67%) reported using life jackets. However only 26% were observed to be wearing a life jacket when they disembarked. Use of life jackets did not appear to be influenced by gender, age, or swimming ability. Respondents attributed the low rates of life jacket use to uncertain jacket quality on market, cost, and ignorance of the value of using jackets.

Many people did not know how to call Marine Police for help. Safety measures such as life jackets, and sailors’ skills training were entirely up to the individual. Strategies suggested to increase jacket use included providing free jackets, subsidizing the cost of jackets, and enforcement. People were willing to pay between US$12 and US$60 for a good quality life jacket.

Discussion
Results showed high rates of drowning but poor preparedness and responses by the communities and authorities. The drowning seen in these communities is markedly different from that which is widely reported in the literature, especially from Asia, in that in the studied Ugandan communities, it is a livelihood and occupational problem, mostly among male adults, whereas in most other settings drowning is a childhood and environmental problem.

Conclusion
Drowning is a major problem in these communities. Preventive interventions such as the use of life jackets, regulation of vessel quality and management, enforcement of loading limits and life jacket use, and improved rescue services should be prioritized. The role of swimming training in this environment needs further study.

References
The burden of drowning on Lake Victoria and surrounding communities in Uganda

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Introduction
Drowning is a major but neglected public health problem in Uganda. 18% of Uganda is covered by water and thus poses a high risk of drowning. A 1998 study done in rural Uganda indicated that drowning was a leading cause of fatal injury (27%). Uganda Police Marine Unit records about 1000 drowning deaths annually. Uganda has limited drowning research and data. The study set to determine the burden of drowning by establishing the fatal and non-fatal drowning rates; risk factors and documenting current preventive initiatives in Uganda.

Methods
A household survey was conducted in 7 districts of Uganda namely; Buikwe, Buvuma, Jinja, Kalangala, Mpigi, Rakai and Wakiso for 13 weeks (May- August 2014). Household heads were targeted and a 3 staged sampling was used to identify villages and households. Qualitative and quantitative data was collected by 10 trained research assistants. Structured questionnaires, key informant interviews and focus group discussions were the data collected methods employed. Data was entered, cleaned and analyzed in Stata software package. Ethical clearance, special permission and written consent were obtained. Confidentiality was considered.

Results
Households (2,127) and 9,741 individuals were surveyed. Prevalence of drowning was 27.1% (95% CI). Drowned people (55%) were aged 25-44 years, 24% were aged 15-24 years, 13% were 5-14 years, 6% were 45-64 years and 2% were below 5 years. Males (94%) drowned. Drowning (46%) occurred 12 months prior, while 27% occurred 24-36 months and 27% during 48 months. Majority (67.3%) drowning occurred in <5km away from the lake. Drowning occurred 58% while fishing, 19% during transportation, 10% when swimming, 3% while fetching water, 2% while playing near the lake, and 1% while toddling. Drowned (43.8%) had swimming skills. Main outcome of drowning was death constituting 72.4% (fatality rate).

Major causes of drowning were bad weather, conditions of water vessels (quality, type, overloading), substance abuse (alcohol, drugs), and illegal activities. Major risk factors established were sex, setting, occupation, distance of residence from the lake, type of water vessel and drowning knowledge levels. The risk factors were statistically significant. Residing in rural settings puts one more at risk for drowning than in semi-urban (OR 0.7). Peasant farmers were more at risk for drowning than civil servants (OR 0.5). Living very near lake (<5km) puts one more at risk for drowning than living near (=5km) - OR was 0.7. Using boats puts one more at risk for drowning than using canoes (OR was 2.9). Knowledge levels on drowning were significantly associated with drowning. Using the lake as transport means puts one more at risk for drowning than using it for fishing.

Conclusion
Prevalence of drowning on Lake Victoria is very high and associated with high mortality. Drowning on Lake Victoria is associated with fishing as an occupation.

Recommendations
The meteorological weather forecasts, communication and maritime traffic systems should be improved. Lake rescues, mass sensitization, data and research collection should be improved. National water safety plan should be in place.

Current prevention initiatives

Challenges and opportunities
Uganda’s biggest challenge is the old existing laws and policies, while one major opportunity is the review of existing maritime laws and the formation of a maritime autonomous agency to handle water transport.
Who rescues who: A Queensland, Australia investigation

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Data 3, Ballroom 2, November 5, 2015, 11:00 AM - 12:30 PM

Trained rescue professionals, both volunteer and paid rarely drown while attempting a rescue. In the period 1 July 2013 to 30 June 2014 Surf Life Saving Australia carried out 11,711 rescues [1] which is only one part, size unknown, of the overall rescues undertaken by non-lifesavers such as surfers, and other swimmers. In the same period 2% of the 266 drowning deaths in Australia were while a person undertaking a rescue [2]. Many rescues where the rescuer drowns is due to the rescuer trying to save a loved one, coined the aquatic victim-instead-of-rescuer (AVIR) syndrome [3] and three quarters (74%) of the time the primary victim survived [4]. It is recognized that this syndrome is challenging to prevent as the altruism of the rescuer is both lauded as a hero in many societies and the action occurs often without much consideration of their own safety and how to effectively undertake the rescue [4]. It has been postulated that many of the deaths could have been avoided with simple rescue techniques such as rope throw skills, however one study noted that only 1 in 5 were able to throw a rope 10m to within 2m of the target and that 20% of people forgot to secure the rope before throwing [5].

While we are starting to gain a picture of the rescuers who drown, there is still the fundamental question of ‘How do we prevent future similar events from occurring?’ To help answer this question we need to know who is currently undertaking rescues, what skills they currently have, and the specific of the rescue being undertaken.

This study aimed to:
- Provide a profile of who has undertaken a rescue.
- Explore if they were a life saver at the time.
- Explore where the rescues were being undertaken.
- Explore who they were rescuing.

Methods
In 2013 the Queensland Social Survey (QSS), a stratified (by age and gender) randomized computer assisted telephone interviewing (CATI) was used to collected data from Queensland households with a fixed phone line. The QSS is an omnibus style survey which collects basic demographic information from the respondent and other users are able to add questions to this survey. Six questions were added around rescue experience and rescuee. The response rate was 41%.

Results
There were 1293 people who participated in the survey of which 671 (52%) were males, of these 294 (24%) had undertaken a rescue at some time in their life, with the majority (213; 72%) having undertaken only one rescue. Most people (251; 85%) were not a life guard at the time. Also most of the rescues (249; 85%) were more than 5 years ago. Common locations where the rescue occurred were: beach / ocean / harbor (36%), home swimming pool (20%), river / creek / stream (18%) and other swimming pool (13%). Just under half of the rescues were of a stranger (42%). The mean age of the rescued person was 15 years with nearly a quarter (24%) being aged 3-6 years.

Conclusion
While undertaking a rescue is a rare event it is not uncommon and the likelihood of someone undertaken a rescue in their lifetime is 1 in 4, most commonly this will be a person they do not know, yet is likely to be a child. While beach / ocean / harbor were the most common location; rescues occur in all location where there is water. These results reinforce the need for all to be trained in aquatic rescue skills to ensure survival of both rescue and rescuer.

References available on request.
Children reporting rescuing other children drowning in rural Bangladesh: a descriptive study

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Data 3, Ballroom 2, November 5, 2015, 11:00 AM - 12:30 PM

Background
SwimSafe, a basic swimming and safer rescue curriculum, has been taught to large numbers of Bangladeshi children since 2006. This study examines the frequency and characteristics of rescues reported by children who graduated from SwimSafe and compares them with age-matched and sex-matched children who did not participate in SwimSafe.

Methods
Interviews were conducted during the swimming season in Raiganj, Bangladesh. Data were collected from 3890 SwimSafe graduates aged 6–14. Two age-matched and sex-matched controls were selected; one who had learned to swim naturally, the other who had not learned to swim normally.

Results
188 rescues were reported by the three groups. The 12–14-year age groups reported the highest monthly rate of rescues (SwimSafe 10.5/100 000 (95% CI 3.4 to 24.5), natural swimmers 8.5/100 000 (95% CI 2.2 to 21.2)) and annual rate of rescue reported (SwimSafe 25.4/100 000 (95% CI 13.2 to 43.9), natural swimmers 35.4/100 000 (20.8 to 56.2)). Reported rescue numbers among both swimming groups was similar. Mean victim age was 4.1 years and 92.5% were under 7 years. All victims were younger than their rescuer (mean 5.9 years less). Most rescues (73.7%) took place in ponds or ditches with most (86.6%) within 10 m of the bank. Most victims had entered the water to bathe (53.8%). A large majority of reported rescues (90.9%) were conducted with the rescuer in the water, half requiring the rescuer to swim.

Conclusions
Children report frequent drowning rescues of younger children in rural Bangladesh. Most reported are contact rescues with the rescuer in the water. Formal training for in-water rescue techniques may be needed to reduce the risk to the child rescuer.

References
River drowning deaths: A systematic literature review of the epidemiology, risk factors and strategies for prevention

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Data 3, Ballroom 2, November 5, 2015, 11:00 AM - 12:30 PM

Introduction

Rivers, creeks and streams (rivers) are the leading location for drowning deaths in Australia, accounting for 20.3% of drowning deaths in Australia between 1 July 2002 and 30 June 2007 [1]. There are a range of contributory factors that lead to drowning in rivers [2], including the use of alcohol, the absence of life jackets when using watercraft and exposure to flood waters [3].

To date there has been limited research into drowning in rivers in Australia. Little is known about the risk factors, use of rivers, who is at risk, what role alcohol plays and the impact of flooding. To this end, a systematic literature review will aim to identify research that has been published on river drowning deaths and interventions internationally.

Aims

The aim of this research is to:

- Describe the current state of knowledge about what is currently known with respect to the epidemiology, risk factors and drowning prevention strategies associated with drowning in rivers, creeks and streams.

Targets

This research is aimed at those interested in drowning prevention particularly those practitioners working in rural environments or countries who experience drowning fatalities in inland locations.

Methods

Literature published in the English language between 1980 and 2014 were searched using Medline; Scopus; ScienceDirect; Embase; PsychInfo; SafetyLit; SportDiscuss and the Cochrane Central Register for Controlled Trials.

Initial search terms were “drown*” and “river*” and/or, “creek*” and/or, “stream*” – these were deliberately broad and were not qualified by publication type or methodology to ensure that all relevant articles could be located. A manual search was completed for all references retained for data extraction. Grey literature was searched using the World Health Organisation (WHO) search methods and protocols.

The literature focused on unintentional (and non-fatal) drowning in aquatic locations classified as rivers, creeks and streams (or corresponding language in other countries).

Results

An initial search of MedLine using the terms drown* and river* and/or, creek* and/or, stream* limited to English language, 1980 to 2014 and humans returned 82 results.

Research is currently being undertaken and full results will be made available prior to the conference.

Discussion

There is limited research which has explored the epidemiology, exposure and prevention strategies related to drowning in rivers globally. Current strategies in drowning prevention focus on beaches [4], backyard swimming pools [5], commercial swimming pools [6] and boating [7]. There is a need for good evidence based drowning prevention interventions for rivers to be developed based on a sound understanding of the epidemiology, risk factors and exposure.

There are a range of contributory factors that lead to drowning in rivers. Any interventions designed to be successful in preventing drowning in such aquatic locations must be evidence based and take into account a number of risk factors.

Conclusion

With rivers, creeks and streams the leading location for drowning, accounting for 25% of all drowning deaths in Australian waterways between 2002 and 2012, preventing unintentional river drowning fatalities will go a long way to reducing the overall burden of drowning experienced in Australia annually.

Acknowledgements

The drowning prevention work of Royal Life Saving Society – Australia is supported by the Australian Government.

References

Autonomic conflict – cardiac arrhythmias following cold water immersion and submersion

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Data 3, Ballroom 2, November 5, 2015, 11:00 AM - 12:30 PM

The USA Triathlon (USAT) Fatality Incidents Study reviewed data over an eight year period (2003 to 2011) and reported that 30 of the 43 deaths reported occurred during the swim, in what are presumed to be competent swimmers with no reported deaths in training (1). The causality of these deaths remains unclear. All occurred in open (assumed cold) water, with additional sympathetic stimulation from exercise and the competition specific sympathetic stimulants of anxiety and anger/over competitiveness seen during mass starts and points of congestion e.g. tight turns.

Parasympathetic stimulation may be enhanced by enforced breath holding in the confused water of a mass swim (2). This leads to the suggestion that Autonomic conflict (co-activation of the sympathetic and parasympathetic limbs of the autonomic nervous system resulting in fatal cardiac arrhythmia (3,4)) may be a cause of sudden cardiac death in open water swimming. When extrapolated to the general populace it is feasible to suggest that autonomic conflict, with subsequent cardiac death, may occur in an individual who accidentally finds themselves disorientated (with associated fear and anxiety) in cold water. The arrhythmogenic nature of such events may be exacerbated in certain disease states e.g. Ischaemic heart disease or long QT syndrome.

The aim of this study was to examine the arrhythmias associated with the co-activation of the parasympathetic and sympathetic limbs of the autonomic nervous system by immersion and submersion in cold water with exercise and involuntary hyperventilation.

This study used a within subject repeated measures design, with each participant (N=9) being their own control. 3 environmental conditions were examined consecutively on separate days: Air (20°C), tepid water (25°C) and cold water (15°C). In each condition they performed standardised exercise for 2 minutes prior to breath holding. In the two water conditions the initial breath hold was whilst immersed (head out), followed by a further 1 minute of exercise and breath hold during submersion (head under). Inspiratory volume, respiratory rate, fractional end-tidal carbon dioxide (FetCO₂), pulse-oximetry (SpO₂) and electrocardiography (ECG) were measured.

The incidence of arrhythmias, within 15 seconds either side of break of breath hold, was significantly higher with submersion in cold water compared to all other conditions. (No. of arrhythmia episodes [N participants] data: tepid immersion 11 [N=9]; tepid submersion 15 [N=8]; cold immersion 12 [N=7]; cold submersion 27 [N=7]). One participant was withdrawn from the study at their choice after attempting tepid water submersion due to a feeling of being unable to hold their breath. A second was withdrawn from the study after meeting the exclusion criteria of multiple ventricular ectopics during attempted breath hold in a cold water immersion.

In the air test there were no significant arrhythmias.

In conclusion this study suggests that increasing the intensity of stimulus to both sympathetic and parasympathetic limbs of the autonomic nervous system results in an increased incidence of cardiac arrhythmia. These observations add further evidence to the suggestion that autonomic conflict is a cause of sudden cardiac death. An inability to breath hold during tepid submersion and participant exclusion due to excessive arrhythmias is itself an insight to potential causality.

References
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Fiji: review of the drowning case from May 2012 - April 2015

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The presentation focuses on the key findings from the extensive and collaborative study carried through by the Water Safety Council FIJI (WSCF) from May 2012 to April 2015.

To further demonstrate the implementation of the tightly focused quality assured research project, the WSCF worked at close hand with Fiji Police Force, Fiji Meteorological Services and Fiji’s Ministry of Health and Medical Services.

The core findings found that the majority of the drownings occurred within the cyclone seasons with drownings increasing year on year since 2012. The research further focused on illustrating who is drowning against geographical influences, demographics and primary contributing factors such as time of year and core activity being undertaken by each victim.

Evidently, the findings encourages the need for ongoing collaboration and research to develop, implement and imbed tailored strategies into core educational, disaster management and drowning deterrent programs to “prevent one of the leading causes of unintentional injury death” – drowning (World Health Organization, 2014).

WSCF’s purpose is to champion lifestyle change in water safety measures through a collaborative, educational and research approach on drowning prevention.

References
International Tourists and Unintentional Fatal Drowning in Australia – A 10 Year Review 2002-2012

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Data 4, Ballroom 2, November 5, 2015, 1:30 PM - 3:00 PM

Introduction
It has been postulated that tourists may be more at risk of drowning than residents of a country given their unfamiliarity with the hazards and risks that particular aquatic locations may pose.

Tourism is a key part of Australia’s economy. In 2013/14 The Australian Bureau of Statistics recorded 6,672,900 short –term international visitors to Australia [1]. International tourism is estimated to be worth $11.4 billion dollars to Australian’s Gross Domestic Product (0.8%) [2].

Previous research found that accidental drowning/submersion accounted for 5% of all deaths of overseas visitors to Australia between 2001 and 2003 [3].

Aims
This research project aims to:
• Identify the incidence of drowning among international tourists in Australian waterways between 1 July 2002 and 30 June 2012
• Examine the risk factors associated with drowning deaths of international tourists in Australian waterways
• Discuss potential strategies for preventing drowning deaths among international tourists to Australia

Targets
The targets of this research are drowning prevention practitioners and those with an interest in the Australian tourism industry.

Methods
Data is drawn from the Royal Life Saving National Fatal Drowning Database [4]. Cases are identified through media and police reports and then cross-referenced against the National Coronial Information System (NCIS). A number of variables are collected through the NCIS including the victim’s residential postcode. Victims who do not reside in Australia are given a residential postcode of 7777 within the Database. Data was collated and analysed in SPSS [5].

Results
Between 1 July 2002 and 30 June 2012 drowning deaths among people known to be overseas tourists accounted for 4% (n=126) of the 2,946 drowning deaths reported in Australian waterways across this 10 year period.

With respect to the rate of drowning per 100,000 visitations, the yearly average across the ten year period is a rate of 0.23 drowning deaths per 100,000 visitations.

Men account for the vast majority of overseas tourists who drown in Australian waterways (79%). The largest proportion of drowning in male tourists in Australia occurred in the 25-34 years age group (21%).

Drowning deaths occurred primarily at the beach (36%) and in ocean/harbour (26%) locations, with a further 19% drowning in inland waterways such as rivers, creeks, lakes and dams.

The largest number occurred as a result of swimming and recreating (49%), followed by diving (scuba diving, snorkelling etc) (20%) and watercraft (13%).

Alcohol was known to be involved in 11% of drowning deaths, with the largest number of alcohol-related drowning deaths occurring in the 25-34 age group (36% of all alcohol-related drowning deaths in overseas tourists).

China (10%) was the country where the largest number of drowning victims lived, followed by Japan (9%) and England and the United States of America (8% respectively).

Discussion
Preventing drowning deaths among international tourists is an important part of maintaining Australia’s reputation as a safe destination for visitors as well as reducing Australia’s annual drowning toll. These figures follow trends among Australian residents, that males, particularly those in early adulthood (18 to 34) should be the target of drowning prevention interventions. Any interventions must also focus on the risks of alcohol.

Drowning prevention education and interventions must also target those international tourists recreating at the beach and in our oceans, predominately when swimming and diving.

Conclusion
With the health and safety of international tourists an important issue for Australia and other tourist destinations, it’s vital that drowning prevention practitioners consider strategies for reducing drowning risk among residents as well as visitors to their country.

Acknowledgements
The drowning prevention research of the Royal Life Saving Society – Australia is supported by the Australian Government.

References
Aquatic related death and injury in Victoria, Australia

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Background & Aim
Drowning is a major cause of injury and death worldwide. However, there is little information on the broader picture of non-drowning injuries that occur in aquatic environments. This study aims to provide evidence on all aquatic-related incidents attended by paramedics in Victoria, Australia utilising data from Ambulance Victoria (AV).

Methodology
A retrospective study was conducted for all aquatic related incidents including fatal and non-fatal drowning incidents and other water incidents, attended by ambulance paramedics in Victoria from 2007 to 2012. Potential cases were identified electronically.

Drowning patients were classified into two groups, namely ‘fatal’ and ‘non-fatal’. Drowning was defined in accordance with Recommended Guidelines which state that drowning is a process resulting in primary respiratory impairment from submersion/immersion in a liquid medium. Water incidents included all other cases that occurred in an aquatic environment such as traumatic, sporting and boating accidents, as well as falls/slips where nil respiratory impairment was recorded. Data for non-accidental drowning or injury were excluded from the analyses.

Spatial data analysis was used to determine relative risk ratios for all aquatic events to identify areas of high risk. Relative risk ratios across different geographic units were devised by a count of events per geographic unit, using a Geographic Information System. The geographic units selected for the study were Victorian Local Government Area (LGA) administrative units.

Results & Conclusion
There were 1033 cases identified in the six year study period. Of these 524 (51%) were water accidents, 339 (33%) were non-fatal drowning, and 170 (16%) were fatal-drowning. The overall incidence of water related injury mortality and morbidity was 3.16 per 100,000 population.

Children aged 0-4 years accounted for 43% of all non-fatal drowning incidents compared with 13% of water incidents and 12% of fatal drowning incidents. Those aged between 5-64 years were more commonly injured in water incidents (82%). Older adults aged 65 years and over were more likely to suffer a fatal drowning (26.0%, p<0.001). Males were consistently more likely to be involved in any incident (62%).

The majority of incidents occurred in a public place (69%), during summer (53%). Water incidents were most likely to occur in the ocean (44%), followed by public swimming pools (21%). Most non-fatal drowning incidents occurred in the ocean (27%), followed by public or private swimming pools (25% and 23%, respectively). Fatal drowning incidents most frequently occurred in the ocean (37.9%) followed by inland waterways (27%).

Non-fatal incidents were more likely to be witnessed by a bystander when compared with fatal incidents (43.7% vs. 20.0%, p<0.001). Witness status was not recorded for water incidents. Spatial analysis indicated that over a third (36%) of LGAs required an ambulance to attend more often than would have been expected given the population distribution.

Discussion & Conclusion
Drowning prevention remains the major focus for aquatic safety practitioners. However other forms of aquatic injury also warrant attention to ensure the safety of the community in recreational aquatic activities.
One of the leading causes of accidental death worldwide is drowning and so it is in Germany. For the understanding of drowning and its mechanisms, but also for its prevention it is important to have reliable data and statistics on this incident.

In Germany there are currently three statistics from different sources on drowning:

- Cause of death statistics of the statistical offices of the German government. “Drowning” is recorded here as a cause of death, when it was stated by the emergency doctor or general practitioner in the death certificate and by the registrar’s office reported to the regional statistical office.
- Statistics of the Deutsche Lebens-Rettungs-Gesellschaft e.V. (DLRG), case numbers to drowning caused by a media clipping commissioned.
- Statistics of the German resuscitation register, that gains its information on the cause of death by recordings from the registries of the emergency services and emergency physicians, if reported.

These three different statistics are barely comparable and display inconsistent figures.

Currently, none of these statistics provide reliable data on drowning and each has specific problems for interpretation.

A central problem in the statistics of the German government is the fact that the reported cause of death not necessarily is the exact cause of death. Incorrect coding may arise especially in death certificates of patients who have been successfully resuscitated after drowning, brought to a hospital and died later because of complications such as an Acute Respiratory Distress Syndrome (ARDS) or multiple organ dysfunction syndrome.

A major problem of the statistics of the DLRG is how the data are obtained. Media clipping may lead to an overlap. Furthermore, those drowning cases are not covered, which are not published in newspapers and news.

The statistical data from the German resuscitation register only covers those cases seen by an emergency physician and only after at least the attempt of a resuscitation. Furthermore, reporting to the register is voluntarily and not performed comprehensively.

Therefore, all statistics on drowning in Germany extensively are compared and analyzed.

The aim of the project is to gain reliable data on drowning in Germany by optimizing the data collection and to draw conclusions on how drowning can be reduced by preventive measures.
Water related deaths during 2 summer seasons in Spain

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Introduction

People commonly established their civilizations around water exposing them to the risk of drowning. As beach and pool attendance increased steadily since the beginning of the 20th century, both for leisure and exercise purposes people became even more at risk of drowning.

The recently published WHO Global report on drowning estimates that drowning kills 372 000 people each year, making it the third leading cause of death from unintentional injury worldwide. The estimated death toll is even more alarming because official data categorization methods for drowning exclude: drowning deaths caused by flood disasters, by transport-related incidents, or intentional drowning deaths by suicide or homicide.

Available data show that there are substantial differences in drowning fatality rates across the globe. Still, comparisons are difficult even among developed countries because, even in countries where counts of drowning deaths appear relatively complete, important basic details about the event are often lacking, including information on the location of drowning, the intent and the circumstances. In particular Spain has no national surveillance system that defines the circumstances surrounding a drowning event well enough to enable the development of effective preventive strategies. Both lack of information and misclassification have an effect on overall estimates of the impact of drowning. Many researchers have therefore challenged the utility of newspapers for unintentional injury surveillance and described newspapers reports as a useful source for assessment of risk factors for drowning, offering hope for improved surveillance where official sources are poor, or not accessible in a timely and detailed way.

The aim of this study was thus to: analyse the unintentional drowning deaths occurring in Spain during summer in recent years, and identify opportunities for improvement when it comes to preventing these deaths.

Method

This is a quantitative prospective and descriptive study, covering the period of four months of two summer beach seasons in Spain (1June-30September, 2012-2013). A Google alert was activated using the words “ahogado” and “ahogada”. Daily emails were received with links to the websites with further information where these words appeared. As inclusion criterion only news in which the words “ahogado”/“ahogada” appeared related to leisure and free time activities were considered. As exclusion criterion, those reports related to illegal immigration (the attempt to reach the Spanish coast by any means (boating, floating devices or swimming), industrial accidents (professional fishermen) or major disasters (floods or flash floods) were not considered.

Results

During the period studied a total of 2.200 news were received, an average of 9 news/day. Almost entirely, the news came from digital, local or national newspapers from Latin American countries. In Spain, from 1st of June to the 30th of September 2012, news on events resulting in death in the aquatic environment in Spain corresponded to 186 victims. During the same period in 2013, the number of fatal drownings was 181. During this presentation the complete profile of the victims will be provided, regarding variables such as: sex and age of the victim, activity immediately prior to drowning, type of aquatic environment, time of the day, and geographic location, among others.

Conclusions

Our study has a clear social value by providing results that allow a more complete understanding of the circumstances in which deaths occur in the aquatic environment, making it possible to foster measures to prevent such deaths. These findings could be used to elicit an appropriate public and private response public in terms of sufficient human and material rescue resources, which enables to avoid accidents and intervene immediately if they happen.
Sinking or swimming? Connecting public health researchers and practitioners to design, implement and evaluate evidence based drowning prevention strategies

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Data 4, Ballroom 2, November 5, 2015, 1:30 PM - 3:00 PM

Introduction
Drowning is a frequently occurring and preventable population health issue [1]. The need for evidence informed health promotion to prevent drowning is required on a global scale. Health promotion has been widely integrated into practice and policy to improve population health outcomes in many countries, using a combination of educational, organisational, and political actions designed with genuine consumer participation to facilitate behavioural, environmental and policy change [2]. Health promotion has contributed to significant health improvements across a range of issues [3]. Traditionally, drowning prevention interventions have been conducted by community based organisations (CBOs) that may not always have health promotion or research expertise or capacity to effectively evaluate programs, and may not see dissemination of project findings beyond reports to funders to be part of their remit. Greater collaboration between research academics and CBOs will enhance the dissemination of findings, build workforce capacity and increase knowledge transfer between stakeholders [4]. This ultimately provides evidence to support strategies that may prevent drowning.

Aim
This paper describes the process undertaken to establish and promote partnership, information exchange and develop capacity for health promotion practitioners working in drowning prevention. Several exemplars, including a relationship in Western Australia (WA) between a large CBO and academic researchers will be presented.

Methods
In WA a relationship was established between the researchers and the CBO in 2012, consisting of a literature review and informing evaluation design methods. In 2014 via the use of a Knowledge Broker (KB) (an increasingly popular strategy to promote the interaction between researchers and end-users) [4], the relationship between the research team and the CBO was extended into a formal three year partnership. The KB has been central to the development of a collaborative trusting relationship between the agency, the researchers and other key stakeholders, supported by the long term commitment between the two parties.

Results
To date extensive formative evaluation has been conducted on two state-wide drowning prevention campaigns ‘Keep Watch’ and ‘Don’t Drink and Drown’. Research instruments have been designed, tested and used in the field and findings disseminated. The strong partnership between the agency and the researchers builds evaluation capacity to conduct evaluation activities, identifies opportunities for collaborative research and ultimately informs future efforts to prevent drowning [5].

Discussion
Contemporary health promotion practice has seen many CBOs develop partnerships with researchers. The advantages of these partnerships are tangible and mutually beneficial. The benefits include: access to specialised knowledge, increased rigour in program evaluation and increased practitioner and researcher credibility; facilitated cost neutral access to academic writing resources normally beyond the reach of a NGO; increased avenues and opportunities to disseminate findings; and increased return on investment for funders.

Conclusion
A critical focus in a research - practice partnership is not just determining what works, but rather what works, why, for whom, how and in what circumstances. Strong links to practice ensures researchers ask the right questions and conduct research grounded in the real world, generating both practice based evidence and evidence informed practice [3]. The implementation of projects with a robust evidence base ultimately leads to improved health outcomes.

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Drowning Deaths in Older People: A 10 year analysis of drowning in people aged 50 years and over in Australia

Miss Alison Mahony¹, Ms Amy E Peden¹, Associate Professor Richard Franklin¹,², Dr. (PhD) Ana Catarina Queiroga¹, Mr Justin Scarr¹
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Data 5, Ballroom 2, November 5, 2015, 3:30 PM - 5:30 PM

Introduction
Drowning deaths among older people currently account for over a third of all unintentional fatal drownings in Australian waterways annually [1]. With an aging population in Australia, it has been projected that the percentage of the population aged 50 years and over will rise from 38% in 2011 to 42% by 2051 [2].

Older people are at a greater risk of drowning due to loss or diminishment of a range of abilities such as loss of muscle strength, aerobic endurance, agility, balance, flexibility and bone density [3] [4] [5] [6], however aquatic activities represent an excellent way to rehabilitate muscles and bones after falls and offers an aerobically effective way to exercise in a low impact fashion [7].

Aims
This research aims to:
• Identify the incidence of drowning among people aged 50 years and over in Australia between 1 July 2002 and 30 June 2012
• Examine the risk factors associated with drowning deaths among people aged 50 years and over in Australian waterways and discuss potential prevention strategies.

Targets
The targets of this research are those involved with drowning prevention interventions and water safety initiatives concerned with reducing drowning deaths among older people in their respective countries.

Methods
Drowning data has been extracted from the Royal Life Saving National Fatal Drowning Database for all victims aged 50 years and older between 1 July 2002 and 30 June 2012. Information on drowning deaths is sourced from media and police reports and cross-referenced against the National Coronial Information System. Information is collected and analysed in SPSS.

Results
Between 1 July 2002 and 30 June 2012, there were 1,072 people aged 50 years and over drowned in Australian waterways [8]. Over the 12 years of this study the drowning rate per 100,000 has varied from a high of 2.06 in 2002/03 to a low of 1.31 in 2006/07.

Males accounted for 75% of all drowning deaths in the study period. For males the risk of drowning was higher before retirement age (less than 65 years) and for females, after retirement age (65 years and over).

Older people drown in a wide range of aquatic locations whilst undertaking a variety of activities. Rivers, creeks and streams were the main locations for drowning deaths in people aged 50 years and over accounting for 27% of all drownings, followed by ocean/harbour locations (20%). Before retirement older people were more exposed to drowning after using watercraft, compared to unintentional falls into water after retirement.

Medical conditions most likely to have contributed to the fatal drowning among people aged 65 years and older include dementia and frailty leading to simple falls into water hazards and cardiac conditions whilst swimming.

Discussion
The high number of drowning deaths among older people in Australian waterways can be reduced by encouraging aquatic activity at controlled locations such as public swimming pools, encouraging older people to recreate with other people to ensure help is on hand, to be aware of the role of underlying medical conditions and to consider the impact medications and alcohol may have on drowning risk.

Conclusion
Preventing drowning deaths in this broad age group is challenging but progress must be made in order to reduce drowning deaths in Australia. Lessons learned from interventions in Australia can be used to further prevention efforts internationally.

Acknowledgements
The drowning prevention research of the Royal Life Saving Society – Australia is supported by the Australian Government.

References
Classification of drowning deaths in the river basins of Parana state: probable cause, activities and locations

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Introduction

According to the World Health Organization drowning is a serious and neglected public health threat claiming the lives of 372,000 people a year worldwide; 40 people every hour of every day. More than 90% of these deaths occur in LMICs. In Brazil nearly 1 million people drown and 6,500 die by drowning each year. Between 2010 and 2012, 1,043 people from Paraná drowned to death (3.32 deaths/100,000 inhabitants in the state). The State of Paraná is located in the south of the country and is geographically divided into 16 river basins, each with its own particularities. There are sites that have excellent rivers for fishing, while others are considered ideal for the practice of bathing and boat driving. Understanding these features and classifying them regarding the cause triggering the drowning may allow a more effective preventive approach.

The objective of this work is to understand this dynamic and know the profile of drowning causes, comparing the different river basins and thus allowing us to customize our prevention activities.

Material and Methods

For this study were analysed and classified drowning deaths by river basin in Paraná State. The risk index was considered as the number of deaths divided by the sum of the population of the cities belonging to the basin, using as reference the 2010 IBGE census tabulated for 100,000 inhabitants.

Results

Between 2010-2012, the National Health System Database (DATASUS) registered 1043 drowning deaths in the state, classified geographically among the 16 river basins.

We’ve observed that Paraná River Basin II is the most dangerous of the state considering the drowning rate of 6.7/100,000 inhabitants – 100% higher than the average of the state (3.3/100,000). The Itacaré River Basin comes in second (5.9) – 77.1% above state's average, and in third the Paranapanema River Basin I with a drowning rate of 5.5/100,000 inhabitants – 53% above state's average.

The Paraná River Basin II has an average of 2.3 drowning deaths per year, being fishing the main activity prior to drowning, falls the precipitating cause of the event and river rapids the main location, encompassing 75% of all cases.

The Itacaré River Basin has an average of 7.7 drowning deaths per year, being bathing/recreational swimming the main activities prior to drowning, with problems during swimming precipitating the event and river rapids the main location, covering 36.3% of all cases.

The Paranapanema River Basin I has an average of 5 drowning deaths per year, being bathing/recreational swimming the main activities prior to drowning, with problems during swimming precipitating the event and river rapids the main location, including 46.7% of all cases.

Conclusion

With the research and the systematization of data in this study was possible to identify the areas of the state that need more investment in water safety thus assisting a future implementation of specific preventive measures, making the cities located in these river basins more resilient against drowning incidents.

As preventive measure we emphasize the need to enforce the use of lifejacket while boating/fishing after verifying that several deaths occurred after falling from a boat, and to ban bathing and recreational swimming in certain river sections.

References

Drowning Statistics in South Africa (2008-2014)

Mr Dhaya Sewduth
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A formative research project in 2007 on Drowning Statistics in South Africa was conducted by Lifesaving South Africa, the registered voluntary lifeguard movement in the country (a not–for-profit, voluntary, PBO Registration number). The findings of this investigation were presented at the International Lifesaving Federation (ILS) World Conference on Drowning Prevention (WCDP) at Porto, Portugal in 2007. The report was a culmination of consultation with the Medical and Research Council (MRC) but it relied heavily on the statistics maintained by the National Injury Mortality Surveillance System (NIMSS), an inter-governmental and university body which is hosted at the University of South Africa.

The dependency on the organizations mentioned in the preceding paragraph was largely due to the unreliability of the statistics kept by the only legal government responsible for the maintaining of statistics of all unnatural deaths, drowning being one of them - the South African Police Services (SAPS). It proved extremely difficulty to access those statistics. While the reliance was on the MRC and the NIMSS, the assurance that the investigator had was that the figures reported upon was verified and cross checked, so the validity was assured. Lifesaving South Africa and its provincial affiliates also collate data on drowning but that is gleaned mainly from media reports. This source of information is useful in terms of making comparisons with the official data that is released by SAPS.

As there seems to be no other report in the succeeding seven years since that first report was presented, the questions asked then remain: Has the SAPS unit responsible for the data recording improved in its recordkeeping? What effects has the data had on preventing loss of life through drowning? Has the data impacted on the prevention of drowning fatalities?

This paper sets out to investigate and collate the recording of data during the period of 2008-2014, seven years since that inaugural report. The usual approach would follow which is to approach the relevant units in SAPS unit to obtain the recorded statistics and then to cross check that with the information published and released via the MRC / NIMSS structures. While the focus would be on obtaining the data, the purpose of this paper is not merely to report on the quantitative statistics, rather this would be layered with analyses of the information gathered by relevant authorities, public institutions and individuals who are responsible for the prevention of drownings and / or who have experienced drownings in their presence. As the matter of loss of life particularly under tragic circumstances is quite a sensitive, the intention would be to ask unstructured questions to the respondents who are prepared to comment on the circumstances surrounding the loss of life through drowning and record these comments as part of the qualitative component of the research.

The rationale for undertaking such a study is also motivated by the fact that the WHO Global Report on Drowning, released at end of 2014, amplifies the fact that the data on drowning in Africa is woefully inadequate which requires greater efforts from all concerned. It would be useful to compare the findings of the research against the trends and factors reported in the Global Drowning Report.
2013-2015 Drowning data in Kenya

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Data 5, Ballroom 2, November 5, 2015, 3:30 PM - 5:30 PM

Introduction
The first drowning data in Kenya was provided by KLF was 2010-2012 and was presented at the WCPD 2013 in Potsdam Germany.

The recommendation from this research gave positive progress in the development of drowning prevention efforts in Kenya as it attracted the attention of the relevant government authorities that lead to the establishment of public aquatic facilities safety standards-guidelines for safety and beach safety.

Flooding contributes to over 50% of death by drowning and could be a lot higher as lack of proper reporting, no available scientific and accessibility to the remote areas affected by these aquatic disasters.

Objective
2. Compare and analyze the data with 2010-2012.
3. To add propensity to the development of strategic planning for drowning prevention efforts/lifesaving development proposal to the Kenya government and other development agencies.
4. To provide Kenya drowning data at a national and international arena
5. To give further recommendation and proposition on way forward.

Methods
Secondary data from Reelforge media monitoring company contracted by the federation to analyze drowning data from Print Media, Radio stations and Television stations in Kenya.

Result
To be presented at WCPD 2015 in Malaysia and may be much less probable as the data i presented in 2013 using the above method was much less probable if the population of Kenya is close to 41 Million and at the average number of drownings for emerging nations we would expect drowning mortality 4-8/100,000 thus we would expect 1640-3280 drowning deaths per year in Kenya if this can be done via a cohort study that is done by door to door survey by trained persons who ask 100,000 people in urban and rural locations about family members who have drowned. I presume the radio drowning reports include all the ones that are reported in print and TV and If I choose the largest of these numbers, that makes 1546/41,000,000x100,000 = 2.4 drownings death/100,000 population which is lower than is expected. We would normally reserve the epidemic focus for drowning rates that are significantly above the global average of 6.4/100,000 which I expect is really the case in Kenya. (Dr Steve Beerman et 2015)

Discussion
A paradigm shift in all manners that drowning matters are handling is urgently required at community level and national level by the authorities concern in Kenya. death by drowning is treated a lesser death as we witness great national and international mobilization of all resources in disparate measures taken when lives are lost at risk from other factors like Ebola, aids, bird flu, road accidents, malaria the list is endless. Perhaps we should get a new definition/classification of death by drowning and state as accepted and approved transition of life to the other worlds via water or least state approved national/international depopulation strategy.

Conclusion
Drowning problem is a big reality in Kenya and in the world in general and we need no more persuasions and negotiations but act now with all means possible. Ineptness’ in dealing with drowning cancer is a crime against humanity in itself; where are the national human rights commission/organizations, UN and all international agencies or do we continue to live in a state of denial.
10,000 failed acute rescues in water-related immersion deaths, Canada, epidemiology & policy

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Data 5, Ballroom 2, November 5, 2015, 3:30 PM - 5:30 PM

Background
Population-based data on acute rescues for all water-related immersion (drowning) deaths are scarce. Frequencies of rescues and rescuers by activity, environment, and host factors were assessed.

Methods
Using a structured questionnaire, data on rescues were collected prospectively from coroners during 1991-2010 as part of a national surveillance program for all water-related injury deaths. The Canadian population averaged about 30 million during the study period.

Results
For 9961 immersion deaths with drowning and/or hypothermia, rescues included 3170 (32%) acute rescues, 1534 (15%) acute rescues followed by body searches, 2992 (30%) body searches, 1666 (17%) no rescue, and 599 (6%) unknowns. During 1991-2000, 44% of victims had acute rescue attempted and for 2001-2010, 51%.

Activities: Of 4704 acute rescues, aquatic activities accounted for 33%, boating 26%, falls into water 18%, land/ice/air transport 13%, bathing 8%, unknown 1%. Frequent recreational activities (67%) included playing near water or ice, swimming, fishing, boating; daily life activities (22%) on-road transport and bathing; occupational activities (6%) commercial fishing and marine shipping; rescue (2%; n=114), unknown (2%).

Rescuers and rescues: 80% involved non-professional rescuers, including 61% with persons known to the victim. Professionals were involved in 54% and of these police 18%, paramedics 13%, firefighters, 10%, lifeguards 3%, physician/nurse 2%, others 9%, unknown 9%. Rescues included carrying 35%, swimming 11%, rowing 10%, reaching 5%, wading 4%, other 25%, unknown 10%. CPR was attempted in 59%, not 31%, unknown 10%. Non-professionals were frequently involved in rescues for all types of activities; falls into water and bathing incidents mainly involved rescues by persons known to the victim. Police were frequently involved in rescues for all activities excepting bathing, firefighters in aquatic and land transport activities, paramedics in all activities other than boating, physicians and nurses rarely for any activity, and lifeguards almost entirely for aquatic activities. The most frequent rescues for aquatic activities were carrying, swimming, and rowing, for boating carrying, rowing, and swimming, for falls into water carrying, swimming, reaching, and wading, and for land and ice transport carrying, swimming, reaching, and wading. Children 0-14-years-old were most frequently rescued by carrying, swimming, wading, and reaching, youth 15-19-years-old by carrying, swimming, and rowing, and adults by carrying, rowing, swimming, and reaching.

Personal: Victims receiving acute rescue were 80% male. Infants <1-year-old accounted for 1%, toddlers 1-4-years old 10%, 5-14-year-olds 9%, 15-24-year-olds 19%, and 25-75+year-olds 61%. Acute rescue was attempted for 88% of 0-4-year-olds, 71% of 5-15-year-olds, 49% of 15-24-year-olds, and 37% of 25-75+year-olds. Non-swimmers and weak swimmers were more frequent than average and strong swimmers. 5% of acute rescues were for persons with a seizure disorder/epilepsy, 3% with mental disabilities, 3% depression, 2% physical disabilities, 1% schizophrenia, and 1% dementia. At least 34% were alcohol associated.

Environment: Where pertinent, wave conditions were described as rough/white caps to storm/gale force in 19% of acute rescues, winds as strong in 9%, and water as very cold (<10°C) in 20%. True numbers would be higher, as there were many unknowns. For rescues involving ice, it was described as intact but thin/soft for 17%, open hole 9%, cracked or broken 3%, floe/pack 3%, unknown 65%.

Supervision/accompaniment: 52% of victims who had acute rescue were with an adult(s), 34% alone, 9% with minors, and 5% unknown. 3% (n=143) were in a lifeguarded environment. Of 1558 aquatic activity deaths, only 9% occurred in a lifeguarded environment.

Conclusion
Water-related activities are best carried out in the presence of adults trained in water safety to avoid immersion incidents, and in rescue in the event of unplanned immersions. Police, paramedics, and firefighters are key professional groups who supplement initial rescues by non-professionals first at the scene, since the vast majority of deaths occur in non-lifeguarded locations. Using epidemiologic data on fatalities involving an acute rescue, training of pertinent non-professionals and professionals can be focused on target activities, risk groups, environments, and types of rescue. Mortality data on unsuccessful rescues should be supplemented by data on successful rescues. Since there were 114 deaths of rescuers, safe rescuing practices also require emphasis.
Drowning risk environment and preventive practices in rural Bangladesh

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Data 5, Ballroom 2, November 5, 2015, 3:30 PM - 5:30 PM

Background/Introduction
Drowning accounts for 9% of under-five mortality in Bangladesh and is the leading cause of death (43%) among 1-4 year old children in Bangladesh (1). The International Centre for Diarrhoeal Disease Research, Bangladesh in collaboration with the Johns Hopkins-International Injury Research Unit, and the Centre for Injury Prevention and Research, Bangladesh is conducting an implementation study titled “Saving of Lives from Drowning in Bangladesh” to assess the effectiveness of two drowning prevention interventions (playpens and enrolment in crèches) in reducing under-five drowning deaths in seven sub-districts of the country. As part of the study a baseline survey was conducted in the study areas to estimate the burden of injuries including drowning and associated risk factors.

Aims/Objectives
The aim of this study is to describe the risk environment for drowning in under-five children in four rural sub-districts of Bangladesh and to present information on preventive measures practiced by the communities with particular emphasis on supervision practices of mothers of under-five children.

Target
Policy makers, program implementer including NGOs, researchers.

Methods
A cross-sectional survey was conducted in four sub-districts of 2 districts of Bangladesh from July 2013-December 2013. Trained enumerators conducted a census of all households in the selected villages and identified women with an under-five child. These women were interviewed to collect information on the presence of and distance to water bodies around the household, on preventive measures practiced by the household and on the mothers’ activities including child supervision practices during different times of the day. Descriptive analysis has been done to present information on the risk environment and supervision practices. Ethical approval was obtained from Institutional Review Board of all three institutions.

Results/Evaluation
A total of 55,271 women who had an under-five child were interviewed. Ponds (82%), ditches (42%), submerged paddy fields (33%) and canals (24%) were the most common water bodies available around the households. The ponds and ditches were the closest with about 65-70% of the women mentioning them to be within 10 metres of the households (mean distance was 10 metres). The most common measures practiced by the household to protect the child from falling into water bodies included monitoring the child (94%), frightening the child (48%), tying a bell around the child’s waist (23%) and setting barriers in front of the door (19%). Review of mothers’ activities at different periods of day reveals that mothers were mostly busy with household chores and child care between 6.00 am to 1.00 pm and were more involved in leisurely activities between 1.00pm to 9.00 pm. The mothers were also the main person responsible for supervising the child, with supports available from grandparents in about one-fifth to one-third of the cases at different times during the day.

Discussion
The findings reveal that the environmental risk of drowning in rural Bangladesh is very high with families relying mainly on supervision to protect the child from falling into water bodies. The child is primarily supervised by the mother who at the same time is also busy with household activities. This inadequate supervision especially between 9.00am- 1.00pm increases the risk of drowning among children. Hence there is a need for interventions that help mothers to monitor their child effectively during the critical periods of the day.

Conclusion
The risk of drowning in children is greatly increased by the presence of large number of natural water bodies. Drowning deaths in children can be reduced if effective interventions are in place to improve child supervision.

Acknowledgement
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References
Randomized controlled trial on drowning prevention for parents with children aged below five years in Bangladesh

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Data 5, Ballroom 2, November 5, 2015, 3:30 PM - 5:30 PM

Background
Drowning is the third leading cause of death for children under five years of age in many Asian countries, and is a serious but neglected health problem in low and middle-income countries like Bangladesh. The aim of the study is to outline the study protocol of a trial to test the efficacy of a mobile SMS based intervention for the prevention of childhood drowning.

Method/design
A two-arm cluster randomized community trial will be conducted to test the efficacy of the mobile SMS based intervention for childhood drowning on parents with children below five years of age and compared to an assessment only control group. A total of 788 parents in the villages with children aged below five years of age will participate. The village will be used as a randomized unit, randomly assigned to an intervention group (N = 394) receiving the mobile coach based intervention or an assessment only control group (N = 394). An individualized mobile SMS intervention based on the social-demographic, environmental and behaviours data and the individual will be developed, and SMSs, and voice call about childhood drowning will be sent to the participants of the intervention group over a period of six months. The participants will receive per week one text message (SMS) and voice call. The primary outcome measure will be increased knowledge and safety attitude, and behaviour practice about childhood drowning assessed at the six-month follow-up, and the secondary outcome measure will be the reduced incidence of childhood drowning in Bangladesh. The study assistants conducting the baseline and the follow-up assessments will be blinded regarding the group assignment.

Discussion
This is the first study testing a fully mobile coach intervention for childhood drowning prevention in Bangladesh. It is hoped that the programme will offer an effective and inexpensive way to prevent childhood drowning among children aged below five years and also increase the awareness of parents concerning the risks to their children from drowning.
Actual Situations of Drowning of Japan

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The drowning deaths of 372,000 people a year in the world was reported by the World Health Organization’s 2014 global report on drowning. The number of drowning deaths in Japan in 2011 was 8,999 which was second place following that of the Russian Federation’s 11,981 according to this report. Also, the drowning fatalities of people over 45 were at a ratio of approximately 50%. In this study, actual situations of drowning of Japan were investigated using some national data and lifesaver’s reports.

The unexpected drowning deaths of Japan are from 5,000 to 7,000 every year reported by the 2009 national report of Ministry of Health, Labour and Welfare. In 2011, it was 7,356. So, a breakdown was created of unexpected drowning deaths in household accident and outdoors accident. Almost all drowning deaths in households were due to bathtub accidents which were 5,063 people in 2011. This is in regards to the Japanese culture of bathing. Also, the drowning fatalities of people over 45 years old was ratio of approximately 97 % was reported. Some possible reasons could be attributed to the frequency of tub use, the depth of tub size and the triggering of fatal situations due to the high water temperature. On the other hand, drowning deaths in the outdoors such as sea, river etc. were from 1,500 to 2,000 every year reported by the 2011 national report of the National Police Agency. In 2011, there were 795 drowning deaths including missing people under 1,656 drowning accidents. The accidents occurring in the sea account for approximately 50%. So, the sea accident is followed by rivers and then lakes and waterway accidents.

In beach accidents, the emergency care which is the rescue of unconscious victims was from 10 to 20 on approximately 200 beaches starting from 1998 to 2014 by the analysis of lifesaver’s rescue reports. Although an average of the emergency care victims was approximately 14, the rate of revival is 51% during this period. Therefore, prevention measures against drowning are required. On the other hand, the preventive action which is the rescue of potential drowning from high risk areas to safe areas by lifesavers was from 1,000 to 3,000. This is 5-7 times the number of the drowning accidents by public emergency organizations. So, many beach drowning accidents occurred due to the rip currents in Japan. The average number of rip current drowning including the fatalities and survivors in one year was approximately 300 starting from 2003 to 2011. Also, the ratio of rip current drowning was at 45% from 2003 to 2013.

Furthermore, drowning connected to alcohol drinking was in second place followed by those that were lacking swimming skills in the outbreak of personal factors. Actually, some drowners who had cardiac arrest were drinking alcohol according to lifesaver’s rescue report.

In order to reduce drowning, clarification of the potential risks of some drowning situations including the bathtub, rip currents, and alcohol would be effective. So people have to truly understand risks and methods for drowning prevention.
Does teaching children to swim increase exposure to water or risk-taking when in the water? Emerging evidence from Bangladesh

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Background
SwimSafe, a basic swimming and safe rescue curriculum, has been taught to large numbers of children in Bangladesh. Teaching swimming potentially increases risk if it increases water exposure or high-risk practices in water. This study compares water exposure and risk practices for SwimSafe graduates (SS) with children who learned swimming naturally.

Methods
Interviewers obtained detailed water exposure histories for the preceding 48 h from 3936 SS aged 6–14 and 3952 age-matched and sex-matched children who had learned swimming naturally. Frequencies of water exposure and water entries for swimming or playing were compared.

Results
There were 9741 entries into water among the 7046 participants in the 48 h prior to interview. About one-third (31.2%) had no water entries, one-tenth (10.5%) entered once, half (49.2%) entered twice and a tenth (9.1%) entered three or more times. Proportions of children in each group were similar. About 99.5% of both groups only entered the water for bathing. For those entering to swim or play, the mean number of entries was similar (SS 1.63, natural swimmer (NS) 1.36, p=0.40). Swimming or playing alone in the water was rare (1 SS, 0 NS).

Conclusions
Most water exposure for children is for bathing. Less than 1% swam or played in the water during the 48 h recall period (0.6% SS, 0.4% NS). Learning swimming in SwimSafe did not increase water exposure nor did it increase water entry for playing or swimming compared with children who learned to swim naturally.

References
Profile of drowning deaths at swimming pools and bathtubs in Brazil – A 9-years evaluation (2003-2011)

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Poster Session 1, Poster Foyer, November 4, 2015, 9:00 AM - 5:15 PM

Drowning is a complex process from the perspective of prevention that needs a lot of information to be fully understood. High quality information is essential for a successful strategic prevention campaign. In 2012 the Brazilian population was 194 million inhabitants, of which 1,1 million died. External causes were responsible for 13% of all deaths, and among the first two reasons of death for people aged between 1 and 44 years old. Drowning was responsible for 6,369 deaths (3,3/100.000 inhabitants) and was the second leading cause of death for all deaths of children aged 1 to 9 years old, the third among 10 and 19 years old, and the fourth among 20 to 25 years old. The risk of injury in aquatic settings was estimated to be 5,03/100.000 inhabitants considering drowning and other related trauma (Szpilman-2014). When considering all age groups together, pools and bathtubs were locations of limited relevance for drowning deaths, representing only 2% of all deaths by drowning (n=144 in 2011). The aim of this study was to characterize the drowning profile at pools and bathtubs in Brazil, from 2003 to 2011, and use that information to understand and manage the risk of drowning at these areas.

Methods
Drowning rates among Brazilian residents were determined using death certificates from 2003 to 2011 based on DATASUS—the Public Health System Information of Brazilian Government (www.datasus.gov.br), using the International Classification of Disease for drowning (ICD 10): W65 - while in bathtub; W66 - fall into bathtub; W67 - while in swimming pool; W68 - fall into swimming pool. The number of pools was estimated based on data on chlorine use by industries and pools manufacturers (ANAPP).

Results
There were 61,857 drowning deaths (3,6/100.000 inhabitants), averaging of 6,970 per year, in Brazil along the 9 years of the study (2003-2011). There was no overall statistically significant decrease in incidence of drowning from 2003 (3,8/100.000) to 2011 (3,4/100.000). Pools and bathtub were responsible for 2,3 (n=1395) of all cases (pools:2%, bathtubs:0,3%). There was no significant difference among those 2 locations and both were predominantly the places where children under 4 years-old drowned (38%). Among all deaths at pools 54% afflicted 1-9 years old. Pools were the location of 53% of all drowning deaths at that age range and 76% between 1 to 29 year-old. Considering the setting, 49% of those deaths were domestic, 10% at clubs and gyms and 7% at schools. Drowning rates “while in swimming pool” were 2 times higher than the rate of drowning deaths due to “fall into swimming pool”. The most affected population groups were Caucasians and people with lower educational level. Males died in average 3 times more frequently than females. The difference was significantly higher for the age groups 25-29 (16x) and 35-39 (47x). Geographically, the highest rates of death were found in the southwest region (42%) but the centre region represented the higher risk (1 death/million inhabitant). Furthermore, 44% of all deaths happened during summer. For the whole country we estimated the existence of 1,7 million ground pools (including domestic or not) with an associated estimated risk of 1 death per 639 pools per year, considering a pool lifetime of 20 years. Gross National Income per capita was a determinant risk factor for drowning in Brazil, directly proportional to the number of pools and inversely to other aquatic locations. The total estimated cost for drowning death at pool was US$12 million/yearly.

Discussion
This study reveals that pools and bathtubs are important risk locations for drowning, especially for children aged 1 to 9 years-old, during summer time, at the most HIC regions and at domestic settings. This information is essential for planning increasingly cost-effective educational campaigns directed at the highest risk groups.
Looking Upstream to Prevent Drowning

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Poster Session 1, Poster Foyer, November 4, 2015, 9:00 AM - 5:15 PM

Introduction
Prior to a drowning incident, a sequence of critical errors occur that contribute to the outcome(1-3). Lack of supervision has been identified as contributing to drowning episodes,(4-6) yet theoretical models to assess supervision levels (7) are difficult to apply to ICD10 coded data where detail is lacking. This study has examined the predisposing and precipitating factors (8-10) using recorded narrative data associated with drowning and near drowning.

Methods
Data from pre-hospital, emergency department, hospital admission and fatality of all drowning events in Queensland (0-19yrs) were linked for the years 2002-2008. Case narratives were filtered by age and location to extract contributing factors associated with supervision.

Results
Of the 1299 fatal and non-fatal drowning cases, 58% had case narratives recorded (394 were pre-hospital cases and 668 emergency, hospital and fatality cases. Data were analysed by location to find age group at highest risk of drowning, and the most common supervision scenarios associated with the drowning event.

Bath: <1yr – 67% of bath drowning events occurred when there was no supervisor in the room for periods ranging from 1s to 30mins; 7% were left with a sibling; and 5% was the result of a seizure or intentional harm. None of the 18 cases who had direct supervision was fatal.

Inland water: 1-4yrs- dams were the most common (55%) location. In 30% of rural settings parents were involved in farm work. 10-19yrs: major contributing factors were under-estimating current strength or jump height (30%), or after consuming alcohol (8%), and 93% were with others (ie supervised).

Coastal: 5-19yrs - almost half of fatal events were related to watercraft; swimming alone or at night, or in rough unpatrolled surf.

Man-made water hazards: <1yr - the majority of these locations involved static water, and buckets were the most common drowning danger (35%). Of the total 77% were unsupervised.

Pool: 1-3yrs – the majority of swimmers got into difficulty while they were known to be in or around water. However, 0-4yr olds were most likely to have fallen in. Supervision figures will be provided for each age group.

Discussion & Conclusion
Such details are difficult to obtain from retrospective ICD10 coded data. These results indicate that utilising routinely collected narrative data provides insights into supervision levels, and specific locations. Results assist in directing prevention efforts further upstream of the drowning incident.

References
Public Risk on Shore Platforms: How do Surf Life Saving Australia (SLSA) Experts Perceive Risk on Rocky Shores?

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Poster Session 1, Poster Foyer, November 4, 2015, 9:00 AM - 5:15 PM

Australia’s rocky coast is a hazardous environment accounting for 178 drowning fatalities between 2004-2014, which is 19% of all coastal drownings (SLSA, 2014). Fatalities mainly occur at the edge of shore platforms where people are swept into the sea by unanticipated waves. The key factors that affect wave energy moving onto a platform are platform elevation above mean sea level, the slope of platforms, as well as water depth immediately off the seaward edge (Kennedy et al. 2013). However, little is known about what features of the rocky coast are perceived as being hazardous. Understanding the perceived risks, versus the scientific risks, can significantly improve our holistic understanding of hazards on platforms, which can inform a site-specific risk rating.

Risk perception data was collected via an online self-completion questionnaire from Surf Life Saving Australia (SLSA) volunteers. These people were chosen by virtue of direct experience with hazards under investigation. This experience allows the communication of site-specific expertise on risk, in addition to informed perceptions of frequency, magnitude, and acute understanding of capabilities in a hazardous scenario. All SLSA volunteers whose surf club is within 1km of a rocky coast in Victoria, Australia received the questionnaire. Mixed methods are used to generate data from competing epistemological and ontological assumptions of risk to compare these alternative forms of risk knowledge and analyse their compatibility. Three geo-tagged photos of a rocky platform were taken and assigned a physical hazard rating (morphological exposure) using airborne LiDAR. SLSA volunteers applied their own hazard rating on a 7-point Likert scale to each photo.

Respondents were experienced lifesavers, with 33% having been a lifesaver for over 15 years' and only 5% < 1 year (n=336). In addition, 69% of members who are actively patrolling have over 150 logged patrol hours. Respondent hazard ratings were similar to the physical ratings (ME). Just under half (45%) identified the photo with a low ME as ‘somewhat hazardous’, while 49% and 46% identified platforms with high ME as ‘very hazardous’. Additionally, each respondent identified specific hazards in each photo. The largest hazard (31% of all responses) was slipping on wet surfaces. Waves accounted for the second highest identified hazard (26% of respondents).

Multiple linear regression analysis indicates a volunteer’s years of experience have the largest effect on risk perceptions, regardless of their training or certification. This project contributes new risk knowledge to the development of a rocky coast hazard framework and demonstrates a methodology to improve the understanding of complex human-environmental systems through mixed methods. It appears that slipping hazards are perceived as the greatest risk on rocky shores, which in addition to ME, can be used as a proxy for quantifying and communicating site-specific risk in hazardous rocky coast environments.

References

Drowning profile in the state of Parana

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Poster Session 1, Poster Foyer, November 4, 2015, 9:00 AM - 5:15 PM

Introduction
Drowning is a problem with difficult solution. In 2012, 6,369 people (3,3/100.000 inhabitants) died by drowning (SOBRASA, 2014). Understanding this dynamic and knowing the drowning profile is very important to develop the best preventive measures. Bearing in mind that drowning is one of the diseases with greater impact on health and on the world’s economy, we consider it should be treated as an Endemic problem likely to be mitigated. To this end, it is essential to better understand the risk factors involved in these fatal incidents since there is a great cultural and geographical variability between Brazilian regions and states. The State of Paraná has 399 municipalities, totalling a population of 10,439,601 inhabitants (IBGE-2010).

The objective of this study was to analyse the profile of drowning in the State of Paraná to support the development of public policies and the implementation of different prevention programs.

Material and Methods
For this study we analysed the drowning data for Paraná State, to create a profile based on variables such as the season, age, sex, day of the week, environment, activity and probable cause of death, retrieved from the occurrences record system of Paraná’s Fire Department (SISBM), which is the source containing more detailed information regarding this type of occurrence. We’ve compared the number of occurrences obtained from this source with the number of records retrieved from the National Health System Database (DATASUS), which contains all death certificates, in order to understand the number of cases lost in this full evaluation. Data from a period of 3 years (2010-2012) was analysed.

Results
Between 2010 and 2012, 1,043 people from Paraná drowned to death (3, 32 deaths/100.000 inhabitants in the state), representing an average of 347 people/year. The majority of deaths (62%) registered in DATASUS was attended by teams of Paraná Fire Department (n=650) and this was the sample used to assess the drowning profile.

In 36, 45% of all cases, summer was the season when there was the highest number of drownings. Drowning deaths occurred predominantly in males (90%) and people aged between 15-19 years old (17, 54%). 47% of cases occurred during the weekend and 92% in fresh water. The main activity prior to drowning was bathing/recreational swimming (49.53%) followed by fishing (15.53%). The most probable precipitating cause for these deaths were difficulties during swimming as conveyed by witnesses in the reports. Rivers were the setting for 378 deaths of the 650 analysed, making 54% of all cases.

It is important to stress the fact that pools and bathtubs accounted for 0.028% of all cases but made up 23% of deaths in children aged 1 to 4 years old.

Conclusion
The risk of drowning occurs where there is exposure to water. Knowing the drowning profile is crucial to guide public policies to prevent it. This work identified the need to develop a unified and standardized database comprising more information regarding the drowning profile and its causes, among the agencies and stakeholders directly involved in the intervention in case of drowning.

References
Tracking fatal drownings in public swimming pools:  
An attempt at retrospective multi-scale counting within France

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Poster Session 1, Poster Foyer, November 4, 2015, 9:00 AM - 5:15 PM

Regarding daily life risks, recreational activities tend to catch up with domestic ones in France. As to fatal accidents, we focused on drownings in public swimming-pools (PSP), intending to quantify them. Basing on an exhaustive overview approach of information sources, a national count of fatal drownings in French PSP has been undertaken. Results underline that in spite of numerous databases, it is impossible to grasp the totality of this phenomenon. Gaps in data collection originate in five main methodological issues that are detailed in the discussion section of this article. In conclusion, such shortcomings regarding data gathering and processing enabled us to provide recommendations for stakeholders. The necessity to implement a permanent national observatory of fatal drownings in PSP, through gathering of data at the local level, implemented by field actors, is underlined.
Forecasting of drowning deaths in the area of the Office of Disease Prevention and Control 6th Khon Kaen, Thailand, 2014

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Objective
Aimed to identify the target areas, time and population risks of drowning, and to forecast the number of drowning death in the area responsibility of the Office of Disease Prevention and Control 6th Khon Kaen, Thailand, 2014. The forecasting is useful for preparation of preventive and control measure of drowning.

Methods

Results
The result showed that male died from drowning more than female (3.43: 1). The highest population risk groups is children <15 years old (The mortality rate were 11.76 in children aged 5-9 years old, 5.38 in aged 0-4 years old and 4.32 in aged 10-14 years old, all of them are showed in death per 100,000 population). Subordinate is elderly >65 years (The mortality rate was 6.32 death/100,000 population). Noting the mortality rate of population aged 55-64 years old was ascending, in contrast to the others, which tend to decline.

The mortality cases were highest reported in school closure period of April-May, September-October and the Loy Kratong festival, respectively. The provincial mortality rate per 100,000 population was the highest in Nongkhai (6.02), Roi-Et (5.81) and Buengkhan (5.29), respectively. The mortality rate were ascending during 2011-2013 in Khon Kaen and Rot-Et. The risk areas assessment showed the area with low risk had 13 districts (8.84%), moderate risk 50 districts (34.01%) and high risk 84 district (57.14%), consisted of 5 Nongbualampoo’s districts (83.33%), 13 Roi-Et’s districts (65.00%), 9 Loei’s districts (64.29%) 8 Mahasalakham’s districts (61.54%), 15 Khon Kaen’s districts (57.59%) 14 Udonthani’s districts (56.00%), 10 Kalasin’s districts (55.56%), 4 Buengkhan’s districts (50.00 %) and 6 Nongkhai’s districts (35.29%).

Quantitative forecasting showed that Sum of Squared Residuals was 1526.89, Root Mean Squared Error was 6.51, Mean Absolute Error was 0.55 and Mean Absolute Percent Error was 55.56. The deaths were peaked in September. Estimation of drowning deaths in 2014 are 374 cases, at least, which decline from the past year. This consist of 91 cases in Khon Kaen, 77 cases in Rot-Et, 45 cases in Udonthani, 34 cases in Nongkhai, 29 cases in Mahasalakham, 28 cases in Nongbualampoo, 26 cases in Kalasin, 24 cases in Buengkhan and 20 cases in Loei.

Conclusions
In 2014, the area of Office of Disease Prevention and Control 6th Khon Kaen is estimated to have at least 374 death from drowning, which are less than the past year. Assessment of risk areas showed the 13 low-risk districts (8.84 %), 50 moderate-risk district (34.01 %) and 84 high-risk districts (57.14 %), which distributed among the 9 provinces, especially in male group, children < 15 years and elderly > 65 years and periods during school closures of April - May and September – October. In conclusion, Health agencies and local community should have a preparation plans relevant to their risk, including to emphasize parents and their children to aware of the drowning situation, to train them the first aid protocols to survive from drowning, to survey the local water sources that are in risk in order to provide a safety environment, and to provide lifesaving equipment that is readily available in the community. In case of reported drowning death, the local should conduct a drowning investigation to identify the etiologies and risk factors in determining preventing and control measures.
Analyses of drowning deaths in Brazil over the last 34 years reveal a sharp decline

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Poster Session 2, Poster Foyer, November 5, 2015, 9:00 AM - 5:15 PM

In 2012 the Brazilian population was 194 million inhabitants, of which 1.1 million died in that year. External causes were responsible for 13% of all deaths, and were among the first two reasons of death for people aged between 1-44 years old. Drowning was responsible for 5,369 deaths (3.3/100.000 inhabitants) and was the second leading cause of death for all deaths of children aged 1 to 9 years old, the third among people aged 10 to 19 years old, and the fourth among people aged 20 to 25 years old. The aim of this study was to determine the drowning profile in Brazil along the past 34 years (1976-2012) and understand if any progress is being made in reducing the number of deaths and the risk of death by drowning.

Methods
Drowning rates among Brazilian residents were determined using death certificates (1976-2012) based on DATASUS – the Public Health Mortality System Information of the Brazilian Government <www.datasus.gov.br> using International Classification of Disease for drowning (ICD9 [1976-95] and ICD10 [1996-2012]).

Results
Over the past 34 years (1979-2012), there were 240,235 of drowning deaths (4.6/100.000 inhabitants), including all causes (intentional and unintentional), averaging 7,066 deaths per year, in Brazil. There was an overall decrease in incidence of drowning, from 5.4(1979) to 3.3(2012) per 100.000. The cause for 88% of the drowning deaths was of unintentional, 2% intentional (homicides-0.7%; suicides-1.3%) and 10% were classified as being of unknown cause. The incidence of unintentional cases decreased from 3.9 to 2.8 deaths per 100.000 over the period. The unknown intention (Y21) cases decreased along these 34 years from 27% to 11%. Among unintentional drowning, natural waters were the most frequent setting (40%). Pools were responsible for 2% of cases(49% residence pools) but, among children aged 1 to 9 years old, pools represented 53% of all deaths in that age group. Deaths occurring in bathtubs represented 0.2% (72% in residence) but proportion increased to as much as 38% of all deaths among children under 4 years old. Drowning deaths were higher in adolescents aged 15-19 year-old (16.4%;4.7/100.000hab), followed by people aged 20-24 (13%), 10-14 (10.5%), 25-29 (9.7%) and 1-4 (8.6%). Considering all ages, males died by drowning 5.3 times more frequently than females and represented 84% of all deaths. Considering the year 2012, there were no differences between death rates of males and females for children aged under 1 year old, but males drowned 17 times more in the age group 25 to 29. A huge imbalanced on the risk of death by drowning was observed among different regions and states in Brazil, ranging from 1.7/100.000 at Federal District (central region) to as high as 8.9/100.000 in Amapa (Amazon region).

Discussion
Brazil has one of the largest aquatic recreations areas in the world. This study has demonstrated a significantly decrease of 39% in drowning deaths from 1979 to 2012(p<0.0001). Drowning deaths were predominantly of unintentional nature (88%). Additionally, the observed reduction of drowning deaths categorized as of unknown intention indicates a significant increase in the effectiveness of the reporting of death. Pools and bathtubs locations were not important when considering all ages affected overall, but were significantly over children aged 1 to 9 years-old. Preventive education on drowning is the most effective action that can be undertaken to reduce these numbers but resources are limited. Educational campaigns should be focused on the groups and locations mostly affected or at highest risk, such as young males with special attention to natural bodies of water, in the north region of the country.
Establishment of the International Drowning Research Alliance – IDRA

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Despite having major social and economic impacts drowning has been neglected for several decades. The bias produced by not accounting for the real drowning figures is the major fact to affect the importance given to the problem. Recent studies have shown no link between the global burden of disease and the distribution of total health research or controlled trials. In other words, money for research isn’t in any way related to the scale of health needs. Even richer countries that are publishing much more than poor countries but mostly only in response to their own local needs, did not produce enough evidence to enlighten most of obscure areas of drowning research. This raises especial concern about the amount of knowledge relevant to poor populations, deficient in their own research infrastructure and where most drowning occurs. Policies on drowning prevention and water safety in developing countries will be effective if based on local evidence and research, designed to suit the social, political and economic circumstances found in each setting.

The multidisciplinary nature of drowning research, covering topics of prevention, rescue and treatment, demands improved coordination across various agendas and sectors throughout the world. Hence, it’s crucial to have a network for sharing knowledge and coordination of research efforts. To further increase its efficacy, an international research strategic plan should be developed.

In this regard, an international group of dedicated professionals, with expertise in drowning research and education, founded the non-for profit International Drowning Research Alliance (IDRA). IDRA founding members have a high technical and scientific impact with more than 3.000 citations, a combined i10-index of over 50 and a global research gate score of 141,51.

IDRA’s objectives:

• An international scientific network devoted to all aspects of the use of quantitative and qualitative methods in drowning research to promote safety in and around water environments
• Act as an open admittance permanent body of internationally renowned experts dedicated to reducing the global burden of drowning through research.
• Provide a vital link between drowning researchers and those involved in the practical management of prevention, rescue and treatment of drowning.

A look into the works submitted to recent worldwide forums, seminars, workshops and conferences evidences the variety of research being undertaken and reveals the gaps in knowledge that make this area of public health a dynamic area for research. Furthermore, as evidenced by a scientometric study from our group, drowning research effort is still lagging behind the standards that are nowadays commonplace for other research areas with most efforts being placed on only a few mainstreams, such as emergency and medical responses, activities and occupations.

IDRA Action Plan:

• Coordinate and disseminate drowning research worldwide
• Gather a multidisciplinary group of experts, other than health and lifesaving professionals, around the topics of prevention, rescue and treatment, including experts on public health, educational and sport sciences, psychology, sociology, politics, economics and engineering.
• Act as the link to convert research into practical solutions, programs, resources or equipment
• Collect the latest data on the burden of drowning, on the latest developments in water rescue techniques and effectiveness of interventions for prevention of aquatic incidents, acting as an unique repository for drowning research and stimulating the policy debates
• Provide technical assistance to individuals and organizations with interest in using methodological approaches to answer specific drowning-related issues.

This presentation will provide an insight to the collaborative approach of establishing an international alliance dedicated to promote drowning research by gathering collaborative efforts fostering the reduction of incidents in and around water.

More information available on www.idra.research.org
Flotation non-wearing and wearing in occupational boating fatalities, Canada 1991-2010

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Objectives
Ascertain trends and factors associated with non-wearing of flotation among occupational boating fatalities in Canada, and compare with recreational users.

Methods
Annual Red Cross collection of 1991-2010 Canadian coroner data by structured questionnaire. Analysis using STATA included activity, purpose, personal, equipment, environment factors and trends.

Results
There were 10,511 water-related deaths, 9,961 from immersion including drowning and cold, 513 trauma, and 37 other injuries. Excluding land and air transport, 37% of immersions involved boating. 12% (n=366) of 3324 boating deaths involved occupation and 85% recreational or daily life. Occupational boating immersions included 297 drownings, 53 drownings with hypothermia, 5 deaths due to hypothermia complicated by drowning, and 11 hypothermia deaths. At least 55% involved very cold water less than 10°C. 62% were commercial fishing and 14% marine shipping; 9% of fishers and 12% of shipping victims were properly wearing a flotation device. Overall, 11% were properly wearing, 2% improperly wearing, and at least 35% not wearing flotation, possibly more since flotation was unknown for 38%. For 9% flotation was absent in the boat, and for 55% unknown. Range of boats in violation of current regulations, with no flotation, ranged from 9 to 64%, with many unknowns. Incidents included 31% capsizes, 27% falls overboard, and 25% swamping; only 5% dying falling overboard wore flotation, 9% in capsizes, 17% in swamping. There was no trend in non-wearing during surveillance. Most deaths occurred in Nova Scotia, British Columbia, and Newfoundland/Labrador. Numbers of deaths declined from 246 during 1991-2000 to 120 during 2001-2010. For recreational deaths, a flotation device was worn properly by 12%; in ≥50% flotation was absent, representing violation of current regulations requiring flotation devices in boats, even if wearing is not required.

Conclusion
While occupational deaths have declined, for various reasons, non-wearing of flotation among victims remains high. Legislation on wearing varies and is left to discretion of the operator. Review of various boating interventions has found the greatest effectiveness to be legislation mandating wearing, coupled with effective enforcement. Hypothermia protective garments may also be required in cold water conditions, frequent in the Canadian context, especially for occupational boating.

Acknowledgements
The Cook Rees Memorial Fund for Water Search and Safety funded this project in collaboration with the Canadian Red Cross.
Launched in December 2012, the primary objective of the Princess Charlene of Monaco Foundation is to save lives by fighting against drowning.

Its missions are to raise public awareness about the dangers of water, teach children preventive measures, and teach them to swim.

A number of “Learn to Swim” and “Water Safety” programmes have been implemented by the Princess Charlene of Monaco Foundation worldwide in order to fight against this affliction.

The “Sport & Education” programme makes use of athletic activities as tools contributing to the well-being and development of all children regardless of origin or social status.

In 21 countries, more than 92,000 people, 91,000 of which are children, have benefited from projects supported by the Princess Charlene of Monaco Foundation.
A decade of experience in child drowning prevention in a low-income country setting, Bangladesh: implications for other similar settings

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Session 2 - Opening Plenary, Grand Ballroom, November 4, 2015, 11:00 AM - 12:30 PM

Background
Bangladesh is known for pioneering diarrheal disease interventions such as ORS. Diarrheal diseases were a leading killer of children and the Matlab research site was created to develop effective interventions. Drowning has a similar story. With child drowning rates extremely high, in 2005 CIPRB created a community intervention research site for injury prevention, including drowning. Since then progress has been made to learn to develop interventions that are effective, acceptable to the community and sustainable over time.

Evolution of drowning prevention measures in Bangladesh
1. Counting drowning deaths
The Bangladesh Health and Injury Survey (BHIS) 2005 showed drowning is the leading killer of children after infancy and children 1-4 years had the highest fatal drowning rates. Over 17,000 children fatally drown every year and 12,000 are children 1-4 years old. Risk factors are high rates of water exposure, lack of supervision of young children, lack of awareness of drowning prevention and lack of life saving skills. This provided the conceptual basis for interventions. With it, CIPRB undertook research to measure the effectiveness of interventions and to evaluate how they could be integrated into the national health system.

2. Country specific interventions for prevention of child drowning
Prevention of Child Injuries through Social Intervention and Education (PRECISE): PRECISE, a community trial conducted during 2006 to 2010 identified two major interventions, the community crèche for supervision of children 1-4 year old and SwimSafe, survival swimming skills for children 4 years and over. Complementary research showed SwimSafe graduates do not engage in increased water exposure and can rescue peers who are drowning. Further research showed it is possible to create a village-based first response program for rescuing and resuscitating drowning victims.

Saving of Lives from Drowning (SoLiD) in Bangladesh and Bangladesh Anchal and SwimSafe (BASS) are two ongoing research activities. PRECISE introduced the community crèche and playpens in homes. It found high rates of use and acceptance of community crèches, but low rates of acceptance and use of playpens. SOLiD aims to understand how to increase acceptability and use of playpens in homes. BASS aims to further integrate the community crèche in the national health system, adding additional benefits in other areas of health, growth and development and disability.

Success in child drowning prevention
As a result of the decade’s focus on drowning, the Bangladesh government recognized child drowning is a major child health issue. Nationally a high level committee has been formed for prevention of injuries including drowning headed by the office of the Prime Minister. The government has established a target of eliminating child drowning as a leading cause of death by 2035. CIPRB, with the help of international donors has established the International Drowning Research Centre- Bangladesh (IDRC-B) which is providing a broad base of evidence for child drowning prevention in low and middle income countries. Much of the evidence has been presented in the WHO “World Report on Drowning Prevention”. IDRC-B is currently working to help develop a national drowning prevention plan for Bangladesh.

Conclusion
The decade of effort has led to several milestones in child drowning prevention in Bangladesh:
- The government is committed to eliminate preventable child deaths including drowning by 2035.
- The research has identified cost-effective interventions for child drowning in Bangladesh.
- The evidence provides other LMICs a pathway to achieve similar results in their own countries.

The goal for the next decade is further engagement of policy makers and stakeholders to develop a national plan to eliminate drowning and other causes of injury as leading killers and assist other LMICs in a similar process.
A profile of survival swimming teaching programme in a low resource setting – experience from Bangladesh

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Swimming & Water Safety 1, Bayan, November 4, 2015, 1:30 PM - 3:00 PM

Background
There is evidence that teaching children survival swimming can prevent drowning. The SwimSafe survival swimming program was implemented between 2006 and 2010 in rural Bangladesh. Children 4-10 years old were taught survival swimming in local ponds using village volunteers trained as swimming instructors. The SwimSafe program curricula is internationally recognized and certified, with graduation criteria of swimming for 25 meters and floating for 30 seconds in deep water. In the initial SwimSafe program, the graduation rate was measured but drop-out rates was not. The SwimSafe program has continued since 2010 and in 2013 data was collected on failure to graduate. This paper looks at the experience of the SwimSafe program in 2013 to determine both graduation rates and drop-out or failure rates.

Objectives
To determine passing rates, time to achieve swim competence and failure rates in the programme in 2013.

Methods
36,945 children 4-10 years old were enrolled in the SwimSafe programme in three districts of Bangladesh in 2013. The age, sex and date of enrolment of the children were recorded prior to starting swimming lessons. The children received training using the current SwimSafe curriculum. Swim competence is defined as 25 meter swim distance and 30 second floating in deep water. The date of graduation was noted for each child. The children who could not qualify or did not continue the lessons were recorded.

Results
Among 36,945 enrolled children of 4-10 years 31,185 (84.4 percent) graduated. Boys had a higher rate of graduation (85.5%) than girls (83.3%). In both sexes passing rates increased with age of the child. The lowest and the highest passing rates were observed among 4 year olds (48.6 percent) and 10 year old boys (92.0 percent) respectively. The mean time to learn to swim for all ages and both sexes was 9.9 ± 2.7 days; and the median was 10 days.

Conclusion
Most children (84.4%) of children between 4 and 10 years old can learn swimming in the SwimSafe programme. Older children were more successful in learning swimming than the younger children. Children of all ages and both sexes required a similar number of days to learn to swim. Further research is underway to determine what changes in the curriculum would increase passage rates.

Acknowledgement
We gratefully acknowledge UNICEF-Bangladesh for providing funds for the SwimSafe programme.
The level of swimming skill necessary to protect children in LMICs from drowning

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Swimming & Water Safety 1, Bayan, November 4, 2015, 1:30 PM - 3:00 PM

Over 90% of the world’s drowning occurs in low and middle income countries (LMICs). Well over three fourths of these drownings involve children. Successfully intervening in the global drowning epidemic will require preventing child drowning in LMICs. The median age of drowning in Asian LMICs is under five years. Thus, half of children at risk of drowning are too young to be taught to swim. They will need other interventions that increase proper supervision and isolate them from water bodies. Older children will require attaining swimming skills (among other skills) for drowning protection. The question naturally arises regarding the level of swimming skill needed to be taught for drowning protection.

There is surprisingly little outcome-based evidence to show the level of swimming skill that prevents fatal drowning. Logically, that level will depend on the drowning environment; a ship sinking far offshore will require more swimming skill than required after a fall into water where the bank is a distance of a few meters from where the child fell in. Evidence shows the most common drowning environments in LMICs are where children drown while falling into or while playing or bathing in a natural body of water. A large majority of children drown no further than 5 meters from the bank of the water body, most often a pond, ditch or river.

Case-control studies nested in 4 large community-based surveys in Bangladesh, Thailand, China and Cambodia show significant associations with the reported ability of a child to swim 25 meters and protection from drowning in the drowning environments in these countries. Based on this distance, a cohort trial in Bangladesh showed children 4-12 years old who graduated from SwimSafe and were able to swim 25m had markedly lower drowning rates than age- and sex-matched children who did not attend SwimSafe. Thus for children exposed to the common drowning environments of Asian LMICs evidence shows the level of swimming skill necessary to protect against drowning is 25m.

Swimming skill is only one of several skills taught in SwimSafe. It is likely the combination of all the skills as well as the increase in water safety knowledge resulted in the marked reduction in fatal drowning. None-the-less, the 25m metric is evidence that higher levels of swimming skill are not necessary in the common drowning environments of LMICs. This doesn’t mean swim teaching programs in LMICs cannot teach to higher levels of swimming skills or include more complex skills beyond basic swimming. However, reaching a higher level will require more lessons, more instructor time and necessarily mean a higher cost to protect children from fatal drowning in the most common drowning scenarios they encounter.

A basic principle of public health is when costs are equal the preferred intervention is the one that protects the largest number of the population. Protecting more from the normal drowning scenario at the same or lower cost is the better public health buy than a more costly intervention that protects a smaller number, even if the higher cost intervention is more fully protective for those fewer individuals. When swim training is implemented as a public health intervention across large populations in Asian LMICs, the cheapest and thus most cost-effective level of swimming skill is 25m.
From “Swimming Skill” to “Water Competence”:
Towards a more inclusive drowning prevention future

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Swimming & Water Safety 1, Bayan, November 4, 2015, 1:30 PM - 3:00 PM

Introduction
Teaching swimming skills and knowledge are seen as stratagems for drowning reduction. Debate continues on such questions as a) which stroke should children learn first, b) is survival floating or treading water most protective, c) is swimming on the front more valuable than swimming on the back, d) what distance should be considered one of the outcome measures of water competence, e) to what degree can competence transfer from one setting to another (e.g. from pool to open water), etc.

Tradition and expert opinion are no longer enough. Science can and must assist in the selection of essential competencies. The concept of “water competence” also includes affective and cognitive competencies and is thus more inclusive than “swimming skill”. Drowning prevention now has a more inclusive future.

Aims
The aims of this study were to:
a) select personal water competencies which can be supported by research showing protective value,
b) to translate this research evidence to a pragmatic rationale suggesting how it supports the inclusion of these individual competencies, and
c) propose areas for future research.

Methods
Individual items were selected from the curricula of international and national organizations, scholarly journal articles and organization position statements. A literature search was conducted to explore evidence supporting these competencies. Adjustments were made by adding to or subtracting from the original list. Expert opinion was used to translate this evidence to a pragmatic rationale for support of each competence.

Results
Research supports the inclusion of the following competencies in educational programs:

1. Deep water entry
2. Surface and level off
3. Breath control, economic breathing
4. Buoyancy control, survival float
5. Roll from front to back and back to front
6. Swim on front
7. Swim on back
8. Tread water
9. Turn left & right, on front & back
10. Surface dive
11. Swim under water
12. Exit safely
13. All of the above with clothes
14. All of the above with PFD
15. All of the above in open water
16. Knowledge of local hazards
17. Accurately identify risk
18. Accurately assess personal competence
19. Recognize and respect safety to self and others
20. Positive attitudes to safety of self and others

Conclusions
There are still only a few papers which suggest a link between learning to swim and drowning reduction. In those studies, the contribution of each item is unknown. Recently researchers have focused on assessing the protective value of specific competencies. When examining the protective value of single items, as in this study, it is also unknown how these items together would influence the successful avoidance of drowning. More research is needed, especially linking educational efforts directly to the reduction of drowning incidence and identifying the relative importance of the recommended competencies.

References
Trial of a ‘Before School Swimming and Water Safety Model’ in Victoria, Australia future

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Swimming & Water Safety 1, Bayan, November 4, 2015, 1:30 PM - 3:00 PM

Background
In Australia, drowning is a leading cause of death in children and young people aged 0-24 years (1). Significant progress has been made in understanding toddler (0-4 years) drowning in high income countries, including Australia. In contrast, there is a lack of empirical evidence regarding the drowning risk and protective factors inherent in the 5-24 years age group. While limited research connects swimming and water safety skills and knowledge to a decrease in drowning, swimming and water safety education continues to be considered a preventative strategy that may be beneficial for persons of all ages (2).

Swimming and water safety education is not mandatory in the Victorian school curriculum. Research was conducted by Life Saving Victoria (LSV) in 2012/2013, which included surveying parents and teachers regarding their perceptions of their child/students (aged 11-12 years) swimming competency. The results indicated that 60% of teachers and 36% of parents reported that their child/students aged 11-12 years could not swim continuously for 50 metres, and 40% of teachers and 8% of parents reported that their child/students aged 11-12 years could not float continuously for more than 2 minutes (2). This equates to 39,000 and 26,000 children respectively leaving Victorian primary schools each year without essential swimming and water safety skills. This research also identified barriers to schools participating in swimming and water safety programs, including; crowded curriculum and high demand on classroom time, high cost of instruction and transport to and from pools, and a lack of qualified swim teachers (especially in regional areas). Consequently, LSV trialled implementing a before school swimming and water safety program to address these barriers and to obtain an objective measure of children’s swimming competency.

Aims
The aims of this research project were to determine:
- The feasibility of the before school program in partnership with Victorian schools and aquatic facilities.
- An effective cost model for the sustainability of school swimming and water safety programs to present to Government.
- The relationship between a child’s self-estimated and actual swimming competency and the implication for drowning risk.

Methods
Part 1 - A swimming and water safety education program was implemented at a regional aquatic facility, with two schools from areas of socio-economic disadvantage. The program was designed for children aged 11-12 years and focused on personal survival swimming skills and knowledge, which was a shift in focus from ‘learn-to-swim’ in Victoria which frequently implies correct stroke technique over a particular distance. The same content was delivered to both schools; however, one school completed an intensive block (one lesson before school over 10 days) and the other completed an extended block (one lesson each week before school over 10 weeks).

Part 2 - Prior to undertaking the program, the children completed a self-report questionnaire regarding their swimming competency, water safety knowledge, and exposure to aquatic environments. A self-report questionnaire of the parents/guardians of these children obtained the same information. At the beginning of each program, the actual swimming competency of the children was assessed.

Expected Outcomes
It is expected the trial will successfully address issues identified by schools including, the high cost of instruction and transport, as well as crowded school curriculum and the high demand on classroom time to attend traditional lessons. Additionally, it is anticipated that the findings from this study will provide invaluable evidence for the water safety industry, particularly in relation to the swimming competency and water safety knowledge currently achieved by Victorian primary school children, along with children’s and parents’ perceptions of swimming competency.

Conclusion
Research has identified the need to introduce swimming and water safety programs innovatively into the school curriculum. This trial aimed to enhance swimming and water safety skills and knowledge of children, and ultimately reduce aquatic-related death and injury. The trial demonstrates the provision of an evidence based practical solution, designed to influence policy and practice.

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Should you leave your clothes on? Performance and thermoregulatory consequences of clothing during resting cold water immersion and survival swimming

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Swimming & Water Safety 1, Bayan, November 4, 2015, 1:30 PM - 3:00 PM

Introduction
There are approximately 500,000 to 1 million deaths by drowning each year caused by accidental immersion. In the vast majority of these occurrences the individual falls in to the water whilst fully clothed. If the chances of rescue are remote and the water is cold, the victim must consider whether to attempt to swim to safety before superficial muscle cooling and hypothermia set in; the conventional advice is to remain stationary, float and retain heat. The implications of retaining versus removing clothing were considered in participants who rested compared to undertaking survival swimming (head out breast stroke) in cold water (12 °C).

We hypothesised: clothing would be more beneficial to thermoregulation at rest (i.e. more heat retained; H1) than during swimming where natural insulation would be compromised (H2) and the decrement to swimming performance would significantly reduce distance covered (H3).

Methods
Ten male participants consented to the study; mean (SD) characteristics were: age 24 [4] years; height 1.80 [0.08] m; mass 78.50 [10.93] kg; body composition 14.8 [3.4] % fat. They visited the laboratory on 5 occasions which were i) a test of maximal oxygen uptake (VO2peak), visits ii-v) a resting immersion whilst naked (i.e. they wore a bathing costume), a resting immersion whilst clothed and the corresponding two immersions whilst swimming in a flume for up to 60 minutes or to failure; visits ii –v) were randomised. Test duration, swimming speed (swimming tests only), thermoregulatory changes (mean skin temperature Tmsk and rectal temperature Tre), oxygen consumption (VO2) and rating of perceived exertion (RPE) were measured. Mean [SD] data were calculated and compared between clothed and naked immersions for rest and swimming conditions using ANOVA and paired samples t-tests to an alpha level of 0.05.

Results
Test duration and terminal Tre in the rest conditions were not different: clothed (60 [9] min) and naked (57 [10] min); Tre clothed (36.2 [0.5] °C) and naked (36.3 [0.6] °C). Tmsk was higher whilst clothed (15.5 [0.9] °C) compared to naked (13.3 [0.4] °C). Whilst swimming, test duration was shorter when clothed (39 [19] min) compared to naked (52 [18] min). Consequently participants swim further in the naked condition (1264 [564] m) than when clothed (815 [482] m). Tre was similar clothed (2.56 [0.35] L·min-1) and naked (2.55 [0.37] L·min-1), inferring greater swimming efficiency. Accordingly, the RPE data were higher in the clothed swimming condition (18 [1]) compared to whilst naked (16 [1]). However, terminal Tmsk and Tre were lowest in the naked swim condition suggesting greater heat loss; terminal Tmsk was: naked swim 12.7 [0.8] °C versus clothed swim 14.5 [1.9] °C; Tre naked was 36.1 [0.7] °C versus clothed swim 36.7 [0.8] °C.

Discussion
Our hypotheses were supported partially (H1) and fully (H2, H3). Consequently we suggest that clothing is more of a thermal benefit at rest but more of a performance disadvantage whilst survival swimming by increasing surface drag and reducing swim efficiency, without a concomitant thermal benefit. Yet, when swimming whilst unclothed Tmsk and Tre dropped to a greater extent with the latter conferring a greater risk of hypothermia. Before attempting to swim to safety in cold water the decision to remove clothing to improve swimming efficiency and delay fatigue must be balanced against the increased risk of developing hypothermia if in the water too long. Under the conditions of the present tests, if safety is within an approximate range of 1300 m or can be reached within 50 minutes, swimming is more likely to be successful in the absence of clothing; which appears to impose more of a performance burden than thermoregulatory advantage.

References
available on request
A Policy Strategy for Open Water Drowning Prevention-from Planning to Action to Evaluation

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Prevention 2, Ballroom 3, November 4, 2015, 3:30 PM - 5:30 PM

Drowning is the second leading cause of unintentional injury death among children and teens in the United States. Most drownings in Washington State occur in open water such as lakes, rivers, streams, ponds and the ocean. The state has developed an Open Water Drowning Prevention Policy Strategy Plan for 2011-2016 (1). Action at both the state and local level has been critical to success. Strategies cover the following areas: life jackets and life jacket loaner programs, boating under the influence, physical open water barriers, safer swim areas, swimming skills and water safety education, surveillance and partnerships.

Each of the seven areas have specific policy related strategies and measures of success. Multidisciplinary committees and task forces have addressed each of the priority areas. Partners include sheriff marine patrol, youth organizations, parks departments, coroners, health departments, hospitals, state and local public health, injury prevention and environmental health specialists, universities, families of drowning victims and neighborhood organizations. To date, progress includes: designated swim area guidelines similar to what has been developed for pools; an open water drowning investigation tool to facilitate prevention oriented surveillance; observations of life jacket use integrated into the state boating office role; strengthening of the boating under the influence of alcohol law; model policies to require swimming in schools, the addition of swimming questions to the Healthy Youth Survey; increased single gender public swim opportunities; and the development of innovative new partnerships. Drowning rates due to unintentional drowning for 0 to 17 year olds have decreased from 1.08 in 2006-2010 to 0.78 in 2009-2013.

Lessons learned include recognizing when to start with guidelines instead of policies, early identification of policy and product ownership to assure sustainability; linking policy to programs and how to make a state initiative relevant at a local level. Toolkits have been developed for designated swim areas, drowning investigations, increasing access to swimming and life jacket loaner programs.

Bibliography

Can a public awareness campaign change rock fishing safety behaviours?

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Introduction
Rock fishing is a popular yet dangerous recreational activity. Coroner records reveal that of 13 rock fisher drowning deaths reported from 2000-2012 in the Australian state of Victoria, all were male, 85% were aged 35-59 years, and 85% were from culturally and linguistically diverse (CALD) backgrounds. None of these drowning victims were wearing lifejackets.

This series of drowning events prompted the development of a safety campaign targeting the prevention of rock fisher drowning incidents. The three year state-wide campaign (2013-15) adopted public awareness strategies and advertising which targeted rock fishers and identified at-risk CALD communities. The priority message encouraged all rock fishers to wear lifejackets.

Aims
To measure campaign effectiveness through adoption of safety behaviours or attitudinal change for Victorian rock fishers.

Methods
A three year (2013-2015) study of rock fishers by direct observation and randomised self-report survey in situ was conducted across coastal locations in Victoria. Complementary rock fisher population self-reported data were collected online (not reported here). Study sites (ten rocky platform locations within six regions) were purposely selected for rock fishing popularity and putative drowning risk (based on drowning incidents reported at each location). Trained observers visited the six regions two or more times each year (to ensure safety, observations were taken using binoculars from distant vantage points). Rock fishers and others situated on rocky platforms were observed directly for 90 minutes. Person and situation variables were recorded including clothing (e.g., shoe type), equipment (e.g., lifejacket), and environmental variables (e.g., wind strength). Recorded behaviours included turning one’s back on the sea, fishing alone, and checking conditions prior to fishing. Participants also provided self-reported ratings for perceived risk and safety awareness associated with rock fishing. Data analysis applied statistical tests appropriate to the data using an alpha of p<.01.

Results
A total of 275 direct person-observations (105, 85, and 85 in years 1-3, respectively) and 58 self-report surveys were completed (27, 24, and 7 in years 1-3, respectively) over a 28 day non-consecutive period. Direct observations included persons accompanying rock fishers or those fossicking/sightseeing. For 52 discrete rocky platform observations, no persons were observed on 7 (13%) occasions and one person on 11 (21%) occasions. For direct observations, median estimated age was 30 to 39 years. Males comprised 88% of the sample. Twenty-six (9%) persons appeared to have travelled alone (14, 10, and 2 in years 1-3, respectively, showing a statistically significant downward trend at p<.05). For equipment, 102 (37%) persons were determined to have unsuitable footwear (i.e., not non-slip), 223 (81%) did not have access to a rope and floatation device (e.g., portable cooler), and 268 (97%) persons were observed not wearing lifejackets. For activity behaviours, 50 persons (comprising 74% of the 68 persons arriving during the observation period) were noted to check sea conditions, 164 (60%) positioned themselves within 2 metres of the water’s edge, and 221 (80%) persons were observed to turn their back on the sea. No consistent pattern in risk behaviour reductions or safety practice uptakes was observed over the three-year period except for a decrease in those travelling alone (14, 10, and 2 persons in years 1-3, respectively).

Self-reported data proved consistent with observations. Of 58 respondents, 3 (5%) could not swim and 9 (16%) knew personally someone previously swept off rocks. Knowledge of the targeted safety campaign was reported by 21 (71%) of the 31 respondents surveyed in years 2 and 3. The majority (81%) of respondents agreed that rock fishing carries an inherent risk of drowning, yet only 10% indicated that they always wore a lifejacket while fishing.

Discussion and Conclusion
The campaign goal was to reduce the number of rock fishing deaths in Victoria by increasing rock fishers’ knowledge of the risks associated with rock fishing and facilitating safer behaviour. The rollout of advertising targeting desired behaviour change to safer practices (e.g., wearing a lifejacket) in Year 2 and 3 had limited success in terms of behaviour change. While rock fishers may be travelling alone less frequently, the study findings indicate that other desired behavioural changes are yet to be realised. This finding may be explained by limited representation of the sample, imperfect measure sensitivity, or campaign ineffectiveness. Regardless, study results suggest rock fishers recognise the dangers associated with their activity but fail to behave safely. This presents practical difficulties in changing behaviours necessitating the need for further development of innovative drowning prevention strategies.
Drowning prevention-- different scenarios needs customization water safety messages and actions

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Introduction
Drowning is a major public health problem in Brazil where 18 people die daily, four of them children under 14. Brazil has a very high exposure to aquatic areas used year round, and the one of highest rates of death by drowning in the world. In 2012, drowning was responsible for 6,369 deaths and was the second leading cause of death for those aged 1 to 9. Freshwater venues were responsible for 92% of all deaths but locations vary widely. Preventive education is the most effective action that can be taken to reduce these figures but messages need to be tailored to each venue and group at risk. The aim of this study is to identify different scenarios where drownings occur and their specific water safety messages and actions.

Methods
Drowning experts from the SOBRASA’s Board of Directors were invited to participate electronically and select drowning scenarios, water safety messages and actions to be taken by the lifeguard service. Brazilian national summary information concerning victim profile for each scenario was provided when available. A place for expert rationale input to each recommendation was available. The Delphi method, a structured and interactive communication technique was used in 3 rounds:

1) Propose all scenario’s possibilities, water safety messages and actions. This was split in two sections: one for the public and the other with actions to be taken by the lifeguard service. Each participant classified an action pattern as: pro-active, reactive or mixed;
2) Identify overlaps and propose new messages;
3) Score all messages from 1 to 5 for each particular scenario and rank them in 3 levels of importance. The top priority level rank was set to 4 and above and was used to summarize the most important water safety message to release to the public. The overlapping of top messages in more than 4 scenarios was selected to be general water safety message and actions to be taken by lifeguard service.

Results
12 experts voluntarily answered the 3 rounds of the Delphi process along a 7 months period. Twelve scenarios were identified: general, ocean beaches, river, open water (lakes/ponds/dam), pools, flooding, in and around-house, fishing, boat and water craft, waterfalls, surfing and board craft sports and water transportation. Experts’ selection of water safety top priority messages (>4 points) varied in number from 5 to 14. Messages overlapped scenarios in 27%. Each scenario and their top messages are demonstrated in table 1. The top priority number of preventive actions to be taken by the lifeguard services range from 3 (in and around house) to 11 (rivers), overlapping in over 70% and were directly proportionally to governmental legal responsibility and is shown on table 2.

Conclusion
Preventive education on drowning is the most effective action that can be taken to reduce the drowning burden but resources are limited and messages are available in many different formats. To be effective, water safety messages need to be tailored. This study was able to identify 12 different aquatic scenarios and their correspondent top priority water safety messages based on expertise. Furthermore of great relevance was the identification of which messages are pro-active, reactive or have a mixed component on their content allowing an order of priority on the play. Also from the perspective of the lifeguard service this study highlight their major responsibility of taking actions on prevention education and the risk management at each scenario. The result is a powerful content tool that allows lifeguard services to launch different prevention campaigns tailored for each scenario. Still an evaluation of the power of each message needs to be scientifically tested to prove relevance.
This much? Insights into the formative research underpinning a Western Australian child drowning prevention television campaign

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Introduction

Globally drowning is among the 10 leading causes of death of children and young people, accordingly the impact of drowning is a significant public health problem (1). Children under 5 years are at a heightened risk of fatal and non-fatal drowning incidents irrespective of whether the live in a high or low-middle income country, presenting a need for the development of evidence informed drowning prevention strategies (1). Historically, drowning prevention strategies have included traditional mass media, education, policy, and legislation (2). However, few drowning prevention efforts are informed by behavioural theory, formally evaluated and or published in the peer reviewed literature (3). An opportunity presented to create a partnership between a non-government organisation and a research centre to undertake formative research, and guide a new media strategy using a theory based approach to prevent drowning in young children.

Aim

This paper describes the findings of the formative research underpinning the development of the ‘This Much?’ media campaign, which forms part of the Keep Watch program in Western Australia.

Methods

Seven focus groups were conducted (n= 56) in metropolitan and regional Western Australia, using a convenience sample of parents and caregivers of children aged under five years. Open ended questions were posed to ascertain key messages, misconceptions, style, relevancy, and saliency of the proposed execution. Constructs of the health belief model (4) and social cognitive theory (5) were used to guide question development. A pre-existing 30-second online community service video was presented to each focus group twice. The video used a number of Australian celebrities to demonstrate the range of situations and the small amount of water that a child could drown in. The video ended with a request for viewers to share the video on Facebook. Qualitative content analysis was conducted. Interviews were transcribed verbatim, data coded according to the content and categorised to inform the final execution of the advertisement launched in December 2014. Additional metrics will be collected and analysed in 2015.

Results

Preliminary results suggest comprehension and acceptance were high. Key message take out centred around the amount of water a child could drown in and the need to be aware of potential water hazards. Techniques used to deliver messages were also well received. However, the video was considered to lack cultural diversity. Mixed responses were also received in regards to the use of celebrities. In general, parents were considered easier to relate to, credible and trustworthy. Cues to action within the video also required some improvement. Additional results will be presented.

Discussion

Evidence suggests that successful mass media campaigns are underpinned by behavioural theory and formative evaluation (6). This research will add to the small body of literature that acknowledges the contribution of both theory and evaluation to campaign design and execution to prevent drowning in young children. Dissemination of research findings will provide practitioners with insight for future evidence based child drowning prevention media campaigns.

References

Bronze e-Lifesaving - bringing lifesaving into the classroom for secondary school students

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Background
As a result of consistently high drowning statistics for 15-24 year olds, Royal Life Saving has recognised that teenagers and young adults need to be more engaged in swimming and lifesaving activities to provide them with the skills and knowledge for safe aquatic recreation. For this reason we have developed the Bronze e-Lifesaving initiative to provide an easy to implement platform for learning.

Bronze e-Lifesaving utilises aquatic themes to challenge students to explore risk-taking behaviour, personal attitudes and beliefs, personal relationships and to develop skills in making informed decisions, refusal tactics and leadership. Bronze e-Lifesaving is a classroom based program that teaches survival skills, rescue techniques and basic emergency and first aid care for managing situations where their own or others’ wellbeing and safety may be at risk.

Aims
The key objectives of the implementation of the Bronze e-Lifesaving were:
• Getting lifesaving back into schools
• Increasing awareness of the Royal Life Saving brand
• Developing lifesaving knowledge and skills
• Building relationships with the education sector
• Collection of data and information on users
• Opportunities to on-sell programs and services

This evaluation will investigate whether the objectives of the Bronze e-Lifesaving program have been met and will seek feedback from teachers including:
• Reasons for selecting program for students
• Whether they feel students benefitted from the program
• Did they plan to go on to provide practical skills or complete a lifesaving award
• What have been the barriers to providing lifesaving in schools?

Target
The target demographic for the Bronze e-Lifesaving program is secondary school students in years 7 to 10, mainly aged 12-16 years. This education program targets this age group as a preventative measure as they are prime potential drowning casualties.

The evaluation will target the secondary school teachers that have facilitated the Bronze e-Lifesaving program for their students.

Implementation
The Bronze e-Lifesaving program was launched in October 2014 as a FREE e-learning program for secondary schools in Australia. A number of different promotional strategies were adopted to ensure teachers at schools were targeted, as they would be the decision makers to adopt the program. A campaign page on the RLS website was created to provide extensive information on the program and direct teachers to the e-learning platform. The program was promoted to a database of 2350 secondary schools via an email newsletter and a promotional video. A number of conferences specifically aimed at Health and Physical Education teachers were attended to showcase the program. Other activities included promotion on the Australian Council for Health and Physical Education e-Newsletter (distribution 10,000) and a 2-page article in their Magazine (distribution 3,000).

Evaluation Survey Methods
The teacher evaluation survey was conducted from 13 May until 7 June 2015 and sent out to 232 teachers via SurveyMonkey. A total of 87 responses (37.3%) were received and used in the analysis. The survey was made up of a maximum of 35 questions with some skip logic questions depending on responses. The survey was distributed via email to the teachers who had ordered tokens on the e-learning platform.

Data was also collated from the e-learning platform for enrolment statistics and user information.

Results
In the eight months since launching the program, 538 token orders by schools/teachers have been made. This amounted to a total of 16,289 enrolment tokens being issued. Broken down this was 9105 for Unit 1 (years 7 and 8) and 7184 for Unit 2 (years 9 and 10). For Unit 1, of the 9105 enrolment tokens issued, 2502 students have enrolled (27.5%), 41.1% of those enrolled have completed the program. For Unit 2, of the 7184 enrolment tokens issued, 2272 students have enrolled (31.6%), 47.3% of those enrolled have completed the program.

Full results of the evaluation will be presented at the conference in November.

Conclusion
This evaluation survey will provide valuable information on whether we have achieved the objectives we established at the commencement of the project. This information will be used to guide improvements for the Bronze e-Lifesaving program as well as future development of e-learning programs.

Acknowledgements
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Using photography and yarning to evaluate an Aboriginal community swimming pool program in remote Australia

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Prevention 2, Ballroom 3, November 4, 2015, 3:30 PM - 5:30 PM

Background
Swimming pools have been built in many remote Aboriginal communities throughout Australia to provide safe recreational and education opportunities for community members living in these hot locations. The Remote Aboriginal Swimming Pool program (RASP) has provided swimming and water safety education to communities for over a decade. This State Government funded program is unique in Australia in that it is long-term, fully-funded and has full-time pool managers living in each community. While anecdotal feedback on the RASP program has highlighted many benefits including increased water safety skills and improved health, social and educational outcomes, a formal evaluation of the program has yet to be done.

Aims
To gather feedback from local adults and school children on the effectiveness of the RASP program using Photovoice and yarning. In particular, the study explored barriers to pool use and the effectiveness of using pool access as a reward for school attendance.

Target
Indigenous Australians in three remote communities of Western Australia across all age groups, with a focus on school aged children.

Methods
Photovoice and yarning were chosen as the key methods as both are considered culturally appropriate for conducting research with Aboriginal people and they allow participants to be actively involved in both the collection and implementation of research outcomes. Photovoice participants represent issues or views in their community by taking photographs and detailing the stories or narratives behind them (1). Photovoice is increasingly being used with indigenous and marginalised groups including with Aboriginal young people. Yarning refers to the Aboriginal way of having a conversation through the respectful sharing of ideas and stories and has been shown to be a useful research tool in this group. (2).

In November and December 2014 Photovoice activities and yarning interviews were conducted in three communities. Seven classes participated in Photovoice activities with students ranging in age from 8-15 years (n=72). Students were asked to take photos of things that they do or do not like about the swimming pool and to write captions to accompany them. A discussion workshop was held with each class where the narratives behind the photos and opinions of the school-pool reward policy were explored. Individual and group yarning was conducted with community stakeholders including police, health, school and other key organisations (n=38). Through yarning, participants shared their thoughts and experiences of the swimming pool and its programs and explored solutions to any perceived issues. Feedback was also gathered on the appropriateness and effectiveness of rewarding school attendance with access to the pool.

Daily school and pool attendance data was also collected for participating children.

Results
At the time of writing this abstract, analysis was in the very early stages. Photovoice and yarning data will be coded and analysed for themes. School attendance data will be matched to pool attendance data. The Photovoice activities were considered very effective at engaging children in the research question and were also used to meet school curriculum requirements.

Conclusion
Photovoice and yarning are excellent methods for research with children and Indigenous Australians and could be used to evaluate other swimming and water safety education programs particularly in low and middle income regions.

Acknowledgements
Research designed with Associate Professor Roz Walker and colleagues from the Telethon Kids Institute (Perth), delivered in partnership with Department of Education teachers and funded by BHP Billiton (Australia).

References
Drowning prevention in Flood – A cartoon video produced by Sobrasa e ILS Americas - Portuguese, English and Spanish language

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Prevention 2, Ballroom 3, November 4, 2015, 3:30 PM - 5:30 PM

Introduction
Flooding is the most frequent natural disaster worldwide. It causes the greatest aggregate loss of life and property of all natural disasters. Long term effects include contaminated water supplies and related diseases, damage to roads and transport that slow emergency response, damage to farmland and industry, and psychological effects to those impacted. It impacts every country, regardless of the level of development.

Some floods develop slowly, while others such as flash floods can develop in just a few minutes and without visible signs of rain. Floods can be local, impacting a neighborhoods or a single community; or very large, affecting areas the size of small countries. While riverside flood damage can be mitigated by moving away from rivers and other bodies of water, people have traditionally lived and worked by rivers because the land is usually flat and fertile and because rivers provide easy travel and access to commerce and industry.

Flooding is the primary cause of disaster related death in Brazil (500 in 2011) and the country has the seventh highest level of drowning death by flooding worldwide (UN).

When people are educated about floods and prepared to act appropriately, there is significant potential to avoid death and injury. Property damage may be mitigated if people take prudent measures. However, although flooding is a high impact natural disaster, affecting some part of the world each day, there are only a few campaigns to educate people on actions to take to protect themselves.

SOBRASA and ILS Americas have been working since our respective founding on the ways to promote drowning prevention, especially among children. One of our most efficient tools is an existing project at schools throughout Brazil where we have been using preventive beach and fresh water safety messages in two different cartoon videos. This paper aims to present an original flood drowning prevention cartoon video and its underlying messages.

Methods
Brazilian drowning experts were invited to select all flood water safety messages and actions according to Haddon matrix in pre-event, event and post-event. They were provided with all available issue information. The Delphi method was employed in 3 rounds. The 12 experts voluntarily participated in identifying all safety messages and scored them from 1 to 5. All top priority level ranked four and above were used to summarize the most important water safety messages to release to the public in the cartoon video. A final review was made by two international outside experts.

Results
The video with the cost of US$ 15,000(US), involving more than 16 cartoon video makers, takes 7 minutes to display all the flood water safety messages and how to act safely during and after the flood. Video message transmissions were predominately visual, but were narrated in three languages (Portuguese, English and Spanish). With further funding, additional languages can be used in narration. The cartoon has the summary messages focusing on the main general flooding prevention messages around the world.

1st BLOCK
What flooding is and its causes
2nd BLOCK
Prevention tips to avoid rural and urban flooding
Surviving flooding while at home, on the street, and where to go – how to react. Helping others – How to help without becoming a victim
3rd BLOCK
How to proceed after flooding

Conclusion
The project “Flood Drowning Prevention Cartoon Video” is an effort to spread the flood drowning prevention message to children in a funny, uniform, easy to distribute and interesting way in Brazil and other countries of the world. By targeting children, we believe we can educate a new generation and create a trickle-up effect, whereby children educate parents.
“AQUA” and “LITTLE CAPTAIN” (three cartoons for the prevention of drowning accidents of children, which can be used all over the world)

R. Admiral Romano Grandi

Background
The Società Nazionale di Salvamento (SNS) is a voluntary service association, International Maritime Rescue Federation (IMRF) Full Member, recognized by the Italian Govern for the professional training and the legal certification of the Italian lifeguards, and also devoted to the intervention and relief in general water emergencies.

Considered the Global Report on Drowning issued by the WHO and the general statistics usually available, really awful about the number of children that every year die for drowning, especially in the middle/low income nations, the SNS has prepared so far three short cartoons for children to be screened worldwide, easily understandable because without dialogue to avoid language troubles (two episodes of AQUA, lasting 4 minutes each), or with short subtitles in English (as Little Captain, lasting about 12 minutes). Few comments by an adult in the language of the audience are certainly enough to be well understood by children.

Here, it will be shown the first episode of “AQUA” and a trailer/summary of “Little Captain”.

Aim
To create awareness among children on possible risks that can be met at water; to suggest and support virtuous behaviors not only in swimming or playing at water, but also in the relationship with the water during the everyday life, because often children don’t perceive danger situations.

Scripts
The episodes of “AQUA” face the situation showed by each cartoon, where every child decides and shows his own behavior: if it will be safe, OK, if not, it will be aware of the possible consequences. We hope in the future we can product other episodes of AQUA.

In the third cartoon, Little Captain goes around the world on board of his rocket, facing various situations potentially dangerous: what is the right behavior to face/overcome safely these situations? Find out it following each episode (as AQUA, no dialogue, only images and sound track), each one introduced by children through very short subtitles in English, easily translatable by an adult in the children language.

Target
All children all around the world, of any language and any ethnicity, through schools, public safety Agencies, government Institutions, voluntary service associations, etc.…. wherever they work and assist children. Available for all these Bodies/organizations, free of charges. It’s enough a simple request to SNS (for our records), and the only condition is that is clearly pointed out that the cartoon is an idea and an initiative of the Società Nazionale di Salvamento (National Rescue Society), Genoa, Italy.
Study of the level of knowledge and awareness of children in Greece during the first school age (6-12 years), in the risk of drowning and the safe behavior of prevention and treatment

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Introduction
A study about the level of knowledge and the awareness of children in Greece during the first school age (6-12 years), as it concerns the risk of drowning and the safe behaviour in order to prevent and deal with it.

Drowning constitutes a silent epidemic of accidental death at very high rates both in global and Greek population. Especially as it concerns children, drowning is the second cause of death at ages under 5 years and the third cause of death from accidents at ages under 15, while a high proportion of children who survive a drowning incident end up with permanent and severe neurological damage.

Aim
The aim of our study is to evaluate the level of awareness at the risk of drowning amongst children aged 6-12. By completing a questionnaire children’s knowledge on safety and accident prevention in the water is examined. The objective of the study is to identify deviations from the proper knowledge and attitude against the risk of drowning to identify knowledge gaps and the factors at their behaviour that lead to the risk of drowning. Depending on the results attempts are made to propose targeted awareness actions and briefing children per age group.

Method
A cross-sectional study was conducted, through a questionnaire which was addressed to a sample of children aged between 6 and 12 and was selected to conduct a descriptive statistical study of the results and correlations. This specific age group was chosen due to influence that could be made on the level of their knowledge and behaviour by virtue of the influence of primary education and the development of their perceptual ability. Our sample had a total of n=491 subjects divided into 3 groups: 6-7, 8-9 and 10-12 years old.

Results
According to research results a great percentage of children, 93.3% is aware of the risk of drowning and has been informed primarily by his parents to a greater extent in the two younger age groups (6-7 and 8-9 years) while the largest group (10-12 years) was informed mainly by the media.

School and swimming teams are lagging behind in informing children about drowning. As it concerns simple first aid techniques 1 out of 2 children indicates ignorance while schools and swimming teams exhibit very low awareness rates among skilled, 4.48% and 9.76% respectively.

In all age groups, especially in the older one, children indicate that they have knowledge about drowning and its prevention but they are not sufficiently sensitized. As they grow up the recognition of the risk of drowning doesn’t improve, only 3% has recognized all possible places that a drowning could happen and just the 24% the timing of appearance.

High rates of self-esteem are shown about their excellent and very good swimming abilities in all group ages, with 46.4% excellent and 41.1% very good swimmers (a total of 87.5% capacity adequate swimming abilities) while only the 46.4% has practiced swimming techniques properly at a swimming club. The erroneously high self-esteem swimming ability is an important factor that will lead children in risky behaviours in water.

Discussion
New methodologies of more effective interventions in the subject of drowning in children are:

- Raise awareness among parents, which have the leading role to provide information and supervise children. Paediatricians could have an active role in their information.
- Enhance the role of school and swimming teams in order to inform children both on health issues and accident prevention in water.
- Duty to sufficient lifeguard coverage at swimming pools and beaches.
- Establish more stringent laws in compliance with safety rules in recreational craft and during water activities.
- Institute a global day of drowning prevention

Conclusion
Effective training in more secure attitudes of children, the future adult citizens, will lead to a prospective reduction of deaths by drowning in general population.
Remote Swim & Survive: How strong community relationships in remote Indigenous communities can prevent drowning

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Prevention 2, Ballroom 3, November 4, 2015, 3:30 PM - 5:30 PM

Historically swimming and water safety education has been inaccessible for children living in remote Indigenous communities in the Northern Territory. The Royal Life Saving strongly believes that every child deserves the opportunity to learn valuable lifesaving skills and knowledge in swimming, water safety, personal survival and basic rescue and has been implementing a Remote Swim and Survive Program for more than five years – last year three thousand children participated in this program.

The program also builds community capacity through the delivery of Austswim courses to local community members. These courses are customised to support participants to become Austswim qualified teachers of swimming and water safety and provide continuing community swimming and water safety programs. This presentation examines the results of a five year case study and the importance of community engagement as a success factor.
The provision of Aquatics Education within Primary Schools in the Greater Auckland Region

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Introduction
The New Zealand Curriculum (2007) (1) requires that every student has the opportunity to learn basic aquatic skills by the end of year 6 (p. 22). However recent media concerns about the lack of aquatics education in primary schools in New Zealand have highlighted the need to determine the provision of education delivery (2, 3, 4, 5).

Water competence is generally assumed to have a protective value in open water environments. Aquatics education that also teaches water safety and realistic appraisal of competency and risk within open water environments is likely to enhance that protective value. In spite of widespread public support for aquatics education being taught in schools from a primary school age, little is known about its current provision, the last comprehensive survey having been undertaken more than a decade ago (6). It is the purpose of this study to report on the status of content, quality and quantity of aquatic education in primary schools within Auckland.

Objectives
In exploring the provision of aquatic education in Auckland primary schools, this study will determine:
• the number of schools participating
• the capacity of teachers to deliver
• the components, and proportion of each component
• barriers to delivery, and
• areas where schools could be assisted

Method
A cross-sectional study using self-complete Survey Gizmo survey methodology was used to elicit information on aquatics education provision. Invitations to participate in the project were extended to all 474 Auckland primary schools within the greater Auckland region with a pupil population of approximately 150,000 pupils between the ages of 5–13 years. The survey was directed at the person responsible for aquatics education within each school. It contained 21 questions and was expected to take 5-10 minutes to complete. A mixture of response types were used to elicit categorical, nominal and ordinal data. Where opinions were sought, 5-point Likert scales were used ranging from strongly agrees to strongly disagree. Rating scales from 1-5 were used for prioritising issues or possible improvements, and open-ended questions were to obtain information on provision of school pools, recent aquatics professional development for teachers, barriers for delivery and perceived standard of aquatics programme.

The study was undertaken during the summer term of 2015 when aquatics education was most likely to be taught. The survey was completed online using Survey Gizmo, and data was loaded into SPSS for statistical analysis and any chi-square tests of significance.

Outcomes
Aquatics education is comprised of learn-to-swim, water safety, aquatic sports and recreation, and classroom learning to develop knowledge and critical thinking around aquatic environments. It is envisaged that three critical areas will be identified that impede aquatic education delivery; teacher qualification and professional development, cost factors and schools that do not teach aquatics education. The study will also report on the proportion of swimming, water safety and classroom learning that comprises aquatic education programmes in the Auckland region. It will compare data from the baseline survey completed in 2001 to report on any changes in aquatics education provision in the last decade.

References
Balanced progress: optimal protection in a drowning prevention context - a conceptual model

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Swimming & Water Safety 2, Bayan, November 4, 2015, 3:30 PM - 5:30 PM

Introduction
The literature abounds with arguments for development of all-around water competency (1). Even before 1900, there are references to what some would call principles of water competence. Learning outcomes often recommended are: a) as proficient on the front as on the back, b) as proficient under water as at the surface, c) to otherwise possess an all-around competency. Also, we know more about how a drowning episode evolves. Survivors describe how something they are less than proficient at threatens survival (2). ‘I was unable to get a breath’. ‘Swimming with clothes was too difficult’. ‘I could not stop and rest’. ‘I was injured from the fall’ and more.

A drowning episode can occur at any time. The trigger is usually some competency that is lacking or weakly developed. The testimonies cited above exemplify missing competencies. If stopping to rest was too difficult, resting was too weakly developed in the learning process. This in turn suggests not only what needs to be taught but emphasized.

While a drowning episode can occur at any time, it does occur at a specific point in time. Often at a point in time when the process of learning protective competencies is still in progress. If we stop the clock at the onset of the emergency, the question then is, ‘what should the victim be able to do at exactly this point in time?’ What, precisely, should the profile of competency look like at exactly this slice of time, this time when an emergency has arisen?

Aims
The aims of this paper are to
a) present pragmatic arguments for all-around water competence development,
b) present a conceptual model for ‘balanced progress’ during the learning of water competencies.

Method
A conceptual model is presented which argues that the competency profile at any given point in time must be as balanced as possible to provide optimal protection.

Results
The model presented describes the competency profile thus:

a) if one can propel one’s self for one minute (or any other period of time from zero onward) on the front, one should be able to do the same on the back,
b) if one can propel one’s self for one minute, one should be able to stop and rest for the same period of time (float and tread water),
c) if one can surface dive to one body length of depth, one should be able to swim two body lengths underwater.

Recent new evidence emphasizing the importance of coping with open water and while clothed prompt us to recommend that one also should be equally proficient with and without outer clothing and in both open water and quiet water.

Conclusions
An emergency can occur when on the front or the back, when at the surface or under water, etc. Since the immediate, in water evolution of the emergency episode is unpredictable, a pre-emptive approach demands preparation for multiple possible scenarios. Only balanced progress can provide this. During the learning process, continuous assessment will reveal any competencies which fall behind, becoming a weak link. This will require continuous attempts to eliminate such weak links.

References
Dressed to kill? The effects of clothing on water competency

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Swimming & Water Safety 2, Bayan, November 4, 2015, 3:30 PM - 5:30 PM

Background/Introduction
Unintentional falls into water, often when fully clothed, are a frequent source of open water drowning. In New Zealand, non-recreational immersion incidents, where the victim had no intention of being in the water accounted for one quarter (25%) of all drowning fatalities in the five year period from 2008-2012. Such incidents are likely to require immediate self-recovery or bystander intervention since the victim is unlikely to be wearing a personal flotation device and have rescue personnel at hand. In spite of the frequency of such occurrences, little is known about the effect of clothing on water survival competencies such as swimming and survival floating in the prevention of drowning.

Aims/Objectives
The purpose of this paper is report findings on the effects of wearing clothing when performing water competencies believed to be critical to drowning prevention. Specifically, the aims are:
1. To establish measurement protocols and procedures to quantify the demands of aquatic activity in clothes to guide further research
2. To ascertain the effects of clothing on water competencies required for self-rescue as a consequence of sudden immersion in deep water

Method
In the first phase of a project entitled Can You Swim in Clothes? ways of measuring swimming speed, endurance, and floating with/without clothing were explored.(1) Physical education students (n = 12) with known water proficiency completed a 25m sprint swim, a 5-minute swim, and a 5-minute float in swimwear and then repeated these tests a week later in clothing.

Results
Wearing lightweight clothes significantly reduced swimming speed (33%) and reduced swim endurance (28%) but no significant deterioration in flotation was found, irrespective of age or sex. Greater depreciation was noted in the sprint swim for those who self-reported low water competency.

Discussion
When the sprint was completed in clothes, a 33% decrement in group performance was evident. Similar results have been reported in other studies of railway workers taking twice as long to swim in work clothes over a short distance (11.4m). (2) Performance was also adversely affected in the distance swim (28% less distance) when the swim was repeated in clothes for all participants. Similar findings were reported in testing of children in a 200m combined swim tests.(3) Choi and colleagues (2000) found similar increased maximal oxygen uptake (VO2 max) when comparing front crawl with breaststroke and elementary backstroke.(4) This suggests that wise decisions about stroke selection where survival requires prolonged swimming may be paramount in survival situations.

The floating test produced the only non-significant difference between performance in swimwear and clothing. This observation was important for several reasons. First, it further reinforces previous evidence that clothing, rather than weighing a victim down, may not only provide initial buoyancy in sudden immersion but also insulation and continued buoyancy in subsequent survival.(5)

Conclusions
Water safety advice on what to do in the event of unintentional immersion when wearing clothes is largely based on anecdotal evidence and expert opinion. The results of this initial exploration suggest that clothing does impact detrimentally on swimming-related water competencies especially with regard to stroke selection but does not similarly effect floating competency to the same degree. Further research using the research instruments and replicating the assessment protocols reported in this study is advised. Follow-up studies with participants more representative of a normal population, as well as clothing studies on high risk groups such as males and rock-based fishers, is also recommended.

References
The definition of swimming ability and the curriculum

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Swimming & Water Safety 2, Bayan, November 4, 2015, 3:30 PM - 5:30 PM

The definition of swimming ability and the curriculum

Today it seems impossible to comprehend, but in the late 1800s, when the organization was formed, more than 1 100 persons drowned each year. That's over three persons every day. Conditions today are very different, and still we see about 100 drownings each year. It is with the strongest of convictions that we adhere to our vision: zero drownings.

Naturally, swimming ability is one of our most powerful tools in closing in on our vision of zero drownings. At the same time our organization was founded less than 10% of the children were able to swim. Today, the latest survey made by The National Agency for Education, the swimming ability in around 93%!

We are convinced that our success in this area is dependent on our definition of swimming ability and our influence of the curriculum.

Definition of swimming ability

From the very beginning, our main goal for introducing a definition of swimming ability, was to measure both adults and children and to see whether our activities for reducing drowning and increasing swimming ability were successful or not. The definition was formed from the facts of cold water in Sweden but also from how many minutes you need to survive before help is coming.

“A person that knows how to swim can fall in to the water, get her head underneath the surface, from where she can come back to the surface and swim 200 meters, which 50 meters are backstroke.”

All of the Nordic countries have approved and adopt the definition, and we are working very closely to use it as a tool to affect politically but also to inform the public about water safety.

Definition of swimming ability in the curriculum

We are also working very closely with The National Agency for Education and as a part of this process we’ve particularly been active in the development of the guidelines regarding swimming and water safety. After several years of discussions and lobbying, in 1997, we managed to make sure it is, by law, mandatory to teach each student how to swim and how to act safe around water. The goal that is set by The National Agency for Education and The Swedish Life Saving Society is that the students must be able to swim 200 meters in 6th grade (age of 12).

The guidelines also states how the students should develop within water safety from the 1st to the 6th grade. To ensure that the teachers are following the educational development and that students are learning water safety, which stretches from basic to more advanced exercises and knowledge, we are sending out essential information and guidance to teachers and students free of charge. This concept is called the Children’s Lifesaving School.

Since it is mandatory by law for all children to go to school up to 9th grade (age of 17), we are confident that we have the possibility to reach all children in Sweden. We know thou, in reality, that we still have some difficulties to reach children with a non-Swedish Background. Several studies conducted by the Swedish Life Saving Society and the Swedish National Agency for Education show that children and adolescent in Sweden with a non-Swedish background, have a very low swimming ability. This is partly due to the absence of a tradition of swimming in the country-of-origin, but also relates to significant problems to seek and find information about where and when the education or classes are held, due to difficulties in language and ethnic background.
I can swim but can I get out? The ‘exit problem’ explored.

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Swimming & Water Safety 2, Bayan, November 4, 2015, 3:30 PM - 5:30 PM

Background/Introduction
Reasons for drowning are most commonly associated with failure to stay afloat or swim to safety. Some evidence suggests that victims may also drown because they are unable to exit the water upon reaching the water’s edge, a condition that Connolly has termed ‘the exit problem’. (1) It appears to be more prevalent when the immersion is sudden, unintentional, and occurs in an open water setting. A problem exists in quantifying the extent of this phenomenon since most drowning incidents of this nature are not witnessed and such details are thus not reported. In spite of the likelihood that some drowning victims die because they cannot exit the water once reaching the water’s edge, little is known about the real and perceived capacity of potential victims to extricate themselves from the water in an emergency. (2)

Aims/Objectives
The purpose of this paper is to explore the real and perceived capacity of young adults to safely exit the water and ascertain what safety knowledge about exiting the water is promoted and how/when such information is learned and skills practised.

Method
College-aged physical education students (n = 37) completed a pre-test survey of self-estimated capacity to exit the water under varied conditions. Participants were then tested in shallow water, deep water (flush edge), and deep water with a ledge (0.41m) when fresh, after a 5-minute swim in swimwear, in clothing, and while wearing a buoyancy vest.

Results
Most participants (76%) had not been formally taught exiting techniques, most participants (68% - 97%) could identify good and poor components of exiting techniques. Almost half (41%) reported that they had experienced difficulty when attempting to exit the water in their past aquatic activity. All participants were able to exit shallow and deep water when not fatigued, after a swim when wearing clothing or a buoyancy vest, but many failed to exit deep water over a 0.41m ledge after swimming in clothing (35%) or in a buoyancy vest (49%). Significantly more females than males found exiting deep water difficult. Most participants (especially males) under-estimated the demands of exiting deep water.

Discussion
When asked to predict the ease or difficulty they might have in exiting the water, most were confident of their capacity to exit shallow (97%) and deep water (78%) with ease, but fewer thought they would do this with ease when wearing a buoyancy vest (65%) or in clothes (46%). Males were more confident about getting out of deep water with ease in clothes (males: 67%; females: 19%) or when wearing a buoyancy vest (males: 100%; females: 19%). When tested, however, only half of the males (51%) actually were able to exit deep water with ease after a 5-minute swim, even fewer after a 5-minute swim in clothes (19%) or when wearing a buoyancy vest (45%). None could climb out with ease over the 0.41m bulkhead after the clothed swim. This overestimation of aquatic competency by males is consistent with the findings of previous studies.3-10 The most demanding exit consisted of climbing out over a 0.41m bulkhead after swimming in clothes for a period of 5 minutes after which no participant could exit with ease and more than one-third (35%) failed to exit the water at all. Significant differences were evident between males and females in all exits from deep water over the 0.41m bulkhead, irrespective of pre-exit activity demands.

Conclusions
Even in the relatively benign surrounds of a swimming pool, it was apparent that many of the swimmers in this study failed to exit deep water when confronted with a 0.41m bulkhead. Furthermore, a series of progressively more challenging pre-exit swimming tasks exacerbated ‘the exit problem’ even though many of the participants were physical fit and competent swimmers. Further research is required to determine the difficulties others such as children, youth, and adults may experience in getting out of the water, especially in a variety of open water settings.

References

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Swimming & Water Safety 2, Bayan, November 4, 2015, 3:30 PM - 5:30 PM

Drowning fatalities are one of the 10 leading causes of death in every region of the world for people aged 1 to 24 years, according to the World Health Organisation’s inaugural World Drowning Report released in November 2014. While the fatal drowning toll is significantly lower in high income countries (HICs), it is still a substantial issue that has not been remediated by the current approach to reducing drowning fatalities via implementation of learn to swim (LTS) programs. In Australia, similar to other HICs, there is no empirical evidence either to support or refute the value for drowning prevention of any of the available LTS programs.

While the amount of evidence-based research into the link between swimming and drowning prevention is growing, the picture is still unclear as to what aspects of swimming are associated with drowning prevention. Terms such as ‘basic swimming’, ‘survival swimming’, ‘water safety’ and ‘water competence’ are commonly used terminology in regards to drowning prevention. Nevertheless, in HICs such as Australia, these terms are interpreted and implemented in LTS programs in a widely variable manner, with the belief among some aquatic educators that ‘swimming’ equates to the skills required for the sport of swimming (i.e. competition) and that these skills within the sport equate to drowning prevention. There is also a large variance in the emphasis placed on ‘water safety’, with some believing it is largely secondary to swimming skills while others believe water safety is the most important skill. Finally, there is an axiomatic belief that skills learned in warm, still water (i.e. a pool) are transferable to open water conditions and vice versa.

The aim of this study is to examine whether the level of swimming and water safety identified in the Australian Water Safety Council’s Water Safety Strategy 2012-2015 is applicable to the aquatic conditions in which Australians are drowning (as reported in the Royal Lifesaving Society’s 2012-13 National Drowning Report). This study will investigate the following questions:

1. Is a young adult (18-34 years) who successfully completes the task requirements for the Royal Lifesaving Society’s Swim & Survive Active Award 4, in a heated stationary water environment, able to complete the same tasks in cold and/or non-stationary water conditions (both in swimwear and clothed) that mimic the common conditions for drowning in inland and open waters?

2. Are there any significant differences in time to task completion, confidence and/or movement strategies in completing the tasks between heated static water conditions and cold and/or non-stationary water conditions, either dressed in swimwear or clothed?

3. Is there any correlation between prior exposure to open water conditions (cold and/or moving water) and the ability to complete the simulated open water conditions?

Answering these questions will go towards building evidence that will help create a clearer evidence-base of how swimming and drowning prevention are linked. This in turn will assist in decision making in both areas of aquatic research and education that will enable LTS programs utilising evidence-based practice in terms of drowning prevention.
The decreasing ability to swim in children in an industrial nation – a growing problem

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Swimming & Water Safety 2, Bayan, November 4, 2015, 3:30 PM - 5:30 PM

Drowning is the second most cause of accidental death in children in industrial nations worldwide and in Germany as well. For the prevention of drowning it is crucial therefore that as many children as possible learn how to swim and stay trained with their swimming skills.

In Germany, which is listed to the wealthy industrialized countries of the world, from the 1950s many efforts were made to increase the number of children that are able to swim, so in the 1990s the ability to swim in children with an age from 6 years or older was common and non-swimmers in this age have been exceptional.

Today Germany has to face the situation that the number of those children who are not able to swim increases constantly. We could point out the following reasons:

1. Less swimming lessons at school - while in earlier days swimming lessons were an integrated part of school education; today it became a problem because of a lack of swimming pools either on the school ground or nearby, the lack of teachers with the special qualification and an overload of other subjects considered to be more important.

2. Less public swimming pools - the number of public pools in German municipalities decreased in the past 20 years constantly for monetary reasons. For the same reasons pools in schools, installed for swimming lessons, were taken out of order.

3. Less interest in parents especially with lower education level and lower income.

4. Immigration from a different social and ethical/cultural background.

Therefore, and to stop this dangerous development, the Deutsche Lebens-Rettungs-Gesellschaft (DLRG) started a program to increase the ability to swim in children. The program consist of various measures, such as public information, supporting communities to keep up public pools and helping with life guard services, supporting schools by taking over swimming lessons and special programs to teach the teachers, to provide information on swimming programs in local branches of the DLRG to less educated parents and to families with a migration background and the cooperation with financial supporters for sponsoring.
Parallel Teaching: Maximizing teaching efficiency  
- optimizing learning effect

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Swimming & Water Safety 2, Bayan, November 4, 2015, 3:30 PM - 5:30 PM

Introduction
Optimal learning occurs when an individual is empowered to learn according to their own experience, background, and needs. In the typical group teaching of swimming, a progression of learning outcomes is assumed to be optimal for all. But the optimal progression for one may not be optimal for another. Also, instructors usually consider individualizing teaching as difficult and time consuming.

When alone, children usually learn more than one thing at a time. We can take advantage of this. In most standardized progressions, there are multiple opportunities to present two skills at the same time. The principle of progression is that one proceeds according to degree of difficulty. But in any progression there are pairs of skills which have similar degrees of difficulty as well as being similar in other respects. One of the best examples is floating on the front and floating on the back. These skills are obviously aspects of buoyancy control and similar in that respect. Although similar in degree of difficulty, some children will naturally learn one first, others will learn the other first.

Assuming that one of these skills should be learned first (most learn to float on the front first) then those who would naturally learn on the back first, risk being left behind. By presenting both of these skills at the same time, we allow each child to make the choice. Children quickly discover that which is natural and easiest for them to tackle first. Some would then emphasize floating on the front first, others floating on the back. None would be left behind.

Teacher and learner have benefitted from the motivation provided by mastery. The learner is then brought back to the skill they did not choose first. In this way, they become equally proficient in both.

Aims
The aims of this pilot study were to a) examine the progress of children when employing parallel teaching, b) to assess the time needed to individualize teaching in this manner, c) to observe the attitudes and atmosphere of the teaching climate under these same conditions.

Method
A known progression was chosen as the vehicle for learning. Pairs of skills which would lend themselves to parallel teaching were identified. An experimental group of ten year old non-swimmers (N=29) was randomly selected. A control group of age, gender and skill level matched children was also selected. They were enrolled in a 12 lesson (once per week) program. The experimental group were introduced to two or more skills simultaneously where possible. The control group proceeded one skill at a time in the progression as it had been traditionally used, assuming that it was optimal for all.

Results
While the difference in advancement was not statistically significant, the experimental group advanced further in the same time period. These children exhibited greater persistence and performed more attempts at any given skill, at any given time. The control group were observed to make fewer learning attempts and to have ‘dead time’ where they appeared to be uncertain as to what was expected.

Conclusions
The instructors reported that they did not find this method overly difficult or time consuming but indeed, very natural – i.e. letting the learner show the way.

References
Investigating youth attitudes to risk, peer pressure and alcohol through Bronze e-Lifesaving

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Swimming & Water Safety 2, Bayan, November 4, 2015, 3:30 PM - 5:30 PM

Background
The overarching goal of the Australian Water Safety Strategy 2012-15 is to achieve a 50% reduction in all drowning deaths by the year 2020. This ambitious goal was established in 2008 as part of the previous strategy as the target to work towards. Ten goal areas have been identified with key objectives and performance indicators to be measured against, as well as tracking against the overarching goal.

The Bronze e-Lifesaving project is a strategy that Royal Life Saving Society – Australia has undertaken to work towards achieving one of these goals:

Goal 2 – Reduce drowning deaths in young people aged 15-24 years
The key objective that relates to this project is:

2.2 Develop programs that provide the skills and knowledge for safe water participation and modification of risk taking behaviour by young people which aim to reduce drowning.

Performance indicators are:

• Programs have been implemented that provide appropriate aquatic skills and knowledge including addressing risk taking behaviour.
• A range of alcohol and drowning themes contribute to the design, development and evaluations of interventions in this area.

The key facts of drowning deaths in Australia for 15-24 year olds (1 July 2003 to 30 June 2013) are:

• 36 drowning deaths per year
• 85% are males
• 41% occur in inland waterways
• 21% occur at beaches
• 32% occur as a result of swimming and recreating
• 14% occur using watercraft
• Alcohol was known to be involved in 28% of drowning deaths

The content of the Bronze e-Lifesaving program centres on thought provoking video scenarios which highlight contributing factors and risks to drowning including:

• Risk taking behaviour
• Consumption of alcohol and/or drugs when in and around water
• Influence of peers
• Engaging in high risk aquatic activities
• Increasing independence
• A lack of or declining swimming and water safety skills
• Lack of awareness of hazards or assessment of risks

A pilot study will be undertaken to measure the impact of the Bronze e-Lifesaving program on participants’ attitudes to risk taking behaviour, peer pressure and alcohol.

Aims
This pilot survey aims to investigate the pre and post course attitudes around the themes of risk-taking behaviour, peer pressure and the use of alcohol when recreating around water.

Target
The pilot survey will target secondary school students in years 7 to 10, mainly aged 12-16 years who are undertaking the Bronze e-Lifesaving program.

Implementation
Schools that have ordered enrolment tokens for their students will be contacted to participate in the pilot survey. It is aimed to have students complete a pre and post course survey. Questions will focus on their beliefs, behaviour and attitudes around the themes. It is hoped that comparisons can be made as a result of participating the Bronze e-Lifesaving program.

Results
Full results of the pilot survey will be presented at the conference in November.

Conclusion
Gaining the knowledge and understanding of hazards and risks associated with aquatic environments is the first stage in changing attitudes and behaviours for safer participation. Ideally, combined with learning practical swimming and lifesaving skills, this will aid in providing youth with a level of protection and the tools for making informed decisions. This approach promotes harm minimisation by aiming to reduce risks associated with aquatic recreation and promote positive attitudes and behaviours towards water safety.

Acknowledgements
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Keeping Kids Afloat

Ms Pam O'Reilly
'Water Safety Vietnam (WSV), Kew, Australia

Swimming & Water Safety 2, Bayan, November 4, 2015, 3:30 PM - 5:30 PM

Water Safety Vietnam (WSV) is a registered Australian charity, formed in 2010 when a group of experienced swimming and water safety personnel became aware of the extremely high rate of deaths by drowning in Vietnam.

In Vietnam, more than 35 children drown per day. Ref. Alliance for Safe Children (TASC). This report also states that teaching children to swim can act as a ‘prevention intervention.’

WSV’s purpose is to reduce death by drowning in Vietnam by providing leadership in the education of competent swimming and water safety instructors to deliver high quality teaching and educational programs. Our policy is to lead local teachers towards full sustainability. That is, to give them the skills and knowledge to conduct their own water safety programs.

In order that our programs are sustainable we trained a number of local Vietnamese men and women who have become AUSTSWIM qualified teachers and are continuing to carry out our work as we move into new areas. Our Train the Trainer Program is conducted annually at the Hong Bang University International in HCMC and is part of the instruction for their Physical Education graduates.

In 2011 we set out to find clean, safe and suitable swimming pools and on having difficulty doing this, decided to approach the many Resorts dotted along the Ho Tram coast. We received amazing support.

In 2015, we have expanded the program into six provinces in Vietnam.

Our main target was primary school aged children but in later years, many adults have come forward wanting to learn to swim. Girls and boys are equally represented.

It was absolutely essential to involve the community. We started in the small hamlet of Ho Tram on the coast 40 minutes from Vung Tau. We met with the Local People’s Committee and convinced them that we could assist teach their children to swim.

Using AUSTSWIM methodology we trained adults (initially Beach Boys and Security Men, and now primary school teachers) to be swim teachers. AUSTSWIM is well recognised as a leader in swim education in Australia and our volunteers were trained in this methodology. However, since 2012, we have taken on all the feedback offered to us and have substantially modified the course to make it suitable for Vietnamese conditions.

The model we follow has five stages of implementation and we look at a 5 year timeframe from inception to full sustainability. Of course this differs according to circumstances, support and the people involved.

The most important thing we have learnt is the importance of good partners within Vietnam. Without this support our programs would not have been so successful.

There have been many challenges. As mentioned previously, locating clean swimming pools was the first one we faced in 2011. However, on a positive note, more high quality swimming pools are being built in Vietnam now. The downside is that they are commercial and so, in the main, the entrance fee is too high for poor families.

Obviously language is a major challenge. However, many teachers comment that it made them more aware of their instructions, of having to be very precise and clear and to use non-verbal cues.

Another challenge has been convincing the decision makers that teaching swimming and water safety was important to their children’s health. With so many conflicting primary needs in Vietnam, (dental, educational, medical) we had to work hard to get this message across.

Results to date (2012-2015) include:

• Training 431 adults how to teach children basic water safety and how to swim
• Teaching 412 adults CPR (Cardio Pulmonary Resuscitation)
• Training 158 young Vietnamese men and women to full AUSTSWIM TSWS (Teacher of Swimming and Water Safety), an internationally recognized teaching qualification
• Teaching more than 1600 children basic aspects of water safety, rescue and swimming
• In Ho Tram, our longest standing program, moving from a training role to a coaching mentoring role and to see evidence of sustainability in the management of the new community pool, and
• Conducting research that shows that many course graduates are, in fact, teaching swimming and water safety.

WSV is very proud of these achievements and thank our many supporters and sponsors for assisting us to achieve these results.
A study of the barriers, motivators and high potential opportunities to substantively improve safe boating behaviours among Canadian boaters.

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Session 5 - Day Two Plenary, Grand Ballroom, November 5, 2015, 8:45 AM - 10:15 AM

This study was part of multi-phase research project commissioned by the Canadian Safe Boating Council (CSBC) in 2014. The study was designed to identify the new breakthroughs in changing resistant boating safety behaviours. The challenge was to unlock new ways to motivate changes in ingrained boater behaviours in the two key areas- specifically not wearing a lifejacket and drinking and operating a boat. It was believed if the “key” breakthroughs were identified, and if effective communication strategies could be implemented, then there could be a change in behavior and a reduction in boating fatalities.

In Canada, approximately 120 people drown each year while boating. While the trend is downward, the high risk group and their behaviour remain the same. Most victims are men (80%) and the overwhelming majority are found not wearing a lifejacket (86%) and have consumed alcohol (38%).

Engagement of boating safety stakeholders in defining research needs and sharing research results to inform future interventions/strategies was critical to overall success in changing boater behavior. Stakeholders were consulted at the beginning of the project to identify potential barriers for resistant behavior and motivators for safer behavior and a larger stakeholder groups were recruited in 4 geographically diverse cities in between the qualitative and quantitative research. In total there were 4 stages to the project:

1. Initial Stakeholder Consultation
2. Qualitative Exploratory Consumer Research
3. Boating Safety Stakeholder Consultation Sessions
4. Quantitative Safe Boating Awareness Consumer Tracking Study (IPSOS-Reid)

Based on earlier research and existing knowledge there was evidence that many attitudinal and behavioural barriers “stopped” boaters from practicing safe behavior on the water and there were a number of different reasons why they might change their behavior (motivators). In the qualitative research (Stage 2) that preceded the quantitative research (Stage 4), it was learned that there were a number communication messaging directions that appeared to have potential to increase lifejacket wearing and not drinking and operating a boat. Thirdly in the annual CSBC tracking research, a preliminary pre-test of 6 messaging statements regarding reasons to wear your lifejacket and another 6 reasons to not drink alcoholic beverages when operating a boat found that there seemed to be high potential for most of these message directions to positively influence boaters to change their behavior.

Compiling this past and current knowledge, a long list of items were tested within the quantitative research, specifically:
- 17 potential motivators and 31 potential barriers to “wearing your lifejacket”
- 14 potential motivators and 19 potential barriers to “drinking alcoholic beverages while operating a boat”.

To move beyond the “easy” answers, barriers, motivations and communications statements were tested using a Maximum Difference analysis (MaxDiff). This advanced research technique was used to understand the relative influence of various factors and it provided stronger reliability and clearer insights than more simplistic rating or ranking procedures. The end result was the identification of the “highest potential” communication focus to convince boaters to wear a lifejacket and the “highest potential” focus to convince boaters to not drink and operate a boat.

This research learning was reflected in creative briefing documents developed by the CSBC for the creative team (early 2015) to develop print, radio, on-line and television advertising for the 2015 boating season. The learning was shared with stakeholder groups across the country (e.g. paddling, fishing, power boating).

The research informed the following:
1. To continue the “Call 911” poster campaign
2. To incorporate learning in new print creative- specifically to identify the criminal consequences of drinking and boating.
3. To incorporate learning in development of a new video PSA focusing on the legal consequences of drinking and boating.
4. To develop print articles supporting the criminal consequences of drinking and boating.
5. To develop a new lifejacket advertisement strengthening the importance of how a lifejacket buys time for rescue.
6. To develop a series of new lifejacket print advertisements focusing on cold water awareness.

Encouragingly the annual tracking study, conducted in June 2015, indicated significant increases in overall boater awareness of key messages. Ongoing tracking study measurements will assist in determining the impact and effectiveness of the new creative direction in terms of changes in boating safety attitudes and behaviours and how they have been affected by the awareness of the new campaign messages.
Drowning is the second leading cause of unintentional injury death among children and teens in Washington State and in the United States. In a review of newspaper articles, drownings among immigrant and refugee children stood out. Focus groups with Vietnamese parents and teenagers found a high interest in keeping children safe but a lack of awareness about water safety (1). Focus groups with a multiethnic community found a lack of access to safety equipment (2).

A pilot program was held in 2011 and 2012 at a Head Start preschool in Seattle, Washington. Head Start is a federally funded program that works with low-income families with children from birth-5 years. Parents are required to attend monthly education programs. Most families are non-English speaking or speak English as a second language. The initial program was a 30 minute education session for Vietnamese families. An interpreter translated for the speaker. Key messages included, swim where there is a lifeguard, wear a life jacket in open water or a boat and learn to swim. The session included a handout in Vietnamese that mirrored the presentation content and demonstration of how to properly fit a life jacket. At the end of the program, all children received a free properly fitting life jacket.

With grant support from a local energy company, the program was expanded in 2013. Instead of using interpreters, women were recruited from a low income housing community to become volunteer water safety educators. The women were trained in water safety, fitting a life jacket and how to create an inexpensive rescue devise. They received a stipend for the training and for participation at the presentations. The goal was to have a team of two for each language group. Vietnamese, Spanish, Somali, Ethiopian and Chinese women were trained.

Parents with children 3-5 years old from several Head Start preschools were invited to participate. In 2013, 194 life jackets were fit and distributed at 3 sessions. In 2014, a total of 175 life jackets were fit and distributed at two sessions.

Less than 15% of children and 5% of adults had life jackets prior to the education session. About half the families swam in areas with lifeguards and less than one third of the children had taken swim lessons. After the session, over 90% of parents intended to sign their child up for swim lessons within six months. Parents were told where they could swim in a life guarded area based on where they lived.

Improvements from 2013 to 2014 included the addition of photo boards illustrating each key point. The educators contributed ideas for how to tailor the presentation to better meet cultural practices. For example, the Spanish educator spent more time on supervision in group settings and the Somali and Ethiopian educators spent more time on single gender swim opportunities.

All the women who participated in 2014 were interested in being involved in 2015. They express pride in their safety knowledge and skills and serve as water safety ambassadors in their own community. This program provides water safety information and skills for hard to reach families and builds water safety capacity within their own communities.

Reference Bibliography
PRECISE – A model of community participation in drowning prevention in Bangladesh – Implication for other Low-income countries

Dr Kamran Baset

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Introduction
Due to advancement of social and economic development Bangladesh is passing an epidemiological transition now by decreasing mortality and morbidity of infection disease like diarrhoea, pneumonia, TB and proportionately increasing the mortality and morbidity of non-communicable disease and injury like drowning. Most of the children of Low income countries grow up in an environment where there are risks of injury. Bangladesh situation is not different from others and children of Bangladesh are exposed in injury risk and hazards due to lack of awareness of risk hazards, inadequate supervisions and widespread exposure are the determinants of injury. Behavioral change issues act as a major factor in injury prevention and involvement of the local leadership is necessary, to get a sustainable program. So, active community participation should be pivotal in drowning prevention programme especially in designing, implementing and sustainability issues. A model of community participation was developed and practiced in the PRECISE project in Bangladesh.

Objective
To describe the process of development and role of community groups in a child drowning prevention project in Bangladesh.

Methods
Behavioral change issues act as a major factor in injury prevention initiatives so community participation was identified as one of the guiding principle in PRECISE. Village was identified as unit for developing a community group in PRECISE because village is the lowest geographical unit where 1000-1500 people live in a same society and where the local leaders have a great influence on the behavioral issue of the society. Prior to develop group of enthusiastic villagers were invited in a meeting at village level; magnitude and consequences of injury and prevention issues were discussed. Discussion also took place how the community people can contribute in injury prevention. After that a 7-10 members Village Injury Prevention committee (VIPC) was formed by the community people, with active volunteers taking part. All of the members voluntarily expressed their interest to work for community.

Results
389 Village Injury Prevention Committee (VIPCs) were formed and each committee has 30% female representatives. VIPC comprised of respected and trusted members of the society. Committee members meet every month to review the previous month’s implementation status of injury prevention initiatives in their village. Individual and group responsibilities are identified and plans of action developed accordingly. PRECISE has a regular program for capacity development of the members. Innovative examples of preventive interventions will be discussed and how training for capacity development has developed.

More than 3000 community volunteers are actively involved in the programme. Some difficulties of community participation were there such as internal conflict within the committee members, inactive members, male dominance, political involvement. Community takes some decisions to overcome these problems like include at least 3 women in one committee, include new members in the committee like religious leader, Social worker, if someone not attended 3 consecutive meeting his or her membership will cancel.

Conclusion
Injury prevention is not possible without closely involvement of the community people. PRECISE community shows their support and shares their experiences to change the community as an injury free community. In programme evaluation we found that 28% reduction of the drowning and 33% child injury mortality in the project areas. We believe PRECISE has developed VIPCs as an effective component of the child injury prevention program specially drowning.
International Collaboration in Drowning Prevention Research
Opportunities and Challenges - BASS Child Drowning Prevention Research - Stars in Global Health

Stephen B Beerman

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Prevention 4, Tekulur, November 5, 2015, 11:00 AM - 12:30 PM

Learning Objectives
1. To share the reflective learning from joining an international field of knowledge and skills to extend our research knowledge in Low and Middle Income Countries (LMIC) Child Drowning Prevention.
2. To Use the Bangladesh Anchal and SwimSafe (BASS) Child Drowning Prevention Research project journey as a learning tool to advance our capacity in drowning prevention research.
3. Inspire others to undertake drowning prevention research to benefit our most at risk communities.

Introduction
The WHO Global Report on Drowning identified 10 actions and 4 recommendations that are based on evidence and deemed effective, feasible and scalable (1). The actions were in categories, Community Based Action, Effective policies and legislation and Further Research. The Bangladesh Anchal and SwimSafe (BASS) Child Drowning Prevention Research is a community based action and is addressing well designed priority research questions.

The process of undertaking the Bangladesh Anchal and SwimSafe (BASS) Child Drowning Prevention Research involved many steps and stages that engaged the efforts of international stakeholders. This session will outline those steps and will reflect upon the value, impact and needs of each step and stage. This reflection will identify key steps and this may be useful to those who replicate this work in other communities at risk.

Methods
We need to advance the knowledge and learning of UNICEF Innocenti and TASC/RLSSA/AusAID work on LMIC drowning prevention in Asia (2). We wanted to utilize and continue the Demographic Surveillance System that was in place in some Bangladesh communities. We wanted to continue the learned expertise at the Centre for Injury Prevention and Research Bangladesh (CIPRB) and International Drowning Prevention Research Centre - Bangladesh (IDPRCB).

The 4 components of BASS Child Drowning Prevention Phase 1:
1. Anchals Version 3.0 (include measures and screening)  2. SwimSafe Version 3.0 (include CPR to 5-7 yr olds)
3. Community Awareness (Community Injury Prevention Committees)  4. Surveillance

The public health approach to BASS involves the principles of inclusion, including those at greatest risk of drowning. This is a multi-phase project to demonstrate the value of a public health program in a LMIC setting that can be effective at the pilot rural community setting but also when it is scaled up to a large regional, district and national scope. We wanted to learn how to implement a large scale up of a LMIC community drowning prevention.

Learning is a key feature of this project. The project is learning from the field work team, the community input, other experts in the host community and from the international public health community.

We had a funding opportunity from Grand Challenges Canada. Grand Challenges Canada is funded by the Government of Canada and is dedicated to supporting Bold Ideas with Big Impact in global health(3). Stars of Global Health must have innovative projects and stages that engaged the efforts of international stakeholders. This session will outline those steps and will reflect upon the value, impact and needs of each step and stage. This reflection will identify key steps and this may be useful to those who replicate this work in other communities at risk.

Results
International collaboration of stakeholders’ expertise that has successfully completed Phase 1 and is in transition to Phase 2 (4). The data outcomes from Phase 1 demonstrate the feasibility of the concepts advanced in BASS. Many challenges and successes have occurred and these will be reviewed.

The 40 Anchals provided safety, health, enrichment and social development services to over 4,500 project service recipients. The SwimSafe program provided 1331 children from age 3-9 with survival swimming education, and CPR for those 7-9yrs.

The engagement of the community was broad and helpful. The surveillance system was functional. Data, limitations, successes and challenges will be shared.

Conclusions
International collaborative research is possible and is a desirable approach to achieve well designed community based drowning prevention with impact.

References
Can 3-year old children learn swimming in low resource settings? 
Experience from Bangladesh

Dr. Aminur Rahman1, Dr. Mahruba Khanam1, Dr. Fazlur Rahman1, Dr. Steve Beerman2, Justin Scarr3, Dr. Michael Linnan4
1International Drowning Research Centre - Bangladesh (IDRC-B) of Centre for Injury Prevention and Research, Bangladesh (CIPRB), Dhaka, Bangladesh; 2University of British Columbia, Vancouver, Canada; 3Royal Life Saving Society Australia, Sydney, Australia; 4The Alliance for Safe Children, Atlanta, USA

Background
Bangladesh has very high rates of fatal child drowning. The Bangladesh Health and Injury Survey done in 2003 showed drowning was the single leading killer of children after infancy and over 18,000 children fatally drowned each year. The median age of child drowning was between two and three years. In 2005 the SwimSafe program was developed as one of two interventions for child drowning and targeting children 4 years and older. The other was the Anchal, a village crèche which targeted children between 1 and 4 years old. A retrospective cohort trial showed both to be effective in preventing drowning in their respective age groups.

In the SwimSafe cohort trials a small number of 3 year old children were included at the request of their parents. The graduation rates for the three year olds were similar to older children. Importantly, this suggested that SwimSafe could include three year olds. Fatal drowning rates in this age group are extremely high (66.2 per 100,000 children-year). They can only attend the village crèche for 4 hours a day, leaving them unprotected for large portions of the day.

The International Drowning Research Centre Bangladesh (IDRCB) of CIPRB has continued the operational research program on child drowning. As one research effort, The Bangladesh Anchal and SwimSafe (BASS) project explored including children 3 years old as normal participants in the SwimSafe program.

Objective
To assess the feasibility of teaching swimming to 3 year old children in rural Bangladesh through the SwimSafe programme.

Methods
1,393 children aged 3-9 years old were enrolled for teaching survival swimming. 106 of the children were 3 year old. Criteria for inclusion for 3 year olds was attainment of at least the 50th percentile rank for height and weight, normal social and cognitive development as reported by parents, and being willing to participate. Modifications to the SwimSafe teaching for these children included a student: instructor ratio of 1:1 (normal ratio is 5:1). Graduation criteria were the standard 25 metres swimming and 30 seconds floating in deep water. Each child’s age, sex, date of enrolment in the swimming programme and date of graduation were recorded in a structured form.

Result
Among 1393 children 3-9 years old, 1023 (73.4 percent) graduated. Graduation rates ranged from 83.3% in 7 year olds (83.2% boys, 83.4% girls) to 28.3% in 3 year olds (23.6% boys, 33.3% girls). Excluding 3 year old children i.e. children of 4-9 years age group, the graduation rate was 77.2%. Failure and drop-out rates ranged from 6.2 and 15.4 in 9 year olds to 41.5 and 30.2 percent in 3 year olds. Swimming instructors noted many three year olds were unable to swim 25 meters because of difficulty in learning correct breathing techniques. Instructors also noted mothers of three year olds felt this age was too young for learning to swim.

Conclusion
Graduation rates for three year olds were lower than the average for the older children and less than one third (28.3%) were able to complete the 25 meter criterion. The difference from the higher graduation rates for three year olds in the SwimSafe Cohort Study appear to be related to selection criteria. Those in the earlier study were self-selected participants with enthusiastic parents who encouraged their participation. When these factors are not present, it appears that graduation rates are too low to include three year olds as the normal entry age. Given the very high drowning rates in the three year old age group, further research is needed to assess the feasibility of inclusion of 3 year old children in swimming teaching programme including its cost effectiveness and scale up.
Drowning Prevention in the Philippines: A Pilot Project in the Northern Philippines

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Background
Drowning prevention is a worldwide challenge with an estimated 388,000 people drowning annually, of which 45% are under the age of 20 years. Drowning is preventable, however, there is limited evidence about what works, particularly in resource poor environments. In the Philippines, drowning is a leading cause of injury. For children after infancy (1-17 years), drowning (9.8/100,000), followed by Road Traffic Accidents (RTA) (9.1/100,000) were the leading causes of death. Following the Philippine National Injury Survey, through the “National Policy and Strategic Framework on Child Injury Prevention” (June 2006), the Philippines Department of Health began to build a national program on violence and injury prevention. This policy centered on planning interventions and strategies for children, with drowning being a priority area. In 2011, the Philippines’ Department of Health with support from the World Health Organization (WHO) set about exploring ways to prevent drowning.

Objective
This study explored factors which contribute to drowning deaths in a selected site in the Northern Philippines and the development of strategies to prevent future similar deaths.

Methods: Mixed methods of data collection techniques were used in obtaining baseline data. Methods included: review of drowning mortality records, key informant interviews, focus group discussion and community walk-throughs (observation and discussion with community).

Results
A review of the records found 35 drowning deaths between 2008-2011 which occurred in the whole city (Dagupan City) a crude drowning rate of 7.1/100,000, of which three occurred in the study area (Village of Lucao), crude drowning rate of 8.9/100,000. Risk factors identified which could or did contribute to the drowning events were proximity to bodies of water, inadequate child supervision, lack of information dissemination/awareness campaigns, lack of program on drowning prevention. The results of the assessment were presented at a community assembly and to community leaders and community representatives. Using a participatory action approach, data were validated by those who attended the assembly, measures on how to prevent drowning incidents were explored and initial interventions were identified in consultation with drowning prevention experts and implemented through a committee convened by the community. These interventions include community education sessions, capability building measures, use of barriers, and redesigning of community wells.

Conclusion
Community engagement is a crucial element in the development and implementation of any health program. This study demonstrates that by engaging the community action occurs, however there is a need to conduct evaluation activities to determine if the actions by the community have reduced the risk of drowning and for further projects in larger areas.
Evolution of the Child Drowning Prevention Programme in Thailand

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Background
Drowning is the number one cause of death among children under 15 years of age in Thailand, taking into account all deaths due to infectious and non-infectious diseases. Child drowning death rate (per 100,000 child population) ranged from 7.6 to 11.5 between 2004 and 2013; the average number of annual drowning deaths was 1,234 and the case-fatality rate was 37.2%. The Child Drowning Prevention Programme in Thailand has been implemented since late 2006 with the goal of reducing the child drowning death rate to 5.0 by 2018.

Objective
To develop the standards for the operations of the Child Drowning Prevention Programme in Thailand.

Methods
The operations of the Child Drowning Prevention Programme in Thailand during the period 2006–2014 were reviewed and then a gap analysis was conducted for use as a guide for developing the standards, or bridging the gap, for the operations of the programme.

Results
It has been found that the Ministry of Public Health is the lead agency in the implementation of the Child Drowning Prevention Programme in Thailand. In such efforts, a programme committee has been established comprising representatives from various public and private agencies; and policies on this matter have been issued for the operations in collaboration with other network members or partners. The policies include: teaching all children (>6 years) being able to swim for survival; designating Child Drowning Prevention Campaign Day; distributing Maternal and Child Health Booklets containing the guidelines for drowning prevention; designating all health-care facilities as the sites for educating parents or child caregivers about drowning prevention; conducting drowning surveillance and investigation; supporting Health Promoting Schools using “Drowning Prevention” as a key performance indicator; integrating an action plan for drowning prevention and water rescue into the national emergency medical service system; developing a plan for enhancing water safety skills for school children (Ministry of Education); passing a law to regulate the labelling of baby bathtubs; and collaborating with local governments in child drowning prevention.

After implementing several of such measures, the child drowning death rate declined constantly from 11.5 in 2005 (the first year of programme implementation) to 7.6 in 2013. But gaps were noted at the local or community level, such as the lack of continuity, encouragement and operations of in all aspects of the programme. Thus, to bridge the gaps, in 2015 the Ministry of Public Health adopts the “Merit Maker for Child Drowning Prevention” measure, aiming to identify the networks working on drowning prevention that covers at least six key measures, emphasizing community-based multi-disciplinary approach, resource sharing, participation of local agencies, and rewarding Merit Makers whose contributions are in accordance with the established criteria.

Conclusion/Discussion
Since the launch of the programme on child drowning prevention, policies and measures have been implemented, resulting in a constant reduction in child drowning fatalities. In such efforts, the Ministry of Public Health has also revised several measures so that they are more effective in the country in achieving the child drowning reduction goal.

Recommendations
In resolving the problem of child drowning in a concrete and sustainable manner, efforts should be made to use the multi-sectoral and resource-sharing approach. Moreover, the programme operations should be reviewed to identify and close the gaps, especially in further developing more effective measures for drowning prevention at the local level.
Child drowning is a neglected health problem in urban Bangladesh: experiencing PRECISE

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Introduction
There is a growing consensus in the international health community that drowning is a major cause of childhood death in many parts of the world including Bangladesh and is claiming 17,000 lives per year. The recent epidemiological transition showed that almost half a million deaths worldwide were caused by drowning, 57% of which were among children. Although drowning-related mortality occurs in all age groups, several studies suggest that children aged 1 – 4 years are at the highest risk of drowning.

Objective
This study was intended to estimate the magnitude, and explore the determinants of childhood drowning in a metropolitan city Dhaka, Bangladesh.

Methodology
Baseline survey in the urban area was conducted as the urban component of PRECISE (Prevention of Child Injuries through Social-intervention and Education). An area of Mirpur (ward 2 & 5, Dhaka City Corporation zone 8) in the Dhaka metropolitan city with 40,000 households and a population of approximately 200,000 were also included in order to test, monitor, and evaluate interventions designed for an urban environment. Socio-economic, demographic, environmental and injury related information was collected from adult respondents, especially from mothers and by face-to-face interview with the help of structured questionnaires.

Results
Since the urban environment is different from rural settings, the incidence of injuries especially drowning among children was lower but neglected in urban areas. A total number of deaths were 464 and out of them injury death is 43. Injury mortality among 1–17 years children 25 per 100000/year. The rate is higher among the males than the females. The incidence of drowning among children aged 1 – 4 years old was 58.6 per 100 000 children year. The highest rate 69.7 per 100 000 was observed in 1 - 4 years old male children. Fall and burn were the 10.3% and 7.7% cause of injury death respectively. 16908 persons were identified who were suffering from illness among them, 2188 persons were ill due to injury. There were widespread of drowning risks and hazards like open water reservoir, water container, open manhole, water bodies like lake, ditches and high drain etc. within the residence premises. Mothers’ age and literacy and family income were also identified as risk factors. Drowning is one of the major causes of 1 – 4 years childhood mortality in Bangladesh and 1 - 4 years old male children were at great risk of drowning in urban Bangladesh.

Conclusion: Drowning risks and hazards are different from rural. So, more research and a comprehensive drowning prevention programme for urban children are needed.

Keywords
Bangladesh; urban; Childhood; Drowning; Drowning rates.
Preliminary findings on the utilization of playpens to prevent child drowning in rural Bangladesh

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Background/Introduction:
Bangladesh has seen a significant reduction in child deaths and has already achieved the MDG 4. Implementation of several maternal and child health programs has resulted in the reduction of the absolute risk of death from most causes except drowning. Hence, drowning is now the leading cause of death among 1-4 year old children in Bangladesh and accounts for 43 percent of child mortality in this age group (1). The International Center for Diarrheal Diseases Research, Bangladesh (ICDDR, B) in collaboration with the Center for Injury Prevention and Research, Bangladesh (CIPRB) and Johns Hopkins International Injury Research Unit (JH-IIRU), is conducting an implementation study (“Saving of Lives from Drowning”) to assess the effectiveness of two drowning prevention interventions—the provision of playpens and enrolment in crèche facilities in seven sub-districts of the country.

Aims/Objectives
The aim of this study is to present preliminary findings on the utilization of the playpen intervention among under-two children in four sub-districts of Bangladesh.

Target
Policy makers, program implementer including NGOs, researchers

Methods/Implementation
Playpens were distributed by intervention workers to children aged 9-23 months enrolled in the study. A follow-up schedule was used to visit households to provide support and education and to collect information on utilization of the playpens using a structured tool. Follow-up visits were done approximately on the second, seventh and every two months from the second visit till the end of project. This paper presents preliminary findings from the data collected for four rounds of follow-up visits. Ethical approval for the study was obtained from institutional review board of all three institutions.

Results/Evaluation
Information on utilization was available for four rounds from 6856, 6544, 3722, 1005 participants respectively. On an average the children spent 9 hours in a week in the playpen which decreased by 50% to 4.5 hours in the fourth round. A difference in utilization was seen by age and gender of the child. About 94% of mothers informed that they used the playpen since the workers last visit which decreased to 84% before the fourth visit. Among those who did not use, the most common reason included unwillingness of the child to stay in the playpen, presence of other care-givers to take care of the child and inconvenience in use. During all the visits, the playpens were found to be in usable condition and were mostly located inside the house (about 88-94%). About 19-26% of the children were seen to be in the playpen during the visits, mostly playing and sleeping (84-90%) or crying (9-16%). The mothers reported using the playpens for keeping the child safe during which they carried out other household work. The common problems faced in using the playpens included space constraint and difficulty in setting up. Overall, mothers reported that they were satisfied with the playpens but mentioned the need to supply toys, add wheels to the playpen etc. to improve utilization.

Discussion
Preliminary findings reveal that the utilization of playpens was reasonably high and were used by mothers/caregivers to aid them in supervision. However, problems and limitations reported by mothers or caregivers need to be accounted for in order to ensure continuation of or increase the use of the playpens. Also, complete data from all rounds may need to be considered before drawing any conclusions.

Conclusion
Findings show that mothers consider playpens to be beneficial. However, further analysis of complete data will allow us to gain a complete understanding of the utilization pattern.

Acknowledgement
The project has been funded by Bloomberg Philanthropies

References
Acquisition of self-survival and rescue skills in a rural community of Tanzania

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¹RNLI, Poole, United Kingdom, ²Panje Project, Tanzania

Symposium (5), Bayan, November 6, 2015, 11:00 AM - 12:30 PM

The problem/issue
The RNLI, the Swimming Teachers Association, Royal Lifesaving Society Commonwealth, Nile Swimmers and the Panje Project have been working in partnership to develop a self-survival and rescue intervention; however the technical output of the programme is unknown.

Aim of the presentation
This presentation will present an analysis of the output data from the ‘Aquatic Survival’ intervention in Zanzibar, Tanzania. The results will inform development of the programme and the targeting of the intervention.

Background
A self-survival and rescue course has been developed to teach basic swimming, survival and rescue skills to children. The course is part of the ‘Aquatic Survival’ intervention being developed by the RNLI and partners to reduce the risk of drowning in Africa.

To maximise the opportunity for large-scale uptake of the intervention, the course was designed to be run over a 14 session (2 week) period, with each session taking approximately 90 minutes to complete.

The intervention was hosted and piloted in 2014 and 2015 by The Panje Project in the remote town of Nungwi in Northern Zanzibar, Tanzania.

Target outputs for the course were developed by an expert working group, informed by existing knowledge. Targets included:
- The ability to swim unaided for 15 metres
- The ability to float for 30 seconds
- The ability to tread in water, wave and shout for help while holding a floating object
- The ability to roll from a prone swimming position to supine floating position, and back to a prone swimming position
- The ability to demonstrate a land-based rescue

The aim of the pilot was to examine the outputs of the course to inform the feasibility of the intervention.

Methodology
RNLI trainers trained 8 Panje Project volunteers to deliver the course. Quality assurance was provided by the RNLI and external verifiers who visited the programme to ensure consistency of teaching and provide refresher training.

A secure online database was created by the RNLI to store information about the programme, and record pre- and post-training data. Between July 2014 and March 2015, 256 children aged between 7-14 years were recruited from a local school to take part in the course, which was held in the sea. Enrolment onto the course was based on verbal assurance from the children that they were unable to swim competently, verbal consent from their school teacher, written consent from a parent or guardian, and an absence of any medical condition that may have posed a risk during training.

The child’s age and sex were recorded on a secure online database.

Immediately prior to the course starting participating children completed a distance test to understand their level of swimming capability, supervised by the Panje Project trainers. The children swam next to a length of rope marked with bright coloured rope at 2 metre intervals. The pre-course swimming distance was recorded on an online database.

The course was taught by the Panje Project trainers over a 2 week period. Children’s attendance at each session was recorded, and the children were assessed individually at the end of the course against the target outputs. The results of the assessment were recorded on the online database.

Organisational outcomes
Data from the pilot was exported from the online database and analysed using STATA.

Analysis
- The impact of pre-swimming ability on the course outputs
- The impact of age and sex on course outputs.

Learning outcomes for attendees
Discussion will take place on how the results might influence programme development and the feasibility of the intervention.

Results
Initial analysis of results suggests that while the overall pass-rate for the programme was high, the final swimming distance and skill attainment of individual participants was significantly affected by age and pre-course water confidence.

Discussion
Our results suggest that output data from intensive ‘swim and survive’ programmes may be skewed by the age and initial water confidence of the participants. Young children with no pre-course swimming skills were significantly less likely to achieve course outputs. This demographic of children is that usually targeted by survival swimming programmes. Our results may provide a useful insight for other survival swimming programmes that do not pre-test participant skill levels prior to the start of the course.
Life Saving and Water Safety Education Program for Children who live in rural communities in Sri Lanka

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Swimming and Water Safety 3, Bayan, November 5, 2015, 11:00 AM - 12:30 PM

Objective
In April 2012, we initiated a program in which we could create the expected awareness among the public and meet the objective that we had set for ourselves. It certainly became the primary objective of the Life Saving Association of Sri Lanka in reducing these numbers and it was a gradual process and a well-planned activity. Therefore, the Association targeted school children who live in the rural countryside in Sri Lanka. Our curriculum supported well to educate school children first on life saving activities and then spreading key messages through them to the adults in rural communities. As they had been surrounded by water reservoirs, educating and showing them the importance was not that difficult.

Education
Keeping them focused on the subject and teaching them with the techniques were the key obligations of these educational programs. Showing them the practical side of it and keeping them motivated was a challenge since they were impatiently waiting to build their level of confidence. Training was never restricted to a class room. Key focus areas in these training programs were teaching them in Life Saving and Water Safety Skills, introducing them with innovative Life Saving Skills, exposing them with innovative drowning prevention methods and leadership qualities to carry out their work in their surroundings. These children were trained to use Life Saving equipment in any type of drowning accidents and a comprehensive training was provided throughout a week to build their level of confidence. Necessary resources were given to carry out effective Life Saving duties by the children and the Association made certain that they were brought at least to the level of an intermediate life saver’s standard.

Expectation and delivery
We were able to improve the knowledge of rural communities in Sri Lanka during these programs and were also able to identify several students who were skilled and capable enough to performing or carrying out Life Saving duties for their communities. Those individuals will start their duties in identified areas and their communities will get immediately benefited by their activities. The project gained a noteworthy interest by the awareness created by the media in both rural and urban communities. Next expectation would be to extend this program to the coastal cities or the belt in Sri Lankan communities. Ever since, we targeted school children as our main audience to create awareness and spread this important message across media coverage accelerated and advanced our activities making our lives so much easy to work on our plan that we had in our agenda for a swift delivery.

Reference, Encouragement and Support
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SwimSafe: Empowering adolescents changing lives - experience from Bangladesh

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Adolescence is a transitional period of human life leading to adulthood. Like in many countries, adolescents in Bangladesh face variety of challenges specific to their age group. In Bangladesh, 22% of the population are adolescents, ranging from ages 10 to 19 and girls are treated differently from birth due to the socio-cultural environment of pervasive gender discrimination. This results inequalities of nutrition, health, education, financial and social status. Because of the social and financial situation of the society, the practice of child marriage and dowry contribute to disempowerment, poor health, vulnerability to violence, sexual exploitation and trafficking of women and girls. UNICEF data shows that 23.8% of adolescent girls in Bangladesh are married by the age of 15 and child marriage rate is 62.8% nationally. The practice of child marriage conflicts with a girl's rights as outlined in the United Nations Declaration on Human Rights and the Convention on the Rights of the Child ( UNCRC) which stipulates a person's right to free and full consent to marriage. Though Bangladesh is a signatory of the UNCRC, children's rights and needs are often ignored both by their parents and by society.

Drowning is one of the major causes of death in children in both High Income and Low/Middle Income Countries. Each year drowning kills over 350,000 children in Asia. Bangladesh Health and Injury Survey revealed that drowning is the leading cause of death for children aged 1-17 year in Bangladesh, with approximately 18,000 children dying each year. To prevent drowning since 2006 SwimSafe programme has been implementing in Bangladesh by the NGOs with the financial support from UNICEF and been implementing 23 districts throughout Bangladesh. Adolescents especially the girls have been involved in the SwimSafe programme as community swimming instructors.

The objective of the study was to share the experiences of changing lives of adolescents specially girls who are now empowered to prevent drowning, fight against harmful social norms and raise voice to end child marriage.

SwimSafe trained more than 410,000 children (aged 4-10 years) on survival swimming in both rural and urban areas. This program includes community adolescent girls and boys for teaching swimming in both rural and urban communities. Till date 3686 community swimming instructors were engaged to prevent drowning. In 2009 first time adolescents were introduced as community swimming instructor (CSI) to empower them as social change agent in the society and grow up with social responsibilities. SwimSafe built capacity of these adolescents in survival swimming techniques, first aid with Cardiopulmonary resuscitation (CPR) and as a member of community based adolescents club they are also learning Life Skills Based Education (LSBE). With all these skills these adolescents providing lessons to children on survival swimming, mobilizing community against harmful social practice associated with drowning (like banging plate making noise, spinning overhead, believe drowning is fate not preventable) and providing first aid support including CPR during rescue drowning victims. As CSIs they are getting honour like a teacher and their status in the society changed, now they raise their voice to ending child marriage for own and for their peers as well.

Lessons learnt:
- To date 410,000 children learnt survival swimming
- Around 3686 adolescents trained as CSIs with CPR skills
- Adolescents CSIs have uphold their status in the society and raising voice/decision against child marriage
- Community now aware about drowning, harmful practices and child marriage
- None of the adolescent CSIs (especially girls) got married before 18 years of age
- Though it is little 70% of victim survived by CSIs using first aid and CPR
Women's participation for survival swimming teaching - experiences from SwimSafe programme in Bangladesh

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Swimming and Water Safety 3, Bayan, November 5, 2015, 11:00 AM - 12:30 PM

Background
Drowning is the leading cause of child mortality in Bangladesh; each year over 18,000 children die due to drowning in Bangladesh. Teaching children survival swimming has been identified as an effective intervention for prevention of drowning among 4-10 year old children. Since 2006 CIPRB has been conducting SwimSafe – a survival swimming teaching programme for the said age group. The SwimSafe programme has gradually been expanded to 23 districts in Bangladesh and over 410,000 children were trained under this programme between 2006 and 2014. The SwimSafe programme utilises low cost locally available resources. Local ponds modified with bamboo are the swimming lesson venues; local volunteers who are trained using a pre-test manual are the community swimming instructors (CSIs). Considering the rural local cultural context of Bangladesh at the initial year of the SwimSafe women were not recruited as CSIs. However, researchers considered that for addressing child protection issues, especially for girls, women CSIs should be included in the programme. Later through advocacy and awareness raising meetings and in consultation with the community leaders the project started incorporating adolescent girls and young women as CSIs since 2007.

Objectives
The objective of this study was to describe the participation of women for survival swimming teaching in rural areas of Bangladesh.

Methods
Both quantitative and qualitative methods were applied in this study. Last 9 years data on number of female CSIs participated in the SwimSafe programme were analyzed and three FGDs were conducted with the female CSIs in different locations. Total 20 female instructors, aged between 15 and 25, were interviewed in three groups to understand the perception of female CSIs regarding their involvement in the SwimSafe programme. Two FGDs were also conducted with the parents of the SwimSafe participants, one with the mothers and the other with the fathers of the children. In each group there were eight participants.

Results
In 2006 the number of CSIs was 75 and all were male. In 2007 female CSIs were first introduced in the programme and in that year out of 102 total CSIs only 12 (11.8%) were females. In the successive years the proportion of female CSIs were gradually increased. In 2014 the number of female CSIs became predominant. In that year 725 CSIs were recruited and among them 452 (62%) were females.

In the FGDs the female CSIs reported that they felt proud as they were involvement in a noble work to save children from drowning. They also mentioned that rural community and the SwimSafe participants accepted them as swim trainers. They reported that the programme empowered them both socially and economically. The parents in the FGDs reported that the female CSIs were acceptable to them and they felt comfortable to send their children to learn swimming.

Conclusion
Initially it was thought only male swimming instructors are acceptable by the community but the study revealed that female CSIs are equally acceptable in Bangladeshi rural areas.

Keywords
SwimSafe, Drowning, Female Community Swimming Instructor.
A Multi-Station Approach to Teaching Large Scale Swim Lessons in Resource Deficit Areas - A Pilot Project in Uganda

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Swimming and Water Safety 3, Bayan, November 5, 2015, 11:00 AM - 12:30 PM

Background
Drowning is the leading cause of accidental death worldwide for children under age five (1). Drowning is responsible for 27% of all injury fatalities in Uganda (3). Among those drowning in Uganda, males drown more than females (3). Swim education is critical in preventing drowning, but must be part of a sustainable intervention. Efforts were made in 2012 and 2013 to teach swim instructors in Lira, Uganda. The plan was for these instructors to teach swimming safety year round. For many reasons this failed so during a third visit in August 2014 the focus shifted to teaching large groups of children.

The team used a multi-station approach to deliver swim lessons. Key outcomes were
1) tread/float for three minutes,
2) move up to 22 meters through the water to a point of safety, and
3) perform a reaching assist.

These are corroborated in the World Report on Child Injury Prevention that suggests that swimming lessons provide some protection against the risk of drowning (1).

Methods
Utilizing a telephone and online Delphi method, a group of experts developed a swim safety station curriculum for teaching large groups of participants in a short period of time. The skills chosen were:
1) floating on front and back, 2) rolling from front to back and back to front, 3) reaching assists, 4) modified front crawl, 5) sculling, and 6) bobbing to safety.

The instructional team included two instructor trainers, two assistants who received station-specific training prior to delivering lessons, and several on-site assistants who were assigned helpful tasks.
Thirty-two children participated hourly between 1:00-4:00 p.m. over four consecutive days. There were eight children per station with an in-water instructor and on-deck adult providing translation and safety oversight. The adult groups, which were larger, swam from 4:00-5:00 p.m.

Results
There were 401 children/teens (50% male, 50% female) and 84 adults (predominantly male). Participants ranged from 3-53 years. Each station instructor assessed skill acquisition. The final evaluation included jumping from the edge, kicking up to the surface, and swimming or bobbing to safety.

Discussion
Raising awareness about drowning prevention and swim instruction is essential to reducing the global burden of drowning. We must work toward putting into practice effective large-scale programs that can reach large numbers of participants in a timely way. The youngest children practiced water comfort skills in a wading pool with 12 children per two adults. For safety, rescue cans and whistles were in place. An immediate concern was whether there was adequate time for skill acquisition. Most participants successfully submerged, floated, rolled over, performed a reaching assist, and “swam.” All could bob to safety from neck deep water; not all would jump into deeper water. Some adults completed all skills and the final evaluation. We were limited by not having more instructors or more time for skill repetition and mastery. We endeavored to record the name, gender, and age of each participant, but more assistants could have ensured accurate record keeping including pre- and post-intervention measures of participant abilities and rate of skill acquisition.

Future Direction
There is a difference between learning to swim for survival and swimming for skill. More research is needed to identify which skills are the most important to teach in the most cost- and time-effective way. Research must further stratify necessary skills based on the type of water likely to be encountered, i.e. pools, lakes, rivers, streams. Programs must be sustainable, scalable, and adaptable to resource deficit areas.

Reference Bibliography
Ten Years of Teaching Women to Swim in Southeast Asia

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Swimming and Water Safety 3, Bayan, November 5, 2015, 11:00 AM - 12:30 PM

Background
Sri Lanka is mainly a non-swimming nation, ranked as the 11th worst country for drowning. Paradoxically, the best national swimmers come from the ancient mountain capital of Kandy in the centre of the Island, well away from the sea. In the riverine rice-growing rural and coastal areas, the general philosophy is “Don’t go near water, you will drown”.

In the December 2004 Tsunami, 36,000 people drowned and 80% of the casualties were women and children. The greatest numbers came from informal settlements and villages close to shore; 1,200 alone drowned in a crowded coastal holiday express train. Outside the flooded areas, life was unaffected. After the end of terrorism in 2009, a swift economic catch-up development followed and Sri Lanka became the first country to respond to the WHO’s 2014 Global Report on Drowning.

Target Population
Women and teenage girls constitute the largest non-swimming group in the community available to pass swimming knowledge directly to children at no cost. Teaching young children directly was excluded because that introduces a decade-long delay before any of them are old enough to become swimming teachers. Moreover, if only the children can swim, the question arises: How can the adults safely supervise the children?

Aim
The Project aim is to save lives by teaching women and teenage girls to swim and become swimming teachers, thereby reducing drowning levels in Sri Lanka.

Obstacles
In Asia, ‘pale is lovely’ so bare skin exposure to the sun is avoided wherever possible. In the populous rural and coastal areas, females are chaperoned, wash whilst clothed at the well and are indoctrinated to avoid water. Tourists, on the other hand, dress skimpily and often social behaviour in the tropics works against local women wearing ‘immodest’ swimwear while, ironically, local men actively court the same female tourists under the impression that skimpily dress indicates easy availability.

Most Asian women have little experience of immersion in a large body of water. Tight, wrap-around dress hinders agility and they cannot rescue a child or save themselves from drowning. In many cases, drowning deaths do not appear in national statistics.

There are six specific obstacles to overcome: a lack of perception of the need to swim at all, male head-of-household resistance, lack of suitable swimwear, a paucity of suitable swimming locations, a universal shortage of female swimming teachers and a lack of funds to train and field significant numbers of female swimming teachers, who themselves have first got to be taught to swim.

Implementation and Swimming Methods
The Project began in February 2005 on the rural South Coast between Galle and Matara. The survival skill to Float-and-Breathe is taught first, followed by backstroke, which is then metamorphosed into effortless, streamlined, fish-like front crawl. The women are declared “Swimmers” when they pass an International “Can Swim Safely” Standard of jumping into deep water, floating for 10 minutes and covering 100 metres non-stop without touching the pool sides or bottom. The Project has taught over 4 ½ thousand women and teenage girls to swim for free and is an ongoing model for expansion.

Overcoming Culture and Couture
Teaching female school teachers initially encouraged others in the community to learn to swim. Leggings worn with swim-suits preserved modesty. Initially, women’s lessons attracted predatory male spectators but this was overcome by selecting walled-in, secluded swimming areas.

Sociocultural and Economic Impact
Women gained self-confidence, fitness and improved mental health from the sheer fun of being in water and mastering swimming. Their social status soared and even expectant women learned to swim. Potential swimming teachers are identified, trained and certified to international standards, which includes rescue and CPR. For the first time, these rural women experienced micro-economic independence and some now work abroad, while others continue to support the Project.

Conclusion
Teaching adults to swim has accelerated the availability of swimming teachers in a non-swimming population. This new micro-economic activity benefits the entire community. 4 ½ thousand adults can now swim and a previously feared environment is seen as a healthy, recreational asset. The critical path to scaling up the Project remains the need for funding to train and employ additional swimming teachers and field further large, inexpensive, portable fabric swimming pools to introduce safe swimming into one new community at a time.
The challenges & successes of mixed-gender training programmes in a conservative Muslim society

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In high income countries, there is a large body of evidence that looks at the impact of mixed-gender teaching environments on the achievement levels of males and females. However, similar evidence is lacking in low income countries, particularly in the context of drowning prevention education. The team at Nile Swimmers hopes to provide some evidence for discussion around this topic using experiences gained in Sudan facilitating drowning prevention programs, historically for men only but in March 2015 as mixed gender programs.

Nile Swimmers, in a partnership with the Sudanese Sea Scouts, dating back to 2007, has run a series of drowning prevention programmes in Khartoum, Sudan, for adult males from across the country. From the outset, both the international trainers and Sudanese Sea Scouts have lobbied for the inclusion of women in the training programmes. Social norms and security concerns have meant that this has not been possible. Finally, in March 2015, women were included in the Nile Swimmers training programme for the first time.

In conservative Muslim societies, the challenges around educating females are well documented. However in the specific case of drowning prevention, evidence of these challenges and the approaches required to overcome them are severely lacking. All participants in the Nile Swimmers programme are adults that live in a traditionally conservative Muslim society in which gender segregation is a societal norm. As such, the authors consider the impacts of a mixed-gender teaching environment in not only a low income country, but also in a highly gender-segregated society.

The authors will contrast the successes and challenges of the mixed-gender training programme with that of previously run male-only programmes. The authors will investigate how the presence of female participants impacted on the attitudes and achievement levels of male participants. Additionally, the attitudes and achievements of female participants as compared to their male counterparts will be considered in areas of the programme where direct comparisons can be made. These findings will be contrasted with the body of knowledge that exists for less conservative high income countries.
Stop, there’s water on the road! Developing theory-based messages to prevent people driving through flooded waterways

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Prevention 5, Ballroom 3, November 5, 2015, 1:30 PM - 3:00 PM

Introduction
Floods are among the most widespread of natural disasters and exposure to floodwaters increases drowning risk. A leading cause of flood-related drowning deaths is driving through flooded waterways. To combat these preventable deaths, behaviour change is suggested as one avenue to assist in the prevention of drowning. We aimed to examine drivers’ decisions in these contexts to provide preliminary evidence for the development of theory-based messages to improve safe driving choices during flooded conditions.

Methods
Drawing on the Theory of Planned Behaviour, a two-phased program of formative research was conducted. Phase 1 (N = 25; Mage= 32.38, SD = 11.46) identified common beliefs about driving through a flooded waterway. Phase 2 (N = 174; Mage= 27.43, SD = 10.76) adopted a cross-sectional design to examine the predictors of drivers’ willingness to drive through a flooded waterway. Given differences in consequences due to the depth of water, scenarios of low (road covered in 20cm of water) and high (road covered in 60cm of water) risk situations were investigated.

Results
We found that attitudes toward driving through flooded waterways, perceptions of social pressure to do so, and perceived confidence to negotiate such situations predicted drivers’ willingness to drive through a flooded waterway. Perceived severity (i.e., divers’ beliefs of the seriousness of the specific situation and the consequence of engaging in the behaviour) also predicted drivers’ willingness in the high-risk scenario. In addition, prior experience of driving through a flooded waterway positively influenced drivers’ willingness. Finally, analysis of the beliefs that guide drivers’ willingness to engage in this unsafe driving behaviour revealed a range of attitudinal (e.g., sustain vehicle damage, become stuck/stranded), social (e.g., pressure from friends, family members), and control beliefs (e.g., small distance of water to drive through, presence of signage) as significant predictors of people’s willingness to drive through a flooded waterway.

Conclusions
These findings provide initial evidence to indicate a number of practical implications for the development of strategies and targeting messages to influence driver willingness, in turn, reducing the incidence of people driving through flooded waterways.

• First, strategies that encourage attitudinal change could be considered such as using techniques that make people think about the potential negative consequences (e.g., becoming stuck or encountering hidden hazards) as outweighing any positive outcomes (e.g., reaching their destination).

• Second, strategies to deal with social pressures to undertake driving through a flooded waterway may be useful; for example, providing information about what others’ think about the behaviour and developing messages that convey family members and friends as approving of peoples’ decisions to choose an alternate route.

• Third, techniques to challenge people’s beliefs about their ability to successfully negotiate driving through flooded waterways may be beneficial; for example, identifying barriers and facilitators (e.g., small distance of water to drive through) to performing the behaviour and planning ways to overcome them. In addition, as prior experience of driving through flood waters was related to greater willingness to do so, it may be useful to remind people that all attempts can incur negative consequences.

However, in attempting to increase the awareness of negative behavioural consequences (e.g., potential injury or death) caution should be taken. Research on fear appeals and threatening messages in changing risk-taking behaviour is inconclusive and research suggests that positive emotional appeals may be more successful. Considering perceptions of risk were not significant in the lower risk scenario, emphasizing the positives of not driving through flooded waterways (e.g., not being swept away) may be justified. The findings of the current study and continued efforts to understand this risky driving behaviour will inform the development of future interventions designed to deter people from driving through flooded waterways which, in turn, will ultimately help to save lives.
Real and perceived water competencies among Maori and Pasifika males - a reality gap in a high-risk group?

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Prevention 5, Ballroom 3, November 5, 2015, 1:30 PM - 3:00 PM

Background
Ethnic minorities and males have been identified as high risk groups in drowning prevention. Little is known however, how these high risk groups perceive the risks associated with drowning. Underestimation of risks and overestimation of ability has been identified by other observations (1, 2, 3).

Objectives
The purpose of this study is to report on the perception of swimming competency and risk in an adult male Pacific Island and Maori population, in particular to determine:
• perceived swimming ability in closed and open water
• perceived ability to rescue in open water
• opinion on the risk of various open water scenarios, and
• self-competency and ability to assess risks in open water environments.

Method
This study is a cross-sectional study using self-complete written survey methodology. The sample is a convenience sample of 156 adults selected from Maori and Pacific Island male population within the workplace. The survey was completed within twelve employment organisations that received water safety education as part of Puataunofo ‘Come Home Safely’ presentations during the 2013/2014 summer.

Outcomes
The majority of participants reported they could swim well (78.8%), although most (89.0%) could swim 50 metres or less. Most respondents (88.1%) also thought that they could ‘easily’ rescue someone in open water and that their swimming ability would keep them safe in open water (76.34%). Participants felt more confident swimming in deep, open water (58.3%), swimming without lifeguard supervision at a beach (53.8%) or going to help someone in open water (55.1%). They reported less competence swimming in rough water (41.2%), swimming underwater in murky water (42.9%) or floating in deep open water without a lifejacket (45.5%).

In terms of assessment of risk, participants reported that being caught in a rip at a surf beach (68.6%) or being swept off rocks while fishing (83.3%) were high risk activities.

Just over one third (36.5%) had experienced a life-threatening event when swimming in open water which affected their ongoing participation in water activity for over one third of participants (38.6%).

Relevance
Despite reporting a lack of strong swimming ability, over three-quarters of participants (78.7%) perceived they could easily rescue someone in open water. In addition, over half (55.1%) felt confident going to rescue someone in open water. The aquatic-victim-instead-of-rescuer (AVIR) syndrome (4) has been reported as an omnipresent cause of drowning. In New Zealand Pacific Island and Maori populations are over represented in the rescuer drowning statistics (5).

This study reinforces earlier research of males to show a perceived overestimation of both their competence in both aquatics and rescuing others and an underestimation of the risks involved in open water environments. Education dispelling these perceptions within these high-risk population groups is required to address the drowning risk.

References
Evolution of water safety culture in an historical developing community

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Prevention 5, Ballroom 3, November 5, 2015, 1:30 PM - 3:00 PM

It is estimated that more than 90% of unintentional drowning deaths occur in lower income communities, so-called developing communities. The authors conducted a longitudinal epidemiological study of drowning deaths in Victoria, Australia, during the period of its development in the 19th and 20th centuries. The study found a marked reduction of drowning mortality in Victoria with a drowning death rate of 53.5 deaths per 100,000 in 1863 being reduced to rates of less than 2 per 100,000 by the 1980s.

To gain insight into the causes of this reduction, the records of 1,500 historical death inquests were examined, aiming to identify changes in the factors associated with the deaths during the period of 1863 to 1973. Further, a review was conducted of the broader historical context in which the changes occurred, drawing on a range of archival materials and historical literature.

The results suggested that the reduction of drowning deaths in the developing community were intertwined with the emergence of a culture of water safety. While, there were multiple developmental changes to infrastructure, along with the implementation of specific drowning prevention interventions, the development of a culture of water safety is proposed as an essential factor in driving and maintaining the reduction of drowning deaths.

This presentation proposes a model of water safety culture development, based on Hudson's model for application to high risk industries (1). Hudson's model views the development of a safety culture to be a progression of discrete developmental stages driven by increasing levels of information. The findings of the historical studies were employed to guide a modification of the model and to examine the veracity of the model for application to the development of water safety culture.

The presentation will also explore the ways in which the model could be employed to support the prevention of drowning deaths in contemporary communities experiencing high levels of drowning mortality.

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Drowning Prevention Education in the Community – Reaching children, families and low income groups.

Mr Michael Dunn
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Prevention 5, Ballroom 3, November 5, 2015, 1:30 PM - 3:00 PM

RLSS UK has been working to diversify the ways in which it communicates lifesaving and water safety messages to reach all members of the community. From lifesaving clubs to schools, and from online to on the street, RLSS UK has been seeking new ways of starting the water safety conversation in both targeted and whole-community campaigns.

In this seminar we will briefly review a wide range of methods that the RLSS UK has used in 2015 to increase exposure to water safety messaging in all areas of the community, and also take a close look at the fresh approach taken to reach parents of young children and school children.

The RLSS UK Save a Baby’s Life workshops teach parents and carers what to do in an emergency if their baby stops breathing, and how to keep their babies and children safe from drowning. RLSS UK has embarked on a drive to recruit and qualify new volunteer instructors and instructors from the leisure/training industry to deliver the programme to more members of the community than ever before. Combined with a flexible funding model of charging those who can afford to pay, and offering the training free to those who can’t afford to pay RLSS UK has seen a considerable increase in the number of families receiving training, with socio-economic factors being overcome.

With approximately 10 million children in full time education in the UK, the education system presents a prime opportunity to educate all children in water safety. However, drowning prevention is low priority in most schools, and many children pass through the education system learning very little about water safety and up to 50% of children cannot swim 25m by the age of 11.

RLSS UK has conducted a complete review of how to teach water safety in schools, providing training for teachers, developing new cross-curricular resources, and forming links with the national curriculum and broader education agenda which significantly raised the profile of water safety and drowning prevention in schools.
RLSS UK’s approach to Engaging High Risk Audiences in Drowning Prevention Messaging and Campaign Activity.

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Overview
This session will provide insight into how RLSS UK developed a hard hitting, multi-channel campaign to target ‘high risk’ teenage males in drowning prevention messaging. The session will help facilitate the transfer of best practice, learning points and detailed analysis of how to engage audiences in drowning prevention campaigning and messaging.

Background/Context
Around 400 people drown in the UK each year, and thousands suffer near-drowning experiences, sometimes resulting in life-changing injury. The latest UK drowning statistics reveal that in 2013 – 381 people accidentally drowned. Of these victims 53 were male and aged between 15-24 years old (compared to 9 females in the same age range).

As the UK’s drowning prevention charity, RLSS UK is the leading provider of water safety education. We recognise that a targeted approach to water safety education is essential in achieving maximum effect to help reduce the number of drownings in the UK. We run ‘seasonal’ specific campaigns throughout the year. However, the pinnacle of activity is focussed on our annual Drowning Prevention Week campaign, which runs in June of each year.

The focus of this campaign is to provide key water safety education information to help instil ‘behavioural change’ to try to break the cycle of high numbers of young males losing their lives unnecessarily to drowning.

Activity
The campaign uses positive messaging to promote having fun and staying safe near water. Schools, leisure centres, clubs and communities are encouraged to deliver messages and hold events to distribute water safety messages throughout the week. A range of resources have been produced to aid participants including: School lesson plans, assembly activities, pool session plans, media packs, posters, leaflets and top tips.

Case studies and water safety messages are distributed to the media and we maximise the potential of social media messaging through using multiple channels to engage as many people as possible. For 2014, we commissioned and released a tailored film called ‘Filling Up’ which was a highly, charged emotive film featuring a young teenage boy and it documents some of the effects on the body of jumping into cold water and highlighting the dangers of entering ‘unsupervised’ open water.

In the UK, drowning prevention is not on the Public Health Agenda and through our structured political lobbying activity we successfully engaged nearly 50 MP supporters through running an event in the Houses of Parliament (central government) and have subsequently facilitated the setting up of an All Party Parliamentary Group for Drowning Prevention and Water Safety of which RLSS UK is the Secretariat. Through this political engagement we are seeking to get water safety on the school national curriculum and establish public service announcements for water safety.

Participants are also encouraged to raise money for the charity’s drowning prevention programmes through the campaign’s fundraising element and the securing of corporate sponsorship.

Outcomes and Learning
The campaign is measured and evaluated through a variety of mediums including media coverage, events held, school participation, funds raised, visits to the website and social media metrics.

Year on year the campaign has secured an increase in the profile of the campaign and has engaged more people in the delivery of water safety messages. In 2014 Drowning Prevention Week was featured on lead national television channels including BBC News and Sky News for the first time.

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National Water Safety Forum, 2013 Water Accident and Incident Database
The Aqua English Project: A Proactive Solution to Culturally and Linguistically Diverse (CALD) Drowning Statistics in Australia

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Prevention 5, Ballroom 3, November 5, 2015, 1:30 PM - 3:00 PM

The Aqua English Project
A proactive solution to Culturally and Linguistically Diverse (CALD) drowning statistics in Australia

Background
Australia is an island nation surrounded by iconic beaches and filled with beautiful aquatic environments. Currently, there exists an over representation of CALD drowning statistics within these environments. The recruitment and teaching of CALD communities with traditional foundation aquatic programs is fraught with barriers. The Australian Water Safety Council has called for a proactive solution to these complicated drowning statistics. In addition, The Australian Water Safety Strategies 2008-11 and 2012-15 have called for a reduction of drowning deaths in high risk populations (CALD) through the development of Programs targeting high risk populations that reflect sound community development approaches.

The Aqua English Project: A proactive solution working at a grassroots level
The Aqua English Project was set up to respond to CALD drowning statistics. The project values diversity and actively challenges the social injustice hidden current aquatic curriculums. The project aims to maximise educational outcomes and reduce the marginalisation and exclusion of culturally and linguistically diverse populations. This is achieved through:

• The identification of barriers to participation;  
• Through the explicit teaching strategies, and;  
• Through the positive partnering with local councils.

The Program
Aims to reduce drowning and promote greater social cohesion across Australian communities through:

• Research and development;  
• Community relationship building;  
• Formalising the program into an educational context;  
• Positive partnership;  
• Up-skilling staff and communities;

Partnering for Success
The Aqua English Project was officially established in 2006, although research and program development began in China 2004. The Project is now in a position to make informed recommendations to its affiliates and partners within the community. Current affiliates include:

• The Brisbane City Council (Policy Department, Active & Healthy Parks)  
• The Queensland Government (Department of Communities & Department of Aboriginal and Torres Strait Islanders and Multicultural Affairs)  
• The Gold Coast City Council (Policy Department, Active & Healthy Parks, Lifeguard Service, City Pools);  
• Community Refugee Program;  
• Lockyer Valley Regional Council (The Policy Department);  
• Gold Coast Tourism;  
• Queensland Education and Training International (QETI);  
• The Royal Life Saving Society of Queensland;  
• Swim Australia.

Further relationships exist with peak bodies and not for profit organisations including:

• The Islamic Women’s Association of Queensland (IWAQ);  
• The Wesley Mission Brisbane: Expanded Horizons Program;  
• ACCESS Settlement Services;  
• Queensland Program of Assistance to Survivors of Torture and Trauma (QPASTT).

Framing Multicultural Policy
Participation rates in aquatic education programs are low among CALD communities. Traditional Western teaching strategies and timeframes are not useful in this context. Strategies such as community relationship building and trust are powerful, especially when partnered with a trusted Council Multicultural coordinator. The Aqua English Project has developed a blueprint for a proactive preventative drowning strategy that is currently working in Brisbane. Development of this blueprint comes from a sound understanding of local area multicultural policy, which leads to subsequent funding streams for program delivery.

Aqua English has contributed towards the shaping of local area multicultural policy when it comes to aquatic education. It situates itself as the link between the aquatic facility and the multicultural community with partnered support from local government bodies.

Project Presentation
The Aqua English Project and a Brisbane City Council representative will present and discuss the blueprint for a proactive preventative-drowning program. This program was acknowledged by the Queensland Government in the Premier’s Cultural Diversity Awards, as a finalist in the public sector category. This blueprint program has serviced over 19,000 CALD participants from over 40 nationalities in South-East Queensland.
The Bronze Medallion is an award of the Royal Lifesaving Society (RLSS) and it is a benefit of membership that RLSS Member Branches are able to access and deliver the award.

Most nations have a standard for lifesaving and lifeguard training that is recognized by the government. These standards are important as they provide an established standard of care that can be referenced during inquiries on the standard and duties of care provided by rescue personnel.

Policy and Procedures based on training standards are established as best practices with specific evaluation criteria. Best practices often lead to industry standards and guidelines for safety supervision and rescue response. Further, the government may establish a minimum standard for safety supervision for aquatic venues as legislation and regulation.

The objective of this session is to review the Bronze Medallion as a minimum standard for lifesaving and safety supervision. Nations can add to the standard competencies based on their own demographics, established needs and circumstances.

By establishing a minimum standard for lifesaving training, the ability for lifesavers to transfer their certification among nations would be beneficial when seeking employment.
Implementation research for drowning prevention: learning from Bangladesh

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Background
Drowning, not vaccine preventable childhood illnesses, is the leading cause of child deaths in Bangladesh. It accounts for 43% of all deaths among Bangladeshi children between the ages of 1 and 4 years. Prior attempts at addressing the burden of childhood drowning in Bangladesh have focused on primary prevention strategies such as the elimination of water hazard, use of barrier/supervisory tools (e.g. playpen and door guards), and crèches. While these strategies have been proven effective at a limited scale, their large scale effectiveness is yet to be established.

The Saving of Lives from Drowning in Bangladesh (SoLiD) project is an implementation research project focused on addressing the issue of childhood drowning on a large scale in rural Bangladesh and providing models for drowning prevention in other resource-limited settings. The project, sponsored by the Bloomberg Philanthropies, is led by a triumvirate partnership of the Johns Hopkins International Injury Research Unit (JH-IIRU), USA; the Centre for Injury Prevention Research, Bangladesh (CIPRB) and the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR.B). The partnership is focused on a large scale implementation of two childhood drowning prevention interventions, the use of playpen and a crèche model for injury prevention known as ‘Anchal’, and tracking of all injury outcomes, including drowning, for a rural population of 1.2 million in seven sub-distRICTS of Bangladesh.

The SoLiD injury surveillance system is one of the largest of such systems globally. The SoLiD partners would like to propose a parallel session at the 2015 World Conference on Drowning Prevention to present learning in drowning prevention research and practice for resource-limited settings based on implementing the SoLiD project in Bangladesh. The proposed parallel session will cover 3 main presentations of various aspects of the SoLiD project.

Description
The first presentation, ‘Application of implementation research methods to drowning prevention in Bangladesh: an innovative trial in injury prevention research’ by Dr Olakunle Alonge, Assistant Scientist, Johns Hopkins International Injury Research Unit (JH-IIRU) and Program Manager, Saving of Lives from Drowning (SoLiD) Project, will present an implementation research framework for planning and large scale roll-out of the Anchal and playpen interventions in Bangladesh. It will also present an innovative research study design for evaluating the large scale effectiveness of the interventions and implementation strategies using historical controls for comparison. It will include initial results from the historical data and baseline injury survey on the trend of childhood drowning among the study population.

The second presentation, ‘An update on the ‘Anchal’ model for childhood drowning prevention in resource-limited settings’ by Dr Aminur Rahman, Director, International Drowning Research Centre-Bangladesh (IDRC-B) of the Centre for Injury Prevention Research, Bangladesh (CIPRB), will chronicle over ten years effort of designing and testing a crèche model (Anchal) for childhood drowning prevention in rural Bangladesh. It will present the most recent Anchal model along with the basic steps, resources and community networks required for replicating this version at scale in other resource-limited settings.

The third presentation, ‘Integration of childhood drowning prevention to child health programs in Bangladesh’ by Dr Emdad Hoque, Associate Scientist, International Centre for Diarrhoeal Disease, Bangladesh (ICDDR.B), will describe current efforts at mainstreaming childhood drowning prevention effort into child health program in Bangladesh. The International Centre for Diarrhoeal Disease, Bangladesh (ICDDR.B) has been implementing the Health and Demographic Surveillance System (HDSS) in rural Bangladesh for the last 50 years. The presentation will describe an innovative strategy for integrating health data for tracking child injuries, including drowning, with other child health outcomes in the HDSS.
Application of Implementation Research Methods to Drowning Prevention in Bangladesh: an Innovative Trial in Injury Prevention Research

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Background
Drowning is the commonest cause of injury-related deaths among under-five children worldwide. In Bangladesh, drowning accounts for 43% of all deaths among children between the ages of 1 and 4 years. However, the country has limited evidence to inform a national implementation plan to address the burden of drowning in this age group.

Aims
This presentation will describe a framework for addressing implementation gaps in drowning prevention for under-five children in low and middle income countries (LMICs) (1). The Saving of Lives from Drowning Project in Bangladesh (SoLiD), an on-going large-scale implementation research study, is used to illustrate the framework (2). SoLiD employs an innovative research study design - this will also be presented along with initial results from analysis of the historical data and baseline census of populations in the project area.

Implementation
Fifteen-year (1998-2012) continuous historical data were obtained from the Matlab Health and Demographic Surveillance System. These data cover one major sub-district (Matlab area) of the SoLiD study. The average population for data collected each year range between 12,973 individuals in 1998 to 75,475 in 2012.

A review of common interventions for drowning prevention, and their related implementing challenges, was conducted. An implementation framework was introduced to bridge the major implementation gaps in drowning prevention and this was applied to the SoLiD project (1).

A major outcome for the SoLiD project is drowning mortality rate. This and other injury outcomes are being monitored through an injury and demographic surveillance systems in the SoLiD study area. A baseline census of all population in the study area was conducted prior to establishing the surveillance system. The census data covered 1.2 million individuals in seven sub-districts of Bangladesh and included comprehensive information on their socio-demographic characteristics, environmental assessment, injury events, and detailed information about key injury mechanisms.

Evaluation and Discussion
Historical data revealed that the drowning rate for under-five children decreased from 1998 to 2012 (trend: $P=0.002$). However, proportionate drowning mortality increased over the same period. Children aged 12-23 months had the highest drowning rate. The baseline census data showed that drowning was the leading cause of fatal injuries among study population of all ages. Drowning-specific mortality rate among under-fives was the highest among all-cause mortality rates for all ages. More than 60% of all non-fatal injuries occur in the home environment for under-five children.

The crèche and playpens were identified as two promising interventions for drowning prevention among under-five children. Some of the identified implementation challenges to drowning prevention in LMICs include absence of drowning/injury prevention policies, lack of funding, limited coordination among stakeholders and societal perception of drowning risk (1).

The proposed framework maps eleven key elements for effective implementation of drowning prevention programs in LMICs. These elements include need for global funding, building in-country political will and technical capacity, involvement of appropriate actors, coordination across actors, focused and multi-sectoral action. The framework categorizes the implementation process for drowning intervention into four phases: planning, engaging, executing, and evaluating; and links the key elements to the different phases.

Based on the framework and through a triumvirate partnership, the SoLiD project targets crèche and playpen interventions to 80,000 children between the ages of 9 and 36 months in Bangladesh. The evaluation design for the project employs a pre- post-quasi-experimental design which compares changes in drowning mortality rates in the coverage areas with historical control. Historical controls as opposed to concurrent controls were selected based on ethical and financial grounds.

Conclusion
The framework and SoLiD project design are useful for informing a national implementation plan for drowning prevention in Bangladesh and other LMICs settings.

Acknowledgements
Bloomberg Philanthropies sponsored this project.
An update on the ‘Anchal’ model for childhood drowning prevention in resource-limited settings

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Background
The Center for Injury Prevention Research, Bangladesh (CIPRB) had previously implemented crèche intervention (‘Anchal’) for childhood drowning prevention in three rural sub-districts of Bangladesh [1] but not at scale as proposed under the Saving of Lives from Drowning (SoLiD) in Bangladesh project [2, 3]. The concept of Anchal originated with the notion that to prevent childhood drowning, children should be supervised institutionally during the most vulnerable time of the day by a trained caregiver. Under SoLiD project, a total of 3200 Anchal are proposed to be established and about 80,000 will be receiving this intervention.

Aims/objectives
The overall goal of this session is to provide an update on the crèche model for childhood drowning prevention, discuss challenges and early lessons in implementing the current model as used in the SoLiD project

Implementation
A critical review of past Anchal models implemented by CIPRB was conducted. Two main models were tried prior to the current model being used in the SoLiD project. These are the “Prevention of Child Injuries through Social-intervention and Education” (PRECISE) and complementary models.

The first Anchal model was designed in 2006 as a component of the PRECISE project in rural Bangladesh. The model included the supervision of 20-25 children aged 1-4 year by a trained supervisor in a village provided room between 9 a.m. and 1 p.m. (the peak period for drowning occurrence in rural Bangladesh). In addition, the children also participated in early childhood learning activities. The PRECISE model also included Village Injury Prevention Committees formulated for raising awareness on injury prevention in the community. Between 2006 and 2008, the number of Anchals designed using the PRECISE model expanded from 6 to 640. By 2008, these were providing services to about 16,000 children. The evaluation of the model in 2008 showed that PRECISE Anchals were effective in preventing child drowning.

The complementary models evaluated different opening hours for the PRECISE Anchals based on caregivers’ preference, 9 a.m. to 1 p.m., 10 a.m. to 12 p.m. and 10 a.m. to 2 p.m. The evaluation showed that 9 a.m. to 1 p.m. was the most preferred time.

The SoLiD Anchal model, developed in partnership with the Johns Hopkins International Injury Research Unit (JH-IIRU) and International Center for Diarrheal Diseases Research, Bangladesh (ICDDRB), was based on the PRECISE model. It targets children 9 months to 36 months (as opposed to 1 – 4 year old) and has one crèche mother and crèche assistant supervising 25 – 30 children. Its implementation involved – 1) developing standard operating procedure, manuals and guidelines to ensure uniform delivery of intervention across both implementation sites; 2) conducting advocacy meetings at sub-district and union levels to increase government buy in; 3) community sensitization and formation of village injury prevention committees to increase community participation and increase sustainability; 4) selection and capacity building of crèche workers i.e. crèche mothers and crèche assistant; 5) selection of crèche venue and development of crèche, including environmental modifications, provision of supplies etc.; 6) identification and recruitment of eligible children; 7) developing a monitoring and quality assurance plan; and 8) compliance and participation assessment.

Results and Discussion
Till date a total of 3205 of the proposed crèches are functioning in seven sub-districts and 56,533 children are currently attending crèches.

Some early lessons from the implementation the SoLiD Anchal include the need to – 1) simplify and define intervention to ensure fidelity of implementation across sites, 2) engaging community right from planning stage, 3) allocating time for community sensitization and mobilization, 4) plan for adequate financial and non-financial incentives for crèche workers.

Conclusion
Although the Anchal is a complex intervention for childhood drowning prevention, its implementation is feasible in resource-poor settings.

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Integration of childhood drowning prevention to child health programs in Bangladesh

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Introduction

Bangladesh is amongst few countries that are on track to achieve the Millennium Development Goal 4[1]. The International Centre for Diarrheal Disease Research, Bangladesh (ICDDR,B) has made significant contribution to reduce child mortality and improve child health in Bangladesh. However, most of this work has been in the area of communicable diseases, nutrition and immunization. With reduction in other causes of child mortality, drowning has emerged as a major cause of child deaths in Bangladesh. About 40% of child mortality in Bangladesh is due to drowning [1]. Although the Government of Bangladesh (GoB) has highlighted reducing child injury mortality as a strategic objective for improving child survival in Bangladesh, there is however no child injury implementation plan or strategies in place. The SoLiD project is currently implementing a childhood drowning prevention package which includes the use of playpens and establishing crèches with community education on injury prevention in seven sub-districts of Bangladesh.

Aims/Objectives

The overall goal of this session is to describe the process of mainstreaming childhood drowning prevention in Bangladesh, discuss challenges and lessons learned.

Methods/Implementation

Through series of proposed in-country consultative meetings, the SoLiD implementing partners will present the effectiveness of prevention package, implementation lessons and challenges to key policy-makers, NGOs and child health experts in Bangladesh. In addition, the partners will provide a detailed implementation plan, including cost information, based on the SoLiD project for adoption by the GoB using local NGOs as service providers. An injury prevention cell established under the Ministry of Health and Family Welfare along the SoLiD implementing partners will serve the key role of coordinating these activities.

Since 1966, ICDDR,B has maintained a health and demographic surveillance system (HDSS) in three of the seven SoLiD sub-districts. The HDSS involves Community Health Research Workers (CHRWs) collecting information on births, deaths, migrations, and marriages on regular intervals using an electronic data capture system. The community level acceptance of surveillance is high. A major challenge was that the existing CHRWs could not conduct injury surveillance, as this would increase their workload. Under the SoLiD project, ICDDR,B successfully integrated injury surveillance into the existing HDSS and expanded the coverage of the surveillance. The integration was done using a two-step method where the HDSS CHRW identified cases on injury mortality and morbidity while another cadre of data collector visited identified households to complete detailed injury modules. This process included: 1) modification of existing electronic surveillance form to integrate questions on injury, 2) training of existing CHRWs on identification of injuries and injury deaths, 3) selecting and training of another cadre of injury data collectors, 4) facilitating regular exchange of information between two cadres of data collectors.

Discussion

There is ample scope for the GoB to mainstream implementation of childhood drowning prevention programs in Bangladesh. These integration activities will however require sustained effort on the part of the government and other key stakeholders. Tracking of childhood drowning incidents will be crucial for measuring the impact of these mainstreaming efforts. Some of the challenges experienced in integrating injury surveillance to the HDSS include: 1) under reporting of injuries, and 2) parallel systems – isolation of HDSS and injury surveillance in some areas. Complete integration would require additional training of CHRWs and modification of the electronic data capture system, both of which are resource intensive.

Conclusion

It is feasible to mainstream childhood drowning prevention activities as part of national child survival activities. Injury surveillance can be integrated into the existing disease surveillance systems. Staged method of integration could be a strategy to increase acceptance by both data collectors as well as community.

Acknowledgement

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Contrasting male and female drowning risks in Sudan

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Swimming and Water Safety 4, Bayan, November 5, 2015, 1:30 PM - 3:00 PM

It is accepted that there will always be cross overs and basic skills which are relevant to all groups of water users no matter what their background or socioeconomic status. However the practicalities of devising, implementing and ensuring the large-scale success of drowning prevention programmes mean that organisers and drowning prevention course designers must always consider the specific requirements for each group that they intend to interact with.

There are numerous different ways of selecting the groups for differential analysis. However, the easiest and most relevant in a large number of countries, and that which provides the best opportunity for comparison and contrast in future studies is by gender. This paper will present qualitative evidence from focus group discussions with participants of a recent drowning prevention programme, run in Khartoum, Sudan, about the specific drowning risks faced by women in Sudan; these will be contrasted with typical drowning risks faced by men from similar backgrounds.

In partnership with the Sudanese Sea Scouts, Nile Swimmers has run a series of drowning prevention programmes in Khartoum, Sudan since 2007. From the outset, both the international trainers and Sudanese Sea Scouts have lobbied for the inclusion of women in the training programmes. Social norms and security concerns have meant that up until 2015 this has not been possible.

In March 2015, the situation in Sudan had changed enough that women participated in the Nile Swimmers training programme for the first time in both a delivery and beneficiary capacity (with delivery carried out by an experienced female trainer from the UK, and the beneficiaries all being Sudanese). The long-term aim of this continued expansion is to enable the delivery of high quality drowning programmes to all members of Sudanese society. In order to achieve this, both men and women will need to be involved in delivery roles.

The discussions focused on identifying the differences between situations where women are at risk from drowning and the situations where men were at risk. The reason for this focus is that different situations will require different prevention and rescue strategies. By understanding the risk factors for the different groups, specific strategies can be designed and implemented which are situationally appropriate.

To provide some structure to the discussions and allow the relevant information to be captured, each link in the well-established drowning chain (1) was used to spark discussion and gain an understanding of what it meant for those on the training course. The key points of the responses from the different participants were captured and summarised by the facilitators and used to understand the differences in attitude, ability and level of risk engagement undertaken while carrying out their daily routine.

From role of the searcher drowning victims lead to drowning preventing in the community, Nakhon Ratrasima Province, Thailand

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Background
Nakhon Ratrasima is on the north-eastern of Thailand with a largest area of the country and population, is the 2nd from the capital, Bangkok Metropolitan. Mainly area is the agricultural area, the several rivers flows through includes the canals have many the drilled pools and water wells for the local agricultural. The number of the deaths from 2008 – 2013 were drowned in a most of the country averaged 200 persons a year (with population rate per a thousand equal to 6.4 -9.3) in this number were the children lower aged 15 years, averaged 47 children a year, the underwater rescue of Huk 31 caused gather into a group of volunteers networking with mainly role to seek for the drowning victims and was operated according to seeking for the drowning victims task from 1993 until the current found that more than 1000 victims that was informed and seek in the water have not one to be survival and the crime scene often found that is the nature water will in the community thus was caused of concept to preventing from the origin rather than solve an end up of the problem that is mean have no chance to survive.

Objective
To stimulate the participation of the community in the prevention of drowning.

Methodology
Started operation since 2012 by taught the children and those interested learning about water safety, how to survive by floating in the water and use the easily floating devices (Empty plastic bottles) that assists to buoyancy themselves and how to help the others from drowning in correctly by offered free course 1 time a month and build up the team networking of the community to surveying the risk water wills includes operate to manage the risk water wills in the community in Loy Krathong Festival and Songkran Festival by installed the warning Signs, fitting drowning rescue instruments too easily finding such as plastic gallons, filing beams, ropes, for the purpose that operating and instruments which using were from corporation of the public in the community and donation from the private sectors.

Performances
After operated, the student of Primary Education Level 1-6 trained practical part of 6,114 students, to be the instruction volunteers networking of 606 volunteers, offered free survival method from drowning 1 time a month totally of 35 times with the children, the guardians, the interested public of 350 persons, arranged the risk water will by the preventing the children from drowning networking of 90 water wills and operated covers the sub-districts of 32 districts of Nakhon Ratrasima Province furthermore found that notification to seeking the drowning victims was decreased.

Conclusion and Suggestions
Drowning is preventable by the role of the searcher drowning victims that lead to drowning preventing in the community with operations in simple measures focused skills training for the children, creating the volunteers networking, manage the risk water wills under participation of the community It increases the chances of survival from drowning for the children in Nakhon Ratrasima Province.
Swim Vietnam - Building an operationally and financially sustainable survival swimming program through forging long-term partnerships in Vietnam and abroad

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Swimming and Water Safety 4, Bayan, November 5, 2015, 1:30 PM - 3:00 PM

Background
Swim Vietnam is a UK registered charity which tackles the issue of drowning in Vietnam by training teachers, setting up swimming schools and providing free survival swimming and water safety lessons. Over 150 teachers have been trained to internationally recognised certification, over 11,500 children have been taught to swim and over 20,000 primary school children have received classroom based water safety education (as of July 2015). Swim Vietnam operates its swim programs in Central Vietnam however it trains teachers and provides water safety education throughout Vietnam.

Over its eight years of operation Swim Vietnam has continually built long term relationships with government and other organisations both within and outside Vietnam. These partnerships have led to a high level of staff development and training. They have enabled Swim Vietnam to become increasingly self-sufficient by offering its own swim teaching and lifesaving training courses. This has allowed Swim Vietnam to generate its own income to sustain the charity and the future of swimming and water safety education in Vietnam at the grass roots level.

Government partnerships
Swim Vietnam’s local partner is the Vietnamese Government Department of Education & Training. The Education Department ensures that the Swim Vietnam survival swim program is embedded within the school curriculum. Large numbers of children can be consistently sourced through the school system. The Education Department contributes 20% of Swim Vietnam’s total costs. This demonstrates their commitment to the Swim Vietnam program and their financial commitment helps ensure their operational commitment.

International organisations
All Swim Vietnam teachers achieve their AUSTSWIM teaching qualification. Swim Vietnam has trained 2 staff members to AUSTSWIM trainer presenter level ensuring that training courses are completed in Vietnamese by qualified and experienced local trainers. This ensures the quality and safety of the teaching. Swim Vietnam is a recognised provider of AUSTSWIM TSWS course in Vietnam.

In December 2014 Swim Vietnam partnered with Royal Lifesaving Australia – NSW branch. Local staff have been trained to provide a wide range of RLS courses. This allows Swim Vietnam to generate an independent income by offering these courses to Vietnamese organisations, such as hotels. This significantly reduces dependence on sponsorship which places the organisation in a far more financially self-sustaining position.

International Swim Schools
Swim Vietnam has built a strong long term relationship with Paul Sadler Swimland. Paul Sadler Swimland assists by providing financial support; however the support is not only financial. Swimland has shared its teaching and training program with Swim Vietnam which has greatly strengthened Swim Vietnam’s program and quality of lessons. Staff exchanges between Swim Vietnam and Swimland in Australia have led to improved training and teaching techniques, as well as giving teachers from both organisations the experience of teaching in a different cultural environment.

Local staff development
Building local teaching and managerial capacity within the organisation is vital. Swim Vietnam has initiated and successfully achieved a career path for 90 trained local Vietnamese swimming teachers and teacher trainers. This offers sustainability for the future and effectively spreads the important skills and knowledge of swimming. Foreign involvement is not the answer to ongoing success. Success will ultimately depend on how local people they use these skills and education to grow and promote the benefits of swimming and lifesaving.

Swim Vietnam has built a strong local management team. After eight years of being managed by the foreign founder and director, in 2015 management of all operational functions passed to the local experienced management team.

Other organisations
Swim Vietnam has worked with other charities to train their teachers and set up the survival swim programs. This allows Swim Vietnam to stay small, focus on quality but assist drowning prevention programs to develop throughout Vietnam.

Conclusion
Swim Vietnam is a strong position with well-trained local staff, strong connections with the government and a growing ability to finance its charitable operations. This situation is a direct result of the stable long term partnerships it has built over the years and will continue to develop in the future.
Impact of “Swim n Survive” programme for drowning prevention in India

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Swimming and Water Safety 4, Bayan, November 5, 2015, 1:30 PM - 3:00 PM

Drowning is a leading cause of death among children in low and middle-income countries in Asia. Principal causes of drowning are:

• Increased access to water.
• Unprotected watery bodies.
• Occupations such as fishing or transport.
• Children living near water bodies.
• Economic factors – Tourism
• Water related natural disasters.
• Unsupervised children near water bodies.
• Recreational activities.
• Medical conditions (epilepsy).
• Consumption of alcohol and drug.
• Lack of safety consciousness and safety skills.

Teaching children swimming along with survival skills and providing key safety messages is the best solution to reduce drowning.

Swim N Survive (SNS) practiced in numerous countries is the hallmark of drowning prevention. It is simple and easy to implement with considerable impact on the population, as it involves participation of young children starting at 3/4 years of age. Because of the children the parents also get proactively involved and spread the benefits of the programme in their community.

The Swim N Survive curriculum has been taught to more than 45,000 children in India since 1998. In India like in many other countries the programme has been structured in 2 phases, namely, Himmat (Courage) in 2 levels for children in the age group of 3 to 5 years and Josh (Passion) in 4 levels for children between 5 to 14 years. ‘Himmat’ concentrates on basic ability to swim and survive an accidental fall into deep water. ‘Josh’ encourages participants to take up serious and eventually competitive swimming which then leads on to participation in lifesaving sports.

To extend coverage of the programme to swimming pools in urban areas and natural water bodies in the rural surroundings, organisations have opted for portable pools, particularly where swimming facilities are either not available or difficult to create.

Currently the approach to introduce and popularise this programme is through schools and residential colonies in the urban sector and the village “Panchayats” (Village Administration) in rural areas. The latter is important in countries like India where drowning, being a silent killer, has assumed epidemic status as over 70% of our population is concentrated in the rural settings.

The success of the programme can be gauged by the impact it has on families that have opted for it in the community. From introducing 500 children to the Swim N Survive programme in the city of Pune, Maharashtra in 2005, the programme now trains over 9000 children per year in three states i.e., Maharashtra, Kerala and Karnataka. This accounts for 1800% growth in the last 10 years and it is expected to grow much faster as awareness of SNS and its benefits reach the masses.

In addition to learning to be safer in and around water bodies, young children are introduced to some very basics in better and safer living such as toilet training, washing hands, grooming, cleanliness and hygiene. When a portable pool is set up in rural surroundings, it creates a stir not only among children but also among the grown-ups, who moan about having missed an opportunity but delighted that their children can benefit from the experience. When in operation, the pools draw large crowds giving an opportunity to trainers to draw the attention of adults to first aid protocols, women to child and home care and people at large to the need to develop safety consciousness, care and concern for the fellow being.
Swimming for Safety: Developing a sustainable partnership platform for drowning prevention in Vietnam

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Drowning claims the lives of over 30 children per day in Vietnam. Hue Help works in Thua Thien Province, Central Vietnam, where the great extent of open water environments, annual flooding, the lack of any structured swimming programme and the importance that local bodies of water can hold for the livelihoods of the community means that providing the necessary knowledge and understanding of such conditions is vital. Our Swimming for Safety programme teaches swimming skills, water safety knowledge and land based rescue skills to children at risk of drowning.

In the aftermath of the World Conference of Drowning Prevention in 2011, Hue Help launched Swimming for Safety in partnership with the Swimming Teacher’s Association (STA, UK), the International Federation of Swimming Teacher’s Associations (IFSTA) and Thua Thien Hue Department of Education and Training. The aim of the initiative is to provide high quality teacher and student training that is safe, sustainable and applicable to the local context. The programme teaches basic survival swimming skills, water safety knowledge and land based rescue skills. It started by training just 30 school teachers from ten schools to become swimming teachers, and assisting them to implement swimming lessons for the children in their school. These teachers went on to train 1,200 children at carefully selected and risk assessed open water locations.

After a successful pilot programme, Swimming for Safety continued to develop and expand year on year with support from both international non-governmental organisations (INGOs) and local partners. As of 2014, Swimming for Safety has trained over 120 swimming teachers, 6 teacher trainers and over 5,000 children and now operates in multiple provinces. Significant further expansion is planned for 2015 and partnerships continue to be built. As Swimming for Safety continues to grow and teach skills to vulnerable groups, we believe that the programme can make children safer around water and help reduce preventable deaths by drowning in Vietnam. The programme structure, involving INGOs, a national swimming organisation (STA) and local education authorities can also serve as an effective, safe and sustainable model for low resource environments.
Number of Child Drowning (under 15) in Thailand is 1500/years and if we do nothing it will be more and more. Thai Life Saving Society set up to solve the drowning by Lifeguard Training Course but it’s not enough. So TLSS start up our “Drowning Prevention Project” by 4 topics:

2. Self-Rescue: Supine floating, Survival floating and Tread water.
4. CPR for Intermediate and Advance swimmer level.

Targets: Survival Swimming Instructors, students, child, mom, dad and parents.

TLSS changed the swimming curriculum from competition swimming to survival swimming curriculum. We trained local people to teach their children how to do supine float and know a basic water rescue. With supine float our children will be safe from drowning and we’ll have enough time to rescue.

TLSS worked closely with many International Agencies such as: WHO, UNICEF, RLSSA, SLSA, The Alliance for Safe Children (TASC), Ministry of Public Health, CSIP etc.
A Study on Differences of Survival Swimming Courses in Thailand

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Swimming and Water Safety 4, Bayan, November 5, 2015, 1:30 PM - 3:00 PM

Background
In Thailand, drowning is the number one cause of death among children under 15 years of age. In this age group, there were 12,435 drowning deaths between 2004 and 2013, most of which occurred in natural water settings. Among children under 15 years, only 23.7% can swim, even though Thailand has implemented the survival swimming course since 2009. However, due to limitations in incorporating such lessons into the educational curriculums, the survival swimming course has to be taught in full and modified according to the situations of each locality, with differences in training periods and types of natural water.

Objective
To study the differences in learning activities in various survival swimming courses in Thailand.

Methods
This research was conducted to assess the differences in the learning activities for children in the survival swimming courses, both full courses and those modified according to the local context. Data were collected using a self-administered questionnaire and an in-depth interview form and then analyzed to determine percentages and standard deviations; and t-test as well as odds ratio was performed.

Results
The children who took the full survival swimming course were found to have better knowledge and skills in water safety, survival and problem-solving in emergency situation, than those who took the applied swimming courses. Their average score was significantly different (P < 0.05), but their average scores on water rescue skills were not different. Among full course children, their scores on water safety, water survival skills, water rescue skills, and problem-solving skills were 8.9-fold, 4.1-fold, 1.4-fold, and 10.3-fold higher than those taking the applied courses, respectively; and their capabilities in survival swimming and drowning prevention were 5.2-fold and 7.7-fold higher than those taking the applied courses, respectively.

Conclusion and discussion
Children who took the full survival swimming course had better survival swimming capabilities and drowning prevention skills than those who took the applied course. However, the water rescue skills in both groups were not much different, probably because they all were taught to memorize the key message “shout, throw, and hand over” regularly and consistently during the course, not just during the lessons.

Recommendations
For the maximum benefit of drowning prevention, the full survival swimming course should be used. But for developing countries with limited resources, the applied course might be used; and the knowledge and skills on this matter should also be taught while learning other subjects.

Definitions
- Taking the full survival swimming course means intensive learning in all 3 modules for 15 hours at a standard swimming pool.
- Taking the applied survival swimming course means learning in all 3 modules with different intensity levels, depending on the local context, not for all 15 hours, at a mobile swimming pool, a fish pond or a natural water setting.
Helping Older Adults to Become Everyday Lifesavers: A social inclusion and health project for over 60’s

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Introduction
Adults over 60 years have the highest age-specific drowning rate in Victoria, Australia. In 2012/13, there was a 65% increase in the drowning rate among this age group, compared to the 10 year average (2002-2012). The most common factor contributing to drowning incidents in older adults is unintentional entry into the water as a result of slips, trips and falls. Other factors include underlying medical conditions, a reliance on water safety skills gained earlier in life and reduced fitness levels. With the population in this age group predicted to grow by 38% by 2020, drowning deaths are also likely to increase.

Life Saving Victoria’s ‘Helping Older Adults to Become Everyday Lifesavers’ project is a pilot aquatics and health promotion program targeted at senior Victorian’s to reduce this alarming trend whilst encouraging a healthy, independent and active lifestyle. The program was designed to teach participants a range of water safety, personal survival and lifesaving skills, resuscitation and emergency care techniques.

This research aimed to evaluate the success of the program in terms of development in participants’ water safety awareness and knowledge and planned participation in aquatic activities as well as social inclusion, general health and well-being.

Methods
The 10 week program was delivered to 41 participants aged over 60 at two aquatic facilities in Greater Melbourne, Victoria, in 2014. The program was evaluated using pre- and post-program questionnaires and a health and well-being questionnaire. This gauged pre-program experience of aquatic activity and measured changes in participants’ self-reported aquatic, water safety and resuscitation skills and knowledge, and whether the program encouraged them to engage in further aquatic activities and/or courses. The health and well-being questionnaire contained standardised measures of health-related quality of life and well-being.

Results
Significant increases in participants’ water safety awareness and knowledge were found. The proportion of participants who reported their water safety knowledge as above average or excellent rose from 5% pre-program, to 70% post-program. Similarly, the proportion who thought they possessed sufficient knowledge of water safety issues to avoid getting into hazardous situations in and around water increased from 44% to 95%. The proportion who reported their skills and knowledge as good or excellent also increased significantly in areas of resuscitation skills and knowledge (increasing from 20% to 90%), aquatic skills and knowledge (20% to 85%) and knowledge of how to keep children in their care safe from drowning (44% to 93%).

Participants also described increased confidence around water post-program, including feeling more confident engaging in aquatic exercise (74%) and using personal survival skills (55%). Many (76%) were planning to increase their participation in aquatic activities and 45% were interested in gaining a formal First Aid certificate. Most participants (90%) were also motivated to improve their health and well-being following the program and the proportion reporting their health as excellent increased from 26% to 74%.

Discussion
The ‘Helping Older Adults to Become Everyday Lifesavers’ program was a successful programmatic response to the issue of increasing drowning deaths in adults aged over 60. The demonstrated improvements in water safety awareness and knowledge, participation in aquatic activities, and levels of social inclusion, general health and well-being highlight the program’s positive impact.

This success has led to the roll out of Victoria’s first aquatic participation program aimed at people aged 60 years and over in a number of Victorian aquatic facilities. It will potentially contribute to reducing drowning deaths in this age group by providing older adults with valuable water safety knowledge and lifelong skills. This will enable them to recreate safely and confidently within their community and to care for others with their knowledge of basic resuscitation and emergency care.
Don’t Play in Pipes and Drains: How to target a campaign for a high risk drowning location/environment

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Prevention 7, Ballroom 3, November 5, 2015, 3:30 PM - 5:30 PM

Storm drains and pipes in Northern Australia’s tropical wet seasons are tempting and dangerous environments for children. As part of the Northern Territory Water Safety Strategy a targeted media campaign was developed to raise awareness. The original Northern Territory Don’t Play in Pipes and Drains media campaign was based on a program developed in Cairns, Australia following two tragic drownings in pipes and drains. Despite the media campaign a young boy drowned in a storm drain. At the request of the parents of the boy who drowned the Northern Territory Government in collaboration with the Royal Life Saving Society developed a new campaign – there have been no subsequent drownings in Northern Territory Pipes and drains.
A Vertical Perspective on Water Safety – Addressing effective drowning prevention strategies for people aged 55 years and over.

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Prevention 7, Ballroom 3, November 5, 2015, 3:30 PM - 5:30 PM

According to the World Health Organisation (WHO), the world population has been experiencing significant ageing and increased life expectancy. This major global demographic trend in ageing has profound consequences on a broad range of economic, political, health and social processes.

Statistics indicate that, on average, 87 people aged 55 years and over have drowned in Australia each year for the past 10 years. This number is expected to increase in coming years due to our ageing population.

Current evidence clearly indicates that regular physical activity is an effective way to reduce and/or prevent a number of the functional declines associated with ageing. Older adults have the ability to adapt and respond to both endurance and strength training both on land and in an aquatic environment.

The purpose of this project was to critically determine the relationship between participating in vertical aquatic activity to increase personal water safety skills, confidence in the water and general wellbeing measures in people aged over 55 years.

Twenty two (22) participants with a mean age of sixty six (66) (male and female) and with varying medical conditions (including multiple sclerosis, chronic fatigue, diabetes) participated in vertical aquatic activity for a period of 45 minutes per week for 12 week duration. The participants were instructed by an accredited and licensed aqua instructor also aged over 55. Participants were encouraged to attempt aquatic movement patterns that they would normally avoid. These included lifting both feet off the bottom of the pool in addition to maintaining safe breathing in still, flowing and turbulent water situations. The 12 week project also aimed at determining whether increased time spent in supervised aquatic environments in a vertical position assisted in developing balance, control and buoyancy skills, confident aquatic recovery positions, strength and stability and health and wellbeing measures.

A battery of qualitative and quantitative tests measuring personal aquatic safety, balance and stability in an aquatic environment, in addition to improved health and wellbeing were conducted. The personal aquatic safety test included treading water for 1 - 5 minutes, recovery position (prone and supine, with and without equipment) and propulsion movement up to the distance of 25m. Two aquatic balance and stability test were conducted using a grading scale of 0 - 5, with 0 representing poor and 5 representing excellent. The test required holding a stable position against movement through turbulent water. The first required both feet planted on the pool bottom and abdominal braced while a project tester ran around the participant standing at chest depth. The second test required the participant to perform a movement pattern (up 10 repetitions) with arms outstretch and a stable body while using buoyant equipment. All tests and components of each session were videoed and used as an educational session for the adults. The participants had access to the footage via a web platform. Pre and post questions about confidence in the aquatic environment, sense of wellbeing, energy levels and social interaction were answered by all participants.

In conclusion, the project demonstrated that older adults can safely participate in regular vertical aquatic programs which contribute towards personal aquatic safety skills, renewed confidence in the aquatic environment, increased balance and stability and improved self-confidence and a feeling of wellness. Furthermore, improvement in aquatic personal safety skills and movement in water was attributed to participants making modification based on viewing and analysing footage of themselves during the session.
Community Outreach Rescue Program: Utilizing Partnerships to Develop Opportunities for Youth At-Risk

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Prevention 7, Ballroom 3, November 5, 2015, 3:30 PM - 5:30 PM

Rebecca Boyd, University of Waterloo Aquatics and Risk Management Manager
Bruce Hollowell, Toronto Police Marine Unit Lifeguard Coordinator

Summary of Program
The Toronto Police Marine Unit Lifeguards (TPLS) and Toronto Police Marine Unit (TPSMU) uniform members, supported by community partners: City of Toronto Parks, Forestry and Recreation, Crescent Town Community Centre, Dennis R. Timbrell Resource Centre, West Scarborough Neighbourhood Community Center, Toronto Police Service Community Mobilization and Lifesaving Society (LSS), hosts and conducts a day camp - Community Outreach Rescue Program (CORP) for “at risk” youth ages 7 - 16 years at Woodbine Beach, an beach located in the City of Toronto. CORP focuses on water safety and lifeguarding skills in a fun and interactive program, encouraging and inspiring participants to understand lifeguard duties and seek future employment as lifeguards.

Program sessions include:
• Water Safety  • Lifeguarding/Lifesaving
• First Aid  • Lifesaving Sport
CORP’s theme is “Ready for Enjoyment. Ready for Employment.”

The benefits of CORP includes improved working relationships amongst partners, employment opportunities for youth at risk, improved safety around water, and improved relationships between identified communities and the Toronto Police Service (TPS).

Background
Lifeguarding on Toronto beaches has a long and dignified history. A century and a half ago the Dominion government of Canada funded the creation of a lifesaving service for Toronto's waterfront. In this period, the service was volunteer-based and focused primarily on the rescue of boats and crews. Today the TPSMU and TPLS maintain the same focus and commitment to ensuring the safety and wellbeing of those who use Toronto's beaches. Lifeguards within society exemplify core values and a commitment to public service that inspire and mentor today's young people to achieve all they can be.

Program Overview
CORP is a day camp for "vulnerable youth" 7-16 years from the Toronto area. Youth identified within their communities as "at risk", participate with the TPLS Lifeguards and the TPSMU and learn valued water safety, self-rescue, and lifeguarding skills. The program is presented by certified lifesaving instructors and lifeguards, through education and activities provide water safety awareness, encouraging young people to aspire to become future lifeguards and give back to their community. The improved relationship between the youth and partners is important for improving the communication and cooperation between the community at large and the police service.

CORP runs 18 sessions over 6 weeks, three mornings a week from 8:00 am to 10:30 am on Woodbine Beach, a city-owned beach, operated by TPLS.

The LSS partnership allows participants the opportunity to learn and demonstrate the skills required to obtain badges from the Lifesaving Society's Swim Patrol and first aid programs. Skills are introduced with an emphasis on Lifesaving Sport. At the conclusion of the program, participants are provided the opportunity to compete in the Provincial Junior Lifeguard Games-Waterfront.

Additional grants from the TPS ProAction “Cops and Kids” program provided participants with T-shirts, drinks, snacks and public transit tickets.

Summary
• 45 youth annually; 2/3 male, 1/3 female; new and returning
• 16 volunteer TPLS staff
• Operating five consecutive years
• TPS Priorities represented within mandate (Focusing on Child and Youth Safety and Delivering Inclusive Police Services). Youth participants have gone on to employment with the TPLS with some expressing interest in applying for position with the TPS.
• Involvement in Sport – program graduates competed at Rescue 2014; TPLS won gold at Rescue14 Youth SERC; participation in national and provincial championships – repeat winners of overall championships
• Increased number of applicants for summer positions with TPLS; beneficial during current lifeguard shortage.
The Royal Life Saving Swim and Survive Fund Initiative: Reducing Barriers to Participation in Water Safety Education

Miss Kristal Grainger
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Introduction
To reduce drowning, every child must have basic swimming, water safety skills and knowledge of how to be safe when they are in, on, or around the water [1]. While children in high income countries are learning these skills, children in low and middle income countries are missing out on the basics, putting them at grave risk of drowning.

In Australia, barriers preventing the delivery of quality water safety education include the cost and time to access lessons, access to safe aquatic facilities, insufficient resources and insufficient capacity for quality instruction [2]. These barriers prevent participation in structured water safety education programs, increasing the likelihood that a child will miss out. This lack of water safety knowledge in and around Australian waterways poses a significant risk to Australian children, particularly as their independence increases [3, 4].

What is often overlooked is that without solid foundation skills in water safety, personal survival and basic rescue, the risk of injury and death is further pronounced in adulthood [1].

The Royal Life Saving Swim and Survive Fund provides opportunities for children and young people to learn practical life-skill in swimming and water safety.

Objectives
The Swim and Survive Fund aims to:

• Increase access to swimming and water safety education for children and young people experiencing social or economic disadvantage
• Foster strong, collaborative partnerships with the aquatics industry and the community by adopting a targeted approach to child drowning prevention
• Address Goal 1 and Goal 9 of the Australian Water Safety Strategy 2012-15: Reduce Drowning Deaths in Children Aged 0-14 and Reduce Drowning Deaths in High Risk Populations [5].

Target Populations
The Swim and Survive Fund increases access to swimming and water safety education in Indigenous, culturally and linguistically diverse and lower socio-economic communities.

Refugee and migrant communities, many of whom originate from low or middle income countries where drowning prevention and lifesaving strategies are not common also benefit, by learning about Australia’s unique aquatic environments.

Implementation
The Swim and Survive Fund utilises a collaborative partnership model to engage the drowning prevention community which includes stakeholders, Royal Life Saving State and Territory Member Organisations (STMOs), corporate sponsors and Partner facilities. Donations and in-kind support from individuals, corporate supporters and community organisations facilitate structured swimming and water safety education programs, which are conducted through a national network of Royal Life Saving Partner facilities.

Achievements
Since 2010, the Swim and Survive Fund has provided 7,603 children and young people aged 5-18 years with 10 swimming and water safety lessons, free of charge.

Many of these participants had very limited or no exposure to water, but were able to master basic skills including floating, sculling, treading water, breathing and submersion.

A diverse range of cultures were represented including Africa, Afghanistan, Sri Lanka, China, Iran, Nepal, Pakistan, Ethiopia, Vietnam and India.

Discussion
Developing and implementing successful drowning intervention programs involve key challenges including:

• Overcoming cultural, social and economic barriers to participation
• Educating new arrivals about aquatic environments and water safety cultures
• Accessing communities in regional and remote locations
• Fundraising in the not-for-profit sector

Drowning is preventable, but without collaborative partnerships, informed prevention strategies, education programs and active community engagement to address these challenges, drowning will continue to impact families on a global scale.

Acknowledgements
The Swim and Survive Fund Initiative is supported by Royal Life Saving STMOs, corporate sponsors, Royal Life Saving Partner facilities and the Australian community.

References
Is the message getting across? Taking surf safety education to youth and coastal visitors in New South Wales, Australia

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Background/Introduction
Nearly one third (31%) of all drowning in Australia occurs along the coast, with youth and visitors identified as two populations for concern (1, 2). Forty percent of coastal drowning victims reside more than 50 km from where they drowned and youth 15-24 years old make up 20% of beach drownings (1).

Surf Life Saving (SLS) takes a comprehensive approach in delivering coastal safety education across New South Wales (NSW), from pre-school to older adults and this approach supports a ‘life-long learning’ strategy which encourages knowledge to be passed on for future generations. SLS NSW has had to pro-actively respond and change the way community education has traditionally been delivered, recognising that it is not just about presence on the beach and relying on passive safety campaigns. There is a need to take messages to the communities directly, enabling more efficient and effective drowning prevention being delivered across NSW, especially to new and emerging groups at risk of drowning such as youth, visitors and culturally and linguistically diverse (CALD) communities who may be more unfamiliar with the beach.

To combat this, the ‘Surf School Project’ was developed to address the issues contributing to drowning among visitors and youth; particularly targeting Western Sydney residents who have been identified as having a dramatically increased risk of coastal drowning and death, with more than twice as many coastal drowning victims as residents than any other area in NSW and Australia (3).

Methods
Stage One: An interactive and informative surf safety presentation is delivered on-site at Western Sydney high schools, focusing on high risk activities such as rock fishing, boating, cliff jumping and alcohol consumption.

Stage Two: A practical on-beach surf safety workshop is offered to schools after stage one, aiming to build on the knowledge and skills taught in stage one, and provide an opportunity to gain practical skills in the surf environment.

Results
In 2014, over 6,000 Western Sydney high school students received surf education (Stage One). Nearly all students (94%) could identify one or more characteristics of a rip current, 75% could identify where to find beach safety information and 85% knew what to do if they or someone else got into difficulty. Over three quarters (79%) intended to swim between the patrol flags in the future, 84% intended to check beach signage, and 77% intended to check surf conditions. By the end of 2015, a further 3,000 students are expected to have gone through the Program, with approximately 50% taking part in Stage two (practical component). The outcomes from 2015, including the practical component will be presented in further detail.

Discussion
The Surf School project is an evidence-based, long term strategy to reduce youth drowning in NSW, Australia. Although youth drowning rates increased between 2012-13 and 2013-14, NSW experienced a decline in coastal drowning during this period (from 46 drownings in 2012-2013 to 30 during 2013-2014). Whilst this project cannot be directly accountable for the reported reduction, we believe the Surf School project is effectively addressing the contributing issues among the identified high risk populations. From these outcomes, it appears that Western Sydney youth are benefiting from the information presented, however these results are a one off measure and further evaluation is required to ascertain behaviour change. Nevertheless, these results do show that students clearly understand the messages being delivered and are aware of simple safety strategies when visiting the beach when with their family and friends.

These results provide a new insight into the aquatic habits of Western Sydney residents and will be used to inform future intervention targeting other high risk populations.

References
Risk perception as a mechanism to inform drowning prevention in young males

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Prevention 7, Ballroom 3, November 5, 2015, 3:30 PM - 5:30 PM

Drowning continues to be a serious issue worldwide despite being largely preventable. An estimated 372,000 people die each year due to drowning (WHO, 2014). Globally, men compared to women are over represented in drowning statistics, with a ratio of 4:1 drowning fatalities reported (ILSF, 2011). In particular in Australia drowning for men aged 18–24 years continues to be an issue. In 2014 the 18-24 year age group was the only age group reporting an increase (17%), of those that drowned in this age group 86% were males (RLSSA, 2014). Other nations have also identified this risk (Lin 2013, LSASL, 2014).

While risk perception has been examined for other areas of injury prevention such as traffic accidents, evidence is lacking for drowning prevention. It is crucial to drowning prevention that we acknowledge the mechanisms of risk perception to inform prevention strategies. How are young males characterizing and evaluating aquatic activities and the potential hazards? In order to answer this and similar questions we applied a model of risk perception not previously utilised in this field. If we are to use an emotion based model of risk perception (Peters, Burraston & Mertz, 2004) we know that judgements of risk and benefit are assumed to derive from an emotion based evaluation of the stimulus. This model has been chosen due to several theories of risk now positing that risk perceptions are influenced by affect and cognition (Loewenstein et al., 2001; Slovic et al., 2002). In addition to emotion based (affect) evaluation, worldviews are generalized thoughts toward the world and guide people’s responses in complex situations. What this means for risk perception is that two young people could view the same hazard symbol on a beach warning of danger but their appraisal of the actual risk could differ according to individual affect differences or cultural and worldview differences.

It has been proposed and embraced in psychological theory (Gray, 1981) that two general motivational systems underlie behaviour and affect: a behavioural inhibition system (BIS) and a behavioural activation system (BAS). Particularly important to risk assessment may be the negative reactivity of the BIS. The BIS is sensitive to signals of punishment, non-reward and novelty. It inhibits behaviour that may lead to negative or painful outcomes. Swimming in the water for some people with limited exposure to water may elicit strong negative reactions associated with early experiences. In a country like Australia, swimming is hypothesised to historically elicit strong positive affect based on the cultural experience of fun, swim and surf.

An emotion based model of risk perception would posit that the belief that the benefit of swimming in oceans is high leads to positive affect and that subsequently the risk will be inferred to be low. Similarly if swimming in the oceans is a common and accepted practice the perception of low risk will lead to positive affect and therefore benefits will be inferred to be high. Add to the already perceived low risk associated with positive affect, we know that adolescents often are described as living in a fog of exaggerated personal invulnerability (Quadrel et al., 1993). This means that theoretically adolescent males in Australia are more likely to have a positive affect towards swimming, feel invulnerable to hazard, and therefore perceive less risk potentially engaging in life threatening water activity.

When the risk itself cannot be eliminated, an accurate perception of risk is required to minimise drowning events in young males. An understanding of emotion and cultural factors as major factors in risk perception is crucial to inform drowning prevention campaigns.
A Response to Inland Drowning Research: An Educational Approach

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Prevention 7, Ballroom 3, November 5, 2015, 3:30 PM - 5:30 PM

“The statistics show that we all need to remain vigilant and have to remember that even people who can swim well can still drown. There needs to be contingencies in place and when someone is in the water someone needs to be watching. We are all taught to be careful in the surf, but pools and inland waterways can be just as dangerous”. (Tolputt 2014)

This paper highlights a case of a community-based strategy to implement a preventive drowning education program in a rural/regional area of southwest Queensland.

The motivation for the development of the program was borne out of a common desire to address research by the Royal Life Saving Society of Australia (RLSSA) that indicated that the majority of drowning in Australia occurs in inland waterways - rivers, lakes, dams, irrigation channels, water tanks and creeks have all been sites of drowning deaths.

The objective of the approach was to develop a learning strategy for young children (8-12 years) to enable them to survive any occasion where they might find themselves in an aquatic environment, whether intentional or not and be able to survive and/or assist any other person through use of different resources.

Through the application of the DACUM method with an expert group of experienced aquatic practitioners employed by the local government we were able to establish a program that enables the participants to apply, practice and simulate a range of aquatic experiences to develop:

1. Survival swimming ability
2. Water safety skills and knowledge
3. Basic rescue techniques
4. Aquatic environment and dangers

Techniques covered drew on the core lifesaving principles and techniques and also involved a range of aquatic environs at outdoor swimming pools, wave pools, tidal creeks and the ocean in order to refine and reinforce techniques that are appropriate to the situation.

The presentation will cover the strategy in greater details as well as an evaluation of parents involved in the program and through a reflective analysis by the expert group of the actual activities.
At risk populations – bringing the beach to them

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Prevention 7, Ballroom 3, November 5, 2015, 3:30 PM - 5:30 PM

Surf Life Saving New South Wales (SLSNSW) has over one hundred years of history as the state’s major water safety and rescue organisation, and with nearly 76,000 members is now the largest volunteer movement in the state. With 4,433 people rescued last year and more than 150,000 preventative actions performed, the role of surf lifesavers in NSW is essential to saving lives.

Each year our Lifesavers watch over approximately 6.5 million people who visit New South Wales (NSW) beaches; undertaking rescues, preventative actions and performing first aid. Through extensive research we have discovered that people do not necessarily live where they drown, and as such one of our key priorities is delivering surf education to identified at risk populations inland from our coastlines.

Sydney’s Western Suburbs is a NSW Government Water Safety Black Spot, meaning it has been identified as a high risk geographic location for drowning or near drowning. Additionally, this location has a significant culturally and linguistically diverse population, which is a high risk population group under Black Spot.

So when Village Roadshow Theme Parks Pty Ltd decided to build another Wet ‘n’ Wild water park in Sydney’s Western Suburbs an opportunity to collaborate on drowning prevention became available.

The partnership between SLSNSW and Wet ‘n’ Wild Sydney saw the establishment of a junior development (Nippers) program in the 2013/14 season which was run over 12 weeks. 200 children aged between five years and 12 years of age participated. Approximately five children with disabilities also participated with the support of one-on-one assistance.

The Nippers were taught beach safety and awareness including beach signage, sun safety, personal safety and wellbeing, recognition of emergency situations and how to get help, identifying hazards in the surf, recognising unsafe behaviour and preventative actions, rescue techniques, and first aid. They are also provided with ecosurf education including water conservation, sun safety, energy conservation and weather impacts. Surf Sport activities provide an opportunity to practice the skills that will one day help them perform a rescue, including dolphin-diving, beach and water running techniques, body surfing and board use.

In addition approximately 50 Nippers and 30 of their parents completed the requirements for the Resuscitation Certificate. This parent engagement was the first steps to achieving self-sufficiency for the future of the Wet ‘n’ Wild Sydney Nippers club, our goal being to one day make this a truly local and sustainable initiative.

In the first season 30 SLSNSW members from Coastal Clubs were engaged as paid employees to undertake the roles of Age Manager, while other SLSNSW members volunteered their time to perform water safety. However, when the second season of Wet ‘n’ Wild Sydney Nippers was confirmed for 2014/15 it was decided to that Age Manager and CPR training would be provided to 30 Nipper parents so that they could start taking some ownership over the program and perform the volunteer roles of Age Manager.

The second season of Wet ‘n’ Wild Sydney Nippers is currently underway, with 250 children aged between five and 12 years participating. Several children with disabilities are again participating with additional support.

Evaluation of the 2014/15 program will take place at the end of the season, at which point discussions will start again with Wet ‘n’ Wild Sydney about continuing, and possibility expanding, the program for the 2015/16 season. If this partnership is renewed SLSNSW plans to continue to build capacity within the club so that it can continue to provide essential surf education skills to a whole new generation of children in Western Sydney.
A discussion on gender roles in drowning prevention in conservative Muslim society

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Prevention 7, Ballroom 3, November 5, 2015, 3:30 PM - 5:30 PM

Across the world, the role of gender is discussed with vigour and intensity in the context of a wide range of topics, from economics to elite sport, but there has not yet been a significant discussion on the role of gender in drowning prevention. For the first time since the beginning of the Nile Swimmers project in 2007, women from Sudan were able to participate in a drowning prevention programme, run in conjunction with the Sudanese Sea Scouts, in March 2015.

To date, the exclusion of women was based on concerns surrounding social norms and safety. Nile Swimmers and the Sudanese Sea Scouts have been against this exclusion from the outset, lobbying for the inclusion of women as well as men in the training programmes. These objections are based on the belief that both women and men have an important role to play in drowning prevention, especially in conservative societies.

The well-established drowning chain (1) places education at the very beginning, as the first link in the chain to prevent loss of life through drowning. In conservative Muslim societies, formal education is often reserved for males. However, in the case of drowning prevention, education can start at an early age, with the teaching of basic water survival skills. In many countries (both high & low income), these skills are left to the parents of the child to teach, either through professional swimming instructors, or by passing on their own knowledge. This makes providing advice and education to stay-at-home parents an obvious priority in early intervention.

In conservative Muslim societies, the main child carers are predominantly women. By providing water safety training to Sudanese women, it is hoped that Nile Swimmers and the Sudanese Sea Scouts will be able to have a disproportionately larger impact on the rates of infant drowning in the country. Although official figures are absent, anecdotal evidence from previous projects suggests that infant drowning is a significant problem, especially in rural areas. In any case, increasing the awareness of drowning risk and the strategies available to reduce those risks can only be a positive intervention.

This paper discusses the impact of the training programme on the women involved and the potential impact on future beneficiaries in rural communities. This is assessed through pre- and post-course questionnaires as well as follow-up questions where possible.

The proposed training schedule uses a team of male and female international trainers to teach both male and female beneficiaries, where culturally appropriate. This, along with the inclusion of female participants in a drowning prevention program in Sudan, has not been tried before. As such, the successes and challenges associated with introducing women to a drowning prevention role will be discussed.

SLSA PPE Project: Development of the Level 25 Lifejacket

Mr Anthony Bradstreet¹, Mr Nathan Hight¹, Ms Barbara Brighton¹
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Surf Lifesavers and Lifeguards operate in an inherently hazardous aquatic environment. In many cases, our services receive higher rates of callouts during conditions of heightened risk as coastal users pursue extreme activities such as rock fishing, surfing, kiteboarding and downwind paddle boarding. During surf sports events, an important aspect of skill development and maintenance for lifesavers and lifeguards, many enjoy the challenge of big surf to test skills against their peers.

Unfortunately, every so often we are reminded that our standard operating environment is extremely dangerous. Recently, Surf Life Saving Australia (SLSA) has lost 3 lifesavers in surf sports competition and training, and in the United States there have been 2 lifeguards drown during operational service and recertification. Where these drownings have occurred in open water environments, the body was lost underwater in a Code X situation and unable to be recovered quickly enough to administer effective emergency care.

The risk remains that a lifesaver or lifeguard may become incapacitated in the water, become submerged and unable to be located to receive timely medical attention.

SLSA have conducted investigations to address this risk and explored mechanisms that would enabled injured or incapacitated lifesavers and lifeguards to return to the surface for recovery as quickly as possible.

The objective of the project was to deliver a specification that would reliably return an incapacitated individual to the surface but also minimise impacts on performance to a level as low as reasonably possible.

Though this investigative process, SLSA engaged James Cook University and SAI Global to conduct the assessment process and assist in development of a fit for purpose specification.

The first stage assessed and ruled out the Level 50 International Standard as having excessive buoyancy and adversely impacting exertion levels while conducting tasks such as duck diving. It was then hypothesised that a similarly designed slimline lifejacket with a lower level of buoyancy could feasibly fulfil the objectives.

The second stage assessed a variety of buoyancy aids that were not compliant with any standards. These devices were readily available in the international marketplace as impact vests, surface vests, and competition vests. They were particularly common in extreme sports stores to meet the demands of wakeboarders, big wave surfers and kite boarders.

Testing of these non-compliant buoyancy aids indicated poor quality control over the production processes and varying rates of buoyancy that didn't necessarily correlate to size. This inconsistency correlated to the performance of the devices and their ability to float a person where many devices failed. This raised concerns from a consumer perspective and any perception that these devices may provide sufficient flotation to remain on the surface despite the presence of disclaimers.

Despite the inconsistencies in performance, there was sufficient data collected to inform the development of a fit for purpose specification of low buoyancy lifejackets that could be used in high performance applications. This information has since informed the review and redevelopment of the Australian Standard AS4758 Lifejackets and delivered a new class of lifejacket, the Level 25.

SLSA are currently trialling prototypes of these Level 25 Lifejackets to assess their possible use in Surf Life Saving activities. A final report will be completed by May 2015, including policy recommendations and any necessary implementation plan. This presentation will discuss the process undertaken to develop these policy position and the implementation process.
Investigating the perception of risk and coping strategies of rock-based anglers from Victoria Australia

Ms Terisha Veeran-Colton1, Prof. Rodney Keenan1, Dr Rebecca Ford1, Dr Bernadette Matthews2

1 University of Melbourne, Parkville, Australia, 2 Life Saving Victoria, Port Melbourne, Australia

Prevention 8, Ballroom 3, November 6, 2015, 9:00 AM - 10:30 AM

Introduction

Rock-based angling is commonly described as one of the most dangerous recreational activities in Australia. Mortality data from two decades and hospital morbidity data over eight years shows little change in fatality and injury rates in rock-based angling in New South Wales(1). This trend has also been observed nationally, despite current intervention and safety strategies. Whilst the risks of rock-based angling, primarily waves inundating coastal rock platforms, are known to professional life-savers; little is known about how rock-based anglers’ perceive and cope with these risks.

Aim

This study explores how Victorian rock-based anglers’ perceive and cope with risks associated with the activity and the various factors that influence the cognitive processes involved in threat appraisal and coping appraisal.

Method

The study was conducted in the state of Victoria Australia which for the period 2003 to 2014 had the third highest occurrence of rock-based angling fatalities nationally (2). A total of 33 interviews incorporating semi-structured and photo-based elements were conducted with rock-based anglers’. Eleven participants were of North Asian descent which has been identified as a high risk demographic in Australian rock-based angling fatalities.

A qualitative application of Protection Motivation Theory (PMT) provided a useful framework for understanding how individuals perceive threats, and subsequently cope with them, using the threat and coping appraisal processes (3). Interviews were coded using PMT and template analysis to isolate salient themes. The study provides a unique perspective through incorporating photo methodologies to explore anglers’ visual perception of risk and coping in coastal rock platform environments.

Results

Analysis of results demonstrates that rock-based anglers’ perceive risks associated with the activity in a non-linear and often idiosyncratic manner. Factors such as experience levels, the thrill of catching fish and age, influence the threat appraisal process and subsequently the perception of risk posed by the wave overtopping hazard.

In particular the thrill of catching fish emerged as a significant factor influencing angler safety behaviours. However many anglers’ demonstrated an awareness of risk and safety, articulating they were not risk takers. In terms of coping appraisal results show that rock-based anglers’ use varied coping strategies to deal with the wave overtopping hazard such as drawing from past experience with the hazard, fishing in company, and the use of weather and tide observation techniques.

Discussion

Current safety strategies are not cognizant of the varied ways in which rock-based anglers’ perceive and cope with risk. Instead anglers are categorised as a homogeneous group. This study demonstrates otherwise. Results deviate from conventional thought prevalent in current rock-based angling literature which envisages the majority of anglers’ to be risk takers. However the thrill or sensation of catching fish has been isolated as an important factor which directs and influences risk taking behaviours. This is perhaps a concept which needs to be better understood and integrated into future safety strategies.

Conclusions

The study provides a more comprehensive understanding of risk perception and coping of rock-based anglers. These new findings provide a perspective which has been lacking and is essential for the design of intervention and safety strategies aimed at rock-based anglers.

References

How Ireland is tackling drowning in the nation’s most hazardous workplace – the Commercial fishing sector

John Leech

1 Irish Water Safety

Prevention 8, Ballroom 3, November 6, 2015, 9:00 AM - 10:30 AM

Following the sinking of yet another Commercial Fishing vessel called the “TIT Bonhomme” off Glandore Harbour on the south west coast of Ireland, the Government established a high level working group on safety in the Irish fishing industry. On the 8th of July they asked me to Chair this Working Group (WG).

The terms of reference I was given was as follows:

Name of Group: Working group on safety, training and employment in the Irish fishing industry.

The group will consider and advise, with appropriate recommendations, on the following priorities:

1. Safety Standards on vessels, and the quayside and ways to improve compliance with safety regulations and change culture and attitudes to safety generally
2. Safety Training
3. Technical innovation in safety, procedures and equipment
4. Making the fishing industry more attractive for new entrants
5. Career structures and opportunities for lifelong learning in the fishing sector

In the context of the priority areas set out the group will:

1. Consider ways to enhance safety on board fishing vessels (and on quayside), highlighting appropriate training options.
2. Pay particular attention to the needs of small vessels, focusing on stability and other safety issues.
3. Look into and identify where appropriate, innovative safety procedures and equipment
4. Identify the key issues that are impacting negatively on new entrants joining the catching sector concentrating on;
5. Examining appropriate training for new entrants with particular emphasis on progressive, on-the-job, training.
6. Evaluating the introduction of new and more appropriate qualifications for crew members.
7. Identify possibilities for career structures and personal advancement within the fishing industry
8. Establish the applicability of professional training and life-long-learning for the catching sector with specific emphasis on the following;
9. Training options, including appropriate 3rd level qualifications, which provide fishermen with attractive, professional, career pathways.
10. Consideration of the need for the introduction of new qualifications for operators of vessels under 15 metres
11. Identify areas for cross agency/cross departmental co-operation to further the objectives of the initiative and more efficiently deliver on the recommended actions.

At the time of going to print I am finalizing this report and I would like to give an oral presentation with the aid of power point on this project which has taken over one and a half years to complete as I feel that other nations will find this presentation interesting and beneficial in preventing drownings in their own Commercial Industry.
Immersion deaths among boaters wearing a flotation device: epidemiology and prevention, Canada 1991-2010

Ms Shelley Dalke¹, Dr Peter Barss¹, ², Karlyn Karlyn¹, Jane Hamilton¹
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Background
Boating is the most frequent activity for water-related immersion and trauma deaths in Canada. Central in immersion/drowning is non-wearing of flotation devices (FD). Internationally, mandatory wearing with enforcement has been the most effective boating safety intervention. On the other hand, a small proportion of immersion victims were wearing a FD when they drowned and/or died of cold.

Objective
Assess factors associated with boating immersion deaths among victims wearing a FD.

Methods
Annual Red Cross collection of 1991-2010 Canadian coroner data by structured questionnaire. Analysis included activity, purpose, personal, equipment, environment factors, trends for recreational and daily life boaters properly wearing a flotation device, including a personal flotation device or lifejacket.

Results
Surveillance identified 10,511 deaths, including 9,961 immersions. Excluding land transport, 37% (n=2678) of boating deaths involved recreational and daily life activities. In 12% (n=327) a FD was worn properly, 3% improperly, 21% present unworn, 27% absent, 20% unworn unknown presence, 19% unknown if present or worn. Wearing didn’t change among victims 1991-2010. Incidents for victims properly wearing an FD included capsizing 49%, swamping 20%, falling overboard 9%, collisions 4%, other/unknown 18%. This contrasted with boaters (n=1828) not wearing an FD, with capsizing 41%, falling overboard 29%, swamping 12%, collisions 3%, other/unknown 15%. Age was 25-64-years-old for 72% of FD wearing victims, with 89% males. Alcohol was present or suspected for 17%, compared with 49% not wearing a FD. Swimming ability for FD wearers was 4% non-swimmers, 5% weak swimmers, 4% average, 4% strong, 10% swimmers of unknown level, and 73% unknown. For 66% of victims properly wearing a PFD, hypothermia/exposure to cold was a factor. These criteria included: hypothermia as reported by coroner, data collector, or autopsy, presence of ice or extremely cold water temperature (<10°C) as reported by coroner or police, and cold month of incident (November-April). Cold water was also a factor for 51% of victims improperly wearing an FD, 41% for those who had a PFD present but not worn, 32% of those with no PFD present, and 47% for those where an FD was not worn but it was uncertain if one was present. For FD wearers, water temperature was reported as very/extremely cold (<10°C) 39%, cold or cool (10-20°C) 21%, warm/hot (≥21°C) 1%, unknown 48%. Moving river water, including current, rapids, white water, waterfalls, hydraulics current, dams and dam spillways was associated with at least 30% of deaths where the victim was properly wearing a PFD, likely more as PFD involvement was unknown for 34%. Ocean current including undertows and tide was associated with 11% deaths where the victim was properly wearing a PFD. Wave conditions for non-FD wearers included rough/white caps 37%, storm/gale force waves 8%, choppy/small waves 12%, calm 6%, other 2%, unknown 35%. Wind was strong in 36%, breezy/windy 12%, calm 4%, unknown 48%. Distance from shore was ≤50 metres in 13% and depth of water ≤2.5 metres in 5%.

Conclusion
Boaters who died of drowning and/or immersion while properly wearing a flotation device had a high prevalence of cold water and other cold conditions, strong winds and serious wave conditions, and current. Prevalence of alcohol was low compared with other boaters.

Implications for policy
For conditions of cold, high winds, and large waves, a usual FD may not be enough and supplementary protection against cold, waves, and wind may be indicated. Consideration should also be given to appropriate boat design for such conditions.

Acknowledgements
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Maximizing media coverage - practical tips to get your water safety message promoted by the media

Mr Roger Sweeney¹
¹Irish Water Safety, Galway, Ireland

Prevention 8, Ballroom 3, November 6, 2015, 9:00 AM - 10:30 AM

Maximizing media coverage - practical tips to get your water safety message promoted by the media

In a world of competing sound bites, it can be challenging to get your water safety message published, yet there are ways to make your stories interesting enough not only to be covered at local level but to make them of national interest too - and vice versa.

This presentation will explain the practical steps taken by Irish Water Safety to maximize media coverage for a range of messages that target specific at-risk groups including those swimming, boating, at inland waterways, on holidays, on farms and at their homes.

The speaker will also outline complimentary initiatives that raise the profile of water safety in communities across Ireland.

The methods used by Irish Water Safety to reach and engage journalists and a variety of audiences will be outlined.

Included in the presentation will be an analysis of a campaign aimed at changing the skills, attitudes and behaviors of children nationwide.
Twenty years of PFD non-wearing and wearing in Canada: 2000 lives and 4 billion dollars lost

Dr Peter Barss1,2, Karlyn Olsen, Jane Hamilton1, Shelley Dalke1
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Background
Boating is the most frequent activity for water-related immersion and trauma deaths in Canada. Central in immersion/drowning is non-wearing of personal flotation devices (PFDs). Enforcing presence in boats is inefficient, costly, and invasive.

Objective
Assess compliance with PFD regulations in boating deaths; review international practices.

Methods

Results
Surveillance identified 10,511 deaths, including 9,961 immersions. Excluding land transport, 37% (n=3324) involved boating; capsizing, falling overboard, swamping accounted for >75%. In 12% PFDs were worn properly, 3% improperly; 21% present unworn, 27% absent, 20% unworn unknown presence, 19% unknown present/worn. Hence in ≥50% PFDs were absent, violating regulations requiring PFDs, even if unworn. Only 4% falling overboard wore PFDs. Wearing didn’t change 1991-2010; PFDs present rose slightly. 94% were 15-74-year-old males. Among ≥15 years-old wearing, 0mg% alcohol, 20%; >80mg%, 5%. Among weak/non-swimmers ≥5 years, 6% wore PFDs; mainly capsizing and falling overboard, difficult retrieving PFDs. Cold factors frequent among wearers. 24% of trauma victims wore PFDs, non-protective for head, spine, and major lacerations. Aboriginal wearing was 3%, other ethnicities 15%; 63% drowned in boats without PFDs, others 21%; women and children frequently died in incidents with >1 victim. Among 0-14-year-olds, 44% of known ethnicity were aboriginal, 0% wearing, others 33%; no aboriginal youth wore PFDs, others 13%. Internationally, mandatory wearing with enforcement was the most effective boating safety intervention. Deaths averted exceeded predicted expectations.

Conclusion
Surveillance supports interventions increasing wearing PFDs among Canadian boaters, primarily males ≥15-years-old and all aboriginals.

Implications for policy: Enforcing wearing should be less invasive and faster than observing presence. If Canada replicates Victoria, Australia, savings should be 1000 lives and $2 billion per decade, representing the greatest savings and decrease in immersion deaths ever observed from a single water safety intervention.

Acknowledgements
The Cook Rees Memorial Fund for Water Search and Safety funded this research in collaboration with the Canadian Red Cross.
Northern Territory Water Safety Awareness Program: 10 years of making a difference in drowning prevention in children under 5

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Swimming and Water Safety 6, Bayan, November 6, 2015, 9:00 AM - 10:30 AM

Designed to reduce the rate of child drowning in the Northern Territory and administered by the Royal Life Saving Society of Australia Northern Territory, the Water Safety Awareness Program provides free water safety lessons for parents and their children aged under five in urban, rural and remote areas of the Northern Territory. The Program provides five sessions aimed at developing a child’s confidence and ability in water and teaching general water safety awareness and rescue techniques. The program consists of five sessions aimed at developing a child’s confidence and ability in water and teaching general water safety awareness and rescue techniques.

The five sessions cover:

• emergency care and resuscitation;
• basic water rescue, different holds and the importance of play in teaching skills;
• techniques to teach water entry and exit and the use of toys to encourage movement;
• floating and movement strategies including preparing for submersion; and
• assisted and independent movement and knowledge of child development and expectations of the child in water.

This presentation will examine the impact of the program after ten years of implementation.
A Safe Pool, A Perfect Swim  
– an awareness campaign that targets residential pool owners

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Swimming and Water Safety 6, Bayan, November 6, 2015, 9:00 AM - 10:30 AM

There is, of course, no lifeguard around residential pools, and pool owners are often not equipped with the required material for ensuring their own and their loved ones’ safety. However, the risk of drowning in a residential pool does exist; in Quebec, Canada, there is an average of nine residential pool drownings per year, which represents 12% of all drownings. A third of all residential pool drowning victims are 5 years old or younger, and these victims represent 54% of all drowning victims in above-ground pools.

Access control is one of the main issues that need to be addressed in order to prevent residential pool drownings. A study shows that at least one of the three following features usually makes a backyard pool too easily accessible for children: direct access by a patio or deck, a gate that is not locked by an automatic closure mechanism and a ladder that is kept in the pool at all times.

In July 2010, Quebec’s government adopted the Residential Swimming Pool Safety Regulation, with which all swimming pools installed after October 31st, 2010 must comply. This regulation establishes standards regarding access control.

In addition to these standards, the Lifesaving Society Quebec branch recommends its own set of safety requirements for all residential pool owners; however, most of Quebec’s 300,000 residential pools do not meet these requirements. To better promote residential pool safety, the Quebec Branch works in partnership with the provincial government and private pool retailers and suppliers, who contribute to the Perfect Swim campaign.

This campaign raises awareness amongst the population by communicating its message in three different ways. The first one is an information kit that all Quebec pool retailers and suppliers distribute to new pool and spa buyers. It includes drowning prevention information and material such as a doorknob tab that reads “I am watching my children in the pool. Please go to the back.” and coasters. The Society has also created an interactive website (www.perfectswimming.com) that allows people to self-evaluate the safety of their own backyard pool or spa, and offers a comprehensive list of safety tips based on the Residential Swimming Pool Safety Regulation standards. Furthermore, each summer, the Perfect Swim Tour offers home visit checks as well as Prevent Drowning at Home workshops for organizations and private individuals.
The ‘Everyday Lifesaver’ App - Using digital game-based learning to teach adolescents water safety and emergency response

Ms Kate Simpson¹, Mr Mevan Jayawardena¹, Ms Melissa Laird¹, Ms Sheila Langley¹, Ms Rhiannon Birch¹
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Swimming and Water Safety 6, Bayan, November 6, 2015, 9:00 AM - 10:30 AM

Background
Preventable drowning and aquatic-related injury are a leading cause of death and hospitalisation among adolescents aged 10-19 years in Victoria, Australia. In the period between 2000 and 2013, 241 adolescents aged 10-19 were involved in drowning incidents; of these 41 were fatal and 200 were non-fatal (hospitalisations). Consequently in this age group, for every one fatal drowning there are another five non-fatal drowning incidents.

Drowning prevention strategies targeted at adolescents are challenging because of an increase in risk-taking behaviour and use of alcohol around water, as well as the diversity of drowning locations and activities in this age group (1). Furthermore, when analysing existing methods of teaching adolescents water safety and emergency response in Victoria, it was identified that face-to-face methods are inefficient and unsustainable, especially in regional areas, and that there were no digital game-based learning programs targeted at secondary school students (aged 12-14 years). Consequently, LSV developed an interactive digital game-based learning App to teach and reinforce water safety and emergency response knowledge and skills, to be trialled with secondary school students.

The ‘Everyday Lifesaver’ App is the convergence of three factors; the issue of drowning death and injury in adolescents, the proliferation of mobile devices in schools, and the adoption of mobile game-based learning Apps. The connection of these provides an opportunity to trial an innovative technology solution targeted specifically at adolescents.

Aims
The aims of this project were to:
- Enhance an adolescent’s knowledge and understanding of a range of aquatic environmental hazards, including at pool, ocean/beach, and inland waterway (rivers, lakes and dams) environments.
- Teach the key steps in the emergency response sequence (DRSABCD); and
- Ultimately reduce adolescent aquatic-related death and injury.

Methods
The ‘Everyday Lifesaver’ App was developed in collaboration with key stakeholders, including school teachers, parents and students. LSV aimed to trial the digital game with 4,000 students from 15-20 schools in regional and metropolitan Victoria. Focus group testing with teachers and students was also conducted pre- and post-trial. Key themes will be elicited in regards to awareness and knowledge of water safety and emergency response, including CPR. A subset of students will also be directly assessed to determine their accredited CPR qualification.

Expected Outcomes
The key outputs include:
- Trial with 4,000 secondary school students (aged 12-14 years) from 15-20 Victorian Government schools.
- Concepts introduced to young people aged 12-14 years through this program, will provide foundational awareness and knowledge to complete an accredited CPR qualification.

The key assets achieved include:
- An innovative water safety and emergency response digital game-based learning App, accessible on a variety of devices, that provides teachers and students greater control over how, where and when they learn;
- An online platform for delivering safety content to the classroom, which provides an opportunity for other content to be delivered in a digital format, linked to the technology and game-based learning strategies in schools.

Conclusion
The ‘Everyday Lifesaver’ App is an opportunity to adopt interactive digital game-based learning technology to deliver vital water safety knowledge and emergency response skills to adolescents. The program enhances delivery of water safety and emergency response programs innovatively into the school curriculum by using technology, to ultimately reduce aquatic-related death and injury in adolescents.

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Primary Aquatics Water Safety (PAWS) Programme

John Leech
Irish Water Safety

Swimming and Water Safety 6, Bayan, November 6, 2015, 9:00 AM - 10:30 AM

This programme is specifically tailored for primary school pupils and. Teachers have the ability to certify their pupils with nationally recognised awards from our programme that is recommended by the Department of Education and Skills. Aquatics is a component part of the Physical Education Strand of the Primary School Curriculum. As a Primary Teacher you can take the students through the first three awards in the classroom –LAND PAWS 1, 2 and 3.

These awards consist of the theory of personal safety around water – safe swimming, safety on the farm, safety on open water etc., - simulated rescues on land, throwing a rescue rope into a designated area. After completing the PAWS Programme pupils will have the ability to swim, interact with others, and most importantly be responsible around water.

As with normal Swimming Lessons children learn how to swim with PAWS but they gain so much more with this programme. Aspects covered in the PAWS Programme range from Water Safety Knowledge to Survival Skills to basic Rescue Skills. PAWS is not only specifically linked to Aquatics and Physical Education but also to Social, Personal and Health Education (SPHE) and Social, Environmental and Scientific Education (SPSE).

The main aim of PAWS is to significantly reduce the number of our young people lost to drowning each year and to familiarise pupils with water safety best practices. The most important role of PAWS is to teach children how to stay safe around water.

A C.D. Rom (sponsored by Bird’s Eye) is available with the resource pack provided. All the information you require to run this programme successfully is included in the CD provided. These resources have proved invaluable to teachers while teaching the aquatic strand of PE in the revised curriculum. PAWS is Irish Water Safety’s fastest growing programme with over 70,000 certificates being issued to pupils nationwide last year.
According to WAID data in 2013 there were 381 drowning and water related deaths, of which 46 deaths were children. Simply teaching children to swim in a heated swimming pool is not sufficient, given that more than half of these deaths occurred in inland open water, and one third took place in coastal locations. Research undertaken by the Swimming Teacher’s Association (STA) in 2014 highlighted two worrying issues. Firstly, many people that considered themselves able to swim were not able to perform essential lifesaving skills such as rotating from front to back, climbing out of a pool unaided and being able to return to a point of safety. In addition the majority of respondents considered a person able to swim 25 metres able to swim. Covering this distance alone is not sufficient to self-rescue in open water and secondly this belief might lead to children stopping swimming lessons or receiving less supervision around water as the parent overestimates their ability. Given these statistics it is clear that a new approach to water safety education is urgently required.

In 2014 STA launched Junior Lifeguard Academy, a unique water safety and rescue programme aimed at young people aged eight and over. The programme comprises of over 40 special missions specifically designed to ensure vital survival and water safety messages reach as many young people as possible. In particular this innovative programme:

- Is designed to complement existing water safety programmes and to encompass National Curriculum Requirements.
- Links to other STA lifesaving, teaching, lifeguarding, first aid and open water safety and coaching qualifications. Providing a comprehensive pathway for those who wish to develop their skills further, undertake a formal qualification or pass on the knowledge and skills gained through this programme to others.
- Firmly places the emphasis on fun, enjoyment and achievement. Children learn better when they are enjoying themselves and are more likely to continue engaging in swimming programmes once they have achieved the perceived 25 metre ‘able to swim’ milestone. This is achieved using disciplines such as water polo, synchronised swimming and snorkelling as a vehicle to encourage development of vital lifesaving skills such as accurate throwing and treading water.
- Is flexible and can be run in a wide variety of facilities. Enabling the programme to reach a wider audience including, primary schools, leisure centres, private swim schools and children’s organisations.
- Features water safety instruction booklets, making water safety education accessible to a wider range of organisations that do not have access to a pool.
- Includes first aid and resuscitation training, empowering young people to deal with a range of common medical situations.
- Encourages exploitation of technology to enhance the teaching and learning experience. For example a comprehensive supporting teacher’s manual features QR codes, which link to video clips for many skills taught through the programme, enabling learners to see the skill performed correctly before attempting it themselves. Social media was also employed to generate awareness of water safety amongst members of pilot organisations at key times of year.

The Junior Lifeguard Academy was piloted with a range of different organisations including primary schools, private swim schools and local authorities in varying geographical locations, including rural and coastal areas during 2014 to evaluate the effectiveness of the programme prior to a nationwide roll out. This presentation will discuss:

- Quantitative data relating to programme uptake and achievement of lifesaving skills.
- Lessons learned from pilot organisations that could be applied to improve lifesaving education in similar organisations.
- Best practice relating to teaching, learning and raising awareness from case study organisations.
AUSTSWIM in India: Challenges in swimming and water safety teacher training and program implementation

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Swimming and Water Safety 6, Bayan, November 6, 2015, 9:00 AM - 10:30 AM

India is often described as a bombardment of the senses, it’s certainly true!

In 2013 AUSTSWIM partnered with Winning Matters to train teachers of swimming and water safety and introduce basic aquatic skill classes in Mumbai and Bangalore, India.

AUSTSWIM the Australasian Council for Teaching Swimming and Water Safety is the industry standard in Australia. Winning Matters is a company created by a former Olympian to develop sports in India, from foundation to elite levels.

This session discusses the challenges, explores the outcomes and outlines future developments for this partnership and to act as a platform for future country alignments. The goal was to identify and select appropriate local people to train as teachers of swimming and water safety with a focus on fundamental aquatic knowledge and skill.

Overcoming challenges included innovation and creativity to raise awareness, develop pathways, break down barriers and motivate community leaders to begin tackling the enormous drowning statistics in India.

Influencing attitudes for change, struggling with distance, transport, prohibitive cost, multiple language dialects, cultural and religious differences, access to technology, clean and maintained waterways were some of the challenges faced. Perceptions and attitude challenges included appropriate swimwear and understanding the concept of safer participation in water.

The program is moving toward sustainability in Mumbai and Bangalore as more local AUSTSWIM Presenters are licenced to become leaders in training potential teachers of swimming and water safety within their local communities; development is also underway to reach further afield.
ASA & RNLI Partnership: Water Safety and Self Rescue

Mr Jon Glenn¹

¹ASA, Loughborough, United Kingdom

Swimming and Water Safety 6, Bayan, November 6, 2015, 9:00 AM - 10:30 AM

Swimming, Water Safety and Self Rescue – A UK partnership between the Amateur Swimming Association (ASA) and the Royal National Lifeboat Institution (RNLI) providing children aged 7-14 with an opportunity to swim and learn to survive in open water.

In 2013 the RNLI and ASA identified that there was a gap in the UK’s swimming curriculum for the provision of opportunities for children to swim in open water as well as in public pools. It was agreed that between these two organisations they had the skills and the resources to provide these opportunities in the UK and created the Water Safety and Self Rescue programme. This also came in response to the ASA's school swimming research which found that only 51% of children aged 7-11 were able to swim 25m and 52% of parents do not believe their child would be able to swim to safety if they were to get into danger in the water. As part of the National Curriculum schools are encouraged to ensure that pupils experience “Swimming in Different Aquatic Environments.” The ASA and RNLI have now established a basic standard for this curriculum outcome.

Water Safety and Self Rescue is a community lead programme which forms a standard part of child water safety education and would be made available to every child aged 7-14 in the UK and Ireland.

Water Safety and Self Rescue is a pilot programme run and funded in partnership by the RNLI and the ASA. The programme teaches children between the ages of 7 and 14 years basic skills to stay safe, in and around open water. It is a practical water based programme provided free of charge using RNLI lifeguards and ASA qualified swimming teachers.

Water Safety and Self Rescue was piloted first in 2013 over four weeks in a tidal sea pool and 2300 children attended. In 2014 the Water Safety and Self Rescue pilot was continued and expanded to a further three sites around England to address different waterside topographies and scenarios, including tidal pools, beaches and inland lakes. The Lake Windermere programme also included partnerships with Land owners and the Royal Lifesaving Society UK. The programme reached 4300 children and an estimated 500 adults.

The success of these pilots has now given the partner organisations the evidence required to set an ambitious goal; every child in the UK should have free access to a ‘Water Safety and Self Rescue session. To achieve this further collaboration with sponsors, water safety organisations and landowners will be essential, resulting in a lifesaving initiative that can only be delivered through partnership.

The Partnership between the ASA and RNLI has enabled both organisations to deliver a Water Safety and Self Rescue programme using a strong skill set from both organisation to ensure a high quality community accessible programme. Part of the presentation will look at how this partnership was established and how it has successfully delivered in partnership.

Jon Glenn; Head of Learn to Swim ASA
Barriers controlling access to private backyard pools and drowning rates in children.

Tessa Clemens¹, ², Alison Macpherson¹
¹York University, Toronto, Canada, ²Lifesaving Society Ontario, Toronto, Canada

Prevention 10, Ballroom 2, November 6, 2015, 11:00 AM - 12:30 PM

The World Health Organization’s recent Global report on drowning identified ten actions to prevent drowning; one of these is to install barriers controlling access to water. The majority of fatal drownings in Canada occur in natural bodies of water; however private backyard pools are consistently identified as the number one setting where children under 5 years of age drown. A number of studies conducted primarily in Australia and the United States have provided evidence that pool fencing reduces the risk of drowning among children. In a drowning review conducted in 2011, the Office of the Chief Coroner for Ontario published a number of recommendations including that all municipalities should pass pool enclosure bylaws that mandate barrier safety requirements for new pools as well as retrofitting for existing pools. However this review only included drownings that occurred during the summer months of 2010. No long term analysis of pool fencing as a factor affecting the risk of childhood drowning in Canada has been published.

The primary objective of this study was to compare the drowning death rate of children under the age of 5 years in municipalities that have pool enclosure bylaws to that in municipalities without this legislation. A secondary objective was to describe the characteristics of backyard pool drowning incidents among children less than 5 years of age.

Using a multi-level ecologic study design, the drowning death rate in municipalities with fence and gate legislation was compared to that in municipalities with no legislation. Individual level descriptive analysis was conducted using data collected from files at the Ontario Provincial Coroner’s office. The study population consisted of all children under the age of 5 years who suffered drowning deaths in private backyard pools over a fifteen year period (January 1, 1999 – December 31, 2013) in Ontario. All municipalities with backyard pool fencing legislation were grouped together as “legislation” municipalities. Each municipality was included in the “legislation” group the year after the by-law came into effect. The “no-legislation” group included all municipalities that did not have the by-laws in place, as well as the other municipalities in the years before the by-law was enacted.

Analysis was performed on demographic factors: age and sex, as well as the following incident specific factors: backyard pool bylaws in place, type of private pool, whether or not the pool was directly linked to the home by a patio or terrace, and whether or not the pool was in the backyard of the child’s primary residence. Drowning death rates were calculated per 100 000 population. Denominators for rates were yearly estimates of population under the age of 5 years for each municipality in the “legislation” and “no-legislation” groups. Poisson regression methods were used to estimate relative risks and 95% confidence intervals. Univariate analysis was conducted and descriptive statistics were reported to summarize the characteristics of childhood backyard pool drownings in both the “legislation” and “no-legislation” groups.

The results of this study demonstrate the need for isolation fencing bylaws as well as additional interventions. This study addresses the relationship between pool barrier types, municipal pool barrier bylaws and backyard pool drowning rates in children.
Situations of child drowning and Prevention by MERIT MAKER team in Surin Province

Stapon Sriwan3, Mrs Saluckjit Sakulrak1, Suparat Poonkla1, Sutep Kerdsomnuk2
1Surin Provincial Health Office, 2Sakward School, 3Noansawan School

Prevention 10, Ballroom 2, November 6, 2015, 11:00 AM - 12:30 PM

Drowning is the first cause of death in children who are under 15 years old in Surin province, a province located in the North East of Thailand. Death rate in year 2011, 2012, 2013 and 2014 were 12.94, 11.1, 14.3 and 9.9 respectively (per 100,000 children below 15 years old).

The main factor is that most of children do not know how to swim; therefore, they have no skill to help themselves while drowning. In addition, there are few standard pools in local communities. Many schools have no swimming program for students. Also, parents cannot swim and there are many source of water near home and school where children can jump in.

According to children behavior, they like to play in the water with friends during their school break or vacation. This has led to a significant increase in number of children drowning this period. Our survival swimming team try to find out how to prevent children from drowning. We have discussed and considered of the easiest way to take into action. In 2014, a number of drowning children below 15 years were 28 cases. There are 32.1 percent of males and 67.86 percent of females. The percentage of drowning children below 2 years old is 17.86 percent. The percentage of drowning children age between 3 to 5 years old, 6 to 9 years old and 9 to 12 years old is 21.3 percent, 28.57 percent and 32.14 percent respectively.

The place where drowning occur are community ponds, pond in the field, canal and pond in home and can be calculated as 35.7 percent, 35.7 percent, 10.7 percent and 10.7 percent respectively. We found that 14.3 percent of children can swim and 85.7 percent of children cannot swim and all of them have no skill in survival swimming. The factor leads to drown is that 46.3 percent of them play in the risk water with friends, 42.86 percent of them was drops in the risk water, 7.14 percent of them was catch the fish and 3.57 percent of them was help their friend who drowning. The main point we focus on is how children can float in the water and have a right skill to help people or their friends from drowning since there are not many standard swimming pool available. Mobile pool which is given from a supporter is an alternative way. We adapt survival swimming curriculum for trainer and children. The trainer taught children in easy steps and used simple equipment to help children floating in the water such as a plastic bottle. This saves time and is not dangerous while training in mobile pool. We plan the best practice school model in local communities.

This is important because our team must review and train ourselves to have expert skill in order to teach children. Children who have good skill can train another child. More than 80 percent of students who pass 15 hours of survival swimming curriculum can float in the water. The longest hour some children can float is 4 hours. The important technique is that they need to learn the right way of how to breath by mouth, how to keep air in lung, make right position and use empty plastic bottle (1,000 ml) when floating in the water. By the knowledge management from team network corporation from Hospital, Health station, School, Local administration and other volunteers which work in Province, district and sub-district, we learn how to be a good teamwork to help children. Today, we have the best practice in school and set a leader student to be a coach helper and also help friends in survival swimming program.

Moreover, we have developed a survival swimming program for 500 trainers from every district, co-operate in school program. All of this is a concrete success that all schools can apply and teach in the process of teamwork and to solve the problem of drowning in Surin. The years of success between 2010-2014 are our pride. Everyone voluntarily helps children from drowning. The goal is to reduce death rate of drowning to be lower than 6.5 per 100,000 children who are below 15 years old within 2018. Children can be able to learn survival swimming in primary school, float in water, and know how to help people who drowning.
Community perception of childhood drowning and prevention in a semi-urban district of Cambodia: A qualitative study

Mr. Conrad Foote
Liverpool John Moores University, Liverpool, England

Background
Cambodian children are particularly vulnerable to drowning mortality and morbidity. The drowning rate for children aged 1 to 17 in Cambodia is 35.0 per 100,000(1). This study used community participation to understand perception of drowning, explore existing drowning prevention practice, its limitations and ideas for the future.

Objectives
1. To explore perception of drowning and prevention in a Cambodian community.
2. To explore community understanding of drowning danger in the locality and investigate the risk factors relating to childhood.
3. To understand the cultural beliefs surrounding drowning and assess existing knowledge and prevention practice.

Target
Forty Khmer people were recruited who lived in a peri-urban Cambodian community, in the Mean Chey district of Phnom Penh. All lived in close proximity to various bodies of water close to where the Mekong and Bassac rivers converge. Groups were organised into younger females, younger males, older males and older females.

Methods
NGO Service users were selected via purposive sampling. Four focus group discussions were conducted and participants were asked a set of questions about childhood drowning, risks factors, belief, response and prevention in the locality. Participants were asked to mark their home and the location perceived as most dangerous for drowning on a map.

Results
Childhood drowning was considered to be a significant issue for all participants. All saw close proximity to large bodies of water as a significant risk factor of childhood drowning. Tragic accounts of drowning were told as well as involvement in rescue attempts. The Bassac River was a particular drowning risk with fast flowing water, whirlpools, and strong currents. Children, particularly boys loved to play here. Activities in the river associated with drowning were reported to be playing, swimming, washing clothes, toileting and bathing. Drowning risks in the locality were also floodwater, lakes, industrial places, water jars, buckets, sewers, bridge walkways and water platforms.

Participants spoke of the belief in ‘June Gharp’, where ghosts were believed to lure victims to a specific place of danger, in order to kill them by drowning. The majority of participants (97%) did not believe in ‘June Gharp’ and that spiritual fear would not stop them rescuing a drowning person, regardless of what others in the area believed about that place.

The majority of participants (97%) believed boys most at risk of drowning, as they were more daring and active. Some had seen boys fatally drown or had heard this from their community. Deep water was considered most dangerous for children of all ages and large water containers a particular risk for younger, smaller children. Lack of adult supervision was viewed as a considerable risk and all groups spoke of their anxiety about looking after children around water, especially in flood season.

Existing prevention measures were explained and ideas for future interventions were suggested. Participants recommended swimming schools, water safety workshops and safe swim areas to reduce drowning. They also desired greater organisation of childcare and formal supervision. Just one participant heard of the concept of lifeguards. Many felt national television programs were effective at spreading water safety messages and the government should also invest in building walls and fences to protect children from water.

Discussion
The majority of participants (62%) believed children under 10 were most likely to fatally drown. The younger female group were the most accurate, understanding that drowning death occurred in children aged less than 5 years. Participants evidenced their intent to save lives by their accounts of rescue attempts. It was important to gain understanding of ‘June Gharp’ for the consideration of community barriers of prevention interventions in Cambodia. Limitations of the study include the small unrepresentative sample.

A quantitative study focusing on rescue attempts, belief, and swimming as a protective factor may be beneficial in informing drowning prevention programs in Cambodia.

Conclusion
The community fully understood the burden of childhood drowning that existed in their community and this was illustrated by tragic accounts of drowning and loss. The groups identified a need for assistance to build on their existing prevention practice. A feasibility study to trial drowning prevention interventions, safe areas, water safety education, rescue and swimming instruction is therefore recommended and capacity for organized child supervision is also advised to decrease the injury burden.

Acknowledgements
Dr Lorna Porcellato, at Liverpool John Moores University for supervision and guidance. TASK personnel for facilitation, Ome Choeun, Heang La, Doeun Vuthea and Un Bunthan

References
Caregivers have the perception that they are providing adequate supervision to children in aquatic settings. The reality is they there is often a difference in how caregivers and how drowning prevention organizations define appropriate supervision for children when in, on, or around water. In Canada 61% of all children who drowned in 2012 were unsupervised and 53% of preventable child drowning occurred when the caregiver was momentarily distracted.

Observational studies have indicated that while caregivers feel they are providing adequate supervision, they have been observed to be talking with another individual, reading, or using a smart phone. Often it is the caregiver’s perception that they are present and able to hear a child call for help which allows them to feel they are providing adequate supervision.

The Royal Life Saving Society Canada – Alberta and Northwest Territories working in partnership with the Injury Prevention Centre researched, defined, and established a matrix that considers proximity, continuity and attention the of the caregiver in addition to age and swimming ability of the child. The matrix assisted in the development of the guidelines which indicate and define various levels of supervision for children when in, on, or around water based on their swimming ability and age.

The guidelines have been released to schools, community groups, swimming pools, and governments within Canada’s Alberta and the Northwest Territories and provide the basis for an online training program for caregivers which will educate on how to supervise children when they are in, on and around the water.
Is there associated with social-demographic, environmental and caring factors and children drowning deaths in Bangladesh?

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Prevention 10, Ballroom 2, November 6, 2015, 11:00 AM - 12:30 PM

Background
Drowning donates to incapacity and early death in many countries. In low- and middle-income countries children’s are the maximum susceptible fatalities. Over 50% of the global drowning deaths occur among the age of 15 years of children’s, and highest risk at the children age 1-4 years. In Bangladesh drowning rates are 10 to 20 times more than others developing countries. The object of this study is to conclude the socio-demographic, environmental and caring hazard issues for child drowning in Bangladesh.

Methods
A case-control study and data were collected from the Bangladesh Health and Injury Survey (BHIS) to identify the social-demographic and environmental factors associated with childhood drowning. The participant’s numbered of 171,366 household from seven divisions of Bangladesh-Dhaka, Rajshahi, Chittagong, Barisal, Sylhet, Khulna and Rangpur. The survey was conducted between January and December of 2003. A total of 141 children drowning were identified in the one year preceding the survey. Data was analysis by descriptive statistics and logistic regression analysis. The odds ratios with 95%CI intervals were estimated for various associated factors for child drowning deaths.

Results
In Bangladesh 2003, the incidence of drowning deaths for age less than 5 years 104.8 per 100000, 168.7 per 100000 in rural areas, male 32.4 per 100000, 112.7 per 100000 time 10:00AM-2:00PM, and cannot swim 134.9 per 100000 respectively. Social-demographic danger factors for child drowning deaths were: being male (OR=1.45, 95%CI=1.34-1.78), age less than 5 years (OR=2.89, 95%CI=1.89-3.11), urban areas (OR=0.67, 95%CI=0.67-1.87), mother being illiterate (OR=1.69, 95%CI=1.01-2.81) and occupation (OR=1.11, 95%CI=0.37-3.23) and environmental and caring factor are: being accompanying persons (OR=25.4, 95%CI=14.4-45.3) and children’s cannot swim (OR=4.5, 95%CI=1.25-19.4).

Conclusion
Drowning is the single largest reason of mortality of less than five years of children’s. There is a need to educate Bangladeshi parents and encourage behavioural change. Government does not organize campaigns or use mass media to raise awareness about drowning among the community. It has no policy about drowning and this to the on-going drowning problem. Therefore, there is an immediate need for the Bangladeshi Government to address the drowning problem.
The Proactive Precautions against Drowning Taken by the Volunteer Networks in Nakhon Ratcasasima Province

Somphrach Suwwannee

1 Offer of Emergency Medicine, Nakhon Ratcasasima province. Responsible prevent deaths from drowning. Mrs Kanjana Pradublai nurses The implementation and coordination prevent deaths from drowning Public Health Office, Nakhon Ratcasasima, Thailand

Background
Nakhon Ratcasasima is a big province with the second largest population as compared to that of Bangkok Metropolitan. Agricultural areas cover most part of the province. The water sources of the province include the River Mun, the River Chi, canals, and a number of artesian wells for agricultural use, which were dug by the local administrative organizations and Department of Irrigation. According to the records from the year 2008 to 2013, it was found that 200 people on average (death rate/100,000 people = 6.4-9.3) died of drowning each year. Among the dead were 47 children under 15 on average (death rate/10,000 people=6.4-10.4) per year. It was also found that while there were some floods in some areas of Nakhon Ratcasasima Province in 2011, a large number of flood victims were killed. Meanwhile, Buddha Dhamma Huk 31Foundation’s voluntary rescuers anticipated that all the flood victims who were missing might have died.

Objective
To reduce the drownings in Nakhon Ratcasasima Province

Methodology
Nakhon Ratcasasima Public Health Office joins hands with Buddha Dhamma Huk 31Foundation, schools, local administration organizations, and all relevant agencies in government as well as private sectors in taking all precautions against drowning in 3 phases: ante-drowning phase, drowning phase, and post-drowning phase. First of all, some voluntary waterway rescuers (Huk 31) were sent to train in survival swimming at the Ministry of Public Health by Nakhon Ratcasasima Public Health Office so that they would be able to train the other rescuers in their division. A major team of voluntary survival swimming instructors in Nakhon Ratcasasima Province, as a result, was formed, and its mission was in line with that of local administration networks, local communities, and mass media. Those voluntary survival swimming instructors in co-operation with the Provincial Public Health Office and relevant agencies have been playing a vital role in taking precautions against drowning in local communities.

The precautions against drowning in Nakhon Ratcasasima Province were taken in a wide variety of aspects. Such precautionary measures include mounting a campaign via mass media to make the public recognize drowning as a significant problem; making relevant persons like school teachers, daycare centres’ caregivers, practice nurses, parents at hospitals’ ante-natal care unit and child healthcare unit recognize the risk of drowning; conducting a survey of risky water sources in schools and communities to manage to prevent drowning; and putting up some signs showing the steps of rescuing victims from drowning as well as getting some life-saving equipment ready for a rescue; and instructing people for free once a month in a rescue of drowning victims as well as in floating in the water by voluntary local instructors (since 2011). All the measures mentioned above have successfully been carried out on the basis of community dwellers’ involvement. Meanwhile, they have been sponsored by the private sector and facilitated by the government sector.

Conclusion
The volunteer networks, the recognition of the community leaders, and the government and private sectors are the major factors contributing to the achievement and continuity of the precautions against drowning. The comprehensive precautionary measures were implemented in 3 phases: ante-drowning phase, drowning phase, and post drowning phase. Even though the precautions against drowning were initiated by a small network of volunteers, they are extensively taken by local government agencies at present. Moreover, such measures can be promoted as the country’s mainstream.
Child Drowning Prevention: From Knowledge to Practice Experienced Implementation at Thumbon Nanual, Sanom District, Surin Province, Thailand

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Prevention 10, Ballroom 2, November 6, 2015, 11:00 AM - 12:30 PM

In Thailand, drowning has been the leading cause of death in children under 15 years old. The average amount of 1,243 children died from drowning annually. From the results of this situation, all participants have to realize how to figure out this problem. Thailand national agenda has studied and compiled the various sources of knowledge for preventing and solving of child drowning. However, some limitations have obstructed the implementation in some area in Thailand. That’s why child drowning is still being a silent epidemic.

The total population of Thumbon Nanual, Sanom District, Surin Province represents 5,540 people containing 1,250 children who aged below 15 years old (304 between 0-5, 416 between 6-8 and 530 between 9-14). This area is a rural community and most people live by agriculture. There are natural water resources for agriculture and household water resources, which lead to cause of drowning in children. Over a decade ago, five children who drowned in household water resources were reported in Thumbon Nanual, the last child who died in 2011 was only two years old. This accident has held the government and community attention in focusing on drowning prevention and taking action by using knowledge from Ministry of Public Health.

The community can perform the action though the community is under limited conditions. For example, we set program of two days survival swimming lessons, especially floating skills and also trained supervisors who was a volunteer from community. We have been performing to teach this program for three years and we have had eight generation of students with the total amount of 919 children who aged between 6-14 years old. The issues of our operations shown that supervisors were able to teach only student who aged over 9 years old to float, so we had to change some strategies of operation in child who aged below 9 years old by increasing preventing measure and increasing paying attention. Moreover, parents and community are major part to prevent their children. Educated parents and community are very significant and government also needs to campaign them to join the activities such as, exploring and analyzing the risky water sauces, proposing the preventing measure through the leader and volunteer of community.

Learning from Experience: Problem of child drowning can be decreased if adult understand, care and take action.
POOL + SAFE – a successful drowning prevention campaign in Brazil

Dr David Szpilman¹, Prof Antonio Santos¹, Prof Marcelo Barros de Vasconcellos¹, Prof Renato Harouche¹, BOD¹
¹SOBRASA, Rio De Janeiro, Brazil

Background
In 2012, drowning was responsible for 6,369 deaths (3.5/100.000 inhabitants) in Brazil and was the second leading cause of death among children aged 1-9 years old. When considering all age groups together, pools and bathtubs were locations of limited relevance for drowning deaths, representing only 2,6% of all deaths by drowning (n=167 in 2012) but for children aged 1-9 years-old, 53% of deaths occurred in these venues and specially at residences (49% from all). Brazil has an estimated 1,7 million ground pools with an associated estimated risk of 1 death per 639 pools per year, considering 20 years as lifetime of a pool. With that in mind, SOBRASA developed and launched a strategic prevention campaign to reduce pools and bathtubs drownings.

Method
Drowning experts were invited to select all pool and bathtub water-safety messages and actions. They were provided with all the information on the subject. Delphi method was applied in 3-rounds. 12 experts voluntarily participated and identified safety messages scoring them from 1-5. All messages ranking 4-5 were considered the most important water-safety messages to disclose to people through the POOL+SAFE campaign.

Result
The POOL+SAFE alliance was created involving 18 governmental and non-profit organizations: health-related, swimming federations, pool manufacturers, Fire Departments, Physical Education Councils, children safety institutes and Portuguese Lifesaving organizations. The result was a campaign based on 5 water safety messages with an impacting motto:

“POOL+SAFE campaign draws your attention to 5 steps that may change the future of our children by increasing the safety of your pool. By simply using the word “POOLS” you can easily recall how to vaccinate your pool against drowning, giving 95% of protection to your child with one shot.

Pay 100% attention to your child; be an arm distance, even when a lifeguard is on duty.

Oclude the access to pools using fences and self-locking gates.

Ought to learn how to act when a drowning happens.

Lifeguard on duty: all the time at collective pools. (*)

Suction - Avoid it – Provide ways to turn off the pump while using it and have an anti-hair drain.

(*) At residencies no lifeguards need.”

The image of POOL+SAFE is an open hand with each finger pointing to a message, with an additional encouragement “learn to swim” depicted on the palm. A webpage was created to host all the information. The goal was to instruct owners/managers and swimming teachers across 34 pool clubs and gyms on 8 Brazilian states, reaching more than 34,000 children. At http://www.sobrasa.org/piscinamaissegura/ there’s information for 2 stakeholder groups (free and entirely online): the owners/managers were able to learn how to increase pool safety using fences, self-locking gates, and safety drain systems, as well as the need of a lifeguard on duty, and signalization to the law that forbidding the presence of children under-10 without adult supervision; the swimming teachers could take a course on aquatic emergencies (drowning chain of survival: Shours) and another on how to communicate water-safety messages to the children. Many tools as cartoon video, comic book, mouse pad, stickers, flyers, banners, T-shirts, refrigerator magnet, quiz, and animation, were used to increase the impact of the campaign.

Conclusion
A decrease of 39% in drowning deaths was observed in Brazil from 1979-2012. Still, the socio-economic burden of each drowning is large highlighting the importance of prevention as a key approach to the problem. In 2007, SOBRASA has called for more attention to this problem submitting a proposal to regulate a national law to improve safety at pools but yet not approved. We believe that a national preventive campaign like POOL+SAFE is the hallmark to reduce drowning in pools and increase awareness of the problem.
Update on progress of the U.S. Model Aquatic Health Code (MAHC): a template for data-driven, knowledge based risk reduction guidelines

Jill White¹
¹Starfish Aquatics Institute, Savannah, United States

Rescue 9, Serendit, November 6, 2015, 11:00 AM - 12:30 PM

Background/Introduction
In 2014 the U.S. Centers for Disease Control and Prevention (CDC) released the Model Aquatic Health Code (MAHC) after a 7 year development process working with public health and industry representatives. In the United States there is no federal regulatory authority for public swimming pools and recreational aquatic venues such as water parks and no uniform standards governing the design, construction, operation, maintenance, and safety of such facilities. Existing local code requirements for safety, drowning prevention, and responding to Recreational Water Illness (RWI's) can vary significantly. The MAHC was developed to provide data-driven, knowledge based risk reduction guidelines, with a goal to impact unintentional death or injury from drowning and other health and safety issues that distract from the benefits of participating in aquatic activities at swimming venues.

The underlying principles guiding the project included that the MAHC be:
• data or best practice driven - avoiding prescription when possible
• easy to implement - incremental change by "evolution not revolution"
• easy to understand - user friendly with an annex that includes data and rationale
• free and accessible – posted on CDC’s website at www.cdc.gov/healthywater/swimming/pools/mahc
• updated regularly – through a sustainable model based on public health interests

The MAHC was created using a steering committee, technical committee, and writing committee structure with input from stakeholders representing public health, industry, academia, and the general public. Public comment was obtained for each module in two periods during the development process, followed by the entire "knitted version" of the code being open for public comment prior to final revision and release. The first (current) version consists of a 316 page code document and a 371 page annex of rationale and references.

The MAHC is not a law, but rather serves as a model to save jurisdictional time to create or update existing regulations. It can be altered to fit local jurisdictional needs.

Short Term Outcomes
The short term outcome of establishing a sustainable model to keep the MAHC current and complete has already been realized through the establishment of a member organization.

The Conference for the Model Aquatic Health Code (CMAHC) is a 501(C)(3) non-profit organization created to collect, assess, and relay input on MAHC revisions back to the CDC for final acceptance. Members submit change requests and vote on content every other year. Membership is open to any stakeholder and each member holds a vote. The first CMAHC meeting, “Vote on the Code 2015”, is scheduled October 6-7, 2015.

The CMAHC also will solicit, coordinate, and prioritize research needs. The research agenda is prioritized on the ability to obtain achievable results and improvements in the MAHC:

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<th>Tier 1 - short term</th>
<th>Tier 2 - intermediate term</th>
<th>Tier 3 - long term</th>
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<td>There are currently six research agenda items in Tier 1. Data is needed to develop guidance in the areas of:</td>
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<td>• improvements to indoor air quality</td>
<td>• measures and action levels for combined chlorine</td>
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<td>• measures to enable appropriate sizing of chemical feeders</td>
<td>• impact of using stabilized chlorine products</td>
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<td>• reduction of surface glare</td>
<td>• appropriate depth for competitive use of diving boards and starting blocks</td>
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Research agenda items have not yet been identified for Tier 2 and Tier 3.

Intermediate Outcomes
As the MAHC becomes adopted in local jurisdictions, improvements are expected in the areas of:

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<td>• performance based lifeguarding</td>
<td>• fewer pool/facility closures</td>
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<td>• collection and use of inspection and surveillance data</td>
<td>• development of a research agenda to fill gaps</td>
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<td>• enhanced collaboration among stakeholders</td>
<td>• data-based uniformity in key areas</td>
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Long term outcomes
As improvements are made as a result of the MAHC, public health and safety will be impacted as a result of:

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<td>• fewer drowning incidents in aquatic venues</td>
<td>• fewer outbreaks of recreational water illnesses resulting from exposure to contaminated swimming water</td>
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<td>• fewer injuries from pool chemicals/disinfection by-products</td>
<td>• fewer Emergency Department (ED) visits due to swimming-related issues</td>
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The MAHC is based on scientific data and best practices gathered through a strong partnership between public health and aquatics industry experts. Unlike legislation, the MAHC is voluntarily adopted wholly or in part and will serve as a model for agencies in the U.S. needing guidance to implement a swimming pool code in their jurisdiction to help improve safe operations. It is free, accessible to all, backed by the Centers for Disease Control and Prevention (CDC), and has potential for collaboration on an international effort.
Aquatic risk management and evidence-based decision making: 
Hunua Falls, Auckland region, New Zealand

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A conceptual Drowning and Injury Prevention Strategy has been developed to guide evidence-based aquatic risk management across New Zealand’s water safety sector. The strategy is aligned to best practice risk management principles, and identifies six causal factors that can lead to drowning and injury, with six corresponding risk management strategies. Application of the strategy ensures that all elements of risk in the aquatic landscape are duly considered and addressed in the risk assessment reporting and implementation process.

The Drowning and Injury Prevention Strategy was recently applied to a risk assessment at Hunua Falls, Auckland region, where there have been seven drowning fatalities since 1987. In addition, anecdotal evidence suggests at least another 12 unrecorded deaths have occurred as a result of people jumping off the falls. Hunua Falls is the major destination within Hunua Range Regional Park, which encompasses 17,528 hectares, and is visited by over 220,000 people annually.

The risk assessment utilised a wide range of quantitative and qualitative data sources to inform the analysis. This included site usage data, incident data, on-site visitor surveys (n = 136), discussions with water safety stakeholders, and assessment of the site morphology and physical hazards.

The assessment found a range of natural and anthropogenic hazards present at Hunua Falls and along the Wairoa River, downstream of the falls. Many of the hazards would be considered of moderate threat to those users who are capable of identifying and avoiding hazards, and have appropriate water competence for the environment. However, due to the low resilience of a considerable number of people using Hunua Falls, the risks posed by these hazards should be considered high to very high.

A wide range of safety interventions were therefore recommended to reduce the risk of drowning and injury. These included:

(i) further restricting access to hazardous areas, as well as reducing the prevalence of man-made hazards;
(ii) improved water safety signage and targeted education programmes;
(iii) investigating further bylaws and associated monitoring;
(iv) providing water competence courses at Hunua Falls,
(v) implementing a lifeguarding service during identified high risk periods over summer and early autumn, and
(vi) improving the efficiency and effectiveness of emergency response to the site.

The project is currently in the final stage of consultation, with the aim of incorporating the recommendations in the long-term (10 year) plans of relevant stakeholders, and implementing all interventions progressively within this timeframe.

This case study demonstrates the effectiveness of the evidence-based approach to aquatic safety decision making. This methodology is currently being applied to other high risk aquatic locations throughout New Zealand.
Reducing Drowning Risk Through Inland Water Venue Selection – A Study Of Water Sports In Marina Reservoir

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Rescue 9, Serendit, November 6, 2015, 11:00 AM - 12:30 PM

The inland water, as compared to the open sea, is generally sheltered from the winds, swells tidal currents, and tidal height changes. The inland water is often off limits to larger vessels.

Examples of inland waters include reservoirs, lakes, rivers and lagoons.

The inland water can also be an alternative venue for water sports especially for participants who are staying far away from the sea.

This paper aims to study how drowning risk for water sports can be reduced by selecting a suitable inland water venue such as the Marina Reservoir.

At approximately 240 hectares in size, the Marina Reservoir is Singapore's 15th reservoir and the first city reservoir. Its 10,000-hectare catchment, at approximately one-sixth the size of Singapore, is the largest of all the reservoir catchments.

The Reservoir is generally calm with no strong currents or swells. The four types of motorized vessels that ply the Marina Reservoir are work boats (for reservoir cleaning or infrastructure maintenance), tour cruise boats, small powerboats with outboard engines (for sports safety or race marshal coverage) and amphibious tour vessels. Almost all of these motorized vessels are less than 12m in length and they have to abide by the 5 knots speed limit.

Water sports training, courses and competitions are conducted all year round in Marina Reservoir. The conduct of all activities, including water sports, in Marina Reservoir is governed by the Public Utilities (Reservoirs and Catchment Areas) Regulations and its subsidiary guidelines.

Under the regulations and guidelines, all vessels must apply for permits for use in the Reservoir. Organizers must also apply for permits to conduct water sports races and events. The regulations and guidelines further stipulates that only “non-primary contact” water sports such as sailing, dragonboating, rowboating and canoeing can be conducted at Marina Reservoir. Swimming is not permitted.

Consequently water sports in Marina Reservoir are well controlled. All training and courses are conducted through and from the water sports centres. With rare exceptions, all participants are required to wear personal floatation devices. The public are generally not permitted to bring and to launch their own vessels.

Despite the high level of governance and control in Marina Reservoir a few special risks exist.

The Reservoir is overlaid with underwater pipes. The network of pipes serves two primary functions: to aerate the water and to draw in water for processing. The bubbles generated by the aeration outlets may cause anxiety for the novice water sports participants especially if their vessels are travelling over these bubbles.

No water sports participant is known to have drowned in the Marina Reservoir over the last decade. However there have been reports of non-water sports related drowning, usually associated with alcohol consumption, along the banks of Marina Reservoir.

There have also been a few reports of fatalities related water sports with drowning as a probable cause in other reservoirs in Singapore. In one incident in 2007, the victim's canoe had capsized at a secluded area of the reservoir. In the second and last reported incident in 2009, a canoeing coach had reportedly drowned while coaching a group of participants in another reservoir.

Such fatalities, although rare, highlight that regardless of one's ability, it is still prudent to buddy up with another water sports participant who is capable to render immediate rescue. The fatalities also serve as a reminder that accidents do occur even within the confines of an inland water venue such as a reservoir.
The Splash Patrol: promoting safety as a shared responsibility in aquatic facilities

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Whether you are a bather, a lifeguard or an aquatic facility operator or owner, drowning prevention is everyone’s business. The Splash Patrol initiative has been created by the Lifesaving Society in partnership with the government of Quebec, Régie du bâtiment du Québec. It targets all actors involved in public bath safety and consists of a team of animators who visit several aquatic facilities (pools, beaches and water parks) in the province to spread this key message: safety is a shared responsibility!

The Splash Patrol organizes awareness and educational activities for bathers, such as animations and games about safety in aquatics facilities. Children are also initiated to lifesaving sport and techniques. An annual average of more than 24,000 bathers directly or indirectly participates to these activities.

Another objective of the Splash Patrol is to meet with aquatic managers to spread its safety message. Each year, nearly 120 aquatic managers that represent over 275 facilities meet with the Splash Patrol to learn about trainings and safety standards. In 2014, the patrol performed aquatic safety inspections in almost a 100 facilities.

A visit from the Splash Patrol is also an excellent opportunity for lifeguards to improve their skills in terms of emergency procedures and lifeguarding. In 2014, 1,425 lifeguards participated in various training activities, and were invited to report about the prevention and lifesaving interventions they made each day in a logbook.

In addition, the Lifesaving Society has created a website (www.brigadesplash.com) to better reach and educate all actors involved in aquatic facility safety. It has been visited 5,200 times over the course of 2014 and the Splash Patrol’s Facebook page has over 1,123 fans.
An innovative approach to drowning prevention in public & home pools using video analytics

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Today there is a lack of affordable and reliable tools to assist lifeguards / lifesavers / caregivers during concentration lapse caused by distractions / inattentiveness / stress / fatigue to provide constant monitoring for water safety.

Lifeguarding is not foolproof. It is a function performed by human beings in often less-than-ideal environments. Drowning statistics point to the critical need for improvement in swimming pool safety. In a vigilance study of >500 tests done at >90 US pools, mannequins were used to simulate swimmer in distress without the lifeguards knowledge. Only 9% spotted distress within the first 10 seconds. Numerous drowning deaths involving children occur in public pools with certified Lifeguards present. Pool safety systems using wristbands and bracelets to detect swimmers who exceed a pre-set time at the bottom of the pool are prevalent. However the use of Video analytics to monitor pools opens a new vista in pool safety, Pool surveillance systems using video cameras detect someone at the bottom of the pool before raising an alert.

A real-time video analytic system using behavioural analysis operating at an outdoor swimming pool is presented in this paper. The system is designed to automatically recognize different swimming activities and to detect occurrence of early distress incidents. The Distress Early Warning System (DEWS) uses behavioural analysis to detect a swimmer in distress well before he sinks to the bottom of the pool. In the step to detect an early drowning incident, visual indicators of distress and drowning are incorporated through a set of foreground descriptors.

Modules comprising data fusion and hidden Markov modelling is developed to learn unique traits of different swimming behaviors, in particular, those early drowning events. The experiment of this work reports realistic on-site evaluations performed. Examples of interesting behaviors, i.e., distress, drowning, treading and numerous swimming styles, are simulated and collected. Experimental results show a prototype system which is robust and beyond the stage of proof-of-concept.

The systems are currently installed at a Singapore Government public pool and performance results would be presented to participants. The system received the Singapore Public Service Innovation Award – Award from Prime Minister’s Office for technology innovation and value creation in addition to The Institution of Engineers Singapore – Prestigious Engineering Achievement Award.
Understanding Risk

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Problem
A Third of UK Swimmers come up short on basic swimming skills, four in five (83%) British adults consider themselves as being able to swim. However, only a third (36%) can perform the water-safety skills that are considered to be important. Understanding the interplay between risk, perceived ability and actual ability is the problem.

Background
UK pools are exceptionally safe places, but of the drowning that occurred in open water situations, where people deliberately went swimming, we can clearly determine that they either did not have the appropriate swimming competencies, or they did not understand risk, or both of these. Following the Swimming Teachers’ Association (STA) charitable objective to save lives and reduce injury and death in, on, or around the water STA commissioned research to understand how competent British adults are in the water.

Methodology
Opinium Research carried out an online survey of 2,006 UK adults aged 18+ from 20th to 24th of June 2014. The results have been weighted to nationally representative criteria.

Conclusion
The results, while not surprising were very alarming. People who convinced themselves that because they can swim they can do more in the water than they are capable of and run the risk of endangering themselves and others.

Presentation
The survey results will be presented graphically and it is hoped to generate discussion on how the results might influence programme development and future water safety messages.
Approaches and practices to minimize risk in SwimSafe – making swim training safe in rural LMICs

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Symposium (5), Bayan, November 6, 2015, 11:00 AM - 12:30 PM

Protecting children in middle childhood and beyond from drowning in low and middle income countries (LMICs) requires training children in basic swimming and safe rescue. Prevention effectiveness research has shown the curriculum used to teach basic swimming skills and safe rescue in the SwimSafe program protects children from fatal drowning in the common drowning scenarios in rural Asian LMICs.

A fundamental challenge to SwimSafe and any swimming program in an LMIC is the numbers of children needing protection from drowning. For example in the three countries where SwimSafe has been implemented, Bangladesh, Thailand and Vietnam, there are almost 100 million children 4-17 years at risk of drowning. Like all LMICs, children in these countries have high rates of malnutrition with associated delayed development, other medical conditions that place them at risk of harm while learning to swim (example seizure disorders including epilepsy) and high rates of congenital and/or acquired physical and mental disability. They also lack access to medical care as trained medical providers are rarely in close proximity to their households, especially in rural areas.

Population-based data shows between 25-35% of children are at increased risk of serious or fatal injury, mainly drowning, while participating in SwimSafe. This is between 25 and 35 million children in these three countries alone. Children in these countries cannot be reliably screened by health providers and given medical clearance certificates before participation. In LMICs, survival swimming programs like SwimSafe will need to implement evidence-based risk management procedures to maximize safety for all participants.

Using life table data from large community-based surveys that establish age-specific risk of death from drowning, the public health approach concept of risk/benefit ratio is described as a fundamental underpinning used in SwimSafe. Most children at increased risk of harm while learning to swim are also at increased risk of drowning. In most cases, the risk/benefit ratio favors teaching these higher risk children if rigorous attention is paid to risk management and safety in the training process.

This presentation reviews the lessons from the three SwimSafe programs regarding safety and risk management. It examines common conditions that increase risk for children participating (e.g. growth and maturation delays, medical conditions such as epilepsy, asthma, chronic bronchitis, cardiac disorders and physical disability and discusses screening for these using non-medical providers. It reviews hazards associated with decentralized rural training in natural water bodies and processes implemented to minimize these. It presents the current state of the art for safety and risk management in large scale SwimSafe programs for children of normal risk. It discusses the safety and risk management research protocols currently being tested for use in children who are at increased risk and the active surveillance necessary to ensure the safety for all participants.
A Water Competence Index & A Competency Profile: A conceptual model

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Introduction
During the process of learning water competencies, a variety of competencies are presented to the pupils. These are presented elsewhere (1). There is a need for continuous assessment to not only monitor pupil progress but to monitor the teaching effect. Even the best of teachers is accustomed to adjusting their plan along the way when assessment reveals the need for improved individualization of teaching. Not only are pupils vastly different from one another but each changes from day to day. Our plan(s) need to change with them.

Creating an index and a graphic profile will assist in the assessment process. This can be reduced to a simple check list of items (the teaching progression) to be crossed off at successful completion. But it can also be supplemented with a numerical figure indicating total progress as well as a graphic profile which visually presents not only progress on each item but how progress on these items relates to progress on other items.

Aims
The aims of this paper are to: a) present a conceptual model of an index which indicates total progress as well as a graphic portrayal of that progress, b) to present a matrix which suggests a point value for performance on each item of the progression – for key steps of improvement, c) to present a rationale for the assumptions upon which this model is based.

Method
Several assumptions were made allowing the creation of the matrix according to the premises of the conceptual model. These were: a) that all-around, balanced development provides optimal protection in a drowning prevention context, b) that the difference between being water competent and not being water competent is best described not as a sharp line of demarcation but as a zone. Within this time and learning zone, the learner progresses from being water competent to being even more water competent, c) the zone described here permits accommodating varying degrees of need in varying environmental circumstances (e.g. greater skill or knowledge needed in open water than in quiet water), d) that it is in fact possible to compare the various competencies of the progression, to one another in such a way as to say that a given level on one item coincides with a given level on another item.

Results
A matrix is presented which lists all of the desired competencies of the teaching progression on the Y axis (1), and graded numerical values according to progress, on the X axis. The assumptions presented in the paper “Balanced Progress” (2) are followed in assigning relative numerical values.

Conclusions
Monitoring pupil progress is essential in the teaching/learning of water competence. This monitoring can be effectively augmented by the use of a total score index as well as a simple graphical presentation of progress of the various competencies.

References
Drowning Prevention Seeders – A free web-based prevention program

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Poster Session 1, Poster Foyer, November 4, 2015, 9:00 AM - 5:15 PM

In Brazil, drowning deaths have significantly decreased 39% (1979-2012), in part due to preventive programs offered by SOBRASA. Fatal drowning has a relevant impact in fresh water environments (92%) with higher incidence in males aged 15-29, and occurring mainly in isolated places inland, where the deployment of lifeguards is largely infeasible.

Preventive education is the most effective action to reduce drowning deaths. Delivering that education is challenging: Government support and resources are limited and SOBRASA’s prevention strategies have only comprehensively reached the coast. For several years, SOBRASA has been working efficiently, engaging people from non-lifeguard groups to assist, using the strategy of “teaching the teacher to multiply the prevention message”, and identified the need to implement a plan of preventive actions targeting primary schools, especially those located inland where previous actions weren’t effectively implemented.

Internet is the most powerful and costless way to deliver our message and Brazil, although being a LMIC, ranks fifth in Internet access worldwide. Knowing that, SOBRASA’s “Drowning Prevention Seeders” Program main purpose is to reduce drowning occurrence by identifying and delivering effective prevention messages using the Internet in an enjoyable way to young people otherwise difficult to engage, while improving current awareness to the problem. The program is designed to deliver a wide educational prevention campaign, for free, using a web platform, reaching all corners of our country.

Drowning experts were invited to select drowning scenarios, water safety messages and actions. Delphi method was employed in 3 rounds. 12 experts voluntarily answered the Delphi process along 7 months. Twelve scenarios were identified and, for each scenario, top messages were picked. Videos and pictures that fit the messages were selected and included. The program platform, using the same educational-quiz, has two different approaches to target distinct groups. Adults (primary-school teachers, sports educators and parents) were recruited to engage and encourage the primary target group (children) to participate. Mobilization of people to participate included 8 different strategic paths including the 25.000 members of SOBRASA’s Internet network.

“Drowning Prevention Seeders” Internet Platform was created: http://www.sobrasa.org/semeadores-da-prevencao-totamente-on-line/. The website includes a homepage with information stimulating the user to participate by filling some personal data. At first, it proposes a lecture including all scenarios and messages that takes 30-40 minutes. Then a quiz with 50 questions – picked randomly from a pool of 620 possible questions that encompass a unique data source including all messages. The participant has no time limits to redo it, each time pulling a different set of questions in different order, providing a unique experience each try. There are 2 online certificates: drowning prevention seeder certificate (above 80% correct answers) and instructor (above 90%). Since August 2014, 363 people have been assigned to the program, 27 received certification and 4 graduated as instructors.

Preventive messages are keystones to drowning reduction, available in many different formats but often not adjusted to impact targeted audiences. An audiovisual and interactive quiz offers greater impact by appealing to people’s senses and interests. This Program uses such tools and can be made available at little to no cost to an unlimited number of children and adults, tracking their comprehension in real-time, helping to adjust and gauge the success of the system. While it may be difficult to track the degree to which this approach directly reduces drowning, it will be easy to track the increase in awareness of individuals using the system. In the near future we will conduct a parallel cross-intervention study using additional and important variables. The most innovative aspect of this project is that we will strengthen our message with information about the receptor.
Can you #MakeItSafe? A national public education program to prevent drowning in portable swimming pools in Australia

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Background
Children aged 0-4 years are the age group with the highest rate of drowning in Australia, at 1.43 drowning deaths per 100,000 population in 2013/14 [1]. The risk of drowning in this age group is highest in and around the home, predominately swimming pools.

In the eleven years to 30 June 2013 there were sixteen drowning deaths of children aged under 10 years in portable pools across Australia. In almost all cases the deceased drowned either due to an absence of parent or carer supervision or an unfenced pool. In many cases both were absent [2]. Research shows the majority of drowning deaths in portable pools involve children under five, males account for over half of all fatal drowning in portable pools [3] and drownings often occur during the summer months [4].

Portable pools are widely available in stores and online and are extremely affordable. Despite the requirement in almost all Australian states & territories to fence a pool with a depth greater than 30cm, pools are rarely fenced and continue to result in fatal and non-fatal incidents annually.

Royal Life Saving Society – Australia (RLSSA) in partnership with the Australian Competition and Consumer Commission (ACCC) and Australian State and Territory consumer affairs agencies to deliver a portable swimming pool safety campaign.

Aims
The #MakeItSafe initiative aimed to:

• To develop communication materials that outlines the issue and prevention of child drowning in portable swimming pools.

• To generate substantial media coverage for the issue, spanning TV, Print, Radio and Online (Note – targets across channels developed through consultation with ACCC).

Target(s)
The targets of the campaign were consumers and potential consumers of portable swimming pools who may have been considering purchasing one over the Christmas and summer holiday period in Australia (Dec to February). The aim was to engage parents and carers of young children (under five years of age) and grandparents that may be supervising young children.

Implementation
RLSSA launched the campaign in December 2014 with a national media launch in tandem with online activation. The campaign featured a range of communication materials including: an infographic video, fact sheets, a radio community service announcement and radio script for on air talent, blogs and a website.

Results
The campaign was launched with a soft launch of information and resources to media outlets around the country. National television, radio and print coverage (including online) was generated. Good engagement was seen with the video infographic through YouTube with over 11,000 views. Social media posts reached in excess of 40,000 people. Full results of the evaluation of the campaign will be available for presentation at the Conference in November.

Discussion
The ability to partner with a national governmental organisation such as the ACCC added legitimacy to our campaign. RLSSA was able to focus on the consumer education whilst, in tandem, the ACCC focused on industry education, enforcement and compliance with the mandatory safety standard [5].

Despite challenges with respect to data collection and promoting a national campaign where relevant legislation differs in some states or territories, the campaign was extremely successful in terms of meeting its stated aims.

Conclusion
In conclusion, partnering with a national governmental consumer affairs agency and their network of State and Territory consumer affairs partners was extremely beneficial and strengthened the messages of our campaign.

Acknowledgement(s)
Royal Life Saving Society – Australia would like to acknowledge the Australian Competition and Consumer Commission (ACCC) and state and territory consumer affairs agencies for their support in the development and implementation of this project. This project was delivered using funding from the ACCC.

References
Full reference list available on request.
Effectiveness of mobile SMS based intervention for children drowning in Bangladesh: study protocol of a mixed method

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Background
The goal of the research is to examination the effectiveness of a mobile based Short Message Service's (SMS) intervention for the prevention of childhood drowning.

Method
Mixed methods will be fixed in this study. The first part will be focussed qualitative study. The second part design is an experimental study will be directed to test the effectiveness of the mobile based SMS intervention for childhood drowning and matched to a valuation only control group. In the villages parents with children will participate in this study and the total number of parents with children's is 788. The village will be used such as a randomized unit. Randomly allocated to an intervention group (N=394) getting the mobile SMS based intervention or a valuation only control group (N=394). A personalized mobile SMS based intervention on the social-demographic, environmental and behaviour data and the individual will be established, and SMSs and voice call related to child’s drowning will be directed to the respondents of the intervention cluster through three months. The contributors will get SMS and voice call each week. The main result measure will be increased knowledge attitude, and behaviour training about child’s drowning evaluated by the three-month follow-up, and the subordinate result measure will be the reduced occurrence of childhood drowning in Bangladesh.

Discussion
The programme will offer an active and low-cost technique to decrease child’s drowning and also raise the sensitivity of parents regarding the risks to their children from drowning.
STOP Drowning in Chumpolburi District, Surin Province

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Drowning was the first cause of the death in children under 15 years old in Chumpolburi District, Surin Province. Death rate was 7.45, 16.31 and 18.02 per 100,000 children below 15 years old in 2011, 2012 and 2013 respectively.

For the geographical condition in the Chumpolburi District, there have Lumplabpla Canel in the west, Moon River in the south, Lumpungchoo Canel in the north and Thung gula Lake in the northeast. Moreover, there had been several times of big flood in Chumpolburi causing a risky area where the accident from drowning can occur.

According to the data of Department of Disease Control in 2013, only 23.7 percent of children age below 15 years old can swim. So prevention of death by drowning. ChumphonBuri district has performed in all age groups. As well as the prevention of drowning in the source tube trip.

Do you integrate all sectors as follows: in the school - training teachers, student leaders. In the village - training volunteers and to monitor the risk. In tourism - training operators. Local government organizations. Service center of emergency and rescue with the help. With the strategy “STOP Drowning in Chumpolburi” Shout for Help, Throw the thing for hold, Offer the thing for pull to tug, Phone for emergency teams.

Results
The result of operation can be summarized that the 100% of school can be trained to have the knowledge, understanding and survival swimming skill and have the knowledge and understand the skill in helping drowning people. All of local Government organization and the volunteer team security surveillance in water.

Recommendation
The training should be held covering all of population and the revision should be conducted every year. There should also be the teaching curriculum in all Child center development.

As a good opportunity, the Chumpolburi District Health System Committees had announced the Diseases and Health Hazards Policy of Chumpolburi District. Since 2011, child health was one of the most concerned issues. This will be a great chance to ongoing create cooperation between the network of local administrations and Government officers working together to reduce drowning accident throughout Chumpolburi District.
Toddler swimming and drowning prevention: in search of best practice from a Nordic perspective.

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Poster Session 1, Poster Foyer, November 4, 2015, 9:00 AM - 5:15 PM

Introduction
Water familiarization that leads to self-rescue is part of drowning prevention. However, can indoor pool experience be appropriate preparation for coping with aquatic activities in Nordic open water where most drownings occur? Which self-rescue activities are within the scope of young children in open water and how can we best engage the children in our activities?

Baby and toddler swimming in Norway occurs indoors in warm pools and parents often continue with aquatic play in public pools, usually leisure complexes where pools are 30 degrees plus. Teaching programs within the Norwegian Lifesaving Society have self-rescue as a goal. From the perspective of drowning prevention, the traditional programs for toddler swimming have not taken into account the open water environment where most drownings occur in Norway.

It is a concern that many children and young adults are not acclimatized to open water naturally occurring in Norway and thus are ill equipped if an accident occurs during participation in other aquatic activities.

Furthermore from the perspective of drowning prevention, it is important that parents are well versed in elementary precautionary strategies to enable them to enjoy open water settings safely.

Implementation
The attempts so far to encourage instructors to take groups of young children outdoors has been a slow process. It has not been easy to engage instructors or parents in this activity. One swim school, that did take parent and toddler groups out to mark the end of term, experienced a range of challenges that were revealed in a survey later on. The misconceptions parents and children had over their own aquatic readiness became apparent during this exercise. The instructors, used to the enclosed pool environment, were dubious about being outdoors. Some activities, such as line throwing, although based on important lifesaving skills, were inappropriate considering the age and immaturity of the children. Although many parents had a positive experience, some instructors found the event quite stressful.

The NLS aims to give optimal support to instructors in preparing for outdoor activities geared for young children and their parents but need to know more about the challenges and practical logistics for outdoor courses. So using these initial findings, we started a pilot project to investigate how to better prepare young children for open water activities and water familiarization.

The first route was to engage instructors in rethinking their teaching program and allow them to discover the opportunities outdoors. A second route opened up through the possibility to collaborate with teachers in two kindergartens who had a summer session on the beach (one to two weeks) where the children could be engaged in water familiarization as part of the activities that were natural to the kindergarten program.

Collaboration of Parents
We needed to find out if visual aids were more effective than written information. When are parents most receptive to information on aquatic skills, during lessons or before lessons? How can we measure the extent of their learning? Part of the project is to identify why parents seem to ignore aquatic activities that instructors prioritize. Why do parents priorities sometimes seem to differ from the instructors? Can we improve parental cooperation if we enable them to develop survival skills together with their young child?

Collaboration with Kindergartens
We organized a daily session of 30 minutes on the beach together with a teacher, testing activities that might help the children accustom themselves to not just cold water but strategies to minimize heat loss. At the same time using materials from nature, we found ways of combining encouraging child participation and intervention that gave them an understanding of the water.

We have found that a daily session on the beach improved the children's tolerance of cold water after five days. We also got indications to effective ways of developing a feel for the water and engaging the young children in testing their own buoyancy.

Throughout this process, we are interested in finding out what are the successful activities indoors, have they relevance for survival in open water? However, more importantly, we are looking at how the children adapt themselves in cold water and find a strategy for practice and development of these skills indoors, during winter months.

The goal of the project is to identify the best methods and tools for educating parents and young children in the safe enjoyment of Nordic open water. The findings and materials produced will be the basis of a larger project in preparing all our instructors to participate in and implement a national water safety week in 2016.
Role of Lifesaving Sport events as a drowning prevention tool – case study in Brazil

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Poster Session 1, Poster Foyer, November 4, 2015, 9:00 AM - 5:15 PM

Background
In Brazil, 6,369 people die annually from drowning (3.3/100,000 inhabitants), being the second leading cause of death of children aged 1 to 9 years old. Every action that seeks prevention can mitigate this scenario. In this context, since 1995, a National Lifesaving Championship takes place. It’s a sport and scientific event organized by SOBRASA, the Brazilian Lifesaving Society, so as to bring together lifeguards from across the country with the same goal – reduce the number of drownings through preventive actions. Among the states that participate annually in the event, the Paraná State, through its Fire Department, has joined regularly since 2005.

Aims
This study aims to understand if this annual event, of an essentially sporting context, had an impact in reducing drowning deaths in the state of Paraná.

Methods
2005 was considered the year when Paraná began regularly attending the annual lifesaving sport event. We assessed the drowning mortality rate per 100,000 inhabitants in Paraná for the period covering 7 years before and 8 years after 2005 (1998-2012), using DATASUS system from the Ministry of Health, and listed the drowning prevention actions implemented institutionally by the Paraná State Fire Department in both periods.

Results
Comparing both periods, a 22% reduction in drowning mortality rate was observed in the state of Paraná, 4,6 deaths/100,000 population between 1998 and 2004, and 3,6 deaths/100,000 between 2005 and 2014.

In the period from 1998 to 2004, we’ve identified 9 new actions targeting drowning prevention and reduction in Paraná, such as: the use of rescue tubes, and Personal Protection Equipment (PPE) for lifeguards (sunglasses and sunscreen) and the use of elevated watchtowers; while in the second period (2005-2012), encompassing the years in which the state regularly participated in lifesaving sport events, we’ve registered 31 new actions, corresponding to an increase of 200%. These actions included redesigning of lifeguards’ uniform, adopting a national standard, the use of new materials to assist in the activity, such as boards, stand-ups, jet skis, IRBs, and new rescue tubes, and the implementation of various international protocols, such as the classification of the degrees of drowning.

Discussion
Lifesaving Sport events can be an excellent tool for drowning prevention and reduction, because they don’t focus merely on sport, but also on the interaction among institutions, providing a favourable environment to the exchange and discussion of experiences and ideas, that help and inspire change. The discussion happening in a relaxed environment and nourished by different views, builds up on previous concepts and allows the protocols to evolve faster. This was evidenced by the exponential increase of implemented actions arising from this national scientific and sport meeting and the reduction of around 22% of drowning deaths in the state. Most certainly there are other indirect factors of state participation in these events that also contributed to the mentioned results, such as a manager more conscious to the need for change, a lifeguard troop more motivated and well-trained, and the provision of new and instant information nationwide.

There is no doubt that the Paraná State Fire Department – responsible for the prevention, rescue and treatment of drowning victims, could have changed by itself even if not attending these events. However it is evident that major changes happened with regular participation at SOBRASA’s Lifesaving Sport and Scientific events.

Noteworthy, the information exchanged in this type of event accelerated the improvement process and created strategies that qualified the service provided, ultimately saving lives.
Shout Throw Deliver

Mrs Banyen Nomklang, Mrs Chawalita Thongwilai, Sakorn Srikrudadam

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Learners often appear sad news, “Children die drowning" statistics of Thailand in 11 years, from 2546 to 2556 were children under 15 years died from drowning.

During April and May, Surin Province. The number of deaths from drowning since 2554-2557 Tabao, Prasat, 11 children found drowned 5 simultaneously in the year 2555 from the event. An incentive for stakeholders to realize the importance and prevention to solve the problem, the project submitted as “shout, throw, reach" is a way of reducing the death of a student from drowning.

The purpose of this project is to prevent child drowning eyes light district. To establish measures and guidelines for the prevention of children drowning contextual areas. And to reduce deaths from drowning, not more than 6.5 per thousand population of children aged 5-14 years in Tabao, Prasat Ta Surin. In January 2556 - December 2557 total period of 2 years, the problem of other parents of children in the community, lack of knowledge, lack of skills, floating. I do not know how to help people in the right way. The environment is an agricultural area, so many agricultural and largely unmanaged environment is conducive to safety.

Lack of participation If the operation is successful to prevent children from drowning it will be required to exchange their knowledge and management problem. Education in this application process with the participation of the community and the PDCA cycle and the risk of Water Resources.

Historical Studies By Application Tools 7-piece set of measures to protect the child or the drowning a powerful and tangible. The method of operation. Organizer Child Drowning management discussion and participation. Networking trainer, lecturer, and community volunteer training program for community facilitators 4 sets. Students and Youth Trainers trained and conducted health education in their communities a time per month performance showed that the Montreal community. Create a truly participatory network. The division of roles between the aptitude with emphasis on working together as a team, as a group with technical aptitude and academic content to deliver lectures at the event. As a group, the dominant practice. Serve as mentors to train the buoyant. Volunteer team coach Methods of teaching methods that focus.

Shouting for help Send a cast of a floating island floating in the water to help people and not stand or fall with the rope to pull up. Which helped not going overboard. Reduce the risk of drowning in water. Teaching health education and skills to survive from drowning in school. Child development centers and in the community of 1-month results from the study. Students can reduce deaths from drowning, since the year 2556 to the present. No children died from drowning.

The measures and guidelines for the prevention of children drowning in the context eyes light district area clear target. Consistent with the community is managed to ensure a safe environment, such as a fence off a placard warning that can be seen clearly. And conveys the horror of drowning victims are invisible, like build shrines around the pool. Owners share responsibility for water resources management. A network of child drowning prevention eyes light district. The expertise and know the coordinates of the eyes light district. Access to the scene to help people drowning in a timely manner. The lessons learned is to provide knowledge to the children, parents, child care is very important. Because knowledge is the basis of behavior. When people have the knowledge and Thus began the practice of floating Survival skills Water Safety and Rescue focused on applying the knowledge and skills to throw out such details. Need to manage environmental risks to safety. Child drowning prevention fails to accomplish alone. Require a strong network and are ready. Network in the area is very important.

Many people in the community Knowing the coordinates in the area When the alarm is able to help quickly. But that is the problem. The person who finds the first non-Wikipedia community trained hard, but the general public. Can resuscitation immediately. This will take this issue further development in the future. By increasing knowledge The initial resuscitation to the public. When people know Are ready to help people drowned. Can resuscitation at the scene immediately. Gives the number of children died from drowning reduced or no deaths from drowning again.

The network protection of children drowning Tabaot is evaluating to ensure team-destruction (team protect a child from drowning) Gold Class field Nakonchai Burin, and in 2558, has expanded operations to the district side 2. in order to reduce deaths from drowning of Prasat to zero.
Establishment of public aquatic facility safety standards in Kenya

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Over the years aquatics related activities have become popular recreational activities, more people are engaging in activities in and around water with this has risen drowning cases.

The trend toward aquatic activity generated a new awareness of water fun safety for all ages groups. Swimming pool hygiene and safety has been a great concern to many who uses pools facilities in Kenya.

Properly trained individuals are therefore needed to supervise and guard activities.

Aquatics knowledge and understanding are primary for preventing an accident that could lead to a drowning. Every owner of a public facility has an obligation to provide a safe environment for every user of the pool.

Public aquatic facilities operated without any established standard with no control from regulating authorities for years until late this year when the Kenya Bureau of Standard-KEBS established the Kenyan standard on public aquatic facilities-guideline for safety.

This process was initiated by Kenya lifesaving Federation-KLF submission of its 2008-2012 research papers recommendation on health and safety standards of aquatic facilities in Kenya by 2013.

Finally there is a light at the end of the tunnel as Kenyan standard on public aquatic has been established and gazetted as law of the republic on Kenya.
Sports strategy of the Portuguese lifesaving federation, based on water safety education, uptake and preparation of lifeguards

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Having started his sport activity in 2009, the Portuguese Lifesaving Federation (FEPONS) created a sport strategy that uses aquatic lifesaving sports as a mean to an end: water safety education, the uptake of lifeguards (LG) and the preparation of LG.

Annually organizing three national championships of aquatic lifesaving sports (beach, junior and swimming pool), FEPONS sports strategy is based on the three mentioned areas.

With regard to water safety education, is required, in the junior competition for those under 18 years, that all athletes have previously attended a junior LG program. These programs are public education projects, where is taught to young people across the country: aquatic prevention, water rescue technics, basic life support and first aid, through local LG associations. These programs have a strong educational component, but also a lot of fun, with plenty of other complementary activities.

This first axis leads to the second, the uptake of LG, since most of the young people who attend the junior LG programs, after completed 18 years, join a LG course. In addition, the participation of young people in junior national aquatic lifesaving championships increases their willingness to be LG, as these events create a culture of mutual support, friendship, fellowship and fun. Thus the LG training courses have increased by young candidates, which many of them have prior junior LG certification.

Finally, FEPONS requires to an athlete, that to participate in a senior aquatic lifesaving championship (beach or swimming pool), mandatory they must have a LG course and must has served the profession. The aquatic lifesaving championships, performed before the bathing season (April / May) and autumn (October / November), will prepare the LG for their activity on beaches and swimming pools.

With this sports strategy, the water safety education, the uptake of LG and the preparation of LG, are ensured, always taking the sport as a theme.
Reconceptualising the Drowning and Injury Prevention Strategy for aquatic risk management

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Poster Session 1, Poster Foyer, November 4, 2015, 9:00 AM - 5:15 PM

A new conceptual Drowning and Injury Prevention Strategy has been developed to guide evidence-based aquatic risk management across New Zealand's water safety sector.

Drowning is the third highest cause of unintentional death in New Zealand (1). Territorial authorities, water safety service providers, and other stakeholders invest significant resources into strategies to reduce the incidence of drowning and injury in aquatic environments. However, numerous drownings and non-fatal incidents continue to occur around the country every year, and further work can be done to reduce the risk of drowning and injury as far as practicable.

The Drowning and Injury Prevention Strategy has been developed to provide a risk management framework for water safety practitioners, and is aligned to best practice risk management principles (2). It is recommended as the lead strategy for aquatic risk management in New Zealand. The strategy draws directly from the evidence and experience collected throughout Surf Life Saving New Zealand's aquatic risk management projects.

Six overarching factors that lead to drowning and injury in aquatic environments have been identified, and as such there are six corresponding strategies which can be applied to manage the risk, and therefore the incidence of drowning and injury. The six risk factors are: (i) exposure to the hazard, (ii) ignorance or misunderstanding of the hazard, (iii) disregard for the hazard, (iv) inability to cope when exposed to the hazard, (v) lack of surveillance or advice when exposed to the hazard, and (vi) inability to affect a rescue prior to succumbing to the hazard.

The first corresponding strategy that is to be employed when managing the risk of drowning and injury is (i) eliminating or isolating the hazard. Where the hazard cannot be fully eliminated or isolated, the following additional strategies should be considered: (ii) increase awareness and understanding, (iii) legislate, monitor, and enforce, (iv) enable and equip, (v) increase supervision and surveillance, and (vi) increase efficiency and effectiveness of response.

The Drowning and Injury Prevention Strategy is recommended as the central rationale for the aquatic risk management process, and is being applied in the management of coastal, river and inland waterway environments in New Zealand. It ensures that all elements of risk in the aquatic landscape are duly considered and addressed in the risk assessment reporting and implementation process.

References
New science on boating behavior and risk

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Background
Recreational boating presents a unique injury setting where, in addition to common injuries such as falls, burns and cuts, boaters are also at risk from asphyxia, submersion, and hypothermia. In 2012, the United States Coast Guard reported 4,515 recreational boating incidents involving 651 deaths, 3,000 injuries and $38 million dollars of property damage. We present recent findings on boating risks and safety to address this public health problem.

Methods
Four studies were conducted to assess boating safety in Washington State.
2. Study B: Qualitative study among boaters that explored life jacket use by adults and children.
3. Study C: Cross-sectional survey examining barriers to life jacket use among adult recreational boaters.
4. Study D: Statewide observational survey of boaters.

Studies A, C and D used robust Poisson regression to estimate risk or prevalence ratios and 95% confidence intervals. Study B used grounded theory methods to develop themes.

Results
A) Boating fatalities were more likely if boaters did not use life jackets, if alcohol was present and in non-motorized boats. B-D) Children were more likely to wear life jackets if adults wore them. C) Low adult life jacket use was associated with any alcohol use, perceived swimming ability, and the perception that life jackets were uncomfortable.

Conclusions
Proper adult role modeling, the design of more comfortable life jackets and boater education classes are effective strategies for increasing life jacket use among adults and children. As has been done with seat belts and bicycle helmets, the passage and enforcement of life jacket legislation for teens and adults on high risk waterways is likely the most promising approach for prompting this behavior change. The collective impact of these related studies in an understudied area of injury research informs next steps for boating injury prevention.

Learning Objectives
Participants will learn 1) key risk factors for boat-related injury and death, 2) risk perception and behavior of life jacket wear, 3) policy, program, education and media implications of key findings.
Can you really swim? Study

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Background
Drowning is the second leading cause of unintentional injury death among U.S. children. Multiple studies have shown decreased drowning risk among children who possess some swimming skills. Current surveillance for this protective factor is by self- or proxy-reported swim skill rather than observed in-water performance; however, research has not validated either a child’s self-report or parental report of children’s swim skill.

This study evaluated whether children or parents can validly report a child’s swim skill. It also explored which swim skill survey measure(s) correlate best with children’s in-water swimming performance.

Methods
This cross-sectional study was part of a CDC epidemiological response, to assist the Washington State Department of Health and Seattle Children’s Hospital in reducing unintentional drowning among children. Child/parent dyads (N=482) were recruited at 3 community pools. Pairs of interviewers administered surveys separately and simultaneously to recruited parents and children aged 7-17 years. Surveys covered socio-demographic data about the child, parent and family, and 4 child swim skill measures: “knowing how to swim” (yes/no), “ever taken swim lessons” (yes/no), “perceived swim skill” (4 point scale), and “comfort in water over one’s head” (4 point scale). Agreement between self- and parental-reports on children’s swim skill measures were assessed via paired analyses. Reported swim skill was validated by a lifeguard-administered voluntary in-water swim test.

Results
Of the 586 eligible dyads approached, 82% agreed to participate resulting in 482 child/parent dyads. Most children (65%, n=305) took the swim-test; 85% of them passed. We found agreement between the child’s and parent’s answers for their children when asked the following swim skill survey measures: “ever taken swim lessons”, perceived “good swim skills”, and “comfort in water over your head”. Correlation analyses showed that reports of perceived “good swim skills” was the measure that most strongly correlated with passing the in-water swim test, best when the parent was the informant (r=0.28, p<0.0001; child-informant r=0.20, p=0.0001). This correlation was strongest when parents also reported that they were not comfortable in water over their head (r=0.41, p=0.01). Reported history of a child ever having taken swim lessons was not significantly correlated with passing the swim test.

Conclusion
This study is the first to compare self-and proxy-reported data with actual children’s swim-test results. Findings suggest measures such as perceived “good swim skills” and “comfort in water over your head” can be validly reported by the child and the parent. While a more comprehensive study is necessary to confirm results, validated surveillance measures will enable more effective monitoring of the prevalence of swim skill as a protective factor in drowning prevention. For instance, learn-to-swim programs and public health practitioners can use these measures to more accurately and easily assess swim skill in the population. Lessons learned from this study can also assist pool operators to develop standardized programs to consistently assess children’s swim skill.
Immersion deaths of indigenous peoples in Canada – epidemiology, culture, prevention

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Background
Indigenous peoples in Canada live in a mix of rural and urban areas. Open bodies of water are often essential for subsistence and recreational transport, fishing, and hunting. Activities in or on and around water are frequent. Death rates are several times higher than the national average.

Objective
Prevent immersion deaths by implementing evidence-based interventions for main activities and risk factors in culturally appropriate and effective programs.

Methods
Annual Red Cross collection of 1991-2010 Canadian coroner data by structured questionnaire. Analysis included activity, purpose, personal, equipment, environment factors, and trends. Cultural factors pertinent to interventions were assessed by literature reviews, including anthropological surveys. Interventions were developed based upon risk factors for main activities, cultural values, and practical considerations. Logistic regression was used to assess flotation device wearing, controlling for other variables.

Results
Surveillance identified 1213 immersion and 27 trauma deaths. Boating including transport, fishing, and hunting accounted for 37% (n=444), non-aquatic activities such as walking or playing near water and on ice for 21%, aquatic activities such as swimming or wading for 17%, land ice and air transport for 17%, bathing for 3%, and unknown 6%. 52% of deaths involved recreational activities, 34% daily life/subsistence, occupational 4%, rescue 2%, other 1%, and unknown 8%.

Main risk groups were males 15 years and older, 73%, and 1-4-year old children, 9%. Swimming ability was reported for 26% of victims 5 years and older, including 23% non-swimmers, 12% weak, 45% average, intermediate or unspecified ability, and 6% strong. Alcohol was a factor for at least 60% and illegal drugs in 10% of victims 15 and older. Rivers and often current were a factor for 35%. For children 0-9-years old, 73% died in the absence of adult supervision.

Death rates were similar from east to west across the country, but much higher in northern territories. Boating death rates fell from 4.9 to 1.2 per 100,000 population per year between 1991-1995 and 2006-2010, less so for other activities, for which deaths fell during the first decade but not the second. Main risk factors for boating victims included non-wearing of flotation devices, with only 5% wearing and in 40% no device in the boat. Logistic regression showed 68% (p=0.000) reduced odds of properly wearing flotation, compared with non-aboriginals. Among 0-14-year-olds, 44% of known ethnicity were aboriginal, 0% wearing, others 33%; no aboriginal youth wore PFDs, others 13%.

Capsizing, falling overboard, and swamping accounted for 75%. Waves and wind, together with cold water and other cold factors were frequent. For aquatic activities, 15-40-year-old males were the main victims. Non-aquatic deaths mainly involved 1-4-year-olds and ≥15 males. Rivers were the most frequent body of water. Ice transport victims were predominantly ≥20-years-old males using snowmobiles, while both males and females ≥15 and older were victims of on-road deaths. Ice transport deaths mainly occurred in the flatter central and Prairie Provinces and northern territories. Most road transport immersions were in the Prairies.

Implications for Policy
Surveillance suggests that raising swimming ability and ability to survive in currents, especially for males, and reducing alcohol and illegal drug consumption among adult males would be helpful in averting immersions for all water-related activities. For children, especially 1-4-year-old toddlers, constant adult supervision by families, and/or development of community nurseries, should be ensured.

Internationally, mandatory flotation wearing with enforcement has been the most effective boating safety intervention, as in Victoria Australia where deaths averted exceeded predictions. Enforcing wearing should be less invasive and faster than observing presence. Hence, during boating and also snowmobile travel over ice, wearing of a flotation device at all times by adult males is essential and is being encouraged by programmatic activities, which should be reinforced by legislation and enforcement and other measures. Supplementary cold protection garments would often be indicated as well. Culturally sensitive and effective safety promotional measures are being implemented and assessed for main activities and risk groups.

Acknowledgements
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Pool water safety signage – A Brazilian proposal

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Background
Pools are not the riskier aquatic scenario for drowning deaths in Brazil, but are responsible for 53% of the drowning deaths of children aged 1-9 years old. Brazil has an estimated 1,7 million pools with an associated estimated risk of 1 death per 639 pools, considering a pool lifetime of 20 years. This confined and built for fun environment is an unexpected drowning location for most people, although any pool death draws great media attention since it affects specially children. Despite of being reported has having good knowledge of swimming, 15-20% of all children drowning deaths were caused by trapping at the suction systems.

This particular characteristic needs to be considered when educating people on drowning prevention. This research aims to review all water safety signs used and create specific signage for pools. We also intend to collect feedback from the conference audience for improvement.

Methods
We started by reviewing the ISO 20712-1:2008 (water safety signs and beach safety flags, Part 1: Specifications for water safety signs used in workplaces and public areas) which recommends water safety signs intended for use in association with the aquatic environment. The document is intended for owners and operators of aquatic environments and for signage and equipment manufacturers/sellers. However, it is not directed specifically to pools. Proposed shape, color and design criteria were based on ISO 3864-1-3. According to ISO, signs require that supplementary text should be used together to improve comprehension. 10 Brazilian pool lifeguard experts reviewed all existing pool water safety signs and gaps, through a Delphi process in 4 rounds. They've looked for important and absent messages or signs, based on ISO and on Brazilian pool water safety recommendations.

Results
Signage was classified by contents in 5 different levels: Important general information, prevention (green colored square), warning (yellow colored triangle), danger/prohibition (red colored circle) and first aid information. Important general information depicts 3 different big signs at pool entrance, containing messages regarding prevention, warnings and dangers at the pool, the drowning chain of survival with all 5 steps and the main 5 tips of a pool safe. All other signage is to be used at a specific location at the pool when appropriate and are smaller in size. Proposed prevention signs are 3: Lifeguard on duty, lifesaving buoy available here, and special pool access for elderly and handicaps. Proposed warning signs were 6: sudden depth, slippery area, deep area, strong current, floor step, stop pump button. To sign Dangers/prohibitions 4 proposals: No lifeguard on duty, no diving, no pushing or diving play, no swimming. And finally, 3 first aid signs were proposed: depicting the emergency phone number, first aid kit and External Automatic Defibrillator locations. A rationale was also included in the signs targeting education and more compliance. All signs were design in a fun and attractive way using a lifeguard cartoon character. All water safety signs produced are available at http://www.sobrasa.org/sinalizacoes-em-piscinas/

Conclusion
Pool water safety signage is an important tool for education and trauma and drowning prevention at clubs, gyms, hotels and swim schools. It reduces the owner's liability by giving the user a co-responsibility of being pro-active and allows lifeguards to base their warnings in written criteria posted in plain sight.
Water safety certification for swimming pools – A new Brazilian proposal

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Poster Session 2, Poster Foyer, November 5, 2015, 9:00 AM - 5:15 PM

Background
Brazil has an estimated 1,7 million pools with an estimated associate risk of 1 death/639 pools, considering 20 years the average lifetime of a pool. Currently, high standard services are considered a way to better target customers. Tourism was among the first to classify their level of comfort, safety and hospitality by categorizing their hotels from 1-5 stars. Sadly, water-safety, an important segment of this model, has not received the attention needed.

In 2005, SOBRASA created a water safety certification program for pools, using a set of qualifying criteria for hotels, water parks and condominiums; aiming to reduce accidents in and around pools by providing a list of required behaviors and actions for owners/managers, pursuing the water safety quality certification. Back then, 3 certification possibilities were awarded based on the level of efficacy within which the evaluated locations reached a minimum of criteria requested in the evaluation form.

Certificates were divided in Bronze(80%), Silver(90%) and Gold(100%), based on the fulfillment of 50 evaluation items, encompassing general aquatic safety facilities, quality of medical assistance, lifeguard assistance, lifesaving and medical essential equipment, emergency communication system, lifeguards’ working protocols, and lifeguard water fitness and professional skills. From 2005-2011, only 4 pools managed to obtain certification, all Bronze, due to difficulties regarding the large number of items that institutions had to comply. The program was updated to a simpler version detailed below http://www.sobrasa.org/piscinasegura-academias-clubes-e-piscinas-coletivas/

POOL+SAFE campaign was created focusing on 5 messages:
1. Pay 100% attention to your child; be at an arm distance, even when a lifeguard is on duty.
2. Occlude the access to pools using fences and self-locking gates.
3. Ought to learn how to act when a drowning happens.
4. Lifeguard on duty – all the time in collective pools.
5. Suction – Avoid it – Provide ways to turn off the pump while using it and have an anti-hair drain.

The program uses an impacting motto. “The POOL+SAFE campaign draws your attention to 5 steps that may change the future of our children by increasing the safety of your pool. By simply using the word “POOLS” you can easily recall how to vaccinate your pool against drowning giving 95% of protection to your child with one shot.”

POOL+SAFE alliance was created involving 18 governmental and non-profit organizations: health-related, swimming federations, pool manufacturers, Fire Department, Physical Education Councils, children safety institutes and Portuguese Lifesaving organizations.

The Program changed its target to clubs, gyms and swim schools, usually managed by a swimming teacher, who might be more aware of the need for water-safety and be an easier way to proliferate the message.

A 3-phase access was designed to make adherence to the certification program easier: 1st – An invitation to join the POOL+SAFE campaign was sent to target institutions which only had to comply with one item and host a commemorative week to disseminate safety tips; 2nd – SOBRASA offered for free a 5h online educational course on water safety for all employees of the institution, and a pool qualification support for the owners; 3rd – The institution complies with the 5 mandatory items and requests formal certification. This is the only part that has costs to cover a certification Kit (banners, stickers, comic books, magnets, t-shirts, and plate). Certification allows the use of SOBRASA’s logo in their establishment as well as on lifeguards uniforms. Certification is valid for 2 years and can be announced in any place.

A death in a swimming facility discredits the institution and the socio-economic load is extremely high. Therefore, managers of aquatic facilities should acknowledge the water-safety certification extreme value not only for the safety but also for the business.
An Effectiveness Survey Study of Marine Safety Experience Education Program in Reducing Vessel-Related Fatality

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Poster Session 2, Poster Foyer, November 5, 2015, 9:00 AM - 5:15 PM

Korea nowadays puts emphasis on safety to save people’s lives. Due to frequent exposure to hazard with economic growth, fatal accidents become enlarge and diverse. Because people are lack of sense of safety, these accidents consistently happen. We must need a sound safety awareness and rapid action after the accident in order to safely cope with the disastrous emergency. Korea began to pay more attention to disasters since the tragic sinking of the Sewol ferry on April 16, 2014, which led a lot of passengers to death.

Therefore, it is urgently required to establish countermeasures which contain safety and experience education facility as well as training programs so that people can deal with dangerous circumstances without embarrassing and have the sense to make correct judgment by experiencing such programs. The present study establishes a response-strategy model for the risk management on fatal loss by vessel-related fatal accident, focusing on the preparedness of the disaster management system.

We accomplish a survey study on the risk reduction effect resulted from the Safety experience education program. Based on the result of survey, we assess the risk reduction effect of education program through the imaginary contingent methods (1). The risk reduction effect is evaluated by Yang’s approach (2). The survey is to done by a questionnaire. Korea Coast Guard Academy in Yeosu, in collaboration with Sea Explorers of Korea, is planning to run ‘camp to sea’ this summer to carry out emergency response training. Therefore, the present study is to be conducted through a survey of the institute participant.

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References
Drowning prevention measures directed at a river basin: a new strategy

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Introduction
Drowning kills many young and healthy people who are at the peak of productivity, leaving behind broken families. In 2012, 6,369 people (3,3/100,000 inhabitants) died by drowning (SOBRASA, 2014). Understanding this dynamic and knowing the drowning profile is very important to develop the best preventive measures. In this study we’ve considered drowning deaths as a sustainable development indicator in the river basin. River basins, separated by watersheds represent the geographical catchment area of a key resource for human life – water. This feature is a strong attraction for many types of activities such as irrigation, recreation, navigation, energy, housing and others. In light of the above, the availability of water as a resource facilitates the occupation of the river basin practically throughout its all territory, fact that in general, is defined by high population density rates. River basins constitute themselves as a socially constituted strategic place for planning drowning prevention actions.

The State of Paraná has 399 municipalities, totalling a population of 10,439,601 inhabitants (IBGE-2010).

Objective
Implement a preventive campaign according to characteristics of drowning in the Paraná’s River Basin III with an emphasis on education, development and sustainability, articulated with teams of environmental educators working in this region that serves as a reference for other regions of Paraná.

Methods
For this study we analysed the drowning data for Paraná State, focusing on the Paraná’s River Basin III, retrieved from the occurrences record system of Paraná’s Fire Department (SISBM), and the number of drowning deaths retrieved from the National Health System Database (DATASUS), for a 3 year-period (2010-2012).

Between 2010 and 2012, 1,043 people from Paraná drowned to death (3,32 deaths/100,000 inhabitants in the state), representing an average of 347 people/year. The majority of deaths (62%) registered in DATASUS was attended by teams of Paraná Fire Department (n=650) and this was the sample used to assess the drowning profile and the death classification among the 16 river basins (SCHINDA, 2013). Paraná River Basin III has an average of 26,33 drowning deaths per year, being the 7th river basin with highest number of drowning deaths in the state of Paraná - rate of 4,01/100,000 inhabitants. The main activity immediately prior to drowning was bathing/recreational swimming (49,05% of all cases) and the prevailing locations were river rapids (35,85%), followed by dams (32,08%). The precipitating cause of drowning deaths was related with problems during swimming in 36% of all cases.

Results
Based on the knowledge and analysis of the causes and of the drowning profile described for this specific basin we’ve listed the priority preventive measures:
• 100% attention to children supervising them at an arm distance;
• Do not drink alcohol before bathing/swimming;
• Always wear a lifejacket when boating and while engaging in adventure aquatic sports;
• Do not go into dark and unknown waters;
• Use floating materials tied to a rope to help someone in danger of drowning;
• In rivers and dams always wear a lifejacket;
• Do not get into river rapids;
• Encourage learning how to swim;
• Never go beyond waist height;
• Do not overestimate your swimming ability.

Conclusions
With the results of this research it was possible to understand the drowning problem in the region and through this evidence we have developed a training course for Environmental Education Managers, to disseminate the preventive recommendations in the 29 municipalities of the Paraná River Basin III.

References
Thermal perceptions and breathlessness on cold water immersion; could these sensations drive instinctive behaviour?

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Introduction

Accidental cold-water immersion (CWI) elicits the life threatening cold shock response (CSR). The CSR peaks in the first few seconds of immersion and subsides within 3 to 5 minutes following which an exit strategy may be sought. In these early minutes the current advice is to ‘float first’ and remain stationary. This advice conflicts with the behavioural instinct to commence exercise (i.e. swim/kick your legs) to reach safety. This study aimed to establish whether perceptions of thermal sensation (TS; i.e. how hot/cold or neutral an individual feels), thermal comfort (TC; i.e. how pleasant the thermal environment feels) were consistent with the behavioural drive to either remain stationary or commence exercise to immediately reach safety.

We hypothesised that: CWI would induce cold sensations, thermal discomfort and breathlessness (H1), that exercise after water entry would exacerbate these sensations (H2) both by contrast to warm water immersion (H3).

Methods

Seventeen participants consented to the study (9 males, 8 females); mean [SD] characteristics were: age 21 [3]yrs; height 1.71 [0.01]m; mass 70.9 [10.1]kg. They visited the laboratory on 3 occasions. All immersions were to the same depth, duration (5-minutes), at the same time of day, and were completed in a bathing costume. Test conditions were i) a resting warm water immersion (34.7 [2.6]°C), ii) a resting CWI (12.2 [0.5]°C), a CWI (12.1 [0.5]°C) where light exercise (leg kicking/treading water; 80 bpm-1) commenced 30-seconds after water entry (CWI-K). Perceptions of thermal sensation, thermal comfort and breathlessness were measured on a 13-point (1-unbearably cold, 13–unbearably hot), a 7-point (1–extremely comfortable, 7–extremely uncomfortable) and an 11-point categorical scale (0–not at all breathless, 10–extremely breathless) respectively. Perceptual responses were taken pre-immersion and after 1, 3 and 5-minutes. Mean [SD] data were compared between condition using ANOVA to an alpha level of 0.05.

Results

Prior to water entry, irrespective of the water temperature, the participants were (grand mean [SD]) not at all breathless (1 [0]), felt thermally neutral (7 [0]) and were thermally comfortable (2 [0]); with no difference between conditions. After warm water immersion participants remained not at all breathless (1 [1]), became warm (9 [0]) and remained comfortable (2 [1]); no difference within condition across time. In the CWI and CWI-K conditions the participants became significantly more breathless (after 1 minute CWI: 5 [2] and CWI-K: 5 [2]), became thermally cold (after 1 minute CWI: 3 [1] and CWI-K: 3 [1]) and consequently they became uncomfortable (after 1 minute CWI: 5 [1] and CWI-K: 5 [1]). These subjective responses were retained throughout the remainder of the immersion and were not different between CWI conditions but differed significantly from the warm condition.

Discussion

Two of our hypotheses were supported in that both CWI conditions induced breathlessness, cold sensations and thermal discomfort and by contrast to the warm condition (H1 & H3). Yet, the exercise (leg kicking) did not exacerbate these sensations theoretically by increasing convective cooling across the skin surface increasing skin thermoreceptor activation or by increasing oxygen demand to drive ventilation; H2 is therefore rejected.

Very light exercise in the form of leg kicking (i.e. treading water) did not exacerbate or improve the perceptual sensations that are likely to drive behaviour on accidental CWI. Hence, leg kicking is a suitable survival strategy after water entry to keep the airway clear of the water (i.e. maintain freeboard) whilst cold shock subsides following which an exit strategy could be sought. However, this must be balanced the likelihood that exercise increases cooling rate so, where possible, limb movement should be limited to the legs and at a very low intensity.

References available on request.
IT tool for measuring the effectiveness of preventive measures

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Poster Session 2, Poster Foyer, November 5, 2015, 9:00 AM - 5:15 PM

Background
The project "Schools promoting health in West Pomerania Province" [Zachodniopomorska sieśzkół promujących zdrowie], in cooperation with the Chief Education Officer of West Pomerania Province, included the creation of application measuring the progress of the project. The assumption of the IT project implementation was a continuation of prevention in secondary schools by the newly formed WOPR Youth Teams. Thanks to the project, WOPR WZ [Volunteer Water Rescue Organization of West Pomerania Province] has been provided with an information system: wwwprofilaktyka.wopr.szczecin.pl, which was extended to other educational projects.

Designed system is naturally divided into three parts - modules:
• New Report
• User Control Panel
• Administration Panel (for the WOPR WZ office support)

In the New Report module the program offers easy to use preventive reporting instruction, taking into account:
• details of the person certifying the implementation
• contact details of the place of implementation
• information about the action (including the name of the project)
• participants
• the number of trainers and participants
• the date and duration of the meeting

The package enables the registration and control of research, and the creation of a uniform and common archive of reports and documents, giving the ability to conduct effective and comprehensive supervision over collected, processed and available data.

User Control Panel module is designed to archive preventive reports added by the action initiators: macro-regional coordinators, WOPR instructors, WOPR rescuers, volunteers and teachers.

The software creates an integrated information system collecting information from all districts and cities in West Pomerania Province about first aid trainings.

The Admin Panel includes the following names of the projects:
• Project of the Regional Education Authority
• Prevention outdoors
• Prevention of addiction
• Project Voivode
• Project Safe City
• Project Blue Patrol
• Project of the Voivodship Fund for Environmental Protection and Water Management
• Prevention in the bathing area
• Project of the Regional Education Authority for primary schools
• Project of the Regional Education Authority for secondary school
• Project of the Regional Education Authority for upper secondary schools

The results of preventive actions with the possibility of marking the date (year and month) are prepared using the following indicators:
• WSO – District performance indicator
• WAI – District activity chart
• WUP – Chart of the project participants
• WSP - Trainer performance factor
• Activity chart of individual groups of participants

In the software it is possible to present pie charts on a percentage scale of completed actions with the name of the project and the region, in which it was implemented. The system is designed to ensure full and effective control over the functioning of preventive actions in West Pomerania Province, to provide reliable statistical information on the number of persons covered by the prevention, and to disclose information about the results to competent authorities, institutions and research units.

The computer system has been designed to improve prevention by increasing the level of safety, especially in education facilities, through the creation of a comprehensive and integrated system of collecting and processing data from all preventive actions.

This application allowed for better control over the project implementation in the West Pomerania Province, enabling WOPR WZ to accomplish and finish its task in a short time. The creation of the project website increased access to information about the project, and contributed to further expansion of the project in terms of promoting activities in educational institutions.

The full text will include preliminary results related to the functioning of the application in the first year of use.
Khanongpra safety concern not drowning

Kheatniyom Kwanjaiphutthisa
1Khanonghra Subdistrict Administrative Organization, Packchong, Thailand

Poster Session 2, Poster Foyer, November 5, 2015, 9:00 AM - 5:15 PM

Background
Khanong Phra Sub-District, Pak Chong District, Nakhon Ratchasima Province is the area that has Lam Takhong River flow through the center of the area, which is mostly agricultural. It also has canals and wells dug to use in agriculture. According to the information in 2013 - 2014, found that 6 people had drowned in the area comprise 2 monks, 2 general people and 2 children (under 15 years old).

Objective
To reduce deaths from drowning in Khanong Phra Sub-District.

Methods
Khanong Phra Subdistrict Administrative Organization (SAO) has performed to prevent drowning by swimming course training to survive by the team of trainers from Nakhon Ratchasima Provincial Public Health and Marine Rescue Volunteer (Hook 31) to be the main trainer in the area. This makes Khanong Phra Sub-district has the core trainer team and volunteers who can connect with other organization in Pak Chong District and other areas.

To prevent the drowning, Khanong Phra Subdistrict Administrative Organization has promoted the campaign to show the importance of the issue by the public media to create the awareness for the teachers and staff of Child Development Center to monitoring the areas that have the risk of drowning in Khanong Phra Sub-district, labelled the aid procedure and equipment by using the local resources in the community that are easy to find and have to ensure that the equipment is always available, and they also have to practice how to prevent drowning, consist of the skill training to help people (shout, cast, filed), cardiopulmonary resuscitation (CPR) and buoyancy in the water. All of these practices were taught by the trainer team of Khanong Phra Subdistrict Administrative Organization and will be extend to educate students in Khanong Phra Sub-district and schools or other organizations who are interested.

Summary of Operations
Attention for prevention of drowning of all units is a critical factor in the ongoing success. Although the Community operation will start from a team of volunteer networks, but it can extend the performance to organizational units and other areas that affect the overall operation of the area as well.
Evaluation of Measures for the Management of High-risk Water Sources in Communities for Child Drowning Prevention in Thailand

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Poster Session 2, Poster Foyer, November 5, 2015, 9:00 AM - 5:15 PM

Background
In Thailand, drowning is the number one cause of death among children under 15 years of age, whose drowning death rate ranged from 7.6 to 11.5 per 100,000 child population between 2004 and 2013. Of all child drownings, 49.4% occurred in natural water settings that are numerous in rural areas. Due to state budget limitation, the measures for community's management of high-risk water sources involve only the installation of warning signboards and easily available water safety devices rather than installing fences around such places or standard water-safety devices.

Objective
To evaluate the measures for the management of high-risk water sources in communities by installing warning signboards and easily available water safety devices for child drowning prevention.

Methods
This evaluative research was conducted in two types of communities: one with the installation of warning signboards on water safety and advice for assisting drowning victims and making simple water safety devices that could be acquired in the community such as empty plastic 1-gallon containers, empty plastic water bottles, long sticks, and ropes, and the other without any water safety signboards or devices. Data were collected using a questionnaire and an interview form, and then analyzed to determine percentages and standard deviations; and ANOVA was also performed.

Results
The residents in the communities with the water safety measures for high-risk natural water settings by installing warning signboards had a higher average score on knowledge, understanding, and perception about drowning risks than that in the communities without such measures. However, the difference was not statistically significant. In the communities with such measures, 68.75% of the people realized that warning signboards were useful for child drowning prevention, while 87.07% regarded the water safety devices as useful for reducing drowning risk – the difference being significant, compared with that in the communities without such devices. Both groups of people did not think that installing water safety devices increased child drowning risk, while only 41.39% thought that there was a possibility of setting up fencing measures for drowning prevention at the water sources in the community.

Conclusion and Discussion
The management of high-risk natural water settings undertaken by the community by installing warning or advice signboards and making available water safety devices made of locally available materials is regarded by community members as useful and effective in reducing child drowning risk. Thus, such an effort is considered as one measure for reducing the risk of child drowning. Even though fencing around all four sides of a water source will be an effective measure for child drowning prevention, such a measure is not feasible as natural water settings are large and numerous and a huge budget will be required. That is a constraint for developing countries.

Recommendations
In remote rural areas with a high incidence of drownings in natural water settings, the community should be encouraged to take part in conducting a survey and running a water safety management programme for high-risk water sources, using water safety warning signboards and devices made of locally available materials for drowning prevention.
Making Open Water Swimming Safe

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Background
In recent years there has been a growth in open water swimming in the UK, from unauthorised swims to mass participation events. Some events have been cancelled due to health and safety concerns while other well established events grow in popularity from year to year.

There are concerns over safety for various activities, such as:
• For individuals deciding they want to experience the freedom of swimming in open water, good pool swimmers are not necessarily safe in open water
• Groups training for the swimming leg of triathlons, swimming is quite often their weakest discipline
• People training for charity swimming and long distance events, this training may not be organised

This poster presentation looks at how we make open water swimming safe?

From taking part in various open water swimming events I have experienced the following compulsory safety measures:
• Wearing of wetsuits
• Wearing of tow floats
• Wearing of a ‘Restube’ (body belt with an inflatable tube and small CO2 cylinder to inflate in an emergency)
• Providing a medical certificate for fitness to take part in the swimming event.
• The organised events I have attended have also provided the following:
  • Spotters along the course
  • Support canoeists, body boarders and Stand Up Paddle boarders
  • Jet ski and RIB rescue craft
  • First Aid cover

From my above experiences you can see that organised events have been risk assessed and appropriate safety measures put in place, my concern is for the spontaneous and unorganised open water swimming that takes place, there are several websites dedicated to ‘wild swimming’. It is important to get the safety messages and supporting information about suitable attire and self-rescue to those who wish to participate in open water swimming especially if going off on their own.

How is the Swimming Teachers’ Association (STA) helping open water swimming safety?
• STA have produced a coaching programme to prepare pool swimmers before venturing into open water
• STA have just launched a rescue qualification for those involved with supervising open water activities
• STA’s new Junior Lifeguard programme includes open water swimming activities to introduce children to swimming outdoors safely
• There is a STA Safety and Management of Open Water Activities Guidance document that is freely available
• STA are developing a tow float aimed at safety, in two safety colours, one side for safe swimming turn it over to show you need assistance, plus a whistle to attract attention.
“Mae Shee Loy Nam” No more drown

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Poster Session 3, Poster Foyer, November 6, 2015, 9:00 AM - 5:15 PM

Background
How many classes our students can swim or float?

We all know that if they can swim they will survive. But we need times for teach them to swim, to floating, may be 20 hours to do that. In Thailand by our survival swimming curriculum we teach our student to float before swim, we teach them “Mae Shee Loy Nam“ (supine floating) then some of them can float in 15 minutes and not more than 3 hours to float.

So Thai children who learn survival swimming are safe from drown at the first lesson and we teach them with water safety knowledge to protect aquatic accident, self-rescue to save their life, water rescue: Shout, throwing and reaching and CPR for the intermediate and advance level.

Mae Shee Loy Nam need only 2 skill: lay on the surface of the water like on your bed, straight your body. When you in supine float you can breathe whatever you need, It’s very easy way to learn and short time to practice to survive in the water. “Floating before Swimming.”
Effective Prevention Measures for Reducing Drowning Cases in India

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Poster Session 3, Poster Foyer, November 6, 2015, 9:00 AM - 5:15 PM

Background
This paper aims to highlight the preventive measures to be stressed and worked upon to minimise the number of drowning cases in the country subject to swimming pool and allied areas, case study for India.

Furthermore, this paper also highlights on some of the modifications required in the existing techniques of contact rescue performed by a lifeguard (in a real time drowning case) with reducing his/her efforts significantly.

In the developing countries like India, where the equipments are not available in sufficient number, the technical skills to be imparted in a life guard is of paramount importance. Also, in a country like India the water awareness with respect to survival skills in water is very poor. Thus, adding to the hardships of the lifeguard while rescuing a drowning victim. This aspect again highlights the importance of imparting high quality technical skills in the lifeguard, so as to ensure the quality rescue.

Another, issue that attracts the attention being covered by this paper is the real or in practice work framework of an entrepreneur for the lifeguard also needs strong counselling and modifications to weed out the regulatory inefficiencies that make the rescue ineffective in many cases. This aspect also calls for the immediate and strong support from the various entrepreneurs who owns such facilities where drowning can take place.
Human Aquaticity - Definition of the term and its characteristics - Aquaticity Evaluation Test

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Introduction
Human beings originate from the liquid environment; the fetus grows in the amniotic fluid for nine months. After birth the human organism gradually loses the adaptations in the liquid element but during the terrestrial life these abilities can be developed again. Training in different water sports promotes physical and mental growth in all human essence. In this research we approach the term aquaticity, which is the capacity of a terrestrial mammalian organism to function and habitualise in the aquatic environment and we suggest a physical adequacy assessment test to evaluate the aquaticity level in humans.

The aquaticity test is composed by a series of aquatic tasks relating to abilities that the human body can develop underwater, such as: buoyancy, hydrodynamic position, underwater vision and orientation, neuromuscular control in the water, self-saving challenges, concentration and relaxation ability in the water, breathe hold etc.

It is an easy and user friendly test which can be performed in any swimming pool without a need for highly trained staff and specialized equipment. This test is a useful tool for the implementation of an intervention program for enhancing “Aquaticity” in all kind of water activities.

Aim
The aim for the current review is to attempt to define the term aquaticity, present the factors that describe it and reveal the form in which it could present itself in lifeguard training.

Based on the literature, popular sports culture and our interactions with the diving community it became clear to us that while aquaticity is indeed a term used among divers, swimmers, to describe how ‘comfortable’, ‘efficient’, or ‘successful’ is one athlete during water immersion etc., aquaticity has not been clearly defined in the scientific literature nor is it used to scientifically describe ‘ability in water’. This poses a problem as often coaches, trainers and athletes refer to levels of aquaticity expressed through their empirical observations or expressions of personal experiences. Moreover, as water activities are used in special needs education and rehabilitation/therapy settings, it became evident that there is a need to address the term and place it in a scientific context.

The benefit will be that we will set a basis for describing ‘ability in water’ and that will allow for devising a test to objectively evaluate it, and thus support the needs of various populations engaged in water activities such as lifeguards.

Aquaticity for us does not describe a ‘vague’ relationship between humans and water.

We propose that it is a performance attribute that can be evaluated and improved upon with various interventions. Our purpose is to clarify and define the term as “a water performance” attribute the capacity of a terrestrial mammalian organism to function and habitualise in the aquatic environment. If we achieve this then not only communication among sport scientists, coaches, physical therapists, and water safety educators will be greatly improved – but also communication among other disciplines such as biologists, physiologists and anthropologist.

Methodology
A review of the literature has been conducted using anecdotal reports from the World Wide Web and forums as well as scientific articles and books from databases on issues related to aquatic sports.

Conclusions
Aquaticity offers the characteristics that we need in order to function within water. The meaning of the term aquaticity is closely related to lifeguard training goals.
Drowning Prevention

Felix Uzor
Felix Fitness Foundation

Poster Session 3, Poster Foyer, November 6, 2015, 9:00 AM - 5:15 PM

Background
Ghana is going through an epidemiological transition. While malaria, cholera and maternal health are the main causes of death, non-communicable diseases and accidents are rapidly increasing. One of the major causes of death which has received little attention as compared to other accident related deaths in Ghana is drowning. It is estimated that about fifteen people die a week from drowning in Ghana.

Even though drowning claims about 372,000 lives globally each year, according the World Health Organization’s report 2014, drowning prevention is possible and that is what Felix Fitness Foundation seeks to attain. Felix Fitness Foundation is a Non-Government Organization that has been supported by Reach for Change and Tigo in the past and currently the Royal National Lifeboat Institute to reduce and prevent drowning in Ghana. It has worked with schools, communities and individuals across Greater Accra the capital of Ghana and Western Regions to raise awareness on drowning prevention and to educate children on what to do in an emergency.

The strategies Felix Fitness Foundation uses in drowning prevention are mainly, education, training and lifeguarding. For the past three years, we have trained over 5000 children in drowning skills, educated over 3 million children and adults on drowning prevention through media and personal contacts, trained 100 young ambassadors who also share knowledge on water safety in their schools, trained 50 young people as junior lifesavers in practical aquatic lifesaving skills and lastly over 200 lifeguards.

This year, we seek to educate 26,000 more children in both schools and communities around James Town, Osu and Labadi, all in Accra. People in these communities depend on the ocean, rivers and lakes for their livelihoods hence they are more prone to drowning. We also intend to train 400 junior lifesavers and 200 lifeguards as well as 200 teachers to continue the drowning prevention programme for sustainability.

There is however no longitudinal data in Ghana that shows the number of reported drowning deaths in the country. This makes impact assessment of the project very difficult but not impossible. Felix Fitness Foundation started collating annual data on drowning cases since 2012, and has recorded about 1000 deaths. We wish to make our organization an official centre for collating drowning statistics with much emphasis on the regional disparities to enable the foundation know which region or district to shift its priorities. Even though such data is inadequate, preliminary investigations have shown that the coastal belt of the country have the highest cases and therefore the focus in Accra and its suburbs where we presently work.
The vaccine protects children from drowning KaoKaew Somrongong Thap District Surin

Yupa Luachalard

Background
As has happened in the area of responsibility of students to 5 people drowned same time create grief and trauma to the parents and relatives of children very seriously. This is beginning to find ways to help and prevent this from happening again. So Tambon KaoKaew foresees problems and to manage the end.

The operation was divided into 4 areas as follows.
1. Personnel To be trained in the vaccination of children drowning at the Office of Public Buriram. To practice and training of personnel in Tambon KaoKaew.
2. Implementation of the vaccination program in the area of child drowning.
   • Wat KaoKaew has allocated a budget buy. 2 balls of rubber swimming motion
   • Has taken advanced training in water survival skills to students in a total of 800 people by continuously every year.
   • Has operated continuously. Teaching in Schools Practice of floating in water And the use of equipment to help the victims of the water.
3. Extension of the most knowledgeable presentations and speakers to educate children about the vaccine against drowning.
   • The knowledge of how to teach students since 2553 the number of 7500 people.
   • The personnel of the Ministry of Health since 2553 the number 500 people.
   • The personnel of the Ministry of Education since 2553 is 300 people.
   • The personnel of the office block Civil defense and disaster relief 1,250 people Surin province
4. Students are trained to participate in the race, and the campaign to prevent child drowning.
   • A young athlete competing teams and individuals at the Zoo. Bangkok on March 9, 2554, the award-winning # 1 on the country, can float in water for up to 4 hours.
   • Send children into the show. Skills, water safety team formed VDO on March 3, 2555 at the Bureau of Non-Communicable Diseases, Department of Disease Control, Ministry of Health. Merit awards

Since the implementation of vaccination of children drowning in the area of Tambon KaoKaew since 2553 found that none of the children died from drowning, even one.
Drowning prevention education in elementary schools

Mônica Rodrigues¹
¹Corpo De Bombeiros Militar Do Estado De Goiás, Itumbiara, Brazil

Poster Session 3, Poster Foyer, November 6, 2015, 9:00 AM - 5:15 PM

Objective
In 2013, the Fire Department reported 64 drownings in Goiás, 68% more than in 2012 when there were 38 records. In Itumbiara, in 2012, were recorded 5 drowning deaths, 3 of them in the city and another 2 in its surroundings. In 2013 the number of deaths in Itumbiara increased to 8 drowning deaths, 4 occurring in the city and 4 in its surroundings. In order to reduce these numbers in the city of Itumbiara, it was implemented the project “Drowning Prevention Education in Elementary Schools”. Unprecedented in Goiás, the project teaches children 5-12 years of age the different ways of how to relate more safely with water, preventing drowning, who at the end will take the message to their parents and caregivers.

Methodology
The project began in February 2014 with the production of 8,000 comic books for distribution to children in Elementary Schools. Then, 17 public schools and six private schools of primary education were visited. The project was presented and a space to deliver lectures was requested. Each lecture was given by the Soldier Mônica, properly dressed up and equipped with rescue tube and fins, and had a maximum duration of 50 minutes. The lectures were divided according to the schooling level, from 1st to 5th grade of elementary school. The children watched two videos about drowning prevention, containing tips for drowning prevention at beaches and fresh water (rivers and pools), in animation format with total duration of 12 minutes. Following the presentation of the videos an illustrated cartoon slide show was depicted to assist the discussion of the videos. The slide show was used in order to maintain a strong interaction and reaction to the children's behaviour change proposals around water we were advising. Then, followed the distribution of a comic book, which tells a story of drowning prevention in pools and rivers.

Results
The lectures began on April 25th 2014, at the Municipal School Arcipretti Alexander, which immediately allowed to reach an audience of 267 children. Since then over 22 elementary schools were visited, although one municipal school and one private school showed no interest in the project. In total, the project reached 6150 children. Additionally, the project brought a return of spontaneous dissemination through TV channels, radio channels, local printed newspapers, site fire department, site of the Brazilian Society of Aquatic Rescue and social networks.

Conclusion
It was evident the exceptional interest of students and teachers of the schools visited for the proposed theme and the project triggered a constructive discussion regarding the different forms of safely enjoyment of water environments. The interaction between lifeguards and children in this project also proved very important as it creates a bond and allows the dialogue between the institution and society. The Project will continue to run in the coming years in the city of Itumbiara and will be extended to its surroundings, which are cities under the responsibility of Itumbiara division due to absence of a Fire Department in their municipality. The statistics will be monitored and annually a new comparative study will be conducted in order to check the result that the Project is bringing to the city and region.
Endemic study of drowning deaths in the state of Pernambuco – Brazil: support to implement more effective public prevention policies

Mr André Alves¹
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Poster Session 3, Poster Foyer, November 6, 2015, 9:00 AM - 5:15 PM

Background
The drowning at Pernambuco-Brazil, as an endemic, require a specific strategic plan. The register of Brazilian Ministry of Health shows that the media of drowning death between 1992 and 2012 is 287 shared at 122 cities, also, the mortality rate is 3.7 death/100,000 habitants.

It occurs systematically and constantly to local population, without time perspective to solve this problem, with cyclic and seasonal variety, denoting a drowning endemic at Pernambuco.

The mortality comparison with illnesses like Dengue, Tuberculosis, traffic accidents, shark attacks and Lethal Intentional crimes shows that drowning represents a security and health public problem.

2012 recorded 200 fatalities distributed in 97 of the 187 cities of Pernambuco, including 18 at Recife, 13 at Petrolina, 4 at Olinda and 4 at Santa Maria da Boa Vista; already in 2004, the highest incidence, had 397 occurrences divided into 128 cities, of which 28 at Recife, 18 at Ipojuca and 13 at Olinda.

Between 1992 and 2012, numerically, the drowning fatality (6019) is close to tuberculosis (8049), is higher than deaths from dengue (32) and deaths by shark attack (22).

Since 2008 to 2012, drowning (1364) was inferior to the occurrences of Lethal Intentional crimes (18,900).

The introduction of integrated public policies to bring knowledge and drowning prevention ways for vulnerable communities is a viable alternative to reduce this kind of deaths at Pernambuco.
Drowning prevention through swimming education

Mats Melbye
Norwegian Lifesaving Society, Norway

Poster Session 3, Poster Foyer, November 6, 2015, 9:00 AM - 5:15 PM

Background
First, the sea has great potential to produce a profound and unexpected challenge to survival. Second, the consequences of this challenge, and the fates of those involved, are often in their own hands. Recognition of the early danger signs, however, comes only with experience, careful thought, and planning (Golden and Tipton 2002 p.13)

In principle, no one would drown if one had the following knowledge, skills and competence:
1. Environmental knowledge including experience over time of the changing nature, of challenges to cope for survival and of being in the environment in general.
2. Necessary competence for safe behaviour in, on and around the water – including swimming and self-rescue skills combined with ability to cope with open water conditions.
3. Awareness of one’s own limitations in any given situation and the ability to take precautionary measures to cope with the actual challenges.

These are the requirements for doing a personal risk assessment. Those who go to sea should carry out a risk analysis of any activity in a potentially dangerous environment. Such an assessment should make them aware of the potential dangers involved, the protective measures that they should implement, and, more importantly, the critical early warning signs that might indicate impending danger (Golden and Tipton 2002 p.13)

People drown outdoors, 55% drowns less than 3 meters from a safe refuge. 2/3 of the victims are regarded as good swimmers (Golden and Tipton 2002). Swimming education takes place mainly in swimming pools. When confronted with the idea of lessons in open water the responses are not scientific but emotional. “Are you crazy”, “It’s dangerous”, “It’s freezing cold” are common sayings. However, with just a short pool education as a foundation, and then swimming in open water could result in a life threatening situation.

This was illustrated recently in an incident where an adult, after completing a swimming course indoors got into trouble under filming of an open water swim even though he was wearing a PFD.

In an outdoor, swim project at a school near Oslo, results showed that pupils not only acquired swimming skills but also learnt how to evaluate and take precautions in order to stay safe in open water. Since the children’s activity was also an interaction with nature, they extended their learning to knowledge of the coast and coping in the actual situations

People have an amazing ability for acclimatisation. In Lillehammer, a class planned to swim in the lake at the start of the autumn term. Pupils enjoyed this and asked to be able to continue as long as they could. By Christmas, pupils achieved better and longer swims even though the water temperature was reduced from 15 to 5 degrees.

A school, 150 km north of the Arctic Circle had daily swimming lessons the first week of the autumn term. Daily exposure gave very good water familiarisation and acclimatisation so that indoor lessons began at a much higher level of competency. They could also relate pool work to the challenges of open water.

It is clear from the above examples that acclimatisation happens on location. If the goal of swimming education is to prevent drowning then it is vital to move out of the pool into the environment where the majority of drowning incidents occur. It is possible even in water at a very low temperature. By experiencing the limitations of ones abilities in relation to the challenges of open water, one can learn to take appropriate precautions, develop an ability to foresee danger, and prevent accidents.
A drowning preventative definition of swimming ability

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Background
There have been discussions about developing a definition of swimming ability for generations. However, increased internationalisation, the need for common guidelines and educational exchange programmes, have revitalised the need for discussion, bringing with it the inevitable disagreements and conflicts that have previously arisen.

During the years, there have been several attempts to define “swimming ability”. However recently there has been a development in perspective to include both context and purpose of the definition, a shift from defining just “swimming” to the far more complex concept of “water competence”.

In addition, international discussions seem to be hampered by the complexity of translation, where culture and environment may alter the significance or content incorporated in a phrase or word.

This new approach is unique in that its foundation is based upon the need to cope with challenges in real life as well as the need for swimming ability. In addition to learning to swim, one must also learn about the challenges in the local environment. It is necessary to have personal experience in the environment in order to assess the risks in relation to one’s competence and limitations.

The groundwork has been to first clarify the purpose and the context for the definition. This brought to light the irrationality of making a “rigid definition” or test, which would not necessarily apply to the challenges of a variety of environments, illustrating the gulf between the content of a definition and the content of a concrete test.

One possibility was to look at different definitions of swimming ability and “water competence”. We used drowning prevention as a baseline or reference to find common denominators, which gave us the outline of a test. With the use of local guidelines that take into account environmental aspects the content of the definition might give us a flexible test as an international guideline for “water competence” that can be an effective measure to prevent drowning.

As an example of a definition of swimming: Swimming is a person’s ability to move the body in the water without sinking while being able to breathe. (Michael Iwersen, Kystlivredningen Denmark 2015). With this as a definition, possible test could be: Swim 200 meters.

However, in certain conditions this would not be enough. From our analysis we classed swimming ability as 4 basic skills, a further 8 skills as a foundation for swimming ability and then 8 additional demands related challenges in the outdoor environment. Derived from this we constructed a more appropriate definition and then made proposals for an adequate test.

Kevin Moran has defined water competence as: “the sum of all personal aquatic movements that help prevent drowning, as well as the associated water safety knowledge, attitudes, judgement and behaviours that facilitate safety in, on and around the water” (R. Stallman; in Proceedings of the Lifesaving Conference p. 71, 2011).

A proposal for a test of “drowning preventive swimming skills” in a pool or calm, “warm” open water might be:
• From half a meter height, jump into deep water, keeping head above the surface,
• Swim 100 on the front with head above water making a surface dive and swim 2 meters under water without surfacing during the swim.
• Stop and rest, float on front, tread water in a vertical position and orientate yourself, float on back, in a total of 3 minutes.
• Swim 100 m on the back and climb ashore.

This test is then supported by local guidelines, (for example in Norway: in open water, under 20 degrees C. all distances are halved). There should be guidance as how to apply the definition and test when teaching beginners to swim. Could this be an international reference-point, which can be applied in a flexible way at local level?

Conclusion
A test of swimming ability with the aim to prevent drowning seems to be a contradiction in terms when considering its application to a wide variety of aquatic environments. However, a definition that’s related to a clear context and purpose as a base for a test of swimming skills used as a reference point, supported by local guidelines pertaining to environmental challenges might be a feasible concept.

If the test is not supported by both a definition and local guidelines, it could have the opposite effect (i.e. increase drowning rates) and should not be considered.
Strong Community like a Life Jacket Protecting a Child from Drowning, in Prang Ku District, Sisaket Province, Thailand

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Background
At Prang Ku District, drowning deaths were found in children aged 0-14 years. From 2009 to 2014, mortality rates tend to be higher. According to investigation, most dead children studied at kindergartens or primary schools. Causes of death were from children’s curiosity, wanting to experiment, and naughtiness. When they encountered problems, they did not dare to tell their parents because of their fear of being punished. Most dead children did not know how to swim.

Water sources where drowning accidents took place were far from children’s homes. Most death happened in those places. There were inappropriate ways of basic life support. In addition, risky water sources were mismanaged. The problem that children died from drowning was, therefore, taken into account at Prang Ku District in order to promote ways of controlling and preventing accidents seriously and sustainably. Regarding the policy movement, including integrated action plan making together with associated networks.

Objectives
To take an action on preventing children from drowning apparently according to the context based learning, emphasizing providing knowledge, practicing, and creating awareness in the community like a vaccine protecting children from dying of accidental drowning.

Methodology
Data from the investigation were analyzed and presented to the administrator and associate networks. Knowledge providing and practice were emphasized in activities. The operation was started in all areas of the district. There was also operation in the well child clinic where all children were screened for risk factors for drowning. The action included home visiting and surveillance in risk groups of the community. Parents were informed. Child care givers took children to get vaccinated.

At home and in the community, important risky water sources were surveyed and managed. Equipment was provided to help drowning people. Children were surveilled all the time by the use of local wisdom such as a bell, a hammock, a playpen. At child development centers and schools, there was appropriate environment management and safety. The proportion of children was appropriate to the number of teachers, and measures of dropping off or picking up children were obvious. People in the community participated in dropping off or picking up children.

Among child-care teachers and teachers at schools were trained in environmental management training for children’s safety. Students received knowledge, practiced driving skills for survival, and learned basic life support.

Moreover, life support volunteers and volunteers got trained and practiced basic life support so that they could help drowning people appropriately. The exhibition related to drowning was held to provide knowledge, and there were contests: drawing, essay writing, and drowning prevention slogans. Besides, there was budget support from all local governments to manage activities. Swimming pools were supported by the private sector for swimming practice for survival. Data and drowning situations were presented in a stage of meeting of the community leader. When drowning happened, all children were investigated by SRRT and MCATT teams and the village civil society, using TOP Model process to find measures in the community and follow up and evaluate further results of the measures.

Summary
There was a comprehensive operation to protect drowning deaths in children in the health service center, villages/community, child development centers, and schools. Teachers, students, volunteers, and life support volunteers were trained for basic life support. There was survey and appropriate environment management in all risky water sources. Successful operation needed collaboration with associated networks to make the policy become visible and practical. Emphasized practices were proactive rather than reactive in hospitals. Finally, people in the community could help themselves.
“Gone in 30 Seconds” - Part 5: Decoding the Circumstances of Drowning in Cinematography

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Poster Session 3, Poster Foyer, November 6, 2015, 9:00 AM - 5:15 PM

Introduction
The circumstances of drowning occurrence in cinematography were decoded, revealing messages passed to film viewers.

Method
A criterion/convenient sampling identified film scenes (n=430) containing drowning episodes during the timeframe 1917-2012. A logistic regression analysis was used. The activities were: (1) Water Based (WBA; swim, scuba, snorkeling, free dive, bathing, fishing, stunt); (2) Violent (VA; suicide, bullying, torture, fight, homicide); (3) Non Aquatic (NAA; drive, walking, accidental fall, flight, spaceship, training, sleep); (4) Emergency (EA; hide, trapped, escape, failed rescue); and (5) On Board (OBA; boating, cruising, sailing, surfing).

Results
Statistically significant differences (p<0.05) were identified between the undertaken activities and 15 variables:

1. Drowning Outcome (n=430, p<0.001): Victims were 2.08 times more likely to die when participating in VAs than in WBAs (p=0.017). Victims were 2.62 times more likely to survive participating in EAs than in WBAs (p=0.033).
2. Water Temperature (n=430, p=0.038): In normal water temperatures drowning victims were 2.45 times more likely to be engaged in VAs than in NAAs (p=0.004).
3. Water Condition (calm or rough; n=430, p<0.001): In rough water victims were 3.76 times more likely to drown when involved in OAs (p=0.001) and 5.57 times in EAs (p<0.001) than in NAAs.
4. Water Depth (n=430, p<0.001): In standing level water depth victims were 11.9 times more likely to drown engaged in VAs (p<0.001) and 5.44 times in EAs (p=0.001) than in NAAs.
5. Rescuer Presence (n=430, p<0.001): Without any rescuer present it was 3 times more likely that the victim would drown engaged in VAs than in NAAs (p<0.001).
6. Early Approach (n=430, p<0.001): With no/late approach it was 2.6 times more likely that the victim would drown engaged in VAs than in NAAs (p=0.001).
7. Casualty Gender (n=387, p<0.001): Women were 2 times more likely to drown involved in VAs than in NAAs (p=0.0014).
8. Residence (n=430, p<0.001): Non-locals were 3 times more likely to drown involved in OBAs than in NAAs (p=0.009).
9. Casualty Entered the Water (n=430, p<0.001): When the casualty entered the water intentionally, it was 3.7 times more likely that would drown engaged in VAs (p=0.001) and 8 times in EAs (p<0.001) than in NAAs.
10. Instinctive Drowning Response (IDR; n=430, p<0.001): The IDR was 4.8 times more likely to appear in victims engaged in VAs than in NAAs (p<0.001).
11. Shout for Help (n=430, p=0.0478): Victims not shouting for help were 3.2 times more likely to participate in EAs than in NAAs (p=0.022).
12. No of Casualties (n=430, p<0.001): Multiple drowning victims were 6.4 times more likely to be present in OAs (p<0.001) and 3.5 times in EAs than in NAAs (p=0.018).
13. Time (n=430, p<0.001): During the night it was 3 times more likely that victims would drown engaged in VAs than in NAAs (n<0.001).
14. Personal Flotation Device (PFD; n=430, p=0.032): Those not wearing a PFD were 3 times more likely to drown engaged in VAs than in NAAs (p=0.032).
15. Resuscitation (n=430, p=0.002): Absence of resuscitation was 4 times more likely in victims that drowned during VAs than in NAAs (p=0.011).

Conclusion
The drowning circumstance is essential factor in cinematography. In terms of water temperature, condition and depth, we noted particular drowning patterns to victims engaged in VAs, EAs and OBAs. In VAs, rescuers were absent or made a late approach. Victims involved in VAs demonstrated the IDR and those in EAs shouted for help more often than victims engaged in other activities.

We identified statistically significant differences between various activities with the casualty characteristics (gender, residence, way of entering the water, number of casualties), and other circumstances (time, use of PFD, outcome and resuscitation).
“Gone in 30 Seconds” - Part 4: Decoding the Location of Drowning in Cinematography

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Poster Session 3, Poster Foyer, November 6, 2015, 9:00 AM - 5:15 PM

Introduction
Drowning location characteristics in cinematography were decoded revealing the messages that pass to film viewers.

Method
A criterion/convenient sampling identified film scenes (n=430) that contained drowning episodes during the timeframe 1917-2012. Pearson’s chi-squared and logistic regression analyses (LRA) were used.

Results
Chi-squared statistically significant differences were not identified between the dichotomous (i.e. indoor or outdoor) aquatic environment (AE) and risk-taking behavior (n=415, p=0.084), drowning duration (n=398, p=0.297), how the casualty fell in the water (i.e., intentionally or unintentionally; n=415, p=0.011), the casualty’s dressing (i.e., casual clothes, swimwear or naked; n=415, p=0.097), and the performance of resuscitation (n=415, p=0.41).

However, a LRA revealed statistically significant differences between the AE and 13 variables:

1. Film Genre (n=415, p<0.001): In horror/thriller/mystery/crime (HTMC) films, victims were 3.11 times more likely to drown in an indoor aquatic environment (IAE) compared to victims that appeared in comedy/romantic/musical (CRM) films (p=0.01). Also the drowning victims in IAE were 7.65 times more likely to appear in TV series compared to CRM films (p<0.001)

2. Outcome of Drowning (n=389, p=0.021): The drowning victims were 69% more likely to die than to survive in an IAE (p=0.021).

3. Person Died: A LRA revealed a marginally non-statistically significant difference between the AE and the person that died (n=415, p=0.068). However, it was 63.3% more likely that the victim would not survive in IAEs (p=0.026).

4. Water Temperature (n=415, p<0.001): It was 63 times more likely that the water temperature will be normal than hypothermic in IAE (p<0.001).

5. Water Condition (n=415, p<0.001). No surprisingly it was 17.1 times more likely that the water would be calm than rough in IAE (p<0.001).

6. Water Depth (n=415, p<0.001): The victims in IAE were 6.45 times more likely to drown in standing level compared to the OAEs (OAE, p<0.001).

7. Rescuer (n=415, p<0.001): In IAEs it was 2.79 times more likely that the victim will drown in the absence of a rescuer than that would be rescued by an amateur rescuer (p<0.001).

8. Early Approach (n=415, p<0.001): Surprisingly, those that drowned in IAE were 3.13 times more likely to be approached lately or not at all, than those that drowned in OAE (p<0.001).

9. Casualty Gender (n=379, p<0.01): Female victims were 3.15 times more likely to drown in IAE than in OAE (p<0.001).

10. Residence (n=415, p<0.001): Locals were 3.96 times more likely to drown in IAE than non-locals (p<0.001).

11. Casualty Somatotype (n=415, p=0.02): Muscular victims were 54% less likely to drown in an IAE than thin victims (p=0.037). Also victims with multiple somatotypes were 73% less likely to drown in an IAE than thin victims (p=0.037).

12. Time of Occurrence (n=415, p<0.001): In IAE the victims were 3 times more likely to drown during the night than during the day (p<0.001).

13. Use of Personal Flotation Device (PFD; n=415, p=0.017). The victims that didn’t wear a PFD were 4.4 times more likely to drown in IAE than those that used a PFD (p=0.017).

Conclusion
The victims of HTMC films drowned in IAEs because they were involved in a murder, suicide or violent activity. Similarly the victims died in IAEs mostly because they were unattended, suicidal or murdered.

Not surprisingly, most IAEs had calm water with normal temperature. Interestingly most drownings occurred in standing level and in the absence of a rescuer mostly because they were preceded by unintentional submersions in IAEs.

The absence of rescuer in IAEs explained the delayed (if at all) rescue approach. Females and locals drowned most often in IAEs at night, without wearing a PFD. Collectively, the location is an important factor of drowning in cinematography.
“Gone in 30 Seconds” - Part 3: Decoding the Drowning Victim in Cinematography

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Poster Session 3, Poster Foyer, November 6, 2015, 9:00 AM - 5:15 PM

Introduction
Drowning victim characteristics in cinematography were decoded revealing the messages that pass to film viewers.

Method
A criterion/convenient sampling identified film scenes (n=334) that contained drownings and appeared between 1917-2012. Pearson’s chi-squared was used.

Results
Statistically significant differences were identified in 11 variables:

1. Residence (p=0.001): From totally 107 locals, most victims were non-swimmers (NS; 37, 34.58%) and unconscious victims (UC; 33, 30.84%). Out of 227 nonlocals, most were weak swimmers (WS; 43, 18.94%) and competent swimmers (CS, 60, 26.43%).

2. Victim Entered the Water (p=0.001): From totally 127 victims entering intentionally the water, most were UC (34, 26.77%) and CS (42, 33.07%). From totally 207 victims that fell unintentionally in the water, most were NS (55, 26.57%), WS (37, 17.87%) and multiple victims (MV; 21, 10.14%).

3. Instinctive Drowning Response (IDR; p<0.001): IDR was evident in NS (40, 47.62%) and in cases of MV (9, 10.71%). Not surprisingly, IDR was not identified in WS (44, 17.60%), injured swimmers (IS; 18, 7.20%), UC (64, 25.60%) and CS (69, 27.60%).

4. Shout for Help (p<0.001): All victim types didn’t shout for help (NS= 61, 75.31%; WS= 34, 65.38%; IS= 14, 70.00%; UC= 76, 93.83%; CS= 67, 87.01%). Occasionally, MV did (10, 43.48%) and didn’t shout for help (13, 56.52%).

5. No of Victims (p<0.001): From totally 277 single victims, most were NS (72, 25.99%) and UC (78, 28.16%) compared to MV (in terms of number) where there were more often MV (in terms of type; 23; 40.35%).

6. Time (p=0.001): From totally 225 victims that drowned during the day, most were WS (45, 20.00%) compared to victims that drowned during the night and were IS (12, 11.01%). Similar percentages were found in NS, UC and CS.

7. Use of Personal Flotation Device (PFD; p<0.001): Among the 298 victims that didn’t use a PFD, most were NS (76, 25.50%) and UC (76, 25.50%). Among the 36 victims that used a PFD, we identified IS (7, 19.44%) and MV (7, 19.44%). No difference was noted in PFD use by WS and CS.

8. Drowning Duration (p=0.001): Among the 155 victims, most that drowned within 20sec were NS (50, 32.26%) and WS (28, 18.06%). Among the 125 victims that drowned within 21-60sec, most were UC (44, 35.20%). Among those drowned within 61-120sec, most were MV (4, 13.79%) and CS (11, 37.93%).

9. Outcome of Drowning (p<0.001): Among the 201 non-fatal victims, most were WS (42, 20.90%) and CS (64, 31.84%). Among the 108 fatal victims, there were NS (32, 29.63%), IS (15, 13.89%) and US (37, 34.26%).

10. Water Conditions (p=0.035): Among the 244 drowned in calm water, most were NS (70, 28.69%). Among the 90 victims drowned in rough water, there were mostly WS (18, 20.00%), IS (8, 8.89%) and CS (25, 27.78%).

11. Early Approach (p=0.009): Among the 154 early approached victims most were WS (33, 21.43%). Among the 180 lately approached victims, there were IS (16, 8.89%), MV (15, 8.33%) and CS (47, 26.11%)

Conclusion
Inhabitants had higher danger to drown compared to visitors. WS drowned during the day and IS during the night. WS were approached earlier than other victims. Most single victims were NS and UC whereas MV included multiple victim types. IDR symptoms corresponded to previous studies.

Most victims didn’t shout for help. The victims in most need (i.e., NS, UC) didn’t wear a PFD. UC, CS and MV took longer to drown compared to NS and WS. NS drowned even in calm whereas other victims drowned in rough water. Those that didn’t know swimming entered the water unintentionally as opposed to CS and UC entered intentionally.
"History Lessons" - Part 3: Decoding the Causes of Fatal Drowning to Historical Figures

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Poster Session 3, Poster Foyer, November 6, 2015, 9:00 AM - 5:15 PM

Introduction
We assessed the biographies of notable historical figures that died by drowning to identify their causes of death.

Method
A convenient/criterion sampling identified HFs (n=554) that drowned in Ancient History (-500 A.D.), Middle Ages (501 A.D. - 1500 A.D.) and Modern History (1501 A.D. – today). Statistical analysis included chi-square.

Results
Statistically significant difference was identified between the causes of death and six variables:

1. The Profession (p<0.001): Suicide was an often cause of death to artists (20, 25%), authors/poets (AP; 20, 25%). Violent unintentional deaths (VUD) were commonly identified in religious figures (11, 45.83%), royal/noble people (RNP; 6, 25%). Drowning due to accidental fall in the water (AFiW) was most commonly found in athletes (16, 18.60%) and politicians, presidents and governors (PPG; 19, 22.09%).

Drowning due to involvement in an aquatic activity was evident in athletes (19, 26.03%) and artists (13, 17.81%). Military personnel and prisoners of war (MP/PW; 34, 18.68%), PPGs (26, 14.29%), drowned while engaged in boating accidents. MP/PW (13, 48.15%) and RNP (7, 25.93%) drowned during fighting, at the battle field, in military situations or while attempting to escape. Transportation led to drowning athletes (4, 22.22%), MP/PW (3, 16.67%), RNP (4, 22.22%), and political people (3, 16.67%). Athletes drowned during unsuccessful rescue attempts (URA; 6, 46.15%). Disasters were a most common cause of drowning death to artists (5, 50%).

2. The Personal Attributes (i.e., p<0.001): Artists (15, 18.52%) and those with health/mental problems (25, 30.86%) committed suicide more often. Religious figures had a VUD (10, 45.45%). Those interested in politics (17, 21.25%) and sports (15, 18.75%) drowned more often after AFiW. People interested in politics (17, 23.29%) and arts (11, 15.07%) drowned also when involved in aquatics. Boating was a most often cause of death for artists (26, 14.53%) and MP/PW (43, 24.02%). Fighting and escape attempts led MP/PW almost always to drowning (21, 80.77%). The transportation means led to drowning athletes (5, 29.41%) and MP/PW (5, 29.41%).

3. The Aquatic Environment (p<0.001): Suicide occurred often at sea (28, 35.90%) and inland water (47, 60.26%). VUD occurred most often in inland waters (11, 45.83%). Drowning deaths from AFiW occurred at sea (23, 35.38%) and inland water (38, 58.46%). Drowning deaths during engagement in an aquatic activity occurred at sea (43, 58.90%) and in inland waters (20, 27.40%).

4. The Distance from Safety (p<0.001): Suicide drowning (34, 64.15%), VUD (12, 80%), AFiW (24, 55.81%), occurred most often within 10m from safety. Those involved in various aquatic activities drowned within a few hundred meters from safety (42, 66.67%). Boating (131, 75.29%) and fighting/escape (9, 64.29%) led to drowning in the ocean.

5. The Victim’s Nationality (p=0.001): In America, drowning deaths were due to suicide (27, 32.93%), AFiW (39, 44.32%), participation in aquatic activities (25, 33.78%), boating (65, 34.95%), and transport (10, 55.56%). In Europe, drowning deaths were due to suicide (39, 47.56%), VUD (17, 65.38%), AFiW (39, 44.32%), aquatic activities (35, 47.30%), boating (111, 59.68%), fight/escape (16, 61.54%), transport (5, 27.78%), URA (9, 75.00%), disasters (5, 50%) and heart attacks (6, 54.55%).

6. The Continent where Drowning Occurred (p<0.001): People drowned in America due to suicide (26, 32.50%), AFiW (39, 46.43%), aquatic activities (27, 37.50%), boating (79, 47.31%), transport (11, 61.11%), URA (8, 61.54%), heart attack (7, 63.64%). Others drowned in Australia due to suicide (38, 47.50%), VUD (15, 62.50%), AFiW (35, 41.67%), aquatic activities (26, 36.11%), boating (68, 40.72%), and fight/escape attempts (14, 58.33%).

Conclusion
The drowning death of historical figures that excelled in their field, was associated with their professions, attributes, nationality, the aquatic environment, the distance from safety, and the continent where drowning occurred.
Rescue
Measuring the effectiveness of preventative actions conducted by lifeguards in the UK

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Rescue 1, Ballroom 1, November 4, 2015, 1:30 PM - 3:00 PM

The problem/issue Is it possible to quantify the effectiveness of the preventative actions taken by lifeguards and to measure the potential benefits?  

Aim of the presentation
The aim of this presentation is to provide a case study on the effectiveness of preventative actions conducted by RNLI lifeguards in reducing the number and severity of rescue incidents.

Solution/method Statistics were reviewed for 69 beach lifeguard units between 2007 and 2014. The effectiveness of preventative actions was measured by examining the ratio of rescues to number of beach visitors.

The level of effort by RNLI lifeguards in implementing preventative actions as part of their beach safety management regime has steadily increased during this period.

The ratio of rescues to beach visitors during this period has also shown a strong correlation between the increased efforts in preventive actions and a reduction in rescue activity.

Organisational outcomes
Preventative actions by lifeguards are an effective part of managing beach safety and can have significant potential to reduce the number and severity of aquatic incidents.

Increasing the number of preventative actions decreases the risk to the public and the lifeguards and is not a high cost intervention making it an applicable strategy for services being provided in both higher resourced and lower resourced lifeguard services.

Learning outcomes for attendees
To understand how a lifeguard service operating in a high income country measures its effectiveness and uses this evidence to focus more on preventative activities and at the same time reduce risk

For attendees to consider whether this learning could be applied to their own context.
The Lifeguard Rescue Reporting System

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Rescue 1, Ballroom 1, November 4, 2015, 1:30 PM - 3:00 PM

The Lifeguard Rescue Reporting System has been available since 2009 in the United States and Canada since 2010. This system has been endorsed by the United States Lifesaving Association, the Canadian Red Cross and the American Red Cross Scientific Advisory Council.

The Canadian and American Red Cross organizations encourage lifeguards to report the rescues that they make. Well over 1000 rescues have been entered into the data base. The following items regarding rescues made by lifeguards are collected with the system: time of day, environmental conditions, equipment used, location of the guard, others needed, distance to the entry, distance travelled in the water, type of rescue made, first aid given, injuries to the patient, patients outcome, how the victim was recognized, depth of the water, attendance at the time of the rescue, patients activity at the time of the rescue, and the levels of certification of the rescuer.

The University of North Carolina at Charlotte’s Department of Kinesiology is hosting a reporting system to gather information about how lifeguards respond to all types of water-related incidents on the job. The goal is to help training agencies learn more about what actually is taking place when lifeguards are called upon to respond to an emergency, such as conditions at the time of the rescue, how the lifeguard identified the emergency and the type of equipment used in the rescue. This reporting system is designed to collect longitudinal data to help aquatic professionals understand if certain trends are taking place in the varying aquatic venues.

The system divides rescues into three aquatic areas:
1) Open Water,
2) Water Parks and
3) Swimming Pools and Spas.

The most complete and current data regarding these rescues will be reported to the conference. If you wish to preview the Lifeguard Rescue Reporting System: www.water-rescue.uncc.edu
The Total Service Plan: Case studies highlight how evidence is used to shape policy and inform intervention strategies

Ms Sarah Anderson
1Surf Life Saving Australia, Rosebery, Australia

Rescue 1, Ballroom 1, November 4, 2015, 1:30 PM - 3:00 PM

The Total Service Plan is the national coastal safety strategy and service plan for Surf Life Saving Australia (SLSA). A central tenet of the plan is that SLSA is a knowledge and research hub with a focus on nationally significant issues and programs.

Key items included in and driven by the plan are:
• Research and data
• The National Safety Agenda
• Operations, including distribution of resources and services
• Public education

The Total Service Plan is created using an iterative process of data analysis and review to identify coastal safety issues of national importance. It follows the public health model and is aligned with international risk management principles.

At the core of the plan is the data, including existing material such as population and drowning data, rescue statistics and operational data, as well as coastal risk assessments. SLSA also uses new data, for example, a recent National Coastal Safety Survey, which explored attitudes and behaviours of the Australian public regarding the coast and safety.

In collaboration with stakeholders, the Coastal Safety team analyses this information to identify and prioritise national safety issues and drowning blackspots. The issues and blackspots identified through this process form SLSA's National Safety Agenda.

Monitoring and evaluation is built into the Total Service Plan. Each component is reviewed, evaluated, revised and updated as new evidence and data become available. Every program or project is regularly assessed and improved upon or discontinued as the case may be.

The National Safety Agenda influences and prioritises lifesaving operations, including services and equipment allocation, such as introducing lifesaving patrols during the wet season in Darwin, NT, to reduce drowning deaths and decrease incidents of box jellyfish stings and crocodile attacks.

It also drives public education including evidence-based mitigation strategies, communications campaigns and pilot projects. For example, funding a community education project in Wanneroo, WA, to build residents' knowledge and awareness of area-specific water safety hazards to help increase their resilience to coastal hazards and ultimately reduce drowning deaths.

This presentation will investigate case studies from the Total Service Plan to show how SLSA uses evidence to ensure lifesaving services and assets are located in areas of need and appropriate public education programs and mitigation strategies are in place to address coastal safety issues and known drowning blackspots.
Lifeguards at Hotels, Resorts and Commercial Premises:
Drowning prevention and duty of care

Dr Jeff Wilks\(^1,2\)
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In Roberts v Iberotravel Limited the plaintiff Kevin Roberts, aged six at the time of the incident, suffered a near drowning event while on holidays with his family in Majorca.\(^1\) Kevin was found floating unconscious in the swimming pool and carried by another guest to the hotel reception. Even though there were many guests at the pool when the incident occurred, none offered to help. Kevin sustained catastrophic brain damage. Under Spanish law the hotel had a responsibility to provide pool attendants who could swim and were trained in life saving and the practice of artificial respiration in cases of asphyxia from immersion in water. His Honour Justice Gibbs found “There is no evidence that any staff or other person connected with the hotel and who was in any way trained in lifesaving or resuscitation responded to the emergency … In short there was, as I find, a complete absence of any significant staff, equipment or procedure to deal with any drowning emergency”. His Honour found the hotel negligent both in relation to Kevin’s immersion and their failure to resuscitate.

While child drowning cases at hotels, resorts and cruise ships continue to occur with alarming frequency \(^2\), some businesses are now adopting a best practice approach to their duty of care. Disney, for example, reports that across its corporate group it trains more than 1200 lifeguards a year. \(^3\) In Hong Kong, legislation mandates that every licensee of a swimming pool shall provide at least two lifesaving attendants with valid certificates of competence in lifesaving and first aid to attend the pool at all times when the pool is open to bathers. Not only does such practice prevent accidental drowning but it provides additional benefits by having trained first responders available for other health emergencies. In Fiji, for example, resort lifeguards were first on the scene of a serious car accident and provided emergency first aid. By extension the skills and knowledge of lifeguards working in hotels and resorts can benefit local communities, with newly developed resources such as the International Beach Lifeguard manuals providing a platform for local drowning prevention. \(^4\) This presentation reviews the current status of lifeguards in commercial settings, drawing on case studies from different countries to demonstrate the many benefits of the role, in addition to the key concern of drowning prevention.

Reference Bibliography
\(^1\) Roberts v Iberotravel Limited [2001] QBD 5 March.
10 phases to setting up a sustainable lifesaving service in a low resource setting

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New lifesaving services in low resource settings often try and model themselves on existing examples from highly developed organisations in Europe, North America and Australasia. However, by imitating these established lifesaving services, barriers can often hinder progress and in some cases lead to failure.

Issues are varied and plentiful, but examples of key barriers include;

• Training and operational development based on difficult to access and maintain equipment requirements
• Recruitment and training systems that require a strong educational background and a good level of literacy
• An assumption that everyone thinks a lifesaving service it’s a good opportunity and there’s a strong level of stakeholder support – which is often not the case
• Poor supporting infrastructure and a high dependency on external assistance to sustain and grow the service
• Short term external funding but with no longer term sustainable income sources

The RNLI, CIPRB - Bangladesh and the Cox’s Bazar Lifesaving and Surfing Club have worked in partnership since 2011 to develop a sustainable lifesaving model in Cox’s Bazar, Bangladesh. The resulting (and still evolving) model has since been used to help set up other lifesaving services in the Gambia, Senegal, Tanzania and the Philippines.

Using the case study ‘SeaSafe Bangladesh’ the presentation aims to highlight 5 key areas of interest;

• Brief history of the SeaSafe Bangladesh model (timeline)
• The main barriers to implementing a high income solution in a low resource setting
• An overview of the 10 key phases to building a self-sufficient lifesaving service
• Lessons learnt so far
• Next steps

The presentation assumes that the identification of a drowning risk has already been highlighted, and via a risk assessment, a lifesaving service is shown to be a suitable control measure.

Implementing a self-sufficient lifesaving service in a low resource setting generates a number of unique challenges, and the SeaSafe project in Bangladesh is no exception. Over the past three years the project has identified a number of key barriers to implementation, and at each stage, has aimed to address them by developing localised and sustainable solutions but with wider potential learnings.

As a result the RNLI, CIPRB along with other partners and the local community have developed a range of solutions based on locally generated concepts. Ten key phases have been identified and could be consider when developing a self-sufficient lifesaving service:

1. Community engagement  2. Stakeholder support
3. Recruitment (paid and volunteers)  4. Training
5. Equipment  6. Operations
7. Community education   8. Monitoring and evaluation
9. Funding and communications  10.Leadership

Next steps:
Although the SeaSafe model service is operationally sustainable (the ability to train new lifeguards and manage a lifeguard service without support of an external organisation), there are still a number of areas that require further research and development, including equipment and funding. Working with other organisations the RNLI and CIPRB are developing low cost and sustainable equipment designs, including rescue boards and rescue tubes. Funding is probably the biggest barrier to success. Work is underway to identify funding from within Bangladesh to support the running and expansion costs of the SeaSafe lifesaving service, such as sponsorship, government grants and fundraising activity.

Lessons learnt:
Community engagement is by far the most important requirement for success. A well-established local partner is required to support a grassroots lifesaving service – particularly in the early stages. A suitable training package is essential and must be fit for purpose. Leadership development is as important as lifeguard development. A system needs to be in place to monitor and evaluate the service. A sustainable lifesaving service takes time, commitment and lots of patience. To understand how to develop a sustainable and integrated lifeguard service in a low resource setting and measure its effectiveness.
Data to decision-making: a surf lifeguard supervision model for New Zealand beaches

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Rescue 2, Ballroom 1, November 4, 2015, 3:30 PM - 5:30 PM

Surf lifesaving organisations and local government authorities spend a considerable amount of human and financial resources providing surf lifeguarding services at beaches throughout New Zealand. To ensure the greatest return from this considerable investment, it is essential that current and future resources be utilised as efficiently and effectively as practicable. Furthermore, with increasing demand for extended services at patrolled beaches, and for the provision of new services at unpatrolled locations, there will be added pressures on existing finite resources.

There is currently no standardised method used to determine appropriate surf lifeguard service requirements on New Zealand beaches. As such, a surf lifeguard supervision model has been developed to enable the evidence-based provision of surf lifeguarding services into the future. The model will also help provide justification and empirical support for continued investment in surf lifeguarding services.

The surf lifeguard supervision model is based on the analysis of data from over 52,000 patrols delivered by surf lifeguards in New Zealand. The model uses the calculated probability of rescue as a proxy for determining surf lifeguard service requirements, and comprises two main components. It first investigates the influence of environmental factors, specifically beach morphology and wave energy, on the probability of rescue. This probability was found to vary significantly between the four specified beach types (dissipative, intermediate, reflective, and tide-modified), and under different wave energies. Secondly, the model considers the influence of water use on the probability of rescue. It was found that as water use increases, the probability of rescue also increases, but at a gradually declining rate.

The model uses a base surf lifeguard to water user ratio of 1:25 in low wave energy conditions. Using the mathematical relationships established between environmental factors, water use, and the probability of rescue, this base ratio is then modified in proportion with the calculated risk to determine required surf lifeguard to water user ratios. Critical thresholds for the provision of surf lifeguarding services are also established, based on the calculated environmental hazard, to determine the lower limit at which a service can be considered a viable and cost-effective risk management strategy.

The relationships between water use, wave energy and recommended surf lifeguard numbers were then summarised into four matrices: one for each identified beach type. These matrices enable efficient and consistent application of the model to sites across the country. It is, however, acknowledged that the model cannot take into account all elements that influence risk at a site; therefore, post-modelling adjustments may be made to the recommended surf lifeguard service provision to account for site-specific factors.

The two key components of the surf lifeguard supervision model, environmental hazards and water use, are consistent with those identified by the World Health Organisation (2003) as important to the determination of surf lifeguard service requirements. To the author’s knowledge, this model is the first of its kind to formalise these relationships using a comprehensive statistical base. The concept of the supervision model therefore has applications worldwide, as it enables decision-makers to utilise finite surf lifeguarding resources as effectively as possible.

References:
Feasibility of Remotely Piloted Aircraft in Lifesaving Operations

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Lifesavers have relied on both rotary and fixed-wing aerial assets to support operations in both a rescue and surveillance capacity for many years. In Australia, the Westpac Lifesaver Rescue Helicopter Services was established in 1973 and is the longest serving search and rescue helicopter service in the world. As technology in the remotely piloted aircraft (also commonly termed Unmanned Aerial Vehicles or Drones) field develops, organisations worldwide are assessing the opportunities of these platforms to achieve their operational objectives while reducing financial costs or enhancing safety.

Surf Life Saving Australia (SLSA) has conducted a feasibility assessment of remotely piloted aircraft (RPA) in the Australia context. This process began with development of clear operational concepts to define the possible uses of these platforms in partnership with existing aerial assets. The 4 primary operational concepts developed or suggested to SLSA were:

- Enhancing situational awareness for incident controllers in Search and Rescue Operations
- Delivering flotation to a patient where land or marine assets cannot be deployed
- Conducting night time marine search and rescue operations
- Conducting surveillance patrols over a stretch of coastline

In the process of conducting a feasibility assessment there are several aspects to the use of RPAs that need to be considered. The following aspects were investigated by SLSA and will be discussed on the context of the primary operational concepts:

- Regulatory Environment
  - Operator certification (the service)
  - Controller certification (the pilot)
  - Airspace limitations
- Aircraft Endurance and Range
- Situational Interpretation and Reaction
- Payload Capability and Mission Suitability
- Aircraft Take-Off and Recovery Requirements
- Procurement and Operational Costs
- Ethical, Privacy and Public Perception

With the explosion in the marketplace of affordable devices, and the transition of military reconnaissance platforms into civilian functions, there are opportunities for lifesaving organisations to incorporate the assets into their capability. This presentation will discuss the opportunities and challenges experienced by SLSA as we investigate this innovative new approach to coastal safety.
A Coordinated Approach to Decrease Response Times & Reducing Drowning

Mr Andy Kent¹
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ABSTRACT:
Surf Life Saving New South Wales (SLSNSW) implemented a Surf Rescue Emergency Response System 8 years ago. This 24 hour state-wide tasking and coordination system aims to address the key coastal drowning issue of people swimming (and getting into difficulty) at unpatrolled beaches or after service hours by facilitating the efficient notification of surf rescue resources to an incident.

Coastal Drowning rates in NSW have varied in the last seven years with the seven year average at 37. Swimmers caught in rip currents and rock fishermen swept from rocks featured as the main contributors to this toll. The annual coastal drowning figure has increased over the past decade and NSW continues to hold the highest coastal drowning toll in Australia.

Lifesaving services across the state are often the best and most well positioned resources to respond to a coastal emergency. However, historically the awareness of and communication to these resources by the key emergency services (Police / Ambulance) have been informal, inconsistent or non-existent. As a result, ‘Surf Rescue’ services were not being notified of incidents or significant delays were occurring.

The Surf Rescue Emergency Response System provides a 24/7/365 ‘point of contact’ (13SURF) for other emergency services to notify and task appropriate ‘Surf Rescue’ (professional and/or volunteer) resources to a coastal emergency anywhere in NSW (Note: 13SURF is not a public number, but an internal emergency service number. ‘000’ continues to be promoted by SLS as the public emergency contact number).

SLSNSW delivers this system through a State coordinated team of qualified and experienced emergency service personnel who are rostered as State Duty Officers. SLSNSW manages the many hundreds of surf rescue contact numbers from its State Headquarters in Sydney to ensure the most up-to-date information is consistently held by the State Duty Officers on shift. Resources available and activated by this system extend beyond just SLSNSW assets, and include:

• Australian Lifeguard Services (SLSNSW)
• Council Lifeguard Services (NSW)
• SLS Lifesaving Patrols (Clubs)
• SLS Emergency Callout Teams
• SLS Regional Duty Officers
• SLS Jet ski Rescue Units
• SLS Offshore and Jet Rescue Boats
• SLS Helicopter Services

Since its inception in January 2008, over 2,500 coastal emergency response requests have been put through the system with dozens of lives saved that would have otherwise been lost. The success of the coordinated approach is shown in the increase in annual tasking for 46 tasking’s from Police in 2008 to over 550 in 2014. An analysis of these incidents (tasking agents, incident types/outcomes etc) will be presented along with a number of case studies.

This initiative has and continues to involve the cooperation of a number of levels of government and peak body organizations, including:

• NSW Police (Marine Area Command, Police VKG’s, PolAir, Local Police units)
• NSW Ambulance (Ambulance Communications)
• NSW Council Lifeguard Services
• Surf Life Saving Australia (SLSA)
• Surf Life Saving New South Wales (SLSNSW)
• Marine Rescue NSW
• State Emergency Service (SES)
The Science of Beach Lifeguarding - a new book from CRC Press

Prof Mike Tipton¹, Mr Adam Wooler²
¹Department of Sport and Exercise Science, University of Portsmouth, Portsmouth, United Kingdom, ²Rescue Marine Services Ltd, United Kingdom

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Progress is driven, in part, by the evaluation and re-evaluation of that which has gone before. Each time this occurs, current thinking and expectations are used as the tools by which to gauge the value of that which exists. So it is that as we have moved into an era of ‘evidence-based’ decision making, much of what has gone before, in numerous disciplines, appears largely based on opinion, albeit expert opinion or experience. That is not to say that this is an invalid approach; it is simply less defensible than hard data. At a time when everything exists to be challenged, the more valid the basis of decisions, the more supporting evidence, the greater the ability to defend the consequences, whether those consequences be the exclusion of someone from employment, adoption of a medical procedure or introduction of a beach safety campaign.

The idea for this book came about when the editors undertook a series of studies on behalf of the Royal National Lifeboat Institution (RNLI). Having been asked to become involved in beach lifeguarding and being confronted with the currently accepted pre-employment fitness test, they asked the question ‘why?’ to which the answer was invariably, ‘because we’ve always done it this way’. The initial ground breaking research by a team from the University of Portsmouth (UK), including Dr Tara J. Reilly, therefore quantified the scientific rationale behind a new RNLI-specific fitness standard. This research was then expanded to cover a fairly broad range of topics, from strength standards for the operation of inshore rescue boats and rescue watercraft, to visual acuity, to surveillance techniques, to surf swimming. Two things became apparent during these studies. Firstly, in many areas not much work had been undertaken on the specific topic of the occupational, as opposed to sporting, aspects of beach lifeguarding. Secondly, many of the current practices in beach lifeguarding were consequently not well evidence-based or had simply been imported from other areas with little attempt to check the validity of such a transfer.

We have therefore attempted to assemble a book focused on the scientific evidence that underpins what is taught and practiced in beach lifeguarding. We believe it is the first book to try and pull together all the different areas involved in beach lifeguarding and to evaluate their evidence base. Each chapter is written by an expert or experts in the respective field, with the brief of including as far as possible, the evidence base for existing practice and recommendations. Where areas are not covered or only mentioned (e.g. the choice of specific pieces of lifeguard equipment), it is generally because they lack any data-driven evidence base. The process of identifying these gaps in our scientific knowledge and proposals for further research are therefore addressed in our concluding remarks.

It is hoped that this book will be of value to a wide range of individuals interested in the topics surrounding beach lifeguarding, from those studying areas from drowning to employment standards, to those responsible for the management, recruitment and training of beach lifeguards. The World Health Organisation recently published its Global report on drowning, which found that drowning is the third leading cause of unintentional injury death worldwide. In light of this publication, this book has become even more relevant and important as part of the global effort to reduce this considerable public, but often hidden, health risk.
The History of Beach Lifeguarding

Mr. B., Chris Brewster
1International Life Saving Federation - Americas, San Diego, United States, 2United States Lifesaving Association, Huntington Beach, United States

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This presentation will give an overview of critical timelines and breakthroughs from the beach lifesaving history chapter of the book, The Science of Beach Lifeguarding, edited by Michael Tipton, Adam Wooler, Tara Reilly.

Beaches were not always a popular destination. They were once shunned by most people. That has changed, of course, but the intense popularity of beaches we know today is something very new in a historical sense. It has developed over just the past 100 years or so. With that popularity has come a new role – the beach lifesaver.

In the United States beach lifeguards were first employed to protect tourists at beach resorts that were developed to generate revenues from tourism. In Australia, volunteer beach lifesavers came from bathing clubs which dotted the oceanfront after ocean swimming was first allowed. These two approaches to protecting swimmers and others at beaches around the world developed mostly independently of each other for decades, with some similar and some very different equipment and standards.

Beach lifesaving in other countries developed independently in some cases, but often with some degree of influence from the US or Australian systems and resulting impacts on how these systems function today. In particular, Australia worked prodigiously to export its method of lifesaving to countries around the world, particularly those of the Commonwealth. Over time the small degree of volunteer beach lifesaving that existed early on in the US faded, while Australia came to embrace paid beach lifeguarding as an essential component of beach safety.

A pivotal 1956 event hosted by Australia brought lifesavers and lifeguards from around the world together. At the event Australia was first exposed to modern surfboards and surfing techniques by California lifeguards, who brought light Malibu surfboards. They also brought rescue tubes and rescue buoys. Meanwhile the US lifeguards learned of the value of a national association of lifesavers.

Beach lifesaving equipment evolved too. While Australians were passionate advocates of the reel, line, and belt, Americans began using rescue floatation devices at an early time and ultimately developed the modern versions in use today. Additional equipment was employed including rescue boards, boats, helicopters, four wheel drive vehicles, and even cranes for cliff rescue. There were many other evolutions, including lifeguard towers of varying size and capability.

The training, skills, and capabilities of lifesavers evolved to extend beyond basic rescue and medical aid to include such skills as law enforcement, firefighting, and flood rescue. Women were gradually welcomed into lifesaving, sometimes with significant resistance. Youth programs were developed independently around the world, typically called juniors or nippers.

Two multi-national lifesaving organizations came into existence and, to a degree, competed with each other for supremacy, but also focused on specific areas. Ultimately the two world lifesaving bodies merged into the International Life Saving Federation, which unites lifesaving worldwide today.

Beach lifesaving is less than 130 years old. In the history of humankind, that's a very short time. A public safety discipline that didn't exist at all has evolved quickly and admirably to its present state. The police and firefighting professions have existed for many hundreds, perhaps thousands, of years. We are a new discipline, no less important in the protection and preservation of human life. We have achieved levels of professionalism, be we paid or volunteer, that leave people willing to place their safety and that of family and friends in our hands. And indeed we deliver.
Public Rescue Equipment and the Chain of Survival

Mr Martin O’sullivan¹
¹Irish Water Safety, Cork, Ireland

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This is an update on a presentation made in Potsdam which was an evidence based account of the considerable number of lives saved annually in Ireland by members of the public using the available Public Rescue Equipment – the ring buoy (also known as a lifebuoy, life ring or life belt).

It presents new evidence on rescues carried out by members of the public using ring buoys.

It also presents a section on the evidence based specifications for ring buoys that are deployed on beaches, rivers and lakes in Ireland.

It will demonstrate the link between MPS 19 of ILS and this life saving piece of Public Rescue Equipment.

In Ireland ring buoys are placed on all beaches used by the public. They are placed 100m apart. They are also deployed along river banks, at lakesides and on all marinas.

Irish Water Safety organises an annual Award Ceremony which includes a Just-In-Time Award for members of the public who have saved the lives of people who were in danger of drowning.

The link between the deployment of ring buoys and the lives saved is very significant.

Irish Water Safety has gathered evidence over the past 10 years on the means by which members of the public have successfully carried out rescues of persons in danger of death by drowning. It has also gathered evidence on different types and has agreed specifications for fit-for-purpose ring buoys.

There will also be a short video on the use of the ring buoy as a lifesaver.

This central section of the presentation will outline the number of persons saved from drowning in Ireland by use of the ring buoy.

The presentation will include the drowning stats showing a big drop in the number of people who drowned in Ireland (other than those who have chosen to end their lives by drowning)

The discussion is twin tracked
1. The Irish Water Safety syllabus whereby members of the public are trained from a very young age in the use of ring buoys as a means of saving lives
2. The agreement between IWS and the Municipal Authorities to deploy ring buoys in all aquatic environments which are used by members of the public or indeed exclusively by their own staff

The focus will be on message
Proper training in the use of the ring buoy allied to correct deployment of same in aquatic environments will save lives.
Surveillance Errors by Lifeguards - A comparison of Results 2007-2014: Have we improved?

Mr Billy Doyle
(Surf Life Saving New Zealand, Piha Beach, New Zealand)

Background
We define a surveillance error as: “an unplanned failure to provide constant supervision of patrons in a supervised area.”

Like all errors, these unplanned actions may not necessarily result in an adverse outcome. Rather, maybe indicative of wider issues confronting lifeguards such as training content, workload, surveillance system design and an ongoing failure to acknowledge such issues affect outcomes. In 2007, we audited ten independent locations. Each site received three random and discreet audits over a period of six months to ascertain the frequency, duration and type of surveillance errors. Locations included public swimming facilities (n=4) and open water beaches (n=6), in New Zealand. An audit of the same ten sites was repeated in 2014 using the same methodology for comparison of results.

Methods
Ten independent sites were selected for audit in 2007; the same sites were re-audited in 2014 by the same researcher. Sites were selected randomly and were distributed throughout the country. Each site received three audits using a standardised audit tool. Each visit was scheduled at randomly selected times during business hours over a period of six months. To meet the criteria to proceed with audit, each site must have had a patron population of >25 persons. The auditor observed the on duty lifeguard for a period of sixty minutes. A stopwatch recorded the duration of periods when patrons were not supervised. The activity undertaken at the time of non-supervision was recorded to establish if there are any common behavioural trends across all sites.

Results
In 2007, the maximum duration of non-supervision of patrons from any on site was 2 minutes 15 seconds. In 2014, the maximum duration was 2 minutes 3 seconds. Statistically there was no difference between the audit conducted in 2007 and 2014 at any site audited (p>0.05).

The frequency of the incidence of non-supervision was statistically significant across all sites visited. On average there was a 23.2% (p<0.05) increase in the frequency of surveillance errors across all sites visited between 2007 and 2014.

The most common activity conducted by lifeguards during periods of non-supervision in 2007 was the use of a cell phone (texting) or radio. In 2014 the most common activity was eating, followed closely by ‘talking to others’. Regardless of activity, the net result was the manifestation of cognitive distraction which resulted in cognitive and task overloading and therefore in turn, inadequate constant surveillance.

Discussion
The results of these audits suggest distractions and task over loading remain problematic to maintaining constant vigilant surveillance. An awareness of cognitive distractions such as texting and using a radio may have increased between 2007 and 2014 in the sites audited, explaining the reduction in the frequency of such incidents. This is encouraging. However, the number of incidents and the duration of time when non-supervision occurred have not improved in the seven years between audits. Constant vigilant surveillance remains a challenge.

Human Factor Psychology and training is an integral component to the art and science of many high stakes industries such as aviation, medicine and the military. It is as relevant to lifeguard practice as those industries and as yet, is not routinely part of lifeguard training. Is it time for lifeguards to undertake similar training to move best practice forward?

Despite good evidence, cognitive distractions are a significant contributing factor to the root causes of accidents in other industries. We know very little about exactly why lifeguards are distracted, and whether there are specific human traits, conditions or other human factors that predispose one individual versus another to perform better in this regard while executing their duty. If distractions are widely problematic, and the results of this small and limited audit suggests this is so, do leaders in aquatic safety have to accept this human factor as an unmovable fixed latent condition and moreover, what do they do about it if this is so?

We propose, based on a comparison of results from the two audit periods, that systemic solutions are required to account for an intrinsic human factor deficit that is apparently difficult to counter with current training, more knowledge, experience or other motivational factors.

Based on the results of these audits and other experience, this presentation will describe the most common errors observed during audit and offer some pragmatic solutions to reducing duration and frequency of such surveillance errors. These solutions can be implemented easily with minimal cost based on the experience of other industries who work in high stakes environments and maybe of great use to lifeguards.
The Mediterranean Sea is a land-locked sea where tides are of little importance (the tidal range is microtidal: it does not exceed 30 cm, apart from the northern side of the Adriatic Sea) and fetches are short: so waves, which are not so high as in the oceans, begin breaking at a shorter distance from the seaside, translation and shoaling processes are concentrated in a narrower zone. This makes Italian beaches different from the ones generally analyzed by other students who have concentrated their attention upon oceanic beaches: their morphology depends primarily on the very differently interacting of waves with the emergent bottom of the sea, and much of “oceanic” theory is useless in Italy (as, we think, in the Mediterranean Sea at large). Rip currents work differently and are very dangerous on Italian beaches: 40 – 50 victims out of about 100 hundred drowning accidents per year at sea drown in rip currents.

The beaches of Italian coastlines, and generally in the Mediterranean Sea, belong to six different types, each one presenting characteristic dangers of its own. Four out of six present rip currents. In each case, however, rip currents work differently: the causes provoking them, the working of circulatory cells, and the mechanism apt to trigger them are different.

Moreover the artificial protection of beaches against erosion - in masses and cement (about 55% of Italian coastlines are artificialized) - has produced a variety of hard-engineering structures diverting the longshore drift or changing the circulatory cell in proximity of the beach-face provoking artificial rip currents of its own. These artificial structures work differently on different coastlines.

For all these reasons a single theory of rip currents is simply misleading.

We have produced the following classification of beaches:

1. Flat beaches (sea bottom gradient < 1,50 % / no rip currents)
2. Current dominated beaches – winter profile (sea bottom gradient > 2,50 - 1,50 % >)
3. Current dominated beaches - summer profile (sea bottom gradient > 2,50 - 1,50 % >)
4. Deep beaches (sea bottom gradient > 2,50 – 5% >) / no rip currents
5. Steep beaches (sea bottom gradient > 5 – 10% >)
6. Very steep beaches (or one-breaker beaches) (bottom sea gradient > 10 m.)

The different types of beach are differently distributed on the Italian coastlines. Type 1. is characteristic of the Adriatic Sea; types 2. and 3. of the Tirrenian Sea; type 4 of the Ionian Sea and the west coast of Liguria; Types 5. And 6., characteristic of rocky coastlines, are present everywhere The major islands (Sicily, Sardinia, Elba) present any kind of them.

The classification has been constructed on the basis of other important variables: the particle size of sediments (on which greatly depends the gradient of the beach), the corresponding width of the surf/breaker zones, the number of simultaneously breaking waves, etc. Once classified, a beach needs other variables to be read and interpreted... Lot of indicators may be visually grasped by observers from a beach: a typical trait of our classification is the practical understanding of the working mechanism of a beach as our job is not only to understand, but to save lives.
Hiring Waterfront and Surf Lifeguards: Looking back at ten years of data

Mike Melenchuk¹, Terry Wagar², Heidi Weigand³
¹Lifesaving Society Canada, New Minas, Canada, ²Saint Mary’s University, Halifax, Canada, ³Centre for the Study of Sport and Health at Saint Mary’s University, Halifax, Canada

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The Nova Scotia Lifeguard Service (NSLS) was formed in 1973 due to startling drowning trends at provincial parks in Nova Scotia, Canada. Originally only a handful of beaches, the NSLS now supervises over 20 sites. Since its inception there has not been a drowning during supervised hours at an NSLS beach. Additionally the NSLS boasts 18.1 million people supervised, 4,132 document rescues, 1,497 community service projects and 1,167 different employees (NSLS Annual Report, 2014).

Since early 2000s the NSLS has been using a weighted screening system for hiring. This system was constructed by the NSLS staff and used lifeguarding experts from across Canada to refine the process. Using the screening information, the NSLS tries to identify the best lifeguards for each waterfront or surf location. The screening is done in person and scores are determined for the following: application, interview, a written test, a 500m swim, a 50m in water carry and a 3.2km run. The physical scores are competitive amongst staff while the remaining areas are scored independently for each applicant. Each applicant receives an overall score and is then sorted by geography for hiring.

All the NSLS lifeguards are subject to performance appraisals at mid-season and the end of the season. These appraisals include both physical and technical lifeguarding skills and are meant to help the lifeguards improve by identifying areas from improvement. Additionally, the end of season evaluation includes a recommendation about future employment.

Our study has combined ten years of hiring data and appraisal information for lifeguards. We looked at the relationship between the hiring data and performance appraisals to see if the screening system is working. Then looked deeper to see what other characteristics were present in the top performers and how lifeguards changed from year to year.
Registration of medical interventions by lifeboat crews with the aim to improve the quality and effectivity of training program

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Rescue 2, Ballroom 1, November 4, 2015, 3:30 PM - 5:30 PM

The Royal Dutch Lifeboat Institution (KNRM) covers the open waters of the Northsea, Waddensea and IJsselmeer in the Netherlands by means of 45 lifeboat stations, 65 rescue crafts and 1300 volunteers.

In a recent study (2012), it has been observed that during an eight years period, there were 17001 interventions. Of these, 660 (3.9%) were medical interventions. Analysis of the medical interventions showed that most were due to complicated injuries and diseases; and that the medical interventions occurred during bad or very bad weather conditions. Lifeboat crews have to deal with complex medical situations but at very low frequency. As a consequence of these observations, it was concluded that the current first aid training program was not aimed at the situations the crew members had to deal with. With the objective to better train the lifeboat crews for medical interventions, it was decided that after an initial training on the principles of first aid, the ensuing continuing education and retraining program should shift from class-room education to real-scene scenario training on a boat or in or nearby water.

To better monitor the performances of the medical interventions, a new electronic registration system has been developed. The aims of the system were:

• to become better informed about the numbers, types and quality of medical interventions,
• to be able to verify if the learning objectives of the first aid training program fits the real-scene situation the crews have to deal,
• to be able to verify which of the available medical equipment on board is used by the crews during real-life situations,
• to transfer information and improve communication with the ambulance services and hospitals. For this reason, the system generates the transfer sheet with information relevant for ambulance crews and hospitals,
• to offer support during medical interventions. The registration of the medical interventions will be linked to instructions on the monitors of the most recent rescue craft.

The monitoring system consists of one section with general data that are automatically generated at the moment of the call for intervention, such as kind of incident, the weather condition, crew composition, and the other organisations involved. Medical interventions are categorised as resuscitations and other medical interventions. Data on resuscitation are structured according to the Utstein for drowning definitions and criteria. The other medical interventions are structured according to the national ambulance protocols.

After a pilot period and an operational period, the collected data will most of all serve for training and quality purposes, such as adapting, emphasising or removing certain elements of the basic CPR, first aid and scenario training, adapting or removing medical equipment on board and improvements of the communication with sea and land-based dispatch centres and on-land medical facilities.
Safer Europe by higher qualified lifeguards and Water Safety Managers - Two Projects for the European Qualification Framework

Dr. Detlev Mohr

1 ILS Europe, Potsdam OT Satzkorn, Germany

Session 5 - Day Two Plenary, Grand Ballroom, November 5, 2015, 8:45 AM - 10:15 AM

In Europe still over 30 000 people drown every year. Tourists travel all over Europe and need water safety during holidays as well as the European citizens for their leisure time activities. Therefore standardised information (ISO 20712) and qualified lifeguard service at beaches, in swimming pools and at lakes and rivers are necessary. But also lifeguards and water safety managers must be well educated and should be mobile for taking over vocation in different countries.

The European Parliament and Council recommended in 2008 the establishment of a “European Qualifications Framework (EQF) for lifelong learning” (2008/C 111/01). On the base of this recommendation the International Life Saving Federation of Europe (ILSE) representing more than 5 million lifesavers and lifeguards all over Europe developed the “European Qualification Framework for Lifesaving”. This was accepted by the EU Directorate General on 23rd September 2009.

In a first project “Safer Europe by higher qualified Lifeguards “from 2011 until 2013 thirteen ILSE Member Associations developed in partnership all necessary technical, methodical and didactical aspects for the training of lifesavers (level 1), assistant lifeguards (level 2), lifeguards and instructors (both level 3), chief lifeguards and chief instructors (both level 4). Common curricula describing knowledge, skills and competences for training in all European Member states have been produced. In four seminars the proposals had been evaluated to find out the practice methods. Now the EQF for Lifesaving is recognised by the European Commission and the national governments have to take over these training programmes as standard for vocational training.

A second partnership project “Safer Europe by higher qualified Water Safety Managers “was put forward to develop the Framework further for education levels 5 to 8 (Specialist/Assistant Manager; Bachelor/Manager; Masters; PhD). The result was accepted by the EU Directorate General in 2012. Up to now there was no common European qualification concept for higher levels in Water Safety Management. There is however a growing need for specialists and managers of staff in water safety with higher levels of qualifications. Some Higher Education Institutions (HEI) offer some courses with some lifesaving content, but the main focus of these programs is on different topics such as tourism, sport or environment, and not on Water Safety Management as a specialism.

Now ILSE needs to do all it can to promote the use of this EQF by those institutions as soon as practically possible.

Lifesaving in, on, under and beside water is a basic safety aspect all over Europe. Lifesaving is involving people of all ages, gender and religion: Water recreation is an integral part of daily life in Europe and therefore, water safety and lifesaving skills are also required to ensure safety in aquatic environments all over Europe.

The partnership projects realised a valuable common approach for an advanced vocational lifesaving education and qualification, based on best practises, modern methodical and didactical models, which can be used by all participating and other interested associations in Europe and other parts of the world. The main goal of the international partnership is to transfer successful modules of education from abroad directly into the ongoing work of the teachers and trainers.
EQF2 Developing a European Qualification Framework for Water Safety Management for delivery in Higher Education Institutions by working in partnership

Mr John Martin
Surf Life Saving Great Britain, Othery, United Kingdom

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EQF2 Developing a European Qualification Framework in Water Safety Management for delivery by Higher Education Institutions by working in partnership

This presentation describes how seven member federations of the International Life Saving Federation of Europe (ILSE) worked in partnership, using European Union funding, to develop a specific European Qualification Framework in Water Safety Management for delivery by Higher Education Institutions (HEIs). It will also provide some information on the next stage of the EQF programme which will see the further development and take-up of this initiative with HEIs in different European countries. This project builds on the success of a previous European EQF project that will be covered by other speakers, Dr Detlev Mohr and Dr Dirk Bissinger.

Background

In Europe 35 000-40 000 people drown each year. Tourists travel all over Europe during their leisure time activities and holidays, and wherever they are near or in water, there need to be suitable water safety management practices in place to support standardised, qualified lifeguard services at beaches, in swimming pools, other aquatic facilities, and at lakes and rivers.

Until now there is no common European qualification concept for higher levels in Water Safety Management, yet there is a growing call for specialists and managers of staff in water safety with higher qualification levels. Some HEIs offer some courses with some lifesaving content, but the main focus of these programs is on different topics such as tourism, sport or environment, and not on Water Safety Management as a specialism.

Following the successful European Qualification Framework (EQF) for Lifesaving that was developed by ILSE with funding from the European Union (EU) Directorate General, a new partnership project, EQF2, was established to develop the Framework further for levels 5 to 8 for Water Safety Management and this was accepted in August 2012.

Partners

It was intended that 16 member federations would participate in the project, but ultimately only 7 were accepted to become funded partners. These partners are (listed in alphabetical order):

- Federación de salvamento y socorrismo de Castilla y León (FECLESS – Spain)
- Ligue Francophone Belge de Sauvetage (LFBS – Belgium)
- National Sports Academy “Vassil Levski (NSA – Bulgaria)
- Norges Livredningselskap (NLS - Norway)
- Royal Life Saving Society UK (RLSS UK – UK)
- Surf Life Saving Great Britain (SLSGB – GB)
- Wodne Ochotnicze Pogotowie Ratunkowe (WOPR – Poland)

Outcomes

Through successful partnership working across Europe, the partners successfully shared their expertise in lifesaving and water safety management, enabling them to develop a Qualification Framework for levels 5 to 8 with a curriculum divided into four streams:

- Management
- Health and Safety
- Didactical Methods
- Special Topics

For each stream specific criteria at each level 5 to 7 have been developed:

- Level 5 – Specialist/Assistant Manager in Water Safety Management
- Level 6 – Bachelor Degree in Water Safety Management
- Level 7 – Masters Degree in Water Safety Management

The criteria for each level from the four streams were combined into a single document for each Level, covering the Knowledge, Skills and Competence required for each topic within each stream.

For the final level, a single set of criteria were developed to cover all four streams:

- Level 8 – PhD in the field of Water Safety

HEIs in at least 4 of the 6 countries involved have already indicated an interest in taking up the Qualification Framework for Water Safety Management and are prepared to look further into the possibility of doing so, with interest also being shown in at least 2 countries not involved in the partnership.

In May 2015, the ILSE Board agreed to support a new EQF3 project to begin in late 2015, that will be managed by these HEIs to develop the detailed work beneath the framework to run these new courses. It will seek to bring together a network of HEIs in different European countries to share Water Safety Management experience and research. Following a meeting in June 2015 in Poland, the Bydgoszcz University of Economy, volunteered to be the lead HEI for this exciting new project.
Measuring the economic benefits of lifeguard services in the UK

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The problem/ issue
It is counter to the natural instincts of most providers of lifeguard services to place a value on human life, however, if service providers are going to effectively engage with and influence decision makers to fund lifeguards services they will benefit from understanding the economic benefits of lifeguarding. There are potentially a number of ways of measuring the economic value of a lifeguarding including a number of studies that use cost of life assessments.

Aim of the presentation
This presentation seeks to quantify the economic benefits that derive from the presence of lifeguards on beaches and compare those to the costs of providing the service.

Solution
This paper compares and contrasts several studies that have been undertaken to provide insights into the economic benefit of providing a lifeguard service. The evidence suggests that the economic benefits to a local area of providing lifeguard support on its beaches substantially outweigh the costs. Taking into account the costs of lifeguard support for the local authority suggests that for every £1 the local authority pays, lifeguards attract an additional £5.06 of tourism spending into rural areas and an additional £7.10 into urban areas. Savings for the National Health Service (the UK’s Health system) of lifeguard first aid assistance are also substantially higher than their costs.

People tend to avoid places where they fear they may become a victim of crime. There is a strong perception among beach visitors that the presence of a lifeguard service reduces the incidence of antisocial behaviour and crime which increases the attractiveness of the beach as a venue.

Organisational outcomes
This evidence enables the RNLI to present a compelling case to donors and local authorities for the economic value that lifeguarded beaches provides.

Learning outcomes for attendees
1. To understand a range of potential ways of measuring the value of a lifeguard service
2. To provide insights into the potential influences that drive decision making
Effectiveness of SeaSafe lifeguarding in Cox’s Bazar beach Bangladesh

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\item \textsuperscript{3}Royal National Lifeboat Institution (RNLI), Pool, United Kingdom
\end{itemize}

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Background
Drowning is the leading cause of death among children in Bangladesh and claims the lives of 18,000 children each year. The southern coastal city Cox’s Bazar is one of the largest sandy beaches in the world, and has become a popular tourist destination over the last decade. Fatal drowning on the beach has become common for tourists, including a number of high-profile drowning deaths that have shocked the nation. Most high income countries have professionally trained lifeguards to ensure the safety of tourists on the beach, however prior to the introduction of the SeaSafe programme there were no trained lifeguards on the beach in Cox’s Bazar. In July 2014 new full time lifeguards were appointed in Cox’s Bazar beach. This presentation describes the services they provided over a six month period.

Objective
Assessment of the lifeguard services in management of drowning causalities provided by low resource setting lifeguards in Cox’s Bazar beach Bangladesh.

Methodology
With the support of Royal National Lifeboat Institution (RNLI) the International Drowning Research Centre, Bangladesh (IDRC-B) developed a beach lifeguard program called SeaSafe. Since July 2014, 10 paid lifeguards have been employed to provide lifeguard services on Cox’s Bazar beach. International level lifeguard training was provided by the RNLI. All lifeguards were also trained in First aid and CPR to provide support in medical emergencies. Reporting forms and tools for data collection were developed to record incidents, and the lifeguards were given training in how to complete the forms.

Results
Collected data from 25th of July 2014 to 25th of January have been analyzed. In total 56 causalities were rescued from the sea - 51 male and 5 female. Adolescents were found to be the most vulnerable group. 80% of all rescues were conducted in the lifeguarded zone, between the red and yellow flags. Nearly 62% of incidence was due to rip currents. About 54% of casualties were using inflatables far from shore before being rescued. Lifeguards used surf boards or rescue tube in 84% of rescues. Among the causalities 88% were not from the Cox’s Bazar area.

Conclusion
Lifeguarding is an essential part of any tourist beach, a lot of lives can be saved by providing lifeguard activities. Further long term research is needed to establish an effective lifeguard system in low resources setting.

Key words
SeaSafe, Lifeguard, Rescue, IDRC-B, RNLI
Professional rescuers vs. rescue volunteers
– Comparison of real and perceived skills of CPR

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Introduction
Cardiovascular diseases remain a leading cause of death worldwide. On the other hand, recent WHO studies show that drowning is one of the leading causes of accidental death. As a result, the European Resuscitation Guidelines 2010, made special emphasis on the need for performing quality cardiopulmonary resuscitation (CPR). Considering the above, the purpose of this study is to thoroughly analyse the competences, real and perceived, of professional rescuers and volunteers in CPR and compare both groups as first responders in emergencies.

Methods
The sample of our research consisted of a group of 40 persons belonging to non-medical emergency health bodies (19 professional rescuers and 21 rescue volunteers). Inclusion criteria for both groups were: professional rescuers – lifeguards hired as main professional occupation by beach services and with obligation to act as first responders; and rescue volunteers – emergency services non-medical personnel, collaborating with professional responders but not hired for this purpose: police, fire and civil protection staff, with no obligation to act as first responders. Two tests were performed: at first a questionnaire on demographics, theoretic knowledge and perceptions of CPR protocols, adapted from Moran and Webber (2012), was applied; and secondly, performance testing during a simulated practical CPR case of intervention using the mannequin with evaluator - ResusciAnne Laerdal®. The dependent variables were compared for each group of participants – professional rescuers vs. rescue volunteers.

Results
The results show that the majority of participants (66,7%) has done some training during the three months preceding the study. 82,5% believe that their ability to perform CPR is acceptable, effective or very effective. 27,5% showed hesitation to perform CPR on a real intervention. Most participants (67, 5%) consider the frequency of successful CPR in out-of-hospital cardiac arrest to be over 25%. 50% of participants considered CPR as the most important skill when performing an aquatic intervention. In terms of theoretic knowledge, errors were found in different steps of the protocols in answers of up to 50% of the participants. As for practical compliance with protocols, only 17, 5% succeeded to perform the complete sequence of action. As to the practical skills of CPR, only the 21, 86% of compressions were performed successfully regarding depth and expansion.

In the 2 minutes of the practical assessment, only 8,4% of the ventilations were performed correctly, with an average of 5,7 of the ventilations being considered excessive (> 600ml). Significant differences between professional rescuers and volunteers regarding compressions, ventilations, quality of CPR, the action protocol and theoretical knowledge of CPR protocols were found. No correlation between perceived and actual quality of CPR.

Conclusions
Rescuers who participated in this study had a good knowledge of CPR protocols regarding compression and ventilation but were less accurate in terms of protocols and primary survey. There is an overestimation of the success rate of out-of-hospital CPR. Professional rescuers have a better quality of CPR and knowledge and performance of CPR protocols than rescue volunteers, although differences are rather low and overestimated. It seems necessary to provide training for non-emergency health services, both professional and non-professional for proper and prompt response to emergencies as first responders.
Fixation Errors by Lifeguards in Emergency Situations: How to improve team performance while under duress

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Background
Emergency situations and crisis, especially in any ‘high stakes’ environment, presents challenges for individuals and teams tasked with managing them. A ‘high stakes’ environment is defined as:

Any environment or situation where decisions taken, rightly or wrongly influence an outcome and could result in injury, serious harm or in the extreme, loss of life.

Distinct to high-stakes environments, versus normal environments, is the pressure of time. In such environments, a situation can arise with little or no warning despite good planning and strong systems. Time, or lack of it, strongly influences the likelihood of success or failure. Lifeguards operate in high stakes environments. A lifeguard will likely at some stage in their career, deal with such a situation.

Emergency situations and crisis bring about a complex set of internal physiological and psychological processes that can alter normal behaviour, cognition and communication styles. We describe such situations as the ‘high stakes-under duress’ scenario.

‘High stakes-under duress’ scenarios present unique challenges for those tasked with their management and requires a subset of skills that require mastery. Different thinking, application of non-technical skills such as communication styles and problem solving are required compared to the thinking, problem solving and leading methods used during normal conditions. Skills and methods to train individuals and teams have been developed by other industries such as aviation, the medical profession and the military and are in some cases, a mandatory component of basic training. Is it time lifeguards undertook such mandatory training?

Presentation
In this paper, the authors will present an actual case study (video footage) showing an example of how the management of a lifeguard team and its individuals were impaired by common group and individual human factors induced by the ‘high stakes-under duress’ phenomena.

Patterns of behaviour displayed by individuals and the team are described and several common errors (known as fixation errors in particular) explained. The importance for leaders to be trained to counter conditions that increase the likelihood of fixation error using specific leadership skills and tactics will be described and other examples of failures in team and group dynamics are presented and solutions to reduce such errors suggested.

Also discussed and presented are ‘ready to go tools’ leaders can use to improve their leadership performance in ‘high stakes-under duress’ situations. Examples of how leaders can provide some simple and effective training for their teams where ever they may work are presented and resources provided and shared for future use.

Summary
‘High stakes-under duress’ scenarios are an ever present threat to lifeguard teams throughout the world regardless of environmental context. Whether at the beach or a large water-park, the risk of failure of teams and individuals due to inevitable human factors is greatest in an untrained individual working in an untrained team. To date lifeguard training has focused on training individual technical skills, very little is known or published about the importance of the human factors within lifeguard teams, in particular while under duress. However, valuable lessons and parallels can be drawn from other industries. The authors of this paper draw upon their knowledge and skills in such industries and present possible solutions for lifeguards to reduce the risk of errors and failure in the ‘high stakes-under duress scenario’.
Drowning and First Aid Regarding the Beach Accidents of Japan

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In Japan, approximately 4,000 volunteer lifesavers patrol at 200 beaches during the summer season. Also, the regional lifesaving clubs have been making the patrol logs, first aid reports, rescue reports and the resuscitation reports at each beach since 1998. In these reports, the detailed data regarding accidents on beaches are described. In this study, actual situations of beach accidents of Japan caused by drowning and the first aid were investigated using lifesaver’s reports from 1998 to 2014.

There were 1,500 to 3,000 drowning accidents occurring every year starting from 1998 to 2014. An average of 1,887 drowning accidents occurred. So, a breakdown was created of drowning accidents in the emergency care and the preventive action. The emergency care, which is the rescue of unconscious victims, was from 10 to 30 cases during this period. In addition, there was an average of 15 cases. The largest number of victims in this period occurred in 2014, which had 29 cases. The preventive action, which is the rescue of potential drowners from high risk areas to safe areas by lifesavers, was from 1,000 to 3,000 cases in the same period. In addition, there was an average of 1,871 cases. The accidents caused by the rip currents account for 51%. The average number of rip current drownings including the fatalities and survivors in one year was 473 cases starting from 2003 to 2014. Although the necessary rescue equipment and the water safety information such as signboards were mostly prepared, many rip current drowning accidents chronically occurred at some particular beaches which were facing the Pacific Ocean. So, as principal outbreak factors regarding drowning accidents, the rip current followed by off shore wind account for 20% of cases. As well as longshore currents and waves accounting for 11% and 9% each. So, the human factor regarding drowning accidents, one of which was the lack of swimming skill accounted for 56% of cases from 2010 to 2014. The lack of swimming skill was followed by alcoholic drinking and panics accounting for 15% of cases each and then tiredness accounting for 13%. Drowning connected to alcoholic drinking was in second or third place preceded by those cases that had the lack of swimming skills regarding the outbreak of personal factors. Actually, some drowners who had cardiac arrest were drinking alcohol according to lifesaver’s rescue reports.

On the other hand, lifesavers treated a lot of first aid. First aid was carried out 10,000 to 25,000 times every year starting from 1998 to 2014. The average first aid was 14,831 cases. These first aid cases mainly involved jellyfish stings. The jellyfish stings were followed by lacerations, then abrasions, and finally stingray stings.

In addition, there were approximately from 100 to 200 cases of calling ambulances in recent years.

In order to reduce drowning and first aid, beach users have to truly understand potential risks and prevention methods with local government and lifesaver’s cooperation.
Nordic guidelines for Lifeguard provision

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One of the goals of doing a risk assessment is to calculate how many lifeguards and what level of knowledge, skills and competence they need to ensure the required level of water safety.

In order to do these calculations we need three categories of data:

1. The time available for doing the rescue - One can make some «qualified estimates»: «From beginning to end of the Instinctive Drowning Response... Unless rescued by a trained lifeguard, these drowning people can only struggle on the surface of the water from 20 to 60 seconds before submersion occurs». (Vittone and Plia, in On scene - US Coast guard 2006 p. 14) From this we can calculate a maximum rescue time for children, high risk activities at 20 sec, and for adults, low risk activities at 60 sec. Related to «brain damage», the time from «going under» until the of start CPR should maximum 3 minutes. Due to the need to return to shore before starting CPR, maximum rescue time is calculated to be 90 sec.

2. The time needed to discover, assess and react to an emergency. We can split this into two situations.
   a. «Surveillance from a distance», a «standard requirement» is the ability to discover, assess and react to the situation within 10 sec.
   b. «Surveillance on site», the lifeguard is already in or on the water and able to start the rescue immediately

3. The rescue speed - meaning the distance one can cover within the time limits. This will vary with equipment, skills and sea conditions. This will be tested in coastal areas in Norway, Sweden, and possibly Denmark this summer. We will study the speeds when swimming breast stroke, crawl, crawl with fins, rescue board, rescue kayak, and IRB, all in calm water, low waves and high waves.

Based on this one can calculate the rescue distance for different rescue methods within different time limits in different sea conditions. These values will change depending on the surveillance position of the lifeguard.

By sorting the calculations into tables, you can see the rescue distances related to safety levels, use of rescue methods and equipment, how the distances are reduced with increased wind, higher waves and so forth. When relating this to a specific beach area or event one can use the table as a reference to assess how many lifeguards are needed and what equipment is most effective. This data will be helpful when evaluating changes in conditions and to make decisions in assessing public safety f. ex. make the decision to abort an event.

There were a few surprises when working these guidelines:
• The limitations of swimming in rescue
• The importance of assessing suitable rescue equipment
• Some rescue methods were not suitable within certain conditions and time limits
• The importance of being “on site” when safeguarding “high risk” activities
• How rapidly the distances for “rescue time” where reduced with increasing wind and waves and the impact this could have regarding lifeguard provision

The problem with making these guidelines was that everything varies. Neither the qualifying level of lifeguards nor local conditions are included in the calculations. For this reason, these guidelines can only be regarded as tool or “a way of thinking” in a thorough risk assessment for a beach or event. It could also be a tool in a training program for lifeguards and improvement of water safety.
Identifying a Weakness in the Drowning Chain of Survival: Is there assumption detection is guaranteed? Do trainee lifeguards and the public form an accurate mental model of drowning behaviour from current training methodologies?

Mr Billy Doyle
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Background
The ‘Drowning Chain of Survival’ recently published in Resuscitation (2014), is a major step forward to conceptualise the most appropriate steps to take to reduce and prevent drowning and should it occur, provide the best possible outcomes for victims. The premise for this model, like the ‘Cardiac Arrest Chain of Survival’ is that each link in the chain is vital to outcome. In this regard the conceptualisation is in its own right, a tightly coupled system. If one link breaks or is impaired, outcome is affected.

There is no doubt that conceptually, the Drowning Chain of Survival makes sense and is logical. However, an analysis of ten case studies (drowning incidents) by the author, identifies there may be a failure in what the author proposes is a critical link in the chain, Detection.

The results of our investigation raise questions, but also provide an opportunity to strengthen the chain, a crucial tool for drowning prevention.

Methods
In 2014, an investigation was conducted into ten fatal and non-fatal drowning incidents seeking root causes. These case studies have identified that adverse outcomes are possible due to a failure to detect drowning behaviour, even in plain sight of lifeguards and or others tasked with supervision. One case examines a triple fatal drowning incident where adults failed to detect vital early signs of distress and drowning behaviour. One case examines a non-fatal drowning incident that occurred within several feet of a trained lifeguard conducting surveillance.

Results / Discussion
These cases highlight a critical first order logic question. Can we assume detection is guaranteed? If the answer to that question is ‘yes’, the chain remains tightly coupled. If the answer is ‘no’. The system is vulnerable, the chain breaks.

Other questions need answering through more research: Do we know if the public can reliably detect drowning behaviour and do trainee lifeguards form accurate mental models of drowning behaviour from their training received? If the answer is no, this will need addressing if the ‘Drowning Chain of Survival’ is to reach full potential as a tool. The leading cause of these failures in the cases investigated, include knowledge based errors, cognitive blindness, cognitive distractions, task fixation errors and rule based errors and in one case, subconscious violations. These terminologies are explained and presented.

Detection of drowning behaviour is reliant upon lifeguards and others physically seeing the target and accurately (through cognition) matching behaviour with knowledge. If knowledge is incomplete or inaccurate, the lifeguard or member of the public may fail to make the right decision, especially if distracted, overloaded or while under duress. Gaining that knowledge comes through conventional training methods and includes recalling oral descriptions of what drowning behaviour looks like (from instructors) or reading texts and or diagrams or photos. These methods present a simple and obvious problem when examined through the lens of human factor psychology.

Current training methods require the learner to develop an internal mental model or ‘construct’ of what they make the text, oral description or photo mean inside the mind. Each of these constructs is highly intra-personalised and irrational as they dwell in memory and imagination. Every exposure to drowning behaviour requires the individual to gain access to memory and imagination and make a cognitive assumption as to whether what they ‘see’, matches their internal mental model with what is happening in the real world. If the original ‘knowledge’ conflicts with their internal mental model of the here and now, the mind can be blinded to reality and vice versa. If what is happening in the here and now fails to reach a threshold where any analysis is undertaken at all, the event will go unnoticed. This is cognitive blindness in both conditions.

Over time, trainee lifeguards will, through trial and error strengthens the reliability of their mental model of drowning behaviour by a process of trial and error: Is this good enough in a high stakes environment?

The author proposes that conventional training methods may be inferior to using more real world examples (actual footage) at forming a trainee’s knowledge base. The schema and constructs formed by reviewing real events will be by first principles, fundamentally more accurate and less prone to failure of memory or imagination.

Also presented are solutions for trainers to ensure trainees (and members of the public) form and quickly form, more accurate mental models that better reflect the real world, versus reliance on irrational schema that dwell in memory and imagination: Strengthening the Drowning Chain of Survival.
Towards an understanding of the differences in hazard detection and associated responses of experienced and less experienced beach lifeguards

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Rescue 5, Ballroom 1, November 5, 2015, 3:30 PM - 5:30 PM

Surveillance is the primary and most critical component of a lifeguard's job. Given this, one would expect extensive coverage of surveillance methods in lifeguard training manuals and programmes. However, this is not the always case(1).

Previous research has found: experienced lifeguards are 4.9 times more likely to detect a person drowning than less experienced lifeguards(2); no significant differences in the number of fixations and critical events detected between lifeguards and briefly trained participants(1); that experienced instructors identified significantly more critical events than certified lifeguards(3).

To understand more about lifeguards’ expertise, the aim of this study was to investigate what knowledge and visual search patterns are used by experienced and less experienced beach lifeguards in the lead up to the successful and unsuccessful detection of hazards and, to understand if experience and success are characterised by a specific knowledge-base and trainable search patterns.

It was hypothesised that:
1) Less Experienced lifeguards would identify a similar number of hazards and would require a greater amount of time to detect them than the Experienced lifeguards in Video and Video Control groups
2) Less Experienced lifeguards would detect more hazards at the end of the season compared to the beginning
3) The Experienced lifeguards that watch the “On Drowning” video (Video group) would increase the number of hazards detected from pre- to post-video conditions compared to the Video Control group
4) All lifeguards would respond in similar ways to each hazard
5) The Experienced lifeguards would have longer mean fixation durations, greater percentage time fixating and less time spent fixating on hazards compared to Less Experienced lifeguards in the pre- and post-conditions.

For the video stimuli, footage of complex beach scenes that represent real-life, demanding decision-making scenarios was captured, informed by two focus groups. The Less Experienced group data were collected at the beginning and end of their first season. The Experienced Video group data were collected before and immediately after watching the “On Drowning” video. The Experienced Video Control group data were collected before a 15 minute rest and then immediately after the rest period.

A mobile eye tracker was worn during testing. The lifeguards were trained to:
1) press a button when they saw a hazard
2) verbally indicate what the hazard was
3) show where the hazard was using a laser pen
4) say how they would intervene. After two 30 second practice attempts, the lifeguards watched 20 minutes of real beach footage projected onto a large screen in the two conditions.

The key findings were that Experienced lifeguards perceived more hazards than Less Experienced lifeguards and that the time taken to detect the hazards were similar for Experienced and Less Experienced lifeguards. The experience gained during the lifeguards’ first season did not implicitly improve their hazard detection rates.

Furthermore, watching the “On Drowning” video did not improve the Experienced lifeguards’ hazard detection rates. Less Experienced lifeguards used more “Active” responses when intervening with hazards than the Experienced lifeguards. Experienced compared to Less Experienced lifeguards, and detectors compared to non-detectors, had similar eye tracking patterns in the lead up to hazards. Based upon these finding a series of recommendations for training will be presented.

Application of risk identification & black spot models which target behaviours that place people at risk & high risk locations

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Rescue 5, Ballroom 1, November 5, 2015, 3:30 PM - 5:30 PM

The RNLI and SLSA have both used and applied a similar model that identifies and targets specific behaviours and locations that increase the risk of drowning and other water related fatalities. Both programmes have now reached a state of maturity, and we are starting to see the results of taking such an in-depth focus in risk profiling.

This session will aim to give an overview of how these two leading organisations have applied the same thinking to deliver targeted intervention.

The drowning prevention wheel
Both the RNLI and SLSA have adopted the same mechanism for helping to understand the scope of the drowning issue in their countries. A simple scoping tool (the drowning prevention wheel) has helped to bring clarity around key issues and provided the basis for prioritisation.

Risk profiling
Through in-depth research the RNLI has developed a systematic approach to profiling all identified risks. This approach includes detailed causal analysis of fatalities, research directly with key audiences to provide behavioural profiles and guidance on how each audience likes to be engaged.

Changing the right behaviours
The application of a behaviour change framework that has been developed specifically for drowning prevention has helped the RNLI develop an evidence based approach to all of our new prevention interventions. The model is dependent on understanding the hazard and risk profile you are trying to change, but with this knowledge we have developed a simple to use guide to behaviour change.

Targeting black spots
In order to prioritise limited resources both SLSA and RNLI conduct risk assessments to highlight high risk black spots based on locations, population groups and/or activities. This approach relies on sound statistical analysis and stakeholder consultation to deliver a blueprint for investment to maximise impact.

Applied through community engagement
By combining this knowledge into Community Safety Plans, all stakeholders can be strategically aligned to deliver targeted, evidence based community engagement initiatives designed to mitigate their identified risks. Inherently varied based on context, these initiatives can aim to enhance broad community resilience to drowning, be targeted to deliver tools that assist behavioural change, or provide information and knowledge to influence behaviours of targeted cohorts. The foundation approach (bottom-up) has delivered sustainable success by SLSA through the surf club network and programs like Nippers, while the authority approach (top-down) has also been utilised by the RNLI with the Respect the Water Campaign. Community engagement initiatives are then closely monitored and evaluated to continuously improve the drowning prevention model.
Wave height during the best days for beach attendance varies markedly worldwide - lessons for beach safety knowledge transfer

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Coastal beaches are highly dynamic environments that impose numerous risk factors on its users. Therefore, the design and implementation of beach safety management strategies requires substantial know-how. Since the level of expertise on this field in lifesaving organisations worldwide is highly unbalanced, it is common-practice for the most experienced organisations to share knowledge and provide training to junior institutions. However, local environmental factors, which dictate which risks are more important at a given location, may generate a "management bias" towards the prevention of certain risks that may not be the most relevant at the target location. It is therefore crucial to clarify to what extent best-practices applied in one region can be readily applied to another.

Wave height is a key risk factor at coastal beaches, influencing, among others, the likelihood of rip current formation. At locations regularly experiencing high wave height, lifesavers and beach safety managers are likely to allocate significant attention and resources to tackling its associated dangers, greatly shaping management culture, priorities and personal experiences, and thus significantly contributing for the establishment of the "management bias".

In the present contribution we analyse the link between wave height and the likelihood of beach visitation. Our aim is to characterise wave height during the days with highest beach visitation and use those data to determine if wave height is a risk factor with the same relevance across the globe. To that end we used three years of daily air and sea surface temperatures, precipitation rate and cloud cover data from the Climate Forecast System Reanalysis (NCEP) to compute a daily visitation likelihood index. This index does not account for demographic factors, and instead describes how "pleasant" a day is for beach visitation; assuming visitation is positively correlated with air and water temperatures, and negatively correlated with precipitation rate and cloud cover. Significant wave height data was collected from Aviso for the same time period. Computations were performed for all coastal pixels in a ~2x2° grid, between 65°S and 65°N.

Results show that Africa and Australia are the regions with highest number of "visitable" days, owing to overall lower precipitation and persistent high temperatures. Regarding the wave environment, the highest mean significant wave heights were found around south Chile, Australia, South Africa, Europe and western USA. In order to better estimate whether beachgoers are more or less likely to encounter high surf at a location, we analysed wave height data for the 100 most visitable days for each pixel. We found locations with very high surf during the most visitable days (South Africa, Western Australia, parts of Chile and western USA), and others with smaller wave heights despite their high mean wave height during the three years surveyed (Europe and south Chile). In addition, even regional contrasts could be identified using this method, such as between the Atlantic and Mediterranean coasts of the Iberian Peninsula and between southeast and northeast Australia. Furthermore, some regions with small overall mean wave height were found to exhibit abnormally high surf during the most visitable days (Brazil).

The results here outlined provide a detailed look into how much wave height can be “biasing” beach safety management experts around the globe. This methodology is sufficiently general that it can be applied to study the geographical patterns of other risk factors. By focusing on just the days beach attendance is likely to be higher we were able to find patterns that can assist in improving knowledge transfer strategies, directing them towards the risks that are most important at the location they will be implemented, not the locations the experts originate from.
Surf Life Saving New South Wales (SLSNSW) is currently engaged in a major drowning prevention project through the New South Wales (NSW) Government’s Ministry of Police and Emergency Services Water Safety Blackspot Fund. This project, known as ‘Project Blueprint’, is conducting comprehensive research into the risks associated with coastal environments that may lead to drowning and how best to minimise these risks. The early stages of this project were presented at the 2013 World Conference on Drowning Prevention. This presentation will illustrate the progress that has been made in the years since, provide examples of the outcomes delivered and discuss what our organisation has learned as a result of conducting such a comprehensive four year research program.

“Project Blueprint’ is now in its third year, 75% of all accessible beaches and rock platforms in the State. The project utilises internationally standardised risk management processes, applied to the context of drowning prevention, together with the International Life Saving (ILS) Federation’s Drowning Prevention Chain (1) to deliver localised drowning intervention plans addressing the specific local needs of communities and minimise the risk of drowning in each Local Government Area (LGA) visited. Assessor visit and report on every accessible beach and rock platform in each study area to build up a comprehensive understanding of the hazards, risks and other factors that may lead to coastal drowning deaths. Drowning prevention strategies identified for implementation as a result of the research are aligned to the ILS Drowning Prevention Chain’s overarching strategies to address the factors that lead to drowning:

1. Education and information,
2. Denial of access, improvement of infrastructure and/or provision of warnings,
3. Provision of supervision, and
4. Acquisition of survival skills.

To date this research has been used to deliver outcomes in each of these areas, including:

- To support the delivery of education and awareness programs to high risk communities such as Sydney’s Inland Western Suburbs. The research has indicated often those who drown in coastal areas do not live in those coastal areas. In order to reach those most at risk education and awareness programs have been delivered to these communities.
- The research has been able to modify access to improve exposure to standardised aquatic warning signage and also discourage access to extremely hazardous location and encourage access to more suitable locations.
- The project has been able to illustrate the inconsistent approach taken with respect to the provision of warnings by different land management authorities. Improved signage aligning to the International Standard (ISO 20712) has been implemented in some areas and is planned for others.
- ‘Project Blueprint’ has also identified the need for an Emergency Marker System for coastal areas. This system would provide access identification codes on signage to allow emergency services to rapidly locate and respond to incidents at locations where callers to the emergency services state these codes. NSW Government Agencies are now taking action to deliver the system across the entire State.
- The research has also been used to improve the coverage of paid lifeguard services across the State, including providing lifeguard services at new locations or extending to duration which existing services patrol.
- Locations suitable for new public rescue equipment have been identified and equipment has been installed at a number of locations.

The presentation will expand on these outcomes, provide specific examples, and also discuss some of the issues that have been faced as a result of working with communities and other organisations throughout this research. This project has collected a vast amount of information of coastal areas a number of additional opportunities have been identified.
How can lifeguards apply reasoning and decision making to work more effectively? Problem identification, diagnostic strategies, and management decisions

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Rescue 5, Ballroom 1, November 5, 2015, 3:30 PM - 5:30 PM

Drowning is a leading global killer, particularly among children and young adults. The whole drowning process, from immersion to cardiac arrest, usually occurs in seconds to a few minutes. An early and effective rescue may stop the drowning process and prevent the majority of initial and subsequent water aspiration, respiratory distress, need for resuscitation, and medical complications. Lifeguards work in this very stressful scenario, where every second counts. This situation demands a multitude of very quick decisions to be made in physically and emotionally stressful moments. Numerous decisions are required in one single water rescue. Obviously there is a lot of physical training required in advance so the lifeguards' body is prepared, as well as a certain amount of emotional resiliency. Work as a lifeguard is a complicated process which requires problem identification, diagnostic strategies, and management decisions in a highly risk environment. There are a lot of ways this could potentially go sideways, so lifeguard agencies spend a large precious training time on this.

Lifeguard rescue work has two main paths - A pro-active phase, which encompasses prevention and risk management, and a reactive phase, which contains the rescue and first aid. Our research is directed at understanding how to proactively anticipate and control as many variables as possible as this leaves to the reaction phase a fewer variables.

This paper will determine the application of neuroscience principals to effective lifeguard training.

Method
We systematically reviewed articles from 2009-to-2014, searching Scopus for keywords “rescue”, “reasoning” or “decision maker”. We documented each step among a lifeguard need to do/decide on a daily basis using the concept of a Tree Diagram—a simple way of representing a sequence of events—to demonstrate how there are multiple decisions made by lifeguards for a given situation. We hypothesize that variables related to reasoning and decision making can be classified into two general categories: controlled and non-controlled variables along the entire process of reacting to a drowning. All the selected variables were inserted in a timeline of rescue event.

Results
All variables, both previous to reaction (predominately controlled variables) and reaction (largely uncontrolled variables) throughout a lifeguard’s work day were selected from literature and demonstrated. This “Tree diagram” lifeguard of potential decisions has a total of more than 8 million possibilities considering the total of both controlled and non-controlled variables. A lifeguard’s reasoning/decision-making could be simplified into two types a “dual processing” system, which includes both naturalistic-intuitive and rational-analytic reasoning.

1. Rational-analytic - Synthesizing large amounts of information and mitigating some cognitive biases (essentially new decisions). These require effort and employ a deductive search for a fit between the available information and appropriate scripts. Novices employ this more frequently than their experienced counterparts.

2. Naturalistic/intuitive - These methods are used to speed up the process of finding a satisfactory solution via mental shortcuts to ease the cognitive load of making so many decisions. While this strategy is a hallmark of experienced professionals, errors may result from an overreliance on automatic reasoning.

Discussion
The selection of variables involved in a single rescue in a timeline of events results in more than 8 million possibilities/outcomes. This shows the complexity of the lifeguards’ decision making process. Experienced lifeguards accumulate a vast “library” of response options that can be rapidly and subconsciously accessed for the purpose of generating hypotheses and diagnostic decision-making under pressure. However the potential is there for errors to result from an overreliance on automatic reasoning. Due to the myriad of decisions we are proposing a “rescue script” for lifeguards. These new psychological concepts on lifeguarding and a respect for the power and variability of the aquatic environment are the beginnings of forging competent and professional lifeguards.
Experience Moving Water – A Rip Current Awareness Program

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Rescue 5, Ballroom 1, November 5, 2015, 3:30 PM - 5:30 PM

The Australian Water Safety Strategy 2012-2015 indicated 157 drowning deaths at surf beaches between 2008 and 2011. Surf Life Saving Australia’s National Coastal Safety Report 2014 identified rip currents as a contributing factor in 15% of all drowning deaths at surf beaches in 2013 and 2014. The incidence of rip current drowning is an identified concern, highlighting the need to advance effective education. AUSTSWIM’s Rip Current Awareness Project developed resources to assist teachers of swimming and water safety to provide effective education.

In Australia swimming and water safety education is primarily based in controlled swimming pool environments offering little opportunity for students to gain knowledge, exposure, experience or training in controlled surf environments.

Recognising this gap in aquatic education, AUSTSWIM the Australasian Council for Teaching Swimming and Water Safety developed the Rip Current Awareness Guide and Practical Workshop.

AUSTSWIM advocates curricula activities that encompass and encourage thinking, exploring, developing and doing, through controlled environment activities that simulate open water environments including rivers, surf and lakes this project achieves this aim.

The Experience Moving Water - Rip Current Awareness Project had two components the first being the Awareness and Safety Resource Kit.

Working in collaboration with Surf Life Saving Australia the resource kit provides teachers of swimming and water safety with a comprehensive resource that assists them in delivering lessons utilising simulated open water activities. An accompanying flip chart assists in delivering a theory component.

The second component of the project utilises a portable rip current simulator, known as uRippa, that generates moving water in a pool environment. The thirty-minute practical workshop gives students the opportunity to learn and practice skills for performing personal survival and rescue tasks in moving water.

The Royal Life Saving National Drowning Report 2014 identified inland waterways as the location for 39% of drowning deaths in 2013 and 2014, the principles and benefits of the project are transferable to assist in teaching students about other aquatic environments where moving water and currents contribute to drowning deaths.
An Optimal Design of Buoy Type GPS Drifter for Rip Current Measurements

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Rescue 5, Ballroom 1, November 5, 2015, 3:30 PM - 5:30 PM

Many coastal scientists have been surveying rip currents by several methods, using various field measurement devices. A representative device is the Lagrangian drifter, including a Global Positioning System (GPS) module. Surf zone drifters have been used in researches for decades, and for experiments in physics. Advances in technology permitting the installation of small GPS receivers on drifters have improved measurement accuracy. A GPS system provides simultaneous information of location and time, in almost all weather conditions. Using these data, we can understand flow pattern, current speed and direction.

Rip current has recently become a well-known social issue in Korea. In response, the Korean Meteorological Administration started to set up monitoring systems to establish the causes of the rip current generation mechanism at Haeundae Beach. Field observations of rip currents in coastal zones are scarce in Korea but important for understanding the spatial variability of their generation. As a part of this research, we specifically designed a new type GPS drifter to measure the rip current pattern in the shallow swimming zone. Our field test performance using this new GPS drifter in August 2012 was successful. Our GPS-tracked surf zone drifter was found that it is mainly drifted by the mean flow rather than the breaking waves. Also, the results of GPS drifter indicated good agreement with measured rip currents using the Aquadopp Profiler, which is 3D current meter above the bottom. This development of drifter will be helped to clarify the rip current generation mechanism and prevent drowning accidents.

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Rip currents can pull swimmers into deep water beyond offshore sand bars, posing a significant danger to beachgoers worldwide. At Haeundae Beach in Busan, which is located in the south-eastern part of South Korea, rip currents have recently occurred many times, and people were rescued from fast moving, seaward currents in 2014. The Korean Meteorological Administration (KMA) plans to set up automatic monitoring systems to forecast rip currents for the sake of public safety at Haeundae Beach. The accurate prediction of rip currents is essential to prevent coastal disasters. We performed field measurements at Haeundae Beach in the summers of 2011 and 2013 to clarify their generation mechanism.

The main objective of this study was to provide a warning decision process for rip current generation to protect human life in areas where rip currents occur. The developed warning decision process system for rip current generation couples a nearshore rip current predictive system for Haeundae (NERIPS-H) and Haeundae current model (HAECUM). NERIPS-H is used for the initial rip current warning decision step, which involves the calculation of a predictive rip current index using the wave height, wave period, and wave direction (provided by three coastal prediction systems) to provide guidance on the likelihood of dangerous rip currents (safe and dangerous). If NERIPS-H predicts a strong possibility of dangerous rip currents along the coast, HAECUM predicts safety and current vectors using wave (wave height, wave direction, and period) and wind data based on a numerical prediction system simulation.

In the first step of the warning decision process system application, NERIPS-H predicts dangerous rip currents in advance during swimming seasons. An observation system for investigating rip currents at Haeundae Beach could provide basic data on rip current generation in terms of oceanophysical phenomena, which could be used to improve the economic value of coastal monitoring systems and warning systems. In the second step, HAECUM automatically used wave and wind data in a simulation. To predict wave-induced currents for the sake of public safety, coastal flows and waves were produced at each time step and grid point by means of this simulation. To verify the accuracy of the HAECUM model, we compared the rip current occurrence data with the results of the HAECUM simulation using incident wave conditions supplied by the KMA.

We decided on three warning levels for KMA weather forecasts of rip current generation: normal, advisory and warning. To provide a user-friendly simulation of rip currents, a forecasting system was constructed in the form of a software package called the warning decision process system application. By coupling the predictive index and rip current forecast model, we performed numerical simulations using wave data supplied by the KMA, along with forecast information, which made it possible to provide a 72-h rip current forecast on their website.
The Rip Current Program of Real Federación Española de Salvamento y Socorrismo (RFESS).

Dr Antonio De La Cruz

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Rescue 5, Ballroom 1, November 5, 2015, 3:30 PM - 5:30 PM

The number of drownings in the extensive coastline of Spain is the cause for concern that has made RFESS to design an ambitious program that includes research, risk awareness and education activities.

The research activities, undertaken in partnership with relevant institutions, focus on the characteristics of the Spanish coasts in the Mediterranean, Cantabrian and Atlantic beaches to develop rip currents by the analysis of wind regime, bathymetry, wave approach, erosion, tidal range, etc. An important research issue in the Cantabrian beaches is the analysis of erosional rip channels very well exposed at low tide providing important characteristics on rip current width, orientation and higher development during this period due to offshore sandbar erosion.

Our methodology for rip current detection and monitoring includes techniques for the strategic phase (satellite remote sensing, aerial photos, video cameras, as well as for the tactical phase (beach observations, colour dying and GPS registration) that are both integrated together for more effective results. This methodology has resulted in the gathering of a large rip current collection examples and case studies used in our dissemination activities. The use of archives of high resolution satellite imagery has facilitated the monitoring of rip currents, consideration to their formation factors, as well as the temporal change of activity (changes between summer and winter, etc.).

Our risk awareness deals with the dissemination and education of the lifesaving community and the general public. Training on accident investigation of beach drowning is also provided for organizations involved in search and rescue. This is a difficult and complex task that can be facilitated by the knowledge of rip currents and results in a considerable saving of rescue time and resources. In many instances bodies, affected by littoral dynamics, may be found along rip channels. Therefore, these features should receive search priority even if the victims were not affected by rip currents in the first place.

Our educational efforts include the development of a comprehensive on-line course on rip current detection and monitoring based on reliable confidence indicators as well as the most useful evacuation strategies based on specific sea conditions and most recent research, such as littoral drift, plus numerous rip currents examples and case studies in Spanish and South American beaches.

RFESS has also designed its program of “Security Flags” which are granted to beaches that show a measurable security infrastructure including modern rescue and lifesaving equipment as well as the presence of lifesavers with rip current experience. This program is getting international attention and is sought after by tour operators requesting beach security for the numerous tourists visiting Spain.
This presentation focuses on the work done by a committee of the Model Aquatic Health Code that was sponsored by the Centers for Disease Control and Prevention in the United States. The work was designed to address public swimming pools, hot tubs and spas, interactive fountains and waterparks. Over 300 million trips are made to these types of facilities in the United States each year. The work does not cover private residential pools and spas. The Lifeguarding/Bather Supervision Technical Committee was one of 12 different committees working on the project for more than seven years.

The Lifeguarding / Bather Supervision Technical Committee included lifeguard qualifications and training, staffing of lifeguards and attendants, provision of lifeguard equipment and placement requirements, safety training (CPR, AED, etc.), first aid equipment and facilities, and guidance for unguarded facilities. The Technical Committee examined existing technologies and methodologies in the appropriate jurisdictions. The Technical Committee determined the scientific basis, if any, for existing recommendations and criteria; identified scientific information gaps; and outlined data that were needed to support future science-based revisions.

The final product is intended to be a performance-based Model Aquatic Health Code (MAHC) that is national in scope, data driven, and created using the best available science and engineering practices to help state and local government officials develop and revise swimming pool codes. The presenter served as Vice-Chair of this committee and the presentation will explain the behind the scenes work and the outcomes. Additionally the participants will receive a link to documents that shows the actual code information and the annex information providing the rationale for each item.
Do pool Lifeguards use rescue equipment in real rescues?

Mr Caleb Brown

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Rescue 6, Ballroom 1, November 6, 2015, 9:00 AM - 10:30 AM

This study investigated and evaluated swimming pool rescues that were undertaken by pool lifeguards over a three-year period from 1st January 2012 to 31st December 2014. The objective of the study was to establish if pool lifeguards used rescue equipment when engaging in real rescues.

The study was undertaken within a private health club group with 91 clubs in 8 European countries attracting in excess of 8 million swims per year. Each club has one indoor swimming pool measuring an average of 25m x 12.5m with a constant depth of 1.2m and the majority have an outdoor pool measuring an average of 20m x 10m again with a constant depth of 1.2m. All swimming pools have a range of suitable rescue equipment appropriately stationed around the poolside including reach poles, torpedo buoys, throw bags and rescue rings. All Lifeguards are fully qualified and regularly trained by awarding bodies affiliated with the International Lifesaving Federation.

Children under the age of 9 years of age are identified as being at greatest risk of drowning within the facilities and robust parental supervision policies are in place along with Lifeguard supervision. Despite these precautions a number of children do get in to difficulty and require rescuing each year. Operations Managers at each club are tasked with collating detailed reports of all rescues undertaken by pool Lifeguards and uploading this data on to a central server for archive and storage.

During the three-year period of this study pool lifeguards undertook a total of 157 rescues all casualties were the pre-identified high risk under 9’s demographic. The majority of rescues were undertaken in general swimming sessions when children were under the direct supervision of their parent/guardian and the remainder occurred during programmed swimming lessons. Casualties remained fully conscious in 155 of the 157 rescues and the remaining 2 casualties were unconscious on removal from the water and made a full recovery following appropriate treatment.

Pool lifeguards only used rescue equipment during 12 rescues, a mere 8% of all rescues undertaken. All lifeguard training programmes endorse and promote the use of rescue equipment so it is interesting that pool lifeguards did not use rescue equipment during the majority of rescues. Based on this insight each lifeguard’s account of the rescue was further interrogated to try and understand the rationale of the lifeguards’ decision making process. Lifeguards noted and recorded that the child’s wellbeing was their overriding priority and they wanted to remove the child from a drowning situation as quickly as possible. Lifeguards made these decisions despite rescue equipment being close at hand and did not want to take any action that would delay the rescue.

Most casualties who were identified in a drowning situation were close, less than 2 meters, from the poolside and were able to be rescued rapidly by the pool lifeguard and were all in shallow water due to the pool design. Further studies could seek to evaluate if Lifeguard’s undertake the same actions as exhibited in this study in different settings.

In conclusion this study has identified that pool lifeguards within the study group only used rescue equipment in 8% of all rescues. This resulted in rapid rescues being undertaken in drowning situations to expediently remove casualties from harm.
Type of more frequently accidents in Portuguese indoor swimming pools

Prof. Alexandre Tadeia

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Introduction
Since it’s important to prepare the lifeguards (LG) and security features in indoor swimming pools, for accidents that may occur, it is essential to determine the most frequent types of accidents in these facilities. This study aims to determine the most frequent types of accidents in Portuguese indoor swimming pools, that will have impact in the LG base training, in the continuous and complementary formation of the LG, in the preparation of the necessary equipment, in the emergency drills and ultimately in the security performance of the facilities.

Method
We analyzed 3,859 accidents, recorded between 2001 and 2012, in a set of 4 Portuguese indoor swimming pools, where the water safety was provided by a group of LG belonging to an LG professionalized association, duly recorded in specific records with: the victim's personal data and LG, date and time, location and cause of the accident, type of accident, rescue equipment used, site of injury, first aid material used, initial state of the victim, description of the used treatment and final treatment outcome. In more severe cases was also completed another record where beyond previous data, also exist: identification of two witnesses, textual description of acting, according to the rescue algorithm of “Instituto de Socorros a Náufragos” – Portuguese Navy (ILS Full Member), diagram of the accident and description of LG details to improve.

Conclusion
It was concluded that the cuts and wounds are prominently the most frequent accidents in Portuguese indoor swimming pools, with a percentage of 48.7%, followed by 13.3% of nosebleeds, soft tissue injury with 8.6%, headaches with 8.4%, muscle pain with 4.4% and hypoglycemia with 3.3%. The water rescue situations with 1.7% and non-fatal drowning with 0.3%, demonstrate that there is a low incidence of drowning in the indoor swimming pool, although registered, which requires special attention, since they are risk life cases compared with the most frequent accidents. Thus the LG and the water safety plan must be prepared to respond to all accidents mentioned in the study, with particular focus on the most frequent and aquatic accidents. Finally, another conclusion is that in an indoor swimming pool with: a professional water safety plan, LG properly prepared with based, continuous and complementary training, appropriate rescue equipment and a lot of prevention, the most common accidents are not serious, and the serious accidents reduce to a very low percentage.
A low resource pool lifeguard programme for Low and Middle Income Countries.

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Rescue 6, Ballroom 1, November 6, 2015, 9:00 AM - 10:30 AM

The Royal Life Saving Society (RLSS) is an umbrella body for 28 lifesaving organisations in Commonwealth nations around the world. Many of these organisations are small with very limited resources and are located in low and middle income countries (LMICs). One of the strategic aims of RLSS is to proactively build the capacity of member branches to implement effective drowning prevention interventions, providing advice and support to guide their development and activities.

In 2014, RLSS received several requests for pool lifeguard training materials. Concerns were raised about the appropriateness and relevance of training materials from high income countries (HICs) with well-established pool lifeguard programmes (such as the UK, Canada, and Australia). The legal systems and the layers of “health and safety” that exist in these countries make significant elements of the HIC programmes irrelevant or impossible to achieve in LMICs.

The Community & Organisational Development Committee (CODC) has been tasked with the development of a low resource pool lifeguard training programme which is relevant and applicable in the Commonwealth nations. The focus is on the proactive prevention skills of a lifeguard, rather than an over-reliance on high levels of strength and stamina. Where possible, recommended techniques are evidence-based.

The RLSSC has worked in partnership with the Royal National Lifeboat Institute (RNLI) and others for several years, developing a variety of training resources. This suite of resources includes a low resource beach lifeguard training programme. During the production of the low resource pool lifeguard program the lessons they have learnt were taken into consideration during the development process.

This training resource consists of a candidate training manual, an instructor training manual, and a set of lesson plans and supporting resources. The aim was to provide a high quality resource that lifesaving organisations in LMICs are able to adapt and brand for their own needs. The resource development has been supported by the RLSS (UK) and the Institute for Qualified Lifeguards (IQL).

The authors will discuss the development of the curriculum, syllabus, and training resources. Pilot programmes are anticipated to have taken place prior to WCDP 2015 - and reports from these pilots will also be presented.
Twenty years of immersion deaths in lifeguarded environments in Canada, epidemiology, policy

Ms Shelley Dalke, Dr Peter Barss, Karlyn Olsen

Background
National population-based data on drownings in lifeguarded environments are scarce. While representing only 3% of failed acute rescues in Canada, such fatalities occurring in protected environments are particularly traumatic for families and lifeguards.

Methods
Using structured questionnaires, data on immersions were collected prospectively from coroners during 1991-2010 as part of a national surveillance program for all water-related injury deaths. Risk factors were assessed for deaths in lifeguarded environments, including victim, lifeguard, environment, accompaniment, and structural. The Canadian population averaged 30 million during the study.

Results
9961 immersion deaths with drowning and/or hypothermia included 148 acute rescues (3%) in lifeguarded environments with two occupational deaths of lifeguards. Another 338 deaths (7%) occurred in locations where lifeguarding could have been relevant. 97% of deaths occurred during aquatic activities, 2% from falls into water, and 1% boating. Of 1558 aquatic activity deaths, only 9% occurred in lifeguarded environments. Victims were 83% male. Infants <1-year-old accounted for 0%, toddlers 1-4-years old 4%, 5-14-year-olds 37% (n=55), 15-19-year-old youths 13%, and 25-74-year-olds 45%, and 75+ 1%.

Medical conditions were seizure disorder/epilepsy 10%, mental disabilities 9%, depression 2%, alcoholism 2%, schizophrenia 1%, physical disabilities 1%, and acute conditions including cardiac 6%. For ≥15-years-old, only 3% were alcohol associated. 4% were aboriginals. 3% were practicing breath holding activities including swimming lengths underwater, free diving, front floating, and breathing practice. In 4%, swimming ability was an issue. In 3% victims were swimming out of bounds. Intermittent or non-use of recommended floatation aids was cited in 3%. Bodies of water were public pools 40%, lakes/ponds 39%, private pools 7%, waterparks 6%, rivers 4%, and oceans 3%, other/unknown 1%. In non-pool locations, waves were described as rough/white caps in 6% and wind as strong in 4%; with many unknowns, actual proportions would be higher. Strong current or rapids were noted in 14% of pertinent locations, 7% tide, and 3% undertow, with 61% unknowns.

In 1% unclear water or reflection were cited. Lack of a lifeguard tower with inability to see over crowds was noted in one death. For child victim’s 1-14-years old, 18% were alone, 8% with minors, 25% with an adult, and 39% with adult(s) and minors. Lifeguard training was described as NLS 55%, Bronze Cross 3%, and other qualification 42%. In 2% of deaths, lifeguards were reported as UN- or under-qualified. In 2 deaths, lifeguards were changing, coming or going, and in 3 lifeguards were occupied with other duties. In 9%, inadequate ratios of lifeguards to patrons or overcrowding were reported. In 14% (n=20) of deaths, the lifeguard did not appear to have realised the patron was having difficulty and/or beneath the surface, having been alerted by other patrons, possibly the “silent drowning” phenomenon where victims are unable to call for help. Rescues included carrying 69%, swimming 9%, wading 4%, rowing 3%, reaching 1%, talking 0%. CPR and/or rescue breathing were done for 86% of victims. Locations where it was felt that lifeguarding would have been pertinent included lakes/ponds 53%, rivers 17%, oceans 8%, private motel/hotel pools 9%, multiunit apartment facilities 6%, others 7%.

Conclusion and Policy Implications
Deaths in lifeguarded environments are a small proportion of all drownings and aquatic deaths. Victims included nearly all age groups, especially 5-14-year-old children and 15-19-year-old youths, as well as adults. Pertinent issues for management include ensuring adequate ratios of fully qualified lifeguards at all times, anticipating and providing for crowds, maintaining visibility by towers and noise control at the facility, avoiding occupying more than one lifeguard at a time with other tasks and changeovers, screening patrons including groups for relevant health conditions, including seizures, mental disabilities, physical disabilities, and cardiac.

Lifeguards, caregivers, and other pool patrons must be aware that drownings can be silent and immediate assistance and notification of the lifeguard is essential if any patron is observed inactive and/or slipping beneath the surface. Beaches should be closed or restricted in defined wind, wave, and current conditions. Reliance on swimming aids should be avoided except under strict supervision. Breath-holding practices should be prohibited. Issues for parents and caregivers include remembering that drowning can occur within seconds, mandating constant accompaniment and observation of children, remembering that drowning persons may be unable to call for help or be obviously affected, and not assuming that lifeguards will detect all incidents.
Raising the Bar in Australian Water Safety - The City of Blacktown, with an electronic drowning detection system and community awareness

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Rescue 6, Ballroom 1, November 6, 2015, 9:00 AM - 10:30 AM

Blacktown City Council is the largest Local Government Area (by population) in New South Wales. Key Venues is a section of Blacktown City Council that oversees 9 sport and leisure facilities across the local government area. Key Venues delivers first class activity and program choices and promotes Blacktown City as the leader in sport, recreation and leisure.

Blacktown Leisure Centre Stanhope is Blacktown City Council’s flag-ship aquatic facility. Averaging over ¾ million visitors each year, the centre provides a range of services and programs for both aquatic and dry land based activities. The aquatic facilities include a 25 metre pool, program pool, wave pool and spa.

The Poseidon Drowning Detection system was installed at Blacktown Leisure Centre Stanhope in November 2007. Known as the lifeguard’s ‘third eye’ it is a computer aided drowning detection system that helps lifeguards detect dangerous situations where drowning could occur.

Using specialised software and a network of cameras above and below the water surface, the Poseidon system monitors and analyses the movement of all swimmers in the pool. In as little as 10 seconds, it alerts lifeguards via an audible alarm and a visual display when a swimmer is motionless or having trouble beneath the surface. It identifies the exact location of the swimmer saving precious seconds in trying to locate the swimmer. It has triggered alerts resulting from real incidences.

The Poseidon system at Blacktown Leisure Centre Stanhope is effective. It has led to pool rescues and prevented drowning incidents.

Where safety is concerned, Blacktown City Council takes it very seriously. In addition to the investment in the Poseidon technology, Blacktown has developed several aquatic based education programs including:

- 7,000 learn to swim students across 5 aquatic centres
- The “Surfees Safe Summer Roadshow” pantomime performed to junior and primary school children
- Cartoon strips featuring characters talking about water safety are featured in the local newspapers
- An educational water safety DVD package distributed free to local primary schools
- “Surfees Little Splashes” – a free water safety education program aimed at children from 6 months old to 2 years
- The Indigenous Aquatic Education project targeting water safety and education to the large local Aboriginal and Torres Strait Islander population
- The Koori Indigenous program aimed at providing indigenous locals with an opportunity to learn to swim
Considering an organizational and systemic approach to understand in-depth drowning accidents in public swimming pools.

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Rescue 6, Ballroom 1, November 6, 2015, 9:00 AM - 10:30 AM

A literature review on drowning accidents in public swimming pools reveals that a systemic and organizational approach is rarely considered, unlike educational (Langendorfer, 2011; Brenner, 2003; Moran, 2012) or medical (Bierens, Szpilman, 2006; Sempsrott, 2014) ones, among some others, both focused on the swimmer.

Yet, the work of Soulé (2009) showed that within the field of sports activities, scientific risk analysis models (such as Kervern & Boulenger, 2007) highlight root causes of accidents, which are likely to help to enhance prevention. We applied this systemic description of risk situations in public swimming pools, through such key concepts as process, network and scenario, in order to develop an overview of hazard sequences in their entirety. Currently, as surprising as it may be, little is known about the scenarios leading to drowning sequences or accidents, especially because few systematic in-depth analyses have been undertaken, excepted by Lebihain (2000). After the occurrence of a drowning, the user's carelessness, and/or to the lack of a proper supervision from the lifeguards or swimming instructors, are usually underlined. In a way, these two figures are scapegoated. This dominant view is simplistic, since it leads to ignore a full range of other risk factors. It consequently limits the development of a better, more detailed and realistic understanding of the complex hazard production in public swimming pools.

Admittedly, the user/client carelessness, and/or an inefficient supervision contribute to most drownings, especially near the end of the accident process. But drownings also result from upstream influences.

Therefore, other actors and decision makers should be considered during the analysis, way before the end of the accident sequence, in order to identify influences which could have undermined the safety chain (Perrow 2004). Our research currently consists of an attempt to articulate different systemic risk analysis models, especially cindynics (Kervern & Boulenger, 2007) and STAMP (systems theoretic accident model and processes) (Leveson, 2006) in order to understand the complex genesis of accidents in public swimming pools.

In this presentation, the sociotechnical context of the public swimming pool, as a system, will be detailed and modelled, before the problematics is detailed and discussed. Our attention will notably focus on the deviations of functioning (Bourrier, 2009), as well as the continuing interventions and corrections (Leveson, 2004) allowing the system to migrate towards an unstable state only in exceptional circumstances.
Safeguard Program is a training that provides safety supervision for guardians who accompany groups of young people to aquatic environments

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Rescue 7, Ballroom 1, November 6, 2015, 11:00 AM - 12:30 PM

The Safeguard program is designed for participants who care for young children; day camp counsellors, counsellors in training, babysitters, and child care givers, guardians and leaders. The program focuses on water safety awareness, accident prevention and the principles of aquatic safety supervision. Safeguard teaches participants how to identify hazards and at-risk behavior, how to recognize potential victims, and how to respond safely in an aquatic emergency.
When you lose a “Volunteer Rescue Member” what needs to change!

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In 2011 BC lost one of their Search and Rescue Volunteers in a water rescue incident. This death had drastic effects throughout the Province of BC and many started to question how swift water operations were being conducted and asking themselves was this going to happen again.

At the time in BC there were many providers and groups offering swift water skills to volunteers but there was no set standard between these providers. After a Coroner’s inquest into the volunteer’s death it was deemed that many of those same issues did contribute to the death. At the time in the local area swift water rescues were being provided by a regional team and during this call there were members from at least 6 different groups. The training level of these members ranged from advanced to new. Some had been trained by the same provider and trainer, others had received their training from other means, and no standard was evident. This was one of the concerns that the Coroner identified as a contributor of the death. Also at the time of the death there were swift water practices and equipment used that have been questioned by the inquests and other experts.

After the incident the Coroner’s office called for an inquest into the accident to try and find answers as to how this could have happened and under the Coroner’s office they would come up with changes and recommendation to try and prevent another accident from happening. At the Inquests we heard of different standards, different types of equipment and different levels of leadership, these issues were the bases of the 9 recommendations that were presented by the Jury to the Government of BC. It was felt that there was no clear direction on the scene that day that the members had different levels of training and were put into key positions with no experience. There was no means or plan for any type of rescue if something happened and by introducing new equipment into the scenario caused more stresses and lead to the direct cause of death. Many techniques used were not an accepted standard, the rope system used in this technique also contributed to the death. Another factor which many believed was a contributor was the fact that these groups were videoing the whole scenario with multiple cameras from different angles and at no time during the failed attempt to save the rescuer did the filming stop.

After the Inquest EMBC started a task force as one of the recommendation of the court and started to source out experts and providers to change how SAR teams were providing swift water around the province. The Task Force started with at least a dozen groups or individuals and ended with SAR members and the current providers in BC. By reviewing the incident and looking at best practice around the country and North America the task force was able to successfully present a new program to all SAR teams in BC. These changes have now helped create a set of guidelines and a Level of skills that all members must follow. There were four levels created, BC Swift water Awareness, BC Swift water Operations, BC Swift water Technician and BC Swift water Advanced Technician. A Search Manager who is in charge of a callout can request a swift water resource and have the reassurance that the responders meet the level that is requested.

In the end the goal was to be able to help ensure that the death of this Volunteer SAR member was not in vain and that a positive change was created to keep future members safe.
Using Lifesaving / emergency services social media networks to keep track of and prevent drowning in the greater Durban area

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Rescue 7, Ballroom 1, November 6, 2015, 11:00 AM - 12:30 PM

This paper describes the network of a group of voluntary lifeguard members from Lifesaving South Africa (LSA) clubs; professional lifeguards as well as the local South Africa Police Services Search & Rescue team based in Durban, in the KwaZulu Natal (KZN) Province on the eastern seaboard of South Africa. This network called @SurfRescueKZN, uses the social media application of “WhatsApp” to communicate with each other and keep track of drownings in Durban in particular and the province of KZN in particular. The important factor to note is that the network is not formally structured by merely a group of individuals involved in one way or the other with lifesaving and committed to prevention of loss of lives through drowning.

The network is a very good example of how a committed group of individuals can contribute towards ensuring the data on drowning is reliable as well as contribute towards drowning prevention as well. On occasion the network assist with getting emergency services or lifeguards activated to rescue individuals who are in danger of losing their lives in the ocean or other bodies of water. Then there are occasions where the network have been able to contact its members and their associated organizations to render assistance to non-drowning incidences but incidents near their area of control, such as micro-light crashes; accidents and the like. Sadly though the effectiveness of this network also emphasizes the disparities in the province (and the country) where some areas are so marginalized and remote that assistance only comes in the form of recovering a drowned victim from a dam or river after the incident.

The study will undertake the following in trying to ascertain the successes; challenges and gaps in the efforts of the @SurfRescueKZN mainly via a content analysis study of their WhatsApp postings:
• Firstly ascertaining the profile of the members who make up the network.
• Ascertain the context within which they operate (geographic; professional; voluntary; etc.)
• The kinds of incidences reported upon.
• A quantitative analysis of the number of drowning victims reported on.
• The number of rescues successfully achieved via the efforts of the network.
• The effects of the incidents on their personal being purely from self-reflection of their roles.
• Critical success factors and gaps in the modus operandi of the network.

The rationale for undertaking a study of this nature is to firstly evaluate the quantitative data so that a comparison can be made with the statistics of the official data stewards in the country, that is, the South African Police Services (SAPS). The law in South Africa determines that only a Police official can pronounce a victim as being “dead” from one or other unnatural causes, such as drowning. And it is also the relevant SAPS units which can officially release mortality statistics such as death though drowning. At the same time the study records the self –reflective comments of the individual members to ascertain successes; gaps and challenges.
EQF – A cross-national approach to harmonize Lifesaving and Lifeguarding Education in European Federations

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Rescue 7, Ballroom 1, November 6, 2015, 11:00 AM - 12:30 PM

ILS-Europe created a cross-national project to align education of Lifesavers and Lifeguards across Europe. This project was part of the European Qualification Framework (EQF) and guidance of the European Union with the intention of promoting Lifelong Learning on the basis of a European wide equivalency of education. This project combined requirements set by the Qualification Framework of the European Union with input from all federations involved. In total, 14 different national federations across the European region joined the project, ranging from ‘young’, rather small federations to long standing, large organizations.

As a first stream, a content based approach was chosen to collect data and material on Lifesaving/-guarding topics. Several workshops were held in different locations throughout Europe in course of the project to compare and exchange methods, processes of Lifesaving and Pool, open water and Beach Lifeguarding in order to identify best practices and standards and make them available for other participating federations as well. Topics included basics of swimming and lifesaving techniques, moving onward to special topics like white water and ice rescue. Documentation ranged from photos, video sequences to data collection and preparation of teaching materials. Comparisons and summaries will be provided to demonstrate the effectiveness of this approach. Focus will also be comparability and applicability of the results throughout different national federations.

In a second stream, focus was set onto education itself, i.e. an exchange of trainings methods, theoretical backgrounds and the education of trainers and trains the trainer concepts. This includes also the application of new methods in teaching Lifesaving and Lifeguarding as well as requirements to guarantee any kind of ongoing training itself.

Beside a deeper insight in the project itself, the presentation includes a strategy how to implement the requirements of harmonized education into an existing education system of the German Lifesaving Federation DLRG.
Supraglottical airway devices for rescue swimmers – is it feasible

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Rescue 7, Ballroom 1, November 6, 2015, 11:00 AM - 12:30 PM

Introduction
In drowning, the first and most important measure is the treatment of hypoxaemia as prompt initiation of rescue breathing or positive pressure ventilation increases survival. Therefore administration of high flow oxygen and a continuous positive airway pressure may improve the outcome and should be performed as soon as possible. Both is not possible by mouth-to-mouth ventilation but can be done by the use of a supraglottical airway device. We tested, if rescue swimmers can be trained in the use of such devices and which is better to work with.

Methods
Eighteen lifeguards with no experience with these techniques performed a manikin training on bag-mask-ventilation and the insertion of a laryngeal mask and a laryngeal tube. After this training, five of them, who were students at the Ulm medical school, performed bag-mask-ventilation and the insertion of a laryngeal mask and a laryngeal tube at their clinical training in the OR in patients with general anaesthesia under the supervision of a full trained anaesthesiologist. Additionally, we assessed the feasibility and time requirement for the insertion of a laryngeal tube in open water in a manikin model.

Results
In the manikin training all subjects were able to perform a sufficient bag-mask-ventilation after a training time between 10 and 18 min. All subjects were able to insert both devices after only few attempts properly. When being asked, 15 of them were in favor for the laryngeal tube for easier use, three of them felt no differences.

Although the five who had the chance to test it on a patient felt safe after the training, bag-mask-ventilation failed depending on individual specialities of the patients (such as beard, form of the face and others), so the anaesthesiologist had to take over. In all patients the supraglottical airway devices could be inserted, but when a laryngeal mask was used, it had to be replaced more often to prevent leakage.

Furthermore, even in open water, the insertion of the laryngeal tube was performed successfully and quickly and sufficient ventilation was possible during swimming.

Discussion
Lifeguards can be trained in the techniques of a bag-mask-ventilation and the insertion of a supraglottic airway device but bag-mask-ventilation may fail in a real life scenario because of difficult patient anatomy. In this study, the placement of a supraglottic airway device was successful also in a real life scenario, here the tendency is in favor of the laryngeal tube which may have some advances especially in water rescue. Water rescue organizations should consider taking trainings on the use of such devices in their training programs for life guards.
Specific Responsibility No. 1 of the Rescue Commission of the International Life Saving Federation (ILS) reads as follows: “Ensure that standards promoted by the Commission are evidence-based.” The purpose of this paper is to:

1. Provide a survey of the standards that ILS national federations currently are using as minimum performance measures to test the physical fitness of surf-lifeguards, and
2. Identify what evidence those standards are based upon.
Lifeguard Medical Team Interventions in Ecuador, Nicaragua, and Dominican Republic During Semana Santa and Carnaval 2011-2015

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Rescue 7, Ballroom 1, November 6, 2015, 11:00 AM - 12:30 PM

Objectives
Drowning remains a leading cause of death globally. The true burden is unknown because of underreporting. Carnaval and Semana Santa are large-scale mass gatherings at beaches in Ecuador, Nicaragua and the Dominican Republic and draw large sections of the population to the coast and historically have multiple drowning deaths. The researchers sought to prospectively quantify preventative, rescue, and first aid interventions by United States based volunteer lifeguard medical teams protecting the beaches in the Dominican Republic, Ecuador, and Nicaragua during Carnaval

Methods
IRB-approved, prospective observational study. Inclusion criteria: Any rescue, prevention, or first aid encounters by lifeguards. All lifeguards were trained on the data collection form and dictionary, and completed the form after every intervention. Elements collected included: age, gender, time of day, injuries, contributing factors, disposition, and mortality. The primary measure was the proportion of the 3 types of interventions. We secondarily characterize the lifeguard rescues. We report descriptive statistics as appropriate.

Results
During the events, lifeguard medical teams performed 734 unique interventions: 508 preventative manoeuvres on 3245 swimmers, 158 water rescues, and 68 first aid interventions. The rescued swimmers were predominantly male. Rip current was a factor in 86/158 (54%); Alcohol was a factor in 19/91 (20.9%) of rescues. None of the rescues required resuscitation, but two resuscitations were performed on persons rescued by bystanders, and only 2/158 (1.3%) required transfer to a hospital, but 10/78 (12.8%) first aid cases required transfer to a hospital. There were no drowning deaths. Limitations: Beach crowd estimates and number of individuals impacted by preventative interventions were not adjudicated. Though forms were simple, compliance from lifeguards was not 100%.

Conclusion
The majority of lifeguard interventions were preventative in nature. Most rescues occurred in rip currents in late morning and early afternoon, and involved male, non-intoxicated swimmers. Our data may provide insight for others planning future large water events. Further research is needed on population based trends of beach attendance during these events with matched controls at unguarded beaches.
Surfers as bystander rescuers in Australia

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Rescue 8, Tekulur, November 6, 2015, 11:00 AM - 12:30 PM

It is well documented that the vast majority of drownings on surf beaches globally occur on unpatrolled beaches or outside of lifeguard/lifesaver patrol times and areas. For a bather in distress in these locations, often the only form of help available lies in the form of bystanders. The study of risk factors associated with bystander rescue is a fledgling area of study. These rescues are often impulsive acts without full assessment of the hazards and an overestimation of the rescuers own abilities, which can result in highly dangerous situations for both the rescuer and rescues. Indeed, it is not uncommon for bystanders to become drowning victims. However, while existing studies have focussed on bystander rescues performed by friends and family, who are likely inexperienced with surf conditions, no formal study has examined the occurrence of a rescues made by a potentially experienced, capable and large group of informal lifesavers: surfers.

Surfing locations include beaches with strong wave activity and rip currents - the primary cause of rescues and drowning on beaches. Prime surfing spots are often proximal to headlands and rocks - also associated with another significant cause of drowning, rock fishing. Surfers also seek unpatrolled sections of beach, often in the early morning and evenings, and are therefore commonly found in locations where lifesaving presence is absent. While rescues made by surfers clearly occur and are often reported in the media, most reports are anecdotal and no reliable data yet exists on their occurrence.

This study describes the results of 545 responses to an online survey on surfer rescues in Australia and 12 follow up interviews with respondents. Both methods provided valuable information on the demographics, occurrence, location, primary hazards and outcomes involved in bystander surfer rescues, as well as surfer attitudes and perceptions of their experiences performing rescues on Australian beaches. Results clearly show that in Australia, surfers perform a considerable number of rescues, estimated to be on par with the number conducted by volunteer surf lifesavers. Surfer rescues occur in both lifesaver/lifeguard patrolled (45%) and unpatrolled (53%) beach locations. Rip currents represent the major physical hazard leading to surfer rescue (75%) and the dominant emotional response of people rescued is one of panic (85%). Most surfer rescue events occur during conditions of moderate waves and sunny, fine weather with the highest proportion of rescues occurring on quiet beaches with few people around (26%). Swimming is the activity associated with most rescue events (63%), followed by board riding (25%). Males aged 18-29 represent the largest demographic of people rescued. Surfers with prior water-safety training are more likely to perform a higher number of rescues, however ability to perform rescues is not associated with formal training, but rather number of years’ experience surfing. Seventy-eight percent of surfer respondents were happy to help, while 28% expressed feelings of annoyance or inconvenience, generally towards unwary swimmers and lifesaving/lifeguarding services.

Results of this research show that 63% of surfer respondents felt they have saved a life. This value may be enhanced through improved training of surfers in basic water safety rescue techniques. Of note, the survey is easily applicable to other global regions where surfing is popular and where different hazards may result in surfer assisted rescues. Further promotion and adoption of the survey globally is encouraged to help improve understanding of the occurrence of surfer rescues and the role of surfers as bystander rescuers.
Advanced Surfing Life Support: a new course training health care professionals in drowning prevention and rescue in an aquatic setting

MD Hylmar Elsenga, Dr. Andrew Schmidt, Dr Ingvar TB Berg, Dr Michael Göttinger, Dr Dion van der Schoot, Dr Terrance Farrell
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Rescue 8, Tekulur, November 6, 2015, 11:00 AM - 12:30 PM

Background
Surfers spend a lot of their time in the water, searching for waves floating on their surfboard. In several studies it has been proposed that adding a personal flotation device dramatically improves outcome in a drowning incident. Regardless from possessing a personal flotation device, every year deaths due to drowning occur among surfer around the world. Specific mechanism in this drowning has been reported as panic and exhaustion after being caught in a current (rip). Furthermore, the rescuer is at high risk of being involved in drowning themselves. Among surfers health care professionals exist, who would be expected to be able to deliver Basic Life Support (BLS) in case of emergency. This seems not to be true, as doctors lose their skills in BLS over the years.

Objective
In 2011 a web search was conducted in order to show no course was available to promote safety in the water, train the rescue of drowning victims and treat surf specific injuries. In 2012 the Advanced Surfing medicine Life Support (ASLS) course was designed combining those three subjects, in 2015 for the first time accompanied by a course manual.

Method
In this high standard 7 day course available for surfing health care providers and specialists (Union Européenne de Médecins Spécialistes (UEMS) accredited)) we implemented essential life guarding techniques, skill training in BLS, as well as airway and wound management, and a marine specific wilderness medicine course on various topics. Skill stations comprised of skill training in BLS, as well as airway and wound management. Furthermore skills and knowledge were implemented in scenario training sessions. In order to evaluate every lecture, skill station and scenario training setting, we used evaluation forms which were handed out every day. Using grading scores from 1 (poor quality) to 4 (high quality) we set out to improve our course until perfect.

Results
The past three years the ASLS course was organized annually. A total of 60 participants, ranging from medical students and nurses to specialists and professors, took part in this course yielding over 50 grades and notes. Overall rating of the 2015 course was 3.80 (3-year average 3.75). Usefulness was scored 3.92 (average 3.89), educational value was scored 3.92 (average 3.90). Lecture quality, skill station quality and life guard quality were rated 3.68 (average 3.55), 3.78 (average 3.78) and 3.83 (average 3.71) respectively. The 2015 ASLS manual was overall rated 3.47. The 2014 and 2015 course was accredited over 30 credits (ECMEC’s).

Discussion
Each year we tried to improve the course using the participant feedback as well as our own thought. By criticizing each topic, skill station and aspect we tried to implement changes after observing errors. Although a surf specific manual was created, this should be updated every year and be perfected.

Conclusion
We successfully created a course format unique in the world, combining essential life guarding techniques, skill stations including scenario training, and marine and surfer specific lectures in order to prepare health care professionals for emergencies in a remote aquatic setting.
Transfer of best practices from big wave surfing to rescue services

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Introduction

Big Wave Surfing (BWS) is a high-risk discipline which has caused several fatalities(1). Over the past years it has experienced a relevant growth that has spurred the emergence of new rescue tools and techniques (RTTs). These techniques are not always evaluated and implemented by the rescue services, often due to lack of funding or direct connection with other relevant global agents.

A working group was created in a maritime rescue station run by volunteers, with the aim of looking for rescue techniques originally created within BWS and implementing them in station’s working procedures.

Aims/Objectives

The objective of this program is to build a knowledge-transfer channel between BWS and lifeguard services around the world, facilitating the incorporation of new RTTs, in order to improve their performance and reduce drownings(2).

Target

The program was designed to facilitate the implementation of disruptive or incremental innovations in rescue and lifeguarding services(3) which lack scale to carry out ambitious training programs or international exchange of best practices.

Methods/Implementation

A working team comprised of experienced rescue watercraft operators and lifeguards chosen within the stations crew was established. The first step was to design mechanisms to detect new RTTs being used in BWS. All official BWS championships, as well as most relevant big surf spots were listed, and alerts were set to forecast every relevant surfing session.

The working team assessed available footage and media coverage after every session, recording any new or previously unknown tool or technique in a matrix specifically designed for this purpose. It allowed evaluating each RTT taking into account its effectiveness, potential impact, training required for deployment, availability and cost. Afterwards, quick decisions could be made by station’s board on which new RTTs to implement.

Results/Evaluation

After RTTs had been implemented, they were assessed both 6 and 12 months later by station’s crew, board and program’s working team later in order to decide whether they should remain in the working procedures.

Since this program was launched in 2012, 19 new RTTs have been implemented after being proposed by the working group. 17 of them (89,4%) gained a positive evaluation and are still in use. These measures have led to faster response, increased range of operability in adverse conditions and reducing the number of incidents / accidents, especially those associated with the use rescue watercrafts. It has also improved the ability of all crew to search and implement best practices related to rescue even outside the realm of big-wave surfing.

Conclusion

BWS has been a rising sport in recent years. Its features make it an excellent opportunity for developing and testing RTTs applicable to rescue and lifeguard services worldwide. Given that BWS continues to develop, with growing media coverage and more resources available, its potential keeps growing.

In addition, implementation of working groups that monitor best practices in a structured ways in different areas, with the direct aim of putting them into service, it is a cheap, safe, effective and motivating method for continuous improvement of rescue services, regardless the availability of financial resources.

Acknowledgements

This program was developed by Izaro Water Safety & Rescue staff, in collaboration with volunteer crews from Arriluze – Maritime Rescue Station located in Getxo (Bizkaia) and operated by Spanish Red Cross.

References

Drowning Prevention by the Education of Surfers: Drowning Education’s Next Wave?

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Rescue 8, Tekulur, November 6, 2015, 11:00 AM - 12:30 PM

Surfers are traveling worldwide and have an urge to keep doing so searching the perfect wave. They are always seeking for the most remote spots and voluntarily enter extreme ocean conditions. We conducted a survey on health perceptions and events in surfing, to try to understand how we can reach them with the educational media of surfing medicine.

**Objective**

Find out how medical information is communicated most effectively to surfers, what the perceived educational needs are, and past involvements of surfers in lifesaving incidents.

**Methods**

We conducted an online survey on health perceptions in surfers. Questions addressed preference of way of communication, training, educational level and needs, and past involvement in lifesaving incidents.

**Results**

2429 surfers responded, and we found that there is a strong need among surfers for education. Almost all intermediate and experienced surfers have rescued swimmers from drowning, compared to few rescues in novice surfers.

**Conclusion**

There is strong need for education among surfers. Targeting education about drowning and basic life support to surfers could rapidly spread the knowledge to urban as well as remote communities all around the world, and provide a continuous presence of trained surfers that are very likely to make the difference in the water at least once in their lifetime.
SURF SAVE – extending the concept from Brazil to Portugal

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Rescue 8, Tekulur, November 6, 2015, 11:00 AM - 12:30 PM

Portugal has a great surf tradition and surfers of all ages and skill level are regularly on the beach, be it a patrolled or unpatrolled, from dawn to dusk, all year round. After realizing that many assistances and water rescues performed outside the bathing season or at beaches without lifeguards were mostly carried out by surfers, the Portuguese National Lifesaving Institute (ISN) decided to improve their knowledge of prevention, rescue by using their surfboard and first aid techniques providing free courses.

After a careful research on best practices in the field and considering the success of “Surf Save” in Brazil developed by SOBRASA, ISN adopted a similar strategy and in March 2014 “Surf Save – Portugal” was born with the support of the Portuguese Surf Federation, sponsored by Lidl Portugal.

The main objective of this project was to reduce the number of drownings providing the surfers with basic knowledge of how to prevent drowning and injuries to themselves and others, to help without becoming a victim and provide basic life support. Furthermore surfers can be of great help at patrolled beaches assisting the lifeguards on their duties and help to multiply the message of prevention at the beach.

Method
The concept was the same as its “mother” project in Brazil. It encompasses surfers above 14 years old in any of the different surfing categories: long-board, short-board, surfboard, body-board or Stand-up paddleboard, all together, and everyone is invited to bring their own surfboard. So, the course takes one morning and includes practical learning of introduction to lifesaving, the surfer-lifeguard team, what is ISN’s role, prevention, beach waves, wind and currents, drowning recognition and alerting, providing floatation, in-water Basic Life Support using the surfboard, Basic life support, Drowning classification and appropriate treatment.

Result
In Portugal, the project was launched in two phases. First, training was provided to members of the ISN, surf teachers and coaches so that they could spread the message later. In total 60 people participated in this training course delivered by SOBRASA. The second phase of the project consisted in delivering free courses around the country in surf schools during summer season. In total 34 courses were delivered along 2014 reaching more than 2040 surfers around the country. As an interesting result some of the surfers attending the training reported to have saved people lives in different situations just after the course.

Conclusion
Surfers are not too concerned with water safety and drowning prevention but rather on catching a good wave, and are exposed to high-risk situations both as potential victim and as an untrained rescuer. Hence, providing surfers with basic water safety skills can not only assist lifeguards on duty but also equip surfers with techniques to assist others in need when lifeguards are not nearby. The implementation of this project showed that using other countries’ experience, knowledge and best practices, not only strengthens international partnerships around drowning prevention but also can of great help to speed up the process of development and implementation proved successful strategies in other countries.
Beach Safety Education for Primary School Students: Benefits for students, society and beach safety programs

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It is well established that knowledge of swimming and water safety can reduce a child's drowning risk and provide them with skills that may one day save a life. However, concerns have been raised that even though a large number of diverse programs are offered in Australian schools each year, many students completing primary education (Year 6, ages 11-12 years) still lack the ability to recognize potential aquatic risks, cope with emergencies or assist someone else in danger. For example, Birch and Matthews report that Victorian teachers estimate 39% of Year 6 students lack adequate water safety knowledge (1). This translates to over 25,000 Victorian students leaving primary school without sufficient knowledge to avoid getting into dangerous situations in and around water. There is also a serious lack of program evaluation available to guide and refine the development of quality water safety education in Australian schools. This is not to say the existing resources and programs are inadequate, but rather there is little systematic evaluation of their content and delivery to provide quality improvement.

In Queensland, considerable time and resources are dedicated to educating the public about swimming between the red and yellow flags on patrolled beaches, recognizing safety signage, identifying rip currents and taking appropriate action if one gets into trouble while swimming at the beach. A particular target group is primary school students, with Queensland Health sponsoring a Beach Safety Schools Program that reaches 35,000 primary school students each year. The present study examined core beach safety content and used a leadership model for surf lifesaving instructors to deliver a one day first aid, CPR (Cardio Pulmonary Resuscitation) and beach safety program to 107 Year 6 students (mean age 11.4 years).

A 50 item quiz administered one week before and again one week after the training day showed statistically significant improvements in beach safety knowledge, understanding and emergency response readiness. An eight week follow up quiz confirmed retention of knowledge for safety signage, rip current identification and appropriate action, choices of where to safely swim at a beach, as well as correct responses for emergency situations (DRSABCD) and various emergency scenarios. The leadership model was very effective as it integrated beach safety with first aid, CPR and team bonding exercises.

Drawing on educational theory the colourful and humorous quiz booklets and training manual supported the learning in a non-threatening way and the delivery of the training by uniformed surf lifesavers added a role model element to the program. Two important educational outcomes are the significant increase in the confidence students reported about their willingness to provide assistance in an emergency situation as a result of the training day and the insights provided by the students' responses to tailor the future delivery of beach safety programs. A similar willingness to assist has been reported by 15-16 year old Hong Kong students, even those without training (2). Delivering beach safety education as part of a broader school-based junior leadership program for primary school students may be a useful model in developing nations.

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New Zealand youth surf safety knowledge, attitudes, and behaviours

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Introduction/Background
Risk taking behaviour among youth and young adults is well documented, however little is known about the water safety knowledge, attitudes and behaviours of youth, especially in the context of aquatic recreation at the beach. In 2013, beaches were the most common environment for drowning in New Zealand (NZ) and youth 12-24 years experienced the highest rates of drowning (1); NZ's youth drowning rate of 1.9 per 100,000 people, is worse than the UK (0.5/100,000), and Australia (1.0/100,000) (2). Three quarters (75%) of drowning victims in NZ are male, and make up nearly 60% of total rescues by surf life savers (3).

This research aims to enhance the understanding of youth surf safety knowledge, attitudes, and behaviours to inform new and innovative drowning prevention strategies, specifically targeting youth. The specific objectives were: a) To ascertain levels of knowledge among youth of the surf environment, specifically awareness of rip currents, surf conditions, and water safety principles b) To measure the confidence and self-reported competencies in the surf environment; and c) To examine youth behaviour and risk perception of drowning when at a surf beach.

Methods
A quantitative cross-sectional survey of students aged 16-18 years was conducted during February - April 2014 across five secondary schools in West Auckland, NZ. Schools were selected due to their proximity to popular surf beaches. A self-administered questionnaire was developed, adapted from the 2003 NZ Youth Water Safety Survey (4). Ethics approval was granted by The University of Auckland Human Participants Ethics Committee.

Results
Among the 599 respondents, the mean age was 16 years and 49% were male. Nearly half (48%) identified as NZ European ethnicity, 20% Pacific Island, 9% Maori, 7% Asian and 13% were of other ethnicities. Low levels of swimming ability were reported with over half reporting being unable to swim over 100m in a swimming pool; almost one third (30%) reported not being able to swim more than 25m or could not swim at all.

Frequency for swimming at a surf beach was relatively high; 66% had swum at surf beaches in the past year. Half (50%) reported always or often swim between the patrol flags, 26% sometimes swim on their own, 14% sometimes or often swim after drinking alcohol. Two thirds (67%) know what a rip current is, 40% correctly identified what a rip looked like, 30% identified the safest swimming area at an un-patrolled surf beach, and 54% identified the correct advice when caught in a rip current. When presented with a scenario of going to a surf beach for the day, 56% identified two or more safety considerations, and 60% identified at least one hazard when going in the water. When asked where it was safe to swim, 54% identified that the least risky place was between the flags.

Discussion
The results of this study indicate that youth surf safety knowledge is relatively poor, particularly rip current knowledge. Respondents indicated a high level of confidence when asked about swimming in calm, small and big surf conditions, with only a slight reduction in big surf conditions despite low swimming ability. Self-reported low levels of swimming competency and ‘unsafe’ behaviour are consistent with previous studies(4,5,6,and 7). Given the popularity of beaches as a place to socialise and recreate in New Zealand, this research provides an insight into youth surf safety knowledge, attitudes, and behaviour and provides valuable information that can inform strategies such as a public rip current awareness campaign to reduce youth drowning at the beach, particularly when targeting young males.

Develop our People

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The focus of our 2020 Strategic Plan is to further build the capacity and capability of the movement to save more lives, create better Australians and build better communities, with a key element to realising this being the development of our people.

The plan clearly sets out its intent to ‘Develop our People’ with a focus on leadership at all levels. The introduction of a new education strategy and leadership framework will ensure Surf Life Saving (SLS) has the workforce capabilities, skills and competencies required to safeguard a sustainable and successful organisation.

SLS cannot achieve this on their own. Taking a collaborative style; the sharing of information, approaches, philosophies and procedures is fundamental to our ongoing relevance.

Although training is an important element in organisational impact, it is only one piece. If we want to stay relevant, we have to look beyond just the learning event and focus on the long-term organisational change.

The education strategy articulates the organisation’s requirements in terms of education, development, learning and training and sets out the means of fostering these abilities to underpin SLS effectiveness. For the strategy to be a useful and relevant tool to guide current and future activity, it must respond to the various issues that influence our environment.

Over the next five years, how SLS trains and educates its volunteers will transform. Exponential changes driven by processing power, storage and bandwidth are now reaching a stage that allows us to transform training processes.

The Leadership Framework provides a holistic approach to learning and development and supports a continued pathway of further development of our people. The framework has been shaped by the latest best practice evidence and a broad consultation process within SLS. This means the framework reflects the critical importance that the literature and consultations have placed on the need for collective and innovative approaches to leadership in order that SLS can rise to the complex challenges it faces over the next five years.

The framework emphasises that leadership can be exercised anywhere in SLS; leadership is not solely the responsibility of positional leaders. The framework reinforces the centrality of leadership that requires shared action by those from different practiced disciplines. To get to this, a collaborative approach to the framework development was required. Key collaboration took place with SLS’s seven states and territories, emergency management organisations, education establishments, leadership experts and young professionals.
Italian beaches belong to two different types: free (and unsupervised) or in concession by the State (and supervised). Nearly all of drowning accidents happen on free, unsupervised beaches.

“On Mediterranean beaches, particularly in Italy, there is considerable beach furniture, including cafés, huts, walkways, tables and fixed umbrellas, supporting intensive and highly commercialized beach use, at least in summer season. In northern and western Europe, and most other parts of the world, this kind of development is regarded as unnecessary clutter, spoiling the beach environment and over organising beach recreation…” (ex: E. C.F. Bird, Beach Management, pag. 218)

This paper aims at describing, and explaining, how and why Italian beaches are as they are.

Beaches belong in Italy to the State domain, but may be granted to private concessionary agents who can commercially exploit them. In exchange for it they have to pay a (low) fee, clean the shore and assure the lifeguard service on the portion of beach committed to them. Each grant provides for one lifeguard being present at the beach. At Viareggio, for instance, one of the most renewed resorts in Italy, there is uninterruptedly a lifeguard for each 40 m stretch of beach for the entire seaside (4 Km). On many Southern free beaches lifeguards are totally absent for kilometres.

In Italy there is no general act of the Parliament ruling the use of the beach, and of the coast in general. Until 2001 the beach use has been administered by the Coast Guard, but Coast Guard competence is territorially fragmented into small stretches of coast (“Capitanerie di porto”) with the consequence of rendering fragmentary the entire legislation about. In 2001 Regional Administrations have partially taken over from the Coast Guard the ruling of beaches belonging to the so-called “touristic” State domain, probably causing some damage and possible interferences and jurisdiction troubles, even in the field of the safety on beaches and swimming front waters, also if the users safety and the beach rescue in general clearly remains by law in charge of the Coast Guard.

A little time before Società Nazionale di Salvamento began to produce the first integrated collective lifeguarding plans to grant a lifeguarding service to all, in concession and free beaches, with no difference.

This paper is a description, and a story, of our organisational efforts to render the Italian seaside safer.
Search and rescue dogs – very useful assistants even in water rescue

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Poster Session 2, Poster Foyer, November 5, 2015, 9:00 AM - 5:15 PM

Drowning is one of the leading causes of accidental death and it is crucial to rescue drowning victims as fast as possible. Unfortunately even with eyewitnesses in many cases it is difficult to locate a drowned person quick enough, so rescue is only possible with a certain delay. Therefore, we gave a special training to search and rescue (SAR) dogs and installed a SAR-dog squad in the DLRG.

These special trained dogs can be used in four categories of water rescue:
1) Location of drowning victims even under surface and support of rescue divers: dogs become enabled to scent smell of a human drowning victim and/or a human cadaver. On board of a rescue boat they give tongue when the place of the victim is reached. In real life scenarios this was successful in depth up to 38 m, in training scenarios up to 50 m of depth.

The other three categories cover the more traditional scopes of duties, such as
2) Mantrailing: The trailing dog has to find a missed person by following this person's scent, while scent of other persons that contaminate the track should not affect the dogs work
3) Search for persons at the shore line and in bigger areas
4) Search for patients in flooded and/or destroyed buildings in flood disasters

Today, the SAR-dog squad of the DLRG consists of 20 branches with search and rescue dogs and of 13 branches with special trained water rescue dogs spread all over Germany. At those places, where these dogs are available, they became important partners for the water rescue teams.

Conclusion: search and rescue dogs are on duty in different emergencies for a longer period of time. In water rescue it still is rather uncommon, to work with SAR-dogs, although dogs with a special training on water rescue can be very useful especially when the rescue has to be performed from under water.
In 1910, when people started using the beach for leisure in Brazil, only fishermen were responsible for preservation of life in water. This has created the need to establish organized lifesaving services around the country. Since 1984, the military firefighters took responsibility for lifeguarding all states of the Federation, especially at beaches.

In 2012, drowning data suffered a shift with only 15% of deaths occurring at beaches and 75% occurring at rivers, lakes, ponds and similar locations. Pools would be a location of limited relevance, representing only 2.6% of all deaths by drowning, if not for the fact that in children aged 1-9 years old it represents 53% of drowning deaths.

Brazil has an estimated 1.7 million pools with an estimated associated risk of 1 death per 639 pools. Although there is no Federal law to enforce safety measures at pools, SOBRASA has, for 10 years now, actively called for more attention to this topic and has submitted a law to the congress regarding safety at pools. Having well trained and equipped pool lifeguards during open-hours at all collective pools are one of the mandatory actions proposed.

Before 2008, this topic didn’t receive much attention and the majority of pool lifeguards didn’t have access to a certification process. In 2008, SOBRASA gathered a commission to strategically plan the best practices and policy to deal with their certification. By then, the few states that had a pool lifeguard graduation had their own way of doing it - class duration and contents varied widely. Cost of the certification is important since pool owners have no obligation to hire lifeguards and, when they do, salaries are below average for a job of such responsibility. Typical attendees are young men with basic education, from 18-25 years old, having another job. Hence available time outside their regular jobs was a concern and courses needed to be as short as possible, keeping the content to the essential but accomplishing all training objectives. Courses usually took 14 days costing 250USD, but since they’re not available in all states, additional expenses for travelling, food and accommodation add to be considered.

After a few months debating the issue, the commission established a set of measures to improve the process:

• Reduce 50% of the actual cost – as candidates have difficulty to afford.
• Provide the candidate a better chance and time to assimilate the contents – as they have only basic education.
• Reduce the time of the course to less than 7 days – they usually take a leave and can’t be away for long.
• Include essential contents for a job of such responsibility (at least 52 hours according to ILS) to ensure a minimum professional quality.

At the end a redesigned Pool-lifeguard certification process was achieved, detailed at SOBRASA’s website and summarized below:

1) The courses should last at least 52h covering contents. Course contents are split into online (theoretical) and face-to-face (practical) components.
2) Theory is freely provided online including all contents and a quiz, and allowing candidates to take their time and as many tries as needed.
3) Candidates can only get to the practical part after achieving grades above 90% at the quiz
4) Face-to-face training is offered by any local fire department or pool company and includes a talk about all theoretical concepts learnt. Practical classes usually take no more than 5 days.
5) A SOBRASA’s certified instructor conducts the final examination consisting of 4hours online and practical exam. Overall, candidates need to achieve a result of 60% or above.
6) Certification needs to be revalidated every 2 years by simply taking an online test.
A Strategic Approach to the Placement of Support Operations in New South Wales

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Poster Session 2, Poster Foyer, November 5, 2015, 9:00 AM - 5:15 PM

Surf Life Saving New South Wales (SLSNSW) operates a range of maritime vessels such as Jet Skis (RWC), Offshore Rescue Boats (ORB) and Jet Rescue Boats (JRB), known collectively as ‘Support Operations’ that are crewed by teams of highly skilled volunteers. The primary role of Support Operations is to support the organisations existing network of 129 Surf Life Saving Clubs (SLSC) and to conduct roving patrols of unpatrolled locations. Support Operations provide a sustainable and manageable alternative to traditional club based patrolling while also allowing a quick and effective response to emergency incident outside of typical patrol hours. The importance of Support Operations has increasingly grown as the resources required establishing a traditional SLSC increases. With an increasing number of drowning incidents and emergency response incidents occurring more than 1km from a traditional flagged patrolled area near SLSCs, the importance of effective Support Operations continue to grow.

Support Operations in New South Wales (NSW) has primarily increased in line with the organisations membership growth and without a structured and planned approach that considers factors such as historical incidents, available membership, community population growth, peak visitation rates and the location of other rescue services. This has led to a high number of Support Operations resources clustered in areas that already have a strong presence of traditional SLSCs. In one example on the NSW Central Coast region thirteen SLSCs each with Inflatable Rescue Boats (IRBs) and four RWCs are located within a 30km stretch of coastline, in addition to other maritime rescue services that are also present in the area. This level of duplication heavily contributes to volunteer burnout, resulting in a high turnover of members, while also costing the organisation and community financially through duplicated resources such as RWCs ($17,000 AUD). In contrast, other locations in NSW that experience equally high incident rates have one or two SLSCs and no Support Operations assistance over the same 30km distance in reducing the drowning rate and conducting emergency response rescues.

As part of SLSNSWs existing strategy to radically decrease the drowning rate, while also combating the membership and financial factors, a review of Support Operations in NSW was undertaken by SLSNSW. The review applied a risk management approach and considered the operational scope of Support Operations and the location of current Support Operations to develop a strategic framework that utilises SLSNSWs existing resources in a sustainable and effective way that will better match the communities’ needs and expectations while also reducing the rate of drowning incidents in NSW.

The review firstly considered the operational scope of the 38 Support Operations in NSW, primarily the role and the operational range of each vessel. The response time to incidents and member welfare was considered when determining these figures. Secondly, a specific two part formula was developed that measured the “need” of each current Support Operation, and the potential ‘need’ of a Support Operation, in a number of high risk locations. The first stage of the formula assessed the need of a service to be located in a specific area, based on a number of parameters such as incident history, number of beaches and rock platforms and the number of existing rescue services available in the area.

Once the need of a service was calculated the active “on the water” patrolling dates and times were calculated by assessing the peak population and beach attendance rates during the year. Every Support Operation, as with all NSW SLSCs are available for emergency response 365 days a year, however this aspect of the calculator determined when a Support Operation should be on the water and actively patrolling the high risk locations and traditionally unpatrolled locations.

The result was that, each Support Operation was given a priority ranking (high, medium or low) based on stage one of the formula and a recommended patrolling schedule based on stage two of the formula. Each high and medium ranked Support Operation was offered a “Lifesaving Service Agreement” that provided endorsement and funding from SLSNSW, while the low priority services were offered interim Lifesaving Service Agreements while they transitioned to a location that better reflected the needs of community and contributed to reducing the drowning rate in NSW.

This review redesigned an unstructured organic approach to Support Operations and applied a rational process and framework to determine that some Support Operations should be relocated to a higher risk area to better service the community in a more sustainable manner, compared with applying the same approach with traditional SLSCs.
Quick response to maritime and riverine emergencies in Brazil - a diagnosis of maritime services

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Response to incidents and emergencies with boats in Brazil is a constitutional duty of the Navy, which is the maritime authority in the country. However, due to the length of the Brazilian coast and its large river network, which cuts the country, most of this aid is made through the Fire Brigades, alone or in partnership with the Navy, because these brigades are spread practically all over the country.

The objective is to scale the structure of maritime and riverine emergencies' response in Brazil, used by the Fire Brigades and other bodies but the Navy, and to identify weaknesses in this structure.

The method used in this work is the field research, through surveys to the Fire Brigades and analysis of accident records of the Navy.

Results
Brazil has a coastline of 8000 km, and a wide navigable river network, particularly in the Amazon region (8% of all the fresh water in the world is in Brazil). There are 17 states bordering the Atlantic Ocean, and two cut down by the Amazon River and its streams. There are several other navigable rivers in other regions of the country, which will be mentioned here only regarding the devices for emergency response.

Together, the lifeguard service of Fire Brigades have 63 fast rescue boats and 4 rescue ship, 70% of these crafts are in the south of the country, especially between the states of Rio de Janeiro and Rio Grande do Sul. 30% of them serve the navigable rivers – 20% in the Amazon rivers. Most vessels are medium sized (up to 20 feet and outboard engine up to 200 HP), serving a sea area of up to 6 NM of the coast and inland areas. However, there are larger vessels (from 40 to 100 feet and up to 1.200 HP engine, such as the rescue ship) that serve every area of the territorial sea (12 NM from the coast).

Despite this distribution, around 54% of boating accidents fatalities occur in Amazonian rivers. Between 2012 and 2013, 99 people died in boating accidents in Brazil, 54 of which died in Amazonian rivers. This is mainly due to huge fleet of ships navigating these rivers, being, in many cases, the only means of transportation. The vast majority of crashed boats in Amazonian rivers are used for transportation of people and, in many cases; numerous victims have to be rescued. However, in the southern states, most crashed boats are for fishing or sports and recreation, representing fewer casualties.

The Brazilian region with less assistance by the Fire Brigade rescue boats is the Northeast, where the Navy alone serves nearly all maritime emergencies. This region accounts for less than 10% of boating accidents.

Conclusion
We know there’s still a lot to be done so that navigation in Brazilian waters is considered safe. There are vast river and coastal regions without adequate assistance by rescue boats. However, the most urgent measure we've identified is to increment and reinforce means and devices to assist emergencies on rivers, since rivers are where most fatal accidents occur.

The Brazilian Fire Brigades, due to their dimension and distribution in the country, are apparently the Organization best prepared and more apt for the task. Aware of this factor, they have increased investments in rescue crafts and crew training, doubling the number of fast rescue boats in the last 10 years.
Rescue in Algeria: actions and perspectives

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1Algerian Federation of Rescue, First Aid and Underwater Activities, Alger, Algeria

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The Democratic and popular Republic of Algeria: Located in North Africa, on the Mediterranean coast. With an area of 2,381,741 km² and 1640 km of coastline, it is the largest country in Africa, the Arab world and the Mediterranean.

The Algerian Federation of Rescue, First Aid and Underwater Activities FASSAS single delegate of the Algerian Ministry of Sport and only accredited institution authorized for training:
• Diving scuba,
• Swimming with fins
• Underwater spearfishing.
• Rescue Utility
• first aid.

Its main objective is the development of underwater activities, the utility Aid, Rescue utility and competitive throughout the coast, as well as for various inland water.

International recognition;
• Affiliated with the World Confederation of Underwater Activities (CMAS)
• Affiliated to the Arab Federation of Underwater Activities (FAAS)
• Affiliated with the International Rescue Federation (ILS)

The FASSAS actively involved in training people in first aid. It's currently competes with the Algerian Red Crescent in the field with training with no less than 10,000 rescue workers per year.

It contributes to the training of lifeguards for the needs of beaches and pools and is the only organization in Algeria prepared this training, 3000 Supervisors in 2014.

Furthermore, FASSAS is the only organization accredited for training divers including official institution (Fire and Navy) and scientific divers need for scientific research.

Action of FASSAS In the public interest (Assistance and Rescue)

Civil protection statistics clearly indicate alarming figures drowning in Algeria: At sea, in rivers, in the pool, in the dam and retaining hill, in wells under submerged caves, and during natural disasters.

For example, for 2007, the number of intervention of the civil protection incurred for drowning is 48886 interventions for the summer season only.

Given these alarming figures, the FASSAS remains a vital organization to serve as support to civil security services to help the population and to intervene on the entire Algerian territory through affiliated structures to FASSAS.

To this end, the FASSAS provides technical and logistical support in various occasions:
- Training of the population and professionals from the sea and lakes to technical interventions
- Awareness and drowning prevention
- Support to civil protection during disasters and shipwrecks.
- Training of first rescuers which represents the first link in the chain rescues during drowning.

The FASSAS also active internationally through the Rescue competition and international trade in the various Instructors training in rescue.

At the final presentation (The World Conference on Drowning Prevention 2015), we will present detailed statistics on drowning in Algeria, the training provided and the interventions of the FASSAS as an important link in the rescue at sea in Algeria, and the various international actions carried
Horizontal Manned Parbuckling Method
- an improvised technique for man overboard.

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¹Underwater and Aviation Medicine Division, Royal Thai Navy Medical Department, THAILAND, Thonburi, Thailand

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Removals of the unconscious casualties and man overboard from the water to get inside the Rigid Inflatable Boats (RIBs) are not fast and safely handled without appropriate costly parbuckling equipment in preferred horizontal position. RIBs with string along the tubes can be held by the 1-2 rescuers to form an improvised manned parbuckling with the casualties being in horizontal position at the arms and between the tube and the rescuer.

Performing applied pull-up method will form a parbuckling method and easily roll the casualties the get inside the RIBs by assistance of the boat crew. This method may be utilized by any resource-limiting unit as an improvised manned technique with fast and easy but require fit well-trained rescuers.
Lifeguard rescue equipment operation in Bathing Zones

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Since lifeguard have performed rescues and saved lives, rescue equipment has been developed from scratch, adapted from sports and military applications and above all evolved into a class of its own. Rescue is a response to an incident or accident involving foremost people, goods and patrimony. On a conceptual formula, rescue is an adaptive response to a life-threatening situation, requiring from the lifeguard a permanent assessment and adaptation, thus providing the best possible response to the victim. As such, the rescuer has to identify the problems and propose the best available, preventive measures to decrease incidents, and rescue equipment in the course of rescue operations.

The present research has involved over 50 lifeguards from different generations in a specific beach environment in Portugal. Since 2010, ASAMAR - Associação de Salvamento Aquático (aquatic rescue association), has been managing lifeguard service on Carcavelos beach, a urban beach located 17km east from Lisbon, with a 5 months – 156 day lifeguard season, that attract regular users, sports activities and tourists seeking a leisure space with a nice view. Despite the scenario, over 600 rescues do occur per season, on a beach that can get over 50.000 users on a week-end day and over 300 surfers on the 1,5Km stretch of water.

This research considering current life-saving equipment, environmental rescue conditions, distances, locations, multi-victim scenarios, and lifeguard training have been analyzed and summarized to produce a chart, representing the rational use of such equipment.

For a lifeguard to understand the best tool to perform a rescue, he/she must have the notion of all the equipment, and biases that can arise from a rescue scenario. The life-saving equipment tool chart regarding cost and effectiveness of use is an ongoing work that needs to be presented and further discussed, and consequently providing the answers to what is the best possible rescue means for each situation, which could allow lifeguards to perform rescues in a more efficient manner.

References
Turbidity of Pool Water, An issue for Drowning Prevention in Wet Leisure Facilities?

Mr Richard Lamburn
Swimming Teachers Association, Walsall, United Kingdom

Poster Session 2, Poster Foyer, November 5, 2015, 9:00 AM - 5:15 PM

Recreational water turbidity has become a growing concern in the prevention of drowning accidents within the wet leisure industry in Europe. The WHO stipulates that turbidity must be controlled both for safety and for effective disinfection. A number of drownings across Europe over the past few years have identified the need for turbidity tests to be undertaken and recorded. There are two electronic methods for measuring turbidity, Direct Light and Scattered light also known as nephelometric. The importance of undertaking these tests has recently been highlighted and the demand for testing equipment increased. Highlighting the problem of turbidity is only the start, this paper looks at how we control turbidity what methods we do to lower measurements of turbidity and to ensure recreational waters provided enable a lifeguard to successfully ensure bathers safety.
A Brazilian water safety policy for open water swimming races

Dr David Szpilman¹, Lieutenant Colonel Carlos Smicelato¹, Colonel Joel Pedroso¹, Colonel Onir Mocellin¹, Colonel Jefferson Villela¹, Lieutenant Colonel Paulo Barroso¹, Mr Jorge Cerqueira¹, Lieutenant Colonel Marcio Morato¹, Dr Marcelo Vasconcellos¹, Lieutenant Colonel Edemilson Barros¹, Mr Fabio Braga¹, Mr João Silva-Junior¹

¹SOBRASA, Rio de Janeiro, Brazil

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After adjusting exposure, estimates of the number of deaths by drowning as a function of time are 200 times higher than those of road fatalities. Even though, all sports result in an increased exposure risk of trauma and death, aquatic sports are among the riskier. The elevated risk results from the fact that in aquatic environments, a momentary loss of consciousness, or even just dizziness, may prove fatal, changing the fun environment to a very adverse location. Unless consciousness is re-established, drowning occurs within 1 minute and deaths in less than 5 minutes. However, most accidents can be prevented by the timely implementation of water safety strategic plans customized for each aquatic sport. Those situations are usually never thought as a possibility because athletes are expected to be high performance swimmers, and therefore an athlete usually gets more media coverage than any other drowning situation.

Open water swimming races are especially dangerous because they gather many athletes in one single race. Although everyone's duty, the organizers have the main responsibility for risk prevention and should involve and prepare judges, referees, coaches and athletes providing water safety education for these circumstances.

When an athlete is in need of help while in water action must happen immediately and help shouldn't be based only on lifeguards but also managers, judges, referees, and especially athletes. This can only be made efficiently if education on how to detect and intervene is taught beforehand. Although prevention is important, organizers must also be aware that such events can never be made risk-free, and so action plans are always necessary. Still, a proper balance between costs and benefits is important, as the high cost of professional water safety services would likely make the event financially impractical, leading to less support for people to train, join and learn open water swimming, which ultimately lead to less people prepared to avoid drowning.

This policy resulted from a debate among 15 experienced lifeguards, athletes and aquatic event managers, and based on their real practical experience on open water swin race events. Request came from the Brazilian Aquatic Sports Confederation (CBDA) – official representative affiliated to International Olympic Committee to organize Olympics 2016. The objective was to standardize safety protocols at these events in Brazil, to better prepare the Olympics and also marathons, triathlons, aquathlons and similar events in the ocean, lakes, rivers, bays and channels.

Water safety measures were classified and recommended at 3 levels:

1) PRO-ACTIVE
   a. Place of event: Mitigate risk considering variables as water temperature, currents, rocks, animals, tide, and others.
   b. Choice of track, start and finish points
   c. Present water safety tips at the application
   d. Limit athletes' participation considering their experience, age, gender, and care able to provide
   e. Event briefing including all safety measures
   f. Athletes' health certificate

2) REACTIVE
   a. Good athletes' control: number, identification (color, GPS)
   b. Well establish hand signalization for help and other
   c. Well plan professional lifeguard support to rescue
   d. High technology to count, detect and react faster than human control

3) MIX - prevent and react
   a. Adequate professional lifeguard service – a formula considering all controllable variables.
   b. Adequate rescue equipment managed by well -trained crews to prevent and react
   c. Well-trained staff
   d. Pre-hospital emergency team and a plan for guidance to the hospital

A final formula was built to help organizer to standardize the amount of support needed for the event including 4 variables (ranked from 1-4): location's drowning + athletes' number + track distance + athletes' experience.

This presentation aims to present and discuss with WCDP2015 participants the Brazilian open water swim race Policy.
Rescue crafts operators – reinforcing the use of personal protective equipment

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Each year, the lifeguard services, aware of the efficiency and speeds of service performed with rescue crafts (IRBs and jet-skis), have acquired more of these equipment. Due to its increasing popularity in Brazil, rescue crafts are becoming more affordable, even for services with less financial resources. As a result more equipment is available, resulting in a growing need for crew training, including providing them with appropriate protective equipment. Not surprisingly, the increased use of these crafts, has led to a rise in the number of registered accidents involving lifeguarding crews. The number is not significant, but it is estimated to increase as more services start to use these crafts.

The objective of this work is to identify the types of injuries, fatal or not, caused by trauma to the jet-ski’s crew, and the potential for reducing incidents through the use of appropriate personal protective equipment (PPE).

Method
We conducted a statistical analysis of all accidents involving jet-sky’s crews in Brazil between 2013 to 2014, using the registry database of the Port Authority of the Brazilian Navy. In addition to the fatalities, we’ve looked for the most injured body parts during accidents, fatal or not. For comparison and to evaluate the importance of using PPE, such as helmet, long wetsuit, gloves, boots and life-vest, the types of injuries were studied for accidents occurring in São Paulo involving jet-ski’s lifeguarding crews while using PPE.

Results
In 2014, Brazil had 83,882 registered jet-skis, a number 4 times higher than 20 years ago. The increased use entails an increased number of accidents. Between 2013 and 2014, there were 35 deaths in Brazil resulting from jet-sky’s collisions. Additionally, 54 victims with severe injuries required medical attention. In accidents, fatal or not, it was 40% of notified injuries involved the lower limbs (legs and feet), 30% involved the head or face, 30% involved the trunk and 20% involved upper extremities (hands and arms). In general, there is more than one body part involved. Most lesions in the upper and lower limbs were dislocations and abrasions.

There was a high positive correlation between the types of injured body parts of the jet-skis operators (recreational and sport) and the injured body-parts of lifeguards from São Paulo Fire Department who were using PPE when the accident occurred (N=7). A relevant distinction between the two groups of operators was the near absence of head injuries of the lifeguards, because they were wearing helmets. In accidents involving the lifeguards, the main body parts injured were lower limbs (N=4, 58%), the upper limbs (N=2, 28%), and 14% (N=1) were inflicted in the face, implicating a part not protected by the helmet.

Even though accidents with little to no severe implications to lifeguards are underreported, existent data show that speeding and operating inexperience are the main reasons for accidents to occur with lifeguarding crews.

Conclusion
Results showed that body parts protected by PPE used by lifeguards were not injured. This illustrates the efficiency of PPE in protecting lifeguards while operating rescue crafts, and therefore can and should be widely used by all rescue crafts operators.

This study allowed the São Paulo fire Brigade to justify the mandatory and evidence-based use of PPE, not only the helmet and life-vest, but also the long wetsuit, neoprene boots and gloves. Since the implementation of this measure in 2012, there have been no accidents resulting in injuries to the lifeguarding crews.

It is evident that PPEs meet the objective of improving the safety of lifeguards when operating rescue crafts. Better protected, surely lifeguards’ will have safer working conditions either when patrolling or performing a rescue.
Efficiency of protection laws against sharks attacks in the state of Pernambuco - Brazil

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Sharks of the Carcharhiniformes order are often associated with attacks against humans. In Pernambuco State, located in north-eastern of Brazil, from January 1992 to July 2010, 53 attacks was confirmed by the State Committee for Monitoring Sharks’s Incidents, two species of this order have been associated with these attacks: Charcarhinus leucas (Valenciennes, 1839)- Bull shark- and Galeocerdo cuvier (Peron & Le Sueur, 1822)-Tiger Shark-. This paper describes the impact of laws enacted by the Pernambuco Government of to decrease the quantity of sharks attacks in the Metropolitan Area of Recife, studies the statistics of confirmed cases by the State Government and the laws designed to protect swimmers and surfers in that area.

The laws were more effective in the years following the date of its creation and always in response to the relative increase in the number of attacks recorded in these periods (1995, 1999, 2001, 2004, 2005 and 2006), the lowering of quantity of attacks is directly related to action of research (ecology and monitoring of shark), environmental education conducted by the Federal University of Pernambuco to users of Beaches, and the water safety promoted by the Life Guards of local Firefighting Group; the fatality was higher among victims with two or more bites on the body, also when occurs a big bite on the trunk.
"THE SOURCE" Dealing with the major causes of drowning and risk management.

Mr Prithiviraj Ramharai
'Surf Life Saving Association of Mauritius, Albion, Mauritius

Definition of the Source - How to deal or attacking the source of drowning in the heart of the problem.
Drownings as we are all aware it is a silent killer as well is there is no injection against drowning. We wish that we go to the clinic or the drug store to purchase the injection so that we could be safe around an aquatic environment but unfortunately it is a white elephant. There are many factors related to “the causes of drowning” such as (i) Do not mix alcohol and swimming (ii) Do not eat and swim (iii) Watch your kids etc. but there are new related factors arising and for every country it is different. There are thousands or millions of laws which can be voted but still new causes will take birth example Suicide Drowning.

In Mauritius before the school the Christmas Break, our team of volunteers have been mobilised to organise a one day awareness campaign at Albion Beach near Clubmed as there are many beach users on Sundays. With a group of volunteer lifeguards we have ‘Attacked the source”. We have spoken to our sponsor DHL and decided one Sunday to be on the beach, where we were in different groups to talk to beach users about water safety and give them leaflets based on water safety with our slogan “Go to the Beach and reach home safely” (i) Watch your kids during BBQ do not turn your back to the shore (ii) Swim parallel to shore (iii) What to do if caught in a rip current (iv) Do mix alcohol and swimming (v) use the swimming zone (vi)if water cold please come out immediately (vii) anybody on medication please refrain from swimming (viii) Be careful about inflatable toys

Media as a source of awareness:
The Media have been proactive during our campaign, often where we were live on radio for water safety communication especially for Easter, Christmas, New Year etc., Newspapers are very helpful in terms of water safety advice, and Social Media. This helps us to attack to the source directly and indirectly.

Stakeholders
Restaurants: in the vicinity have been very cooperative, our water safety leaflets have been place in their marketing entrance pane, so that clients can read it in three languages ENGLISH, FRENCH and CREOLE (our mother tongue language).
Shops: have displayed in the City where everybody are in for business.
Social Media: Social Medias have played a major role in water safety awareness campaign. Not only in Mauritius but worldwide

THE SOURCE
If we go deep into the source, we can prevent drowning, but “things might be hard and tough”, but nothing is impossible.
Performance Measures for Rip Current Forecasting by Comparison with CCTV Images

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¹Sungkyunkwan University, South Korea

Beach-based sport and recreation activities become an important part of Korean culture in summer season. All visitors to our shores should be able to enjoy water activities safely without any fatal loss and injury. However, rip currents recently occurred many times at Haeundae Beach in Busan, which is located in the south-east part of South Korea, and more than 50 tube-riding people a year were swept away by fast-moving seaward currents.

Rip current forecasting in Korea is the responsibility of the Korea Meteorological Administration (KMA) and becomes an essential component of a marine meteorological forecasting and warning service. Therefore, a team composed of marine meteorology division of KMA and Coastal Hydraulics Lab of SKKU has tentatively started the rip forecasting service for the sake of public safety at one forecasting site of Haeundae Beach, Busan during 2010~2011. Since then the rip forecasting activities are being performed every year from July to August and gradually extending over the years and plan to cover almost all the major swimming beaches throughout the country.

The purpose of the service is to organize rescue action to reduce potential fatal loss and injury due to rip currents and to further enjoy water activities safely. The wave deformation and rip current generation are predicted by HAECUM at each time step and grid point from incident wave, tide elevation and weather conditions obtained from KMA.

We provide three hourly rip forecasting from 9:00 to 18:00 (swimming hours) one day in advance from July to August. Haeundae Beach is divided into 4 zones and the rip forecasting is classified into 4 levels according to simulated strength of rip currents; ‘Safe’, ‘Watch’, ‘Caution’, and ‘Danger’.

The model performance is measured in terms of the accuracy of forecasts through the comparison with CCTV images. Haeundae Beach is a best site easy to detect rip currents by CCTV images because it is crowded and most of visitors enjoy tubes to ride the wave and flow near the shore. Coast guards rescue the tube riders with boats and jet skis if they move seaward due to rips out of swimming zone.

The overall forecasting accuracy was found to be improving to show 72.55, 75.02, and 76.25% during recent three years, respectively. Outer beaches of Zone A and D show higher accuracy than that of Zone B and C which correspond to inner beach.

It is hoped that the consistent forecasting activities year after year will be further accelerated to achieve greater accuracy of each and every forecast especially in highly crowded beaches which make a CCTV tube image detecting possible.

Acknowledgement
This work is financially supported by the project entitled ‘Forecasting Techniques for Minimizing Marine Disaster Impact’ of Korea Meteorological Administration Research and Development Program.
The experience with the public health approach to the drowning epidemic in Asian LMICs

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Session 2 - Opening Plenary, Grand Ballroom, November 4, 2015, 11:00 AM - 12:30 PM

Drowning is a public health emergency—an epidemic—in low and middle income countries (LMICs). It is a leading killer of children and adults due to high exposure rates to water in daily life, low levels of risk awareness and water safety knowledge and low levels of water safety skills. The public health approach has been at the core of the child survival revolution in LMICs and has resulted in control of other leading killers (examples measles, tuberculosis, diarrheal diseases). The public health approach is best suited to intervene in drowning as well. This approach defines the problem and its scale, risk factors for it and the groups at risk, develops and tests interventions specific to those groups, monitors the impact of the interventions, improves them and then expands them across large populations. This presentation reviews the progress made in using this approach from 2001 to present in several programs in Asian LMICs.

The scale of the drowning epidemic was shown in a series of large scale, community-based surveys in a number of LMICS in Asia from 2001 – 2007. Community-based surveys avoided non-reporting biases and showed drowning was the single leading cause of death after infancy in children and a leading cause of death in older adults. The surveys showed drowning was different in LMICs than in high income countries. Based on the epidemiology in the surveys, a set of community-based interventions were developed using information on risk factors, the age groups at highest risk for drowning and the most common drowning scenarios. The interventions were built around increasing community awareness of drowning, active supervision of young children, and teaching survival swimming and rescue.

A large cohort trial in Bangladesh from 2006 to 2010 showed the interventions were effective in reducing fatal drowning in children. They were also shown to be cost-effective. The experience since 2010 has shown the need for addressing safety, risk management and making the interventions sustainable. The experience has also shown that sustainability will be a necessary factor for the interventions to be adopted as national programs.

Research since 2010 and currently underway has focused on improving safety, cost-effectiveness, sustainability and scalability of interventions. Research is also underway to add additional prevention capacity through development of a first response system suitable for rural villages. Results thus far indicate the public health approach that integrates multiple interventions into a comprehensive prevention effort will be more effective and sustainable than an ad hoc or single intervention approach. The issues encountered, possible solutions and further work needed are reviewed and put in the context of priorities and challenges for the next five years.
Coordination of the drowning prevention and development agendas

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Partnerships 1, Tekulur, November 4, 2015, 1:30 PM - 3:00 PM

Introduction
More than 90% of drowning deaths occur in low and middle income countries (LMIC) and over half of those drowned are under 25 years of age. The focus of drowning prevention efforts is usually on the direct approach to drowning prevention, and indirect influences tend to be overlooked.

Background
Findings from an historical/epidemiological study of drowning and drowning prevention for the century 1860s-1960s, following early settlement in Victoria, Australia, show strong associations between development and drowning reductions. These findings are relevant to the eighth drowning prevention strategy in the WHO World Report on Drowning: Coordinate drowning prevention efforts with those of other sectors and agendas.

While many changes occur during development a link between piped drinking water and observed reductions in drowning in waterholes, wells, and creeks warrants further investigation. While drowning prevention relates to several of the United Nations Sustainable Development Goals (SDGs), which will follow-on from the Millennium Development Goals, this particular observation relates to Goal 6.1: Achieve universal and equitable access to safe and affordable drinking water for all.

With just under half the world’s population having no access to piped water, many safe water programs are operating in LMIC with the principal aim of preventing infectious diseases. Such programs are likely to increase in line with the SDGs. The likely effect of also reducing drowning in the same high risk communities has received little attention.

Approach
The potential synergy between safe water supply and drowning prevention warrants investigation in order to inform the development agenda and potentially bolster cost effectiveness of the combined strategy, and extend program efforts, visibility and donor funding.

The current policy research will investigate the feasibility of developing and evaluating the potential to co-ordinate safe water programs and drowning prevention and to measure the effectiveness of safe water programs in drowning prevention. The initial steps are to review the scope of safe water programs globally, including agencies, size and budget of programs, countries, size of the local drowning problem, and the availability and quality of data on drowning within program areas.

A detailed strategy and progress towards achieving it will be presented.
Development and implementation of a water safety and drowning prevention model: A case study Sri Lanka

Dr Bernadette Matthews¹, Mr Mevan Jayawardena¹, Mr Sanath Wijayaratne², Ms Rhiannon Birch¹, Mr Asanka Nanayakkara²
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Partnerships 1, Tekulur, November 4, 2015, 1:30 PM - 3:00 PM

Introduction
Drowning prevention is an established health and injury prevention issue on the agenda of government, industry, non-profit organisations and lifesaving organisations in high income countries (HICs). Many low and middle income countries (LMICs) are also working towards drowning prevention and striving for attention from those in government, private sector and community settings. Best practise models from HICs can be adapted and applied by those in LMICs. Conversely, there are models from LMICs, particularly based on innovation, which can be adapted and applied in HICs.

The Life Saving Association of Sri Lanka has long been working towards a water safe Sri Lanka. In recent years, and in partnership with Life Saving Victoria, a national model for water safety and drowning prevention was developed and implemented. We outline the key steps and specific examples in the model along with key outputs, using Sri Lanka as a case study.

Methods
The model of water safety and drowning prevention was based on internationally accepted injury prevention models and drowning prevention strategies.

The model consisted of numerous interrelated actions that may be undertaken at different times and in a different order depending on the starting point for action: (A) establish/strengthen the drowning evidence-base, (B) develop/strengthen partnerships and networks, (C) develop/adapt/implement prevention measures with visible early results, (D) align aquatic safety to a local priority area (e.g. tourism or emergency service provision), (E) establish a national plan, (F) promote community education and training, (G) educate and influence organisational and government policy, and (H) evaluate effectiveness. It is important to note that this is a cyclical process with each action requiring ongoing review and input.

Results
In Sri Lanka, key outputs included:
- Over 11,000 people trained in lifesaving skills since 2012.
- Internationally recognised training delivered to Sri Lankan personnel across various industries including tourism, swimming and lifesaving and the armed forces.
- Further development of life saving services utilising armed forces previously involved in the civil conflict. There are now:
  - 51 lifesaving service locations.
  - 1,319 qualified lifeguards performing duties.
  - 400 rescues reported each year by lifeguards.
- Partnerships developed and greater linkages with government, industries and non-profit organisations such as the Registrar General’s Department, the Department of Census and Statistics Sri Lanka, Sri Lanka Police, Sri Lanka Coastguard, Sri Lanka Navy, the World Health Organisation Sri Lanka Office and tourism operators.
- The foundational Drowning Prevention Report for Sri Lanka published in December 2014. The report included: a statistical analysis of drowning death in Sri Lanka; an overview of drowning prevention and water safety activities (education and training, rescue and response) being conducted by non-profit organisations, government agencies, armed forces and schools; lifesaving services provided in Sri Lanka, and key recommendations and actions to be used as a basis for the first national drowning prevention and water safety plan.
- The Sri Lankan Drowning Prevention and Water Safety Plan developed with a multi-stakeholder governance and implementation structure.
- Update of the existing water safety model used by Life Saving Victoria utilising lessons learnt and tools developed in Sri Lanka.

Discussion and Conclusions
The outputs from the water safety and drowning prevention model in Sri Lanka have helped increase the profile and elevate the importance of developing lifesaving and drowning prevention activities within Sri Lanka. This model provides a guide for other practitioners to develop and structure comprehensive drowning prevention initiatives.

Acknowledgements
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Insights into the Development of a National Strategy for Drowning Prevention for the UK by the National Water Safety Forum (NWSF)

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Partnerships 1, Tekulur, November 4, 2015, 1:30 PM - 3:00 PM

Background
On average 400 people drown in the UK each year with a further 200 people committing suicide on our waters. The search and rescue services in the UK are some of the best in the world but even they cannot reach everyone.

The National Water Safety Forum (NWSF) was established over 10 years ago and in that time has seen many examples of excellent collaborative work to reduce drowning and make activities in and around the water as safe as possible. With the advent of the WAter Incident Database (WAID) as the NWSF’s national database, we now have detailed evidence about water related fatal incidents in the UK. This has helped us to respond to the World Health Organisation (WHO) report that recommends each country has a National Water Safety Plan. Our evidence indicates that 44% of the fatalities occur amongst individuals that had no intention of entering the water; a stark reminder that it is not just participants of traditional water related activities who find themselves in trouble.

In the UK, the key water safety related stakeholders realise that collaboration is essential if we are to succeed in reducing fatalities and the risk around the waters of the UK. A working group with representatives from the Marine Coastguard Agency, RNLI, RLSS UK, RoSPA, British Sub Aqua, Canals and River Trust and the Fire and Rescue Service worked together to develop the national strategy.

By working together, the NWSF believes fatalities due to drowning can be reduced by 50% by 2026. The aim is to encourage sign up to the development of local strategies that will contribute to the national plan with the ultimate goal of key agencies and organisations working together to raise people’s awareness of risk in, on and around the water. This will ultimately lead to better education of people with more effective targeting of specific groups and activities, leading to safer communities.

This session explores the development of the strategy, some of the challenges encountered and how they were overcome. We will cover how the approach to realising the strategy through the development of key targets and the next steps of the delivery of the strategy commencing in January 2016.
Creating the National Drowning Prevention Plans, Canadian approach to this opportunity for impact

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Partnerships 1, Tekulur, November 4, 2015, 1:30 PM - 3:00 PM

Learning Objectives

1. To advance our knowledge and skills in creating National Water Safety/Drowning Prevention Plans.
2. To share and connect with others who are working to create National Water Safety/Drowning Prevention Plans in other nations.
4. To Share the successes and challenges that have been encountered in the Canadian and other nations effort to develop National Drowning Prevention Plans.

The WHO Global Report on Drowning is a call for action to prevent a leading killer. (1) The report provides ten actions to prevent drowning and four major recommendations. The report concludes, “Time to act on a preventable killer. Drowning is a leading global killer, particularly among children and young adults. It is preventable but neglected relative to its impact on families, communities and livelihoods.”

Recommendation # 3 states: All countries should aim to develop a national water safety plan.” Action # 9 states: “Develop a national water safety plan.” This plan may be most impactful if is multi-sectoral and engage maritime, health, industry, disaster risk management, tourism, cultural, climate change and other interests and stakeholders. The WHO Global Report on Drowning Prevention provides essential steps for development of a national drowning prevention plan.

This session will bring together representatives, practitioners and academics who are working on National Water Safety/Drowning Prevention Plans. Some participants will be working on new plans or strategies. Some participants are working on existing plans for improvement, revision and impact enhancement. The workshop will be skilfully facilitated to share learning and challenges to advance our knowledge and skills in this key WHO Global Report on Drowning recommendation.

There will be short presentations of existing National Water Safety/Drowning Prevention Plans with emphasis on the reflective learning and challenges overcome.

There will be a short review (5 min) of the Strategic Principles: Appropriate Targets, Coordinated and integrated, Evidence-based, Data driven and Continually monitored.

There will be a facilitated discussion about opportunities, challenges, methodologies and impacts for each of the recommended steps:

1. Assess the drowning situation and raise awareness
2. Engage stakeholders and identify leadership
3. Agree upon vision and principles of the strategy and define goals
4. Set Objectives and select evidence-based drowning prevention strategies to be implemented
5. Establish priorities and responsibilities, coordination mechanisms and define resource needs
6. Obtain stakeholder and government approval
7. Implement, monitor and revise strategy and targets as necessary

The session is focused on learning and sharing to advance our knowledge, skills and impact for creation and implementation of National Water Safety/Drowning Prevention Plans.

The session will reaffirm the essential steps for development of a national drowning prevention plan to inspire and encourage progress on this WHO Global Report on Drowning recommendation. The appreciation of unique national issues and the principles of effective sustainable development will be encouraged.

Representative from the Australia(2), New Zealand(3), Philippines(4), Vietnam, UK(5), the Netherlands(6), Canada and other nations actively engaged in a National Water Safety/Drowning Prevention Plan will be invited to participate. Those nations in the contemplation stage, will be invited to contribute. We will gather to learn from each other and to share examples of best practice. We will explore examples from other sectors. We will work together to improve and refine our ability to make this task clearer, easier and more achievable. This will assist nations, governments and NGOs to be more impactful in our efforts to prevent drowning.

References

Drowning prevention efforts in Australia are synonymous with lifesaving and water safety. Public perceptions place lifesavers, swimming pools and beaches at the centre of efforts to reduce drowning. However, drowning prevention is in transition in Australia and beyond. Evidence based decision making, cross-sectoral collaboration and contrasts with low and middle income perspectives are all changing the way the drowning prevention sector is approaching its lifesaving work.

The drowning prevention journey in Australia has transitioned from the formation of the Australian Water Safety Council (AWSC) and the publication of the first National Water Safety Plan in 1998 to three successive Australian Water Safety Strategies from 2008 that have increasingly harnessed data and a growing evidence base to refine its areas of focus.

In 2008, the Australian Water Safety Council (AWSC) established an ambitious aspirational goal of achieving a 50% reduction in drowning deaths by the year 2020. To achieve this ambitious target the AWSC has maintained a focus on three key drivers for reduction: Taking a life stages approach; Targeting high risk locations; and Focusing on Key Drowning Challenges. Goals of the Strategies are diverse and range from reducing drowning deaths in children, to reducing drowning by strengthening the aquatic industry and addressing drowning deaths as a result of watercraft incidents, drug and alcohol related drowning and drowning in high risk populations.

Successive strategies have seen momentum build with State and Territory level water safety council’s being established and aligning efforts and funding mechanisms to the goals of the Australian Water Safety Strategies. The Council and Strategies play a key role in focusing the efforts of a resource poor sector into the specific areas where effort is likely to be the most effective in achieving overall reductions in drowning.

Challenges arise in ensuring that Strategies that span a three year period have longevity and to ensure buy in is achieved from the diverse sector. This is done through consultative drafts, regular calls for feedback and opportunities to report on progress against the goals of the Strategy at bi-annual National Drowning Prevention Symposiums.

The recently released consultative draft of the Australian Water Safety Strategy 2016-20, is also identifying emerging trends which will need to be addressed by the drowning prevention community in the last three years prior to the 2020 deadline. These three key issues are the burden of males in drowning, the role of alcohol in fatal drowning in Australia and the issue of expanding prevention efforts to focus on non-fatal drowning.

This presentation will share insights on this process and discuss implications for drowning prevention in Australia for the next three years.
Implementing the recommendations of the global report on drowning in low-middle income countries – experience from Bangladesh

Dr Kamran Baset¹, Dr Tajkera Noor, Dr Animesh BISWASH¹, Dr Md Jahangir HOSSAIN¹, Al-Amin, BHUIYAN¹, Saidur Rahman MASHREKY¹
¹CIPRB, Dhaka, Bangladesh

Introduction
The global burden of drowning is huge, but has often been overlooked in attempts to improve health. The World Report on Drowning Prevention published by the World Health Organization on November 2014 it focused the newly emerging public health problem in low and middle-income countries. It also makes an important and guiding paper for the researcher and policymakers to make precise and urgent action to address the drowning problem.

Objectives
This note reviews the findings and recommendations of the ‘Drowning World Report’ and provides guidelines for next steps.

Results
Most of the ten recommendations of the world reports are feasible in Low and middle income countries. CIPRB have the experience of successful implementation of first five recommendations in their communities in Bangladesh. Anchal (crèche), Swimsafe (teaching swimming), home safety (door barrier, playpen etc.), first responder (first aid & CPR training of community volunteers) and community awareness of drowning through community participations were scientifically proven by CIPRB researches. As these interventions were implemented in Bangladesh, so it is possible to run in other similar settings. However, Bangladesh has to take necessary action for rest of the five recommendations to address this deadly issue.

As a first step capacity of the country should critically evaluate to establish a multi-sectoral implementing group. Next step should be dialogue between counterparts in different ministries and it is important for sustainability and achieving the goal. Short, medium and long-term strategy need to be developed on the basis of the findings of the review and dialogs. One organization or institute should play the lead role.

The lack of reliable data is one of the big obstacles. To overcome it, need to be developing a realistic strategy and must need immediate action. However establish a countrywide data system is expensive in LMICs, so we need to develop data linkage programme which will provide authentic information within the government system. As a priority basis it should take initiative for dialogue with all national and international agencies to prepare the National strategy and national water safety plan and which need to tailored to local context. It’s possible by building scientific, technological and managerial capacities which is appropriate for LMICs settings.

Conclusion
To find out the way, its need further more research on effective interventions which address sustainability and scalability. These will require more funds to move in drowning research, dialogue to initiate with all stakeholders. These will also require within the policy makers and implementers, to make the Drowning problem priorities.
Developing a drowning reduction plan using the World Health Organisation 7 steps - Barisal, Bangladesh Case Study

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Whilst piloting and delivering single interventions through partners within small geographical areas is beneficial to our learning and to those particular communities and risk groups, the broader impact is likely to be low as the reach will be limited and constrained. It is also evident that our interventions alone will not address some of the wider and interconnecting issues associated drowning. As such, we are now looking at ways to integrate our interventions, with others, on a much larger scale, using a variety of partners to both coordinate and implement drowning reduction activities across countries and regions.

At the same time the RNLI is exploring the development of national drowning reduction plans, as recently recommended by the World Health Organization (WHO). To implement this recommendation, there is a requirement to design and pilot a framework along with guidance and tools to aid the development of a drowning reduction plan.

To test this approach we are proposing a 3-4 years pilot project, with the Centre for Injury Prevention and Research (CIPRB), in the Barisal Division in Bangladesh.

Develop and implement a drowning reduction plan for the Barisal Division in Bangladesh

Outcomes sought
\begin{itemize}
\item Better understanding of how to develop a drowning reduction plan
\item Evidence of the effectiveness of a drowning reduction plan
\end{itemize}

Pilot objectives
1. Assess the current drowning risks and benchmarks in the Barisal Division
2. Engage the relevant stakeholders and identify/support local leadership
3. Identify and deliver appropriate interventions according to risk
4. Evaluate how coordinated interventions work at scale
5. Learn, document and disseminate the strategic process for wider application
6. Ensure the project is sustainable; activities institutionalised within partner and community organisations and fully supported by the Bangladesh government

In Bangladesh adults and children are widely exposed to open water hazards such as ponds, ditches, rivers and the ocean. In 2005, the Bangladesh Health and Injury Survey (BHIS) revealed that drowning is the leading cause of death for children aged 1-17 year in Bangladesh, with approximately 18,000 children dying each year. Adults are also vulnerable, particularly fisherman and those using water transportation, such as ferries & launches. In addition, Bangladesh is prone to natural disasters and frequent flooding, claiming thousands of lives each year.

The BHIS survey was conducted in all seven of Bangladesh’s divisions. The survey collected data from 1 or 2 sample districts within each division. In the Barisal Division the survey was conducted in the Pirojpur district (Sample pop. 29,070). Out of the 12 districts surveyed across Bangladesh, Pirojpur had both the highest mortality (72.2/100,000) and morbidity rates (254.6/100,000).

The Barisal Division is one of the most vulnerable and risk prone areas to disaster and climate change in Bangladesh and despite the findings of the BHIS, to our knowledge there has been no action taken to reduce drowning in Barisal. Every district in the division is affected by water related risks and disasters.

The project seeks to develop three levels of activity output;
1. Community awareness - Awareness of the risks and hazards associated with water within the community; focussing on vulnerable groups, such as young children and people living in areas prone to severe flooding/bodies of water
2. Community skills - Provide skills and knowledge to the community to help prevent drowning incidents.
3. Community response - Train and equip people with the necessary skills to respond and prepare for drowning related events

During the various project phases the RNLI and its partners, along with research experts and institutions, will develop and test guidelines and tools using 7 steps recommended by the WHO. The findings will influence how the project proceeds and will form the basis of good practice for other areas to develop national or regional drowning reduction plans.
Stop, collaborate and listen: developing a national drowning prevention strategy in Uganda.

Mr Daniel Graham¹, Dr Justin Sempsrott², Mr William Koon³,
Mr Shai Henkel⁴, Mr Moses Kalanzi⁵

¹Nile Swimmers, Bala, United Kingdom, ²Lifeguards Without Borders, Jacksonville, United States of America,
³International Surf Lifesaving Association, Huntingdon Beach, United States of America, ⁴Swim Safe Uganda,
⁵Kampala, Uganda

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In November 2014, at the request of the director of Swim Safe Uganda, a small delegation of representatives from Nile Swimmers (NS), Lifeguards Without Borders (LWB), International Surf Lifesaving Association (ISLA), and Starfish Aquatic Institute (SAI) visited Kampala, Uganda.

The purpose of the visit was to collaborate with SwimSafe Uganda (SSU), Uganda Lifesaving Federation (ULF), Royal Lifesaving Society Uganda (RLSSU), and the Uganda Police Directorate of Rescue Services and Fire Prevention (UPDF) in order to evaluate their capacity and capabilities for building a future international partnership.

NS, LWB, and ISLA all have experience at working with drowning prevention and water safety organisations in various low income countries across Africa and South America. The authors seek to explore some of the common challenges and problems that organisations working in low resource settings may experience.

During the pre-planning phase, it was identified that respective agencies in Uganda had some overlap in functions, but did not routinely work together on projects. Further, it was identified that there was no national, unified lifesaving or drowning prevention agenda. Before the international charities would release funds for the visit, extensive discussions were held about the importance of working collaboratively between SSU, ULF, and RLSSU. To achieve this goal, the only pre-condition for commitment of international resources was a stakeholders meeting with high level representatives from all interested agencies.

The stakeholders meeting was attended by representatives from the Uganda Police Directorate of Rescue Services and Fire Prevention, Commissioner for Physical Education Ministry of Education and Sports, Uganda People’s Defence Force on behalf of Chief of Defence Force, the Asst General Secretary National Council of Sports Uganda, Royal Lifesaving Society Uganda, Uganda Lifesaving Federation, Nalubale (Lake Victoria) Water Sports, Streams of Hope NGO, Marine Police, and Swim Safe Uganda, Lifeguards Without Borders, International Surf Lifesaving Association, Starfish Aquatic Institute, and Nile Swimmers.

Each agency made a brief presentation and discussed specific goals relating to policy and lobbying local governments, training programs and equipment, as well as program logistics and organization. Also discussed were key strategies that have led to successful programme implementation by the interested parties. To the authors and attendees knowledge, this is the first such inter-agency meeting of its kind regarding lifesaving and drowning prevention in Uganda.

The overwhelming message was one of collaboration. The various organisations identified that they need to be able to speak with one voice to the citizens of Uganda as the differences between the organisations are often too subtle to be easily explained to third parties. They all agreed that they share the same goal - zero fatal and non-fatal drowning incidents in Uganda. The simple next step forward agreed upon by each organization was to meet again in one month and continue to dialogue.

Unfortunately, no follow up meetings have occurred. In order to collaborate, representatives from some agencies required a memorandum of understanding, which have not yet been executed. There are also calls for the creation of a new organization, which would be a Ugandan Drowning Prevention Coalition, with its own power structure and representatives from each organizations. For myriad reasons, there are some agencies in favor and some against creating a new organization.

The experiences of the authors and the representatives in Uganda may hold lessons for lifesaving and drowning prevention programs in countries across all income levels. We must work together to develop sustainable, cost- and time-effective interventions with measurable outcomes. If we are all so committed to a goal of zero fatal and non-fatal drowning incidents, why can’t we put aside egos, stop, collaborate, and listen to one another?
The Establishment of a Drowning Prevention Action Plan: Incorporating Community Ownership and Building Capacity in Northern Canada

Barbara Costache¹, Mr. Kelly Carter¹
¹Royal Life Saving Society Canada - Alberta and Northwest Territories Branch, Edmonton, Canada

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The drowning rate for Canada’s First Nations and Inuit people are close to 10 times higher than the Canadian average. Canada’s Northwest Territories (NWT) is boarded by the Arctic Ocean and includes over 163,021km² of fresh water. The Northwest Territories has a population of approximately 43,000 people and over 50% of this population is aboriginal.

Starting with the vision of an injury free Northwest Territories the NWT Injury Prevention Group identified a goal to reduce the incidence of drowning from water-related activities to one or fewer each year by 2013. The group took a health promotion approach, which had a focus on determinants of health, taking intersectional action, addressing disparity in injury occurrence and targeting key groups and settings.

To address the drowning problem the Northwest Territories an Injury Prevention Group was established that included representation from various sectors including: Health and Social Services: Prevention Unit, Office of the Deputy Chief Public Health Officer, Epidemiology; Transportation: Public Affairs & Communication; Municipal and Community Affairs: Recreation, Sport and Youth; External Partners: Royal Life Saving Society Alberta & Northwest Territories, NWT Water Safety Network, and Transport Canada.

The following priorities were established: build on existing services and programs, link drowning prevention with mental health addictions, and assess emerging issues identified through research. The Royal Life Saving Society of Canada - Alberta and Northwest Territories Branch was approached to be the main delivery partner to engage communities and build relationships for sustainability and capacity. The Lifesaving Society developed and delivered the Northwest Territories Water Smart® drowning prevention program to communities. From 2011-2014 the Lifesaving Society had been invited into over 30 remote communities in the Northwest Territories to deliver the Water Smart program.

The guiding principles placed priority on prevention and health promotion, while action was based on partnerships and shared responsibilities between public and non-government sectors. Action was informed by knowledge and evidence while culture, community, and unique needs of vulnerable populations were respected. The model and framework used to develop and deliver the Water Smart® program has emphasized enhanced partnerships, capacity building, knowledge, culture, social determinants of health, education and awareness.

Enhanced partnerships have been achieved through working with the Government of Northwest Territories Injury Prevention Group which includes representation from the departments of Health, Transportation, Education, the Chief Coroner’s office, and municipal and community affairs.

In 2014 an evaluation framework was established and used to evaluate the program. The evaluation results have emphasized the importance of adapting each session to meet the individual community needs, adaptation of program materials to be reflective of the literacy level of the participants, and the importance of incorporating a traditional knowledge component into the program.

This drowning prevention program is designed to leave a legacy with every community by training local community leaders to delivery year round drowning prevention sessions. Community leaders are provided a Water Smart toolkit, which includes a guide with activities to engage children and youth.
Challenges of drowning prevention in Singapore

Mr. Richard Ming Kirk Tan
Singapore Life Saving Society, Singapore

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Singapore celebrates its 50th birthday in 2015 and is considered a developed country by many measures e.g. it is listed as one of 36 Advanced Economies by the International Monetary Fund. The challenges it currently faces in preventing drowning are somewhat different from those it faced in earlier years.

This paper briefly traces the history of drowning as well as drowning prevention in Singapore since the country’s independence in 1965. It will deal with the main participants in drowning prevention in the country including the Singapore Life Saving Society (“SLSS”) and more recently, the National Water Safety Council of Singapore (“NWSC”). The SLSS was founded in 1967 and is the national lifesaving organization. The NWSC was set up in 2007 and is the national co-ordinating body to drive and sustain longer term initiatives overseeing all aspects of water safety in the country.

The paper will highlight some of the current challenges and considerations of drowning prevention Singapore. These include the problems of private pools, the changing built environment, increasing numbers of leisure watercraft, unguarded public beaches, the increase in foreign visitors and flash floods.

References
1. IMF Advanced Economies List. World Economic Outlook, April 2014, p. 160
Changing the Culture? A Collective Response to Reduce Drowning

Mr Mark Lindsay¹, Mr Matthew Claridge¹
¹Water Safety New Zealand, Wellington, New Zealand

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“We are the ones we've been waiting for. We are the change that we seek.”


New Zealand has experienced a steady reduction in drowning fatalities from a peak of 214 in 1985 to 90 in 2014. This still leaves us with the 5th highest number of drowning deaths (per 100,000) in the OECD, and almost double the Australian drowning rate (per capita).

While business as usual for New Zealand’s water safety sector may hold the drowning toll at or around current levels it will not significantly reduce the number of lives lost.

Recognising this, New Zealand’s key water safety agencies have committed themselves to a significant ‘step change’ that is designed to reduce these unacceptable and largely preventable deaths. This commitment is laid out in the Water Safety Sector Strategy 2020.

The Strategy’s ambition is to drive culture change so that all New Zealanders can enjoy the water safely.

The aspirational vision is that no one drowns.

This paper will explore how the notion of culture change requires a change in New Zealanders’ knowledge, attitudes and behaviour towards their aquatic capabilities and the risks presented by water. It also requires the water safety sector to move away from narrow organisational interests and competition for resources, and operate increasingly with collective responsibility for an agreed sector strategy.

Achieving a meaningful reduction in drownings by 2020 will require each agency to consider important changes to their organisational missions and values. Increasingly, agencies will be publically accountable for the shared resourcing and effective delivery of cross-agency drowning prevention programmes.
Insight into the success of RLSS UK in engaging central government in the drowning prevention agenda through political lobbying

Ms Di Steer¹
¹The Royal Life Saving Society - UK, Broom, Alcester, United Kingdom

Background
More than 400 people drown in the UK each year, and thousands suffer near-drowning experiences. Drowning is the third highest cause of accidental death amongst children in the UK. Yet, in the UK drowning prevention is not on the public health agenda – comprehensive statistics aren’t collated by government departments and there is very limited funding providing.

As the UK’s drowning prevention charity, the Royal Life Saving Society UK (RLSS UK) is dedicated to promoting water safety. With consistent figures of around 50%* of primary school aged children leaving school unable to swim 25 metres – the delivery of water safety in schools is more important than ever.

We recognised that to help us achieve our goal of a ‘year on year reduction in UK and Irish citizens drowning’ we needed to look at how improve our engagement and education of people in water safety. To secure both the profile for the drowning prevention agenda and to ensure that the water safety provision in schools is improved we recognised the necessity to start engaging the government audience in our cause – something that we had never done previously.

We set 3 key goals of this engagement:
2. Get water safety on the national curriculum (in addition to the current learn to swim requirement)
3. Secure public service announcements on water safety

We established a political lobbying campaign commencing in December 2013 with the engagement of our local MP, which has resulted in RLSS UK securing over 40 MP supporters attending a drop in event at the House of Commons (UK Parliament) and the setting up of a very active All Party Parliamentary Group (APPG) for Drowning Prevention and Water Safety of which RLSS UK is the Secretariat.

This session will share how we approached lobbying and provide insight into how the engagement of MPs has been a good route in taking a national issue and raising awareness at local/constituency level. In addition, our MP supporters have tabled many written and verbal questions (the latter resulting in a debate in the House of Commons) which have proved to be extremely valuable in terms of raising profile of the water safety and drowning prevention agenda but also as a source of information to help steer campaign directions.

References
1. The Amateur Swimming Association (ASA) most recent statistics (Nov 2014) reveal that 45% of seven to 11 year olds are unable to swim 25 metres unaided.
Creating a new Drowning Chain of Survival

Dr David Spzilman1, Mr Jonathon Webber2, Professor Linda Quan3, Professor Joost Bierens4, Mr Luiz Morizot-Leitée5, Dr Stephen John Langendorfer6,7, Dr Steve Beerman8, Associate Professor Bo Løfgren9

1Sociedade Brasileira de Salvamento Aquatico, Sobrasa, Miguel Couto Hospital – Research Center, Brazil, 2Department of Anaesthesiology, The University of Auckland, Auckland, New Zealand, 3Division of Pediatric Emergency Medicine, Department of Pediatrics, University of Washington School of Medicine, Seattle, WA, USA, 4van Heurnlaan 10, Vught, The Netherlands, 5Ocean Rescue Captain, Miami-Dade Fire Rescue, Miami, FL, USA, 6Bowling Green State University, Kinesiology-HM5L5, Bowling Green, OH, USA, 7Bowling Green State University, BG Perspective: 21st Century Liberal Studies, Bowling Green, OH, USA , 8Postgraduate Family Practice Residency Program, The University of British Columbia, Vancouver, BC, Canada , 9Research Center for Emergency Medicine, Aarhus University Hospital, Aarhus, Denmark

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All nations would benefit from a simple, clear Drowning Chain of Survival. In high income nations this tool will refine prevention and the call for action. In low and middle income nations this tool is a guide for policy making, resource allocation and priority setting in drowning prevention.

A best evidence approach was utilised to create a universal Drowning Chain of Survival. Education on how to prevent drowning and how to react when a drowning incident occurs has not always been guided by good levels of evidence, or high levels of specialised training in the recognition and management of the drowning process.

The Drowning Chain of Survival refers to a series of steps that when enacted, attempts to reduce mortality associated with drowning and attempted aquatic rescue. The term “chain of survival” has provided a useful metaphor for the elements of the emergency cardiac care system for sudden cardiac arrest, however, interventions and patient management in drowning involves principles and actions that are specific to these situations.

The result is a unique and universal Drowning Chain of Survival comprised of five links guiding the important life-saving steps for lay and professional rescuers. This may significantly improve chances of prevention, survival and recovery from drowning.

The steps of the chain are: Prevent drowning, Recognise distress, Provide flotation, Remove from water, and Provide care as needed. This presentation describes the development of a new Drowning Chain of Survival from concept to publication.

References

Marketing as an educational tool - an Irish Water Safety perspective

Mr Roger Sweeney¹
¹Irish Water Safety, Galway, Ireland

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The speaker will talk about the use of marketing as an educational tool to change skills, attitudes and behaviours around water.

The same marketing principles that have changed consumer commercial behaviour the world over have been applied by Irish Water Safety to change public skills, attitudes and behaviour in aquatic environments.

The speaker will discuss a variety of marketing campaigns specifically aimed at preventing drownings and aquatic accidents that in turn place less demand for rescue services and less demand for treatment facilities in hospitals.

The challenging marketing environment is reflected in the fact that for example in 2012, the number of drownings in Ireland was just fifteen fewer than the number of road deaths. The resulting marketing initiatives and partnerships that have become an essential element to delivering Irish Water Safety’s awareness campaigns to the public under tight budgetary constraints will be explored.

The speaker will also discuss Irish Water Safety’s change of mission to acknowledge that due to a number of financial, logistical and other constraints, not everyone can at the present time be trained as a swimmer and a lifesaver. The marketing shift to educate this demographic with initiatives that encourage them to learn water safety best practices and become “Irish Water Safety Advice Agents” to others will also be outlined.

Marketing initiatives that are appropriate to specific at-risk groups such as to children and environments such as homes and farms will be detailed.

Marketing collaborations that successfully deliver water safety information into the local community will be outlined as will related media initiatives that ensure that when it comes to staying safe in, on or near water that the public “Know what they’re getting into.”
Two steps to a Swiss Water Safety Plan

Christoph Müller¹, Othmar Brügger¹
¹bfu - Council for Accident Prevention, Bern, Switzerland

Background and Objective
Unintentional drowning accounts for 44 deaths in Switzerland every year, corresponding with an incidence rate of 6 in 1 million residents. In 2008, the bfu – Swiss Council for Accident Prevention decided to launch a water safety programme involving national key stakeholders in drowning prevention. The main goal was to coordinate the prevention measures of all stakeholders, initiate an evidence-based approach and thus reduce unintentional drowning.

Methods
1. Evidence-based step
In order to be successful in drowning prevention, the first step of action has to be evidence-informed. The situation can be assessed by analysing what happens, why it happens and how to prevent it.

2. Practice-based step
Research cannot provide answers to all questions. It is therefore not only valuable but also crucial to refer to assessments by bodies of experts and practitioners. This second step is the foundation on which a drowning prevention alliance or council can be established.

Process
The bfu provides detailed data and in-depth analysis on drowning mortality and morbidity. This allowed us to define the accident focal points. Chaired by the bfu, a council was established on drowning prevention, which unites stakeholders on a national level. Together, and by means of a structured process, practitioners and researchers drew up a plan of action. At the beginning of the cooperation, the bfu and its partners awarded the necessary financial and personal resources to these activities. The focus was on the prevention of fatal drowning accidents among children. A number of interventions were implemented for which scientific evidence of effectiveness was available: a national campaign on the importance of close supervision by capable adults, a training programme on self-rescue for primary school children, and advice for private and public pool owners on the efficacy of pool fencing.

The bfu has monitored and evaluated the effectiveness of all these activities. Each year, the council meets in a national workshop to exchange new findings and coordinate activities.

Based on the positive experiences with the process and progress made, the bfu and the Swiss Lifesaving Association will this year draw up a new water safety plan for 2016-2020. The target group during this period will probably be young males who swim, bathe and boat in Swiss lakes and rivers.

Conclusion
Bringing together the evidence-based and the practice-based steps is a very valuable experience. The challenge facing the council and the bfu is to merge both steps into a widely recognised and funded programme that leads to a national water safety policy supported by governmental and non-governmental organisations.

References
The establishment of a water safety policy body

Mr Mark Lindsay¹, Mr Matthew Claridge¹
¹Water Safety New Zealand, The Terrace, New Zealand

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Water Safety New Zealand (WSNZ) is a non-government organisation. It has repositioned itself following a government review (2013) of the water safety sector. Now a political advocacy and policy group, its purpose is to reduce drowning by leading the water safety sector in New Zealand.

WSNZ has reformed itself over the last two years. A new constitution has been adopted and a new Board appointed. The organisation has divested itself of delivery and undertaken a significant management restructure. A sector strategy to prevent drowning has been developed.

On average there are 2.6 drowning deaths per 100,000 population in New Zealand, along with another 3.9 hospitalisations per 100,000 population. Drowning is the fourth highest cause of accidental death in New Zealand.

Over 15,000 km of coastline and a population of 4.4 million, comprising avid and active participants in aquatic activity. 1.5 million go boating, over 1.1 million participate in swimming and more than 630,000 go fishing every year. There are also over 20 million visits to public swimming pools.

This presentation will explore the rationale for change, the benefits and process in moving WSNZ from an agency that once competed for awareness and funding, to one focussed on the success of its membership and a sector.

The inter-relationship between government funding and sector expectation will be considered, as WSNZ forms itself in a role reliant on partnerships, yet measured by the perceived success of its investment decisions.

A slow process to build relationships and ultimately trust at a governance level has paved the way for change. Honest conversations and a deep understanding of our collective problem inspired a vision. Change over the short term needs to be incentivised. Funding is a useful mechanism for this, so long as evidence underpins such decisions and they are transparent.

We cast a critical lens over why a policy body for the water safety sector is of benefit to the sector in New Zealand, but also the community. What does this mean for the sector? With an organisation now focussed on leading strategy and policy, the realisation of change is evident.

This story is one of leadership and the noble cause.
How constant engagement leads to the successful change & transformation in recognising the need for drowning prevention initiatives in Fiji

Kathryn Murray¹, Mr John Philp¹
¹Water Safety Council Fiji, Suva, Fiji, ²Fiji Surfing Association, Suva, Fiji

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The Water Safety Council Fiji (WSCF) was established in 2014 following a series of national and international stakeholder engagements. This identified and motivated the formation of the WSCF to champion change in water safety measures through a collaborative, educational and research approach on the prevention of drowning. One year on since the official formation, the organisation is beginning to establish a sense of urgency in terms of understanding drowning and its key relevance to the community. This was largely due to the quality time spent on research, development and expansion of stakeholder engagement.

The presentation will illustrate several actions that have been implemented and how, following the pre-release of the 2014 Annual Drowning Report in March 2015, it will potentially result in the newly recognised target audience gaining awareness, acknowledging and actively learning of the drowning issue in Fiji with the desire to make change. This would not be a likely outcome if the development of relationships were not identified and thoroughly maintained.

To date the relationship development has allowed the WSCF to gain approved accessibility and usage from several primary data-sources. Such sources have included: The Fiji Police Force and Fiji’s Ministry of Health and Medical Services, who contribute to official drowning recordings and reporting; national media outlets (press Fiji Times and Fiji Sun; television Fiji One; web Fiji Village; Fiji Live) for providing background stories on various incidents; and Fiji Meteorological Services who have provided a range of relevant weather statistics (rainfall, temperature).

The intent in releasing the drowning report is to heighten the sense of urgency, thus enabling the WSCF to form a powerful guiding coalition by assembling a team with shared commitment, dedicated time and enough power to lead the change efforts. The objective is to bring the country one step closer to championing change in water safety measures, including the generation of a national water safety plan, as recommended by the World Health Organization (2014).

References
Partnerships of Presence: Unlocking Local Networks with International Lifeguards in Chile

William Koon¹, Claudio Pradenas²
¹International Surf Lifesaving Association (ISLA), Huntington Beach, United States, ²Rescate SEAL Chile, Santiago de Chile, Chile

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Background
Local community awareness and support is vital in creating and growing a lifesaving or drowning prevention organization or agency in a developing nation. Business practice and research shows that even after the initial start-up phase, much of the growth of an organization is constricted by its ability to leverage its own network. Support from government officials, donors, local businesses, and the general population are vital to growth and an expanded mission, but often difficult or impracticable to achieve while running daily operations.

Problem
Open water lifesaving operations along the 4,000 plus kilometer coastline and swimming beaches at inland lakes in Chile are legally overseen by the Chilean Navy, and the vast majority funded by beach private beach concessions. One of the most difficult aspects of running a professional lifesaving operation in Chile is leveraging the legally responsible parties (Navy and beach front enterprises) to improve lifesaving standards, increase the use of lifesaving equipment, and work with lifeguards to offer better services.

A unique partnership between the USA Non-Profit Organization The International Surf Lifesaving Association (ISLA) and Chilean rescue agency and ILS Full Member Rescate SEAL Chile has worked to open up communication between lifesaving bodies, Navy officials, and concession owners to improve the quality lifesaving services in Chile.

Methodology
The annual ISLA-SEAL Chile Lifeguard Exchange was used as a case study to examine the manifest and latent benefits of an international exchange program that allows lifeguards from higher and middle-income countries to spend time living, learning, and working together with Chilean SEAL lifeguards. A retrospective, qualitative analysis was conducted using the past three ISLA-SEAL Chile Exchanges programs. The impact of the presence of foreign lifeguards working alongside Chilean SEAL lifeguards was measured through advances in collaborative lifesaving programs, increased use of lifesaving equipment, and amplified support from the Chilean Navy and beach concessions.

Results
After the third ISLA-SEAL Chile Lifeguard exchange, both parties noticed opening of communication and new opportunities for Rescate SEAL Chile during and immediately after the exchanges. Besides obvious manifest cultural and technical benefits to both SEAL and ISLA lifeguards working together, the Chilean Navy was excited to receive foreign lifeguards and in turn began working more cooperatively with Rescate SEAL Chile, organizers of the Iron Man Pucón gave Rescate SEAL Chile valuable media time to spread water safety messages, and beach concession owners sponsored clinics for surfers to learn rescue techniques and CPR.

Discussion
A very important latent benefit of international partnerships where the physical presence of foreign lifeguards is a key component allows local host rescue agencies to leverage of their own networks for the improvement of service and amplification of water safety messages.
The state of lifesaving in 2015: an analysis based on the content of the revised Drowning book

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Introduction
The first Handbook on Drowning, printed in 2005, provided an overview of drowning prevention, rescue and treatment at the time of the World Congress on Drowning in 2002. The content was mainly based on personal opinions and some joint reports, task-force recommendations and consensus-based recommendation. In 2015, the revision has been published. The content has shifted towards current evidence, science-based knowledge and published experiences in drowning prevention, rescue and treatment.

Methods
The revised book Drowning provides an opportunity to analyse where the lifesaving community stands in practice, theory, concepts and research. The analysis may help to understand which priorities may be important in the future.

Results
The most important observations from the book Drowning include:
1. Over 40 international organisations and 14 commissions participated, reflecting the growing community involved in drowning issues
2. The book contains 3 flow-charts, 10 calculation models, 11 consensus documents, 11 networks, 12 recommendations, 12 theoretical models, 13 classification systems, 14 decision making models, 14 prevention campaigns, 15 regulations, 20 definitions, 21 protocols, 23 evidence-based theorems, and 26 guidelines. This is great progress since 2002. The tools help to structure communication and procedures, but are only used in projects from the reporting bodies.
3. There is still a need for more definitions, such as definitions of drowning morbidity, lifeguard vs. lifesavers, lifeboat, lifejacket, rescue and swimming. Most of the documents, recommendations, decision-making models, regulations, protocols and guidelines are based on the consensus between experts. There is a need for more research to provide the evidence.
4. There are more data on drowning available but many data are of little use for prevention, rescue or treatment. There is a need for more detailed, complete and useful data on drowning deaths as well as on non-lethal drowning, rescue and resuscitation. Such data need to be useful for practical purposes and provides answers to the lifesaving community.
5. Almost all authors are from high-income countries. Scientific and evidence-based data from low income countries are yet scarce. Feed-back from low income countries on the information provided is valuable to understand the perspective of low income countries and to define their needs of information.
6. While the book reports that the role of lifesaving organisations on the water and at the beach is becoming increasingly better organised, its potential role for the society at large is not addressed. There is only limited integration of lifesaving organisations in the structures of the near-by communities. This also refers to the role of lifesaving organisations during disasters.
7. There is a lot of relevant, sometimes not easy accessible, information available from drowning related experts and organisations that are not included in the current networks of experts. There is a variety of reasons to explain this, amongst which language problem and institutional protections. Initiatives have to be taken, to make the drowning knowledge network all-inclusive.

Conclusion
It is obvious that the inertness on the issue on drowning, observed in at the end of the previous century, does not exist anymore. There are many activities in the field. The challenges in the future will be most of all the dispersion and use of the available information amongst all involved, the ambition to make progress together with all involved, and to welcome new organisations and their experts to join this global effort. From a research perspective, there is the need for a research agenda that includes qualitative and multi-centred studies to answer the many questions that matter about the best manners to prevent, rescue and treat drowning.
Role of “Instituto de Socorros a Náufragos” (ISN) in the development of lifesaving within the Portuguese-speaking countries

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The National Lifesaving Institute (ISN – Instituto de Socorros a Náufragos), founded in 1958, has since pursued to evolve and improve its performance on issues related to prevention of drowning and aquatic rescue. As a result of this ongoing quest came the need to share experiences with other organizations internationally. It was with this vision that the ISN approached the Brazilian Society of Aquatic Rescue (SOBRASA) at the International Conference on Drowning in Porto (2007).

As part of the Community of Portuguese-speaking Countries (CPLP), which is considered a multilateral forum aimed to strengthen ties of friendship and cooperative among its members, the National Maritime Authority (NMA), through the ISN, started in 2007, a collaborative process with the SOBRASA.

After signing the memorandum with SOBRASA in 2007, the exchange program between Portugal and Brazil began with the participation of many lifeguards. In 2011, Dr David Spzilman, was invited as a speaker at the seminar for trainers of lifeguards, attended by 90 trainers. In 2014, he returned to Portugal to present and train instructors within the Surf-Save campaign (60 trainees were present) and he’s expected to do the same with the Pool +Safe Campaign.

The established protocol, has allowed the development of a continuous work in drowning prevention, with the exchange of experiences among lifeguards participating in the exchange program. The following projects are currently being developed in partnership:

1. Professional Exchange program for lifeguards
2. Review of rescue protocols and assistance to drowning victims
3. Legislation for the protection of aquatic environments – pools and beaches
4. ISO Review - Security guards at beaches (ISO-TC228-WG5_N0083)
5. Surf-Save Program
6. Bilateral participation in BOD structures
7. Campaign Pool +Safe
8. Equipment exchange

Due to the success of the collaboration with SOBRASA, ISN has sought to expand these ties to other Portuguese-speaking countries, since common language is one of the heritages that unite us, being a communication facilitator. In 2012, ISN has signed a memorandum of understanding with Mozambique in order to support the creation of a beach security system. In 2014, the bonds of friendship have been strengthened with Angola and São Tomé and Príncipe, in order to implement a sustainable water safety project in these countries.

Initially, the NMA through the Ministry of Defence strengthens the bonds of friendship and trust between the countries, identifying the main needs. Later the ISN, with its partners in social responsibility, sets up safety control stations on the beaches, provides equipment, sends means of water and sea rescue and teaching materials. Later, it sends trainers to instruct individuals in each country. The following year, those individuals come to Portugal to take the trainer course, ensuring the training recycling and maintenance of equipment. For some years ISN keeps this support until the country is able to keep doing it sustainably and independently. In Mozambique there are already beaches with lifesaving services, because the protocol allowed instructing over 200 Mozambicans as lifeguards, 10 trainers and 5 as mechanical technicians.

The ISN, along with SOBRASA, has been able to improve its ways of working in drowning prevention. In exchange the ISN, due to its military characteristic, can make a step further taking the combined ideas of Portugal and Brazil to the least developed countries and connecting the business community of Portuguese-speaking countries. Regarding specific training, through partnerships with the University of Coimbra, the ISN aims to create a specific Doctoral Program in the area of Aquatic Rescue.
Building human resource - Managing and sustaining a volunteer workforce in the 21st Century

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Partnerships 3, Tekulur, November 5, 2015, 3:30 PM - 5:30 PM

More than 400 people drown in the UK each year, and thousands suffer near-drowning experiences. Drowning is the third highest cause of accidental death amongst children in the UK.

As the UK’s drowning prevention charity, the Royal Life Saving Society UK (RLSS UK) is dedicated to promoting water safety and runs several evidence based education programmes to help reduce the statistics.

The charity would not be able to function without the support and dedication of volunteers. Each volunteer has their own individual motivations for being involved but all support the cause and the charity. Our volunteers and their passion cultivate the ability for the charity to be able to spread its messages through the UK and Ireland.

Statistics from Volunteering England show that each year more than 100 million hours are volunteered in communities across the country, and estimates place the value of this activity to the economy at more than £40 billion. We recognise that in order to have a growing and sustainable volunteer workforce to deliver ‘a year on year reduction in UK and Irish citizens who drown’ that successful volunteer management must become central to everything that we do.

The charity aims to increase its volunteer workforce across established and targeted projects by 300 each year. This provides the focus that will help to target our messages in education in such a way that will reach out to those most at risk of being involved in a drowning incident. The question became: How do we get our offering right to take a larger piece of the 100 million volunteering hours that were committed?

In 2015 we have established a volunteer strategy that outlined the plan to produce quality volunteer opportunities that supported the charities aims whilst giving something back to people who donated their time to the charity. We focused specifically on 5 key areas:

1. Volunteer recruitment
2. Volunteer training
3. Volunteer deployment
4. Volunteer reward
5. The retention of volunteers

These same principles can be applied to the volunteer sector across the world. The motivations and drivers may be different but the concept of volunteer management applies across the board.

The Charities Aid Foundation (CAF) produced evidence in their World Giving Index in 2014 to support the importance and reliance of volunteering across the globe. Their findings highlighted that existing wealth is no guarantee of a high level of giving showing that any project across the world has an opportunity to encourage voluntary support.

This session will share how we approached our review to volunteering so that we can provide insight to how these principles can be applied to engage volunteers in all kinds of projects across the globe. The session will share case studies and projects that have relied on the successful use of this strategy so that volunteers had all the tools and support they needed to be able to deliver the charities objectives to prevent drowning.

References
1. Charities Aid Foundation – World Giving Index 2014
Developing Drowning Prevention Cooperation in a Low Income Country: A Case Study from Tanzania

Associate Prof. Robert Keig Stallman\(^1,6,7,11\), Mr. Alexander Hamilton Mwaipasi\(^1,2,4\), Mr. John Belela\(^1,2,4\), Mrs. Toni Ongala\(^1\), Mrs. Aziza Ongala\(^1\), Mrs. Amina Mfaume\(^1,2\), Mr. Stewart Kilusa\(^1,3\), Mr. Ramadan Namkoveka\(^1,5\), Mr. Noel Kiunsi\(^1,6,8\), Mr. Juma Massud\(^1\), Mrs. Najat Ahmed\(^1\), Mrs. Gudrun Leirvaag\(^5\), Mr. Sabini Temba\(^1,4,9\), Mr. Geophrey Kimimba\(^1,4,10\)

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Introduction

It is estimated that the majority of drowning deaths occur in Low and Middle Income Countries \((1,2)\). However, most LMIC’s have inadequate surveillance systems, meaning that accurate data are not available. Governments underestimate the scope of the problem and refer to various diseases as far more important. Yet we hear, see and read daily of drowning episodes.

Some countries are more exposed than others. Tanzania is one of the more exposed with Lake Victoria and the other Great Lakes of the Rift Valley, a coast line of ca. 1000 km, and the great rivers, The Ruaha, The Rufiji, and others. Both fishing and water transportation are major activities.

In Tanzania in 2008, attempts began to form cooperative activities among several organizations. Infrastructure was lacking and government support non-existent. Never the less, the Tanzanian Scout Association, the Tanzanian Lifesaving Society and the Tanzanian Navy conducted a five day Water Safety Camp at The Tanzanian Navy Base in Dar es Salaam, in 2009.

This was followed by a Water Safety Workshop, in Moshi in 2010. The Tanzanian Swimming Association and the Tanzanian Beach Life Guards joined the effort. In 2011-2014, several one day workshops were held in Dar es Salaam, organized by the Scout Association. Between 2010 and 2014, The Tanzanian Lifesaving Society held a local Water Safety Week in Dar es Salaam.

The local Water Safety Week of 2014 described above, provided the opportunity to come together and discuss the future. It became clear that launching a common project was the ideal way to bring stakeholders together. A doable project was deemed to be a Water Safety Day, 2015. New thinking suggested an entertainment approach as the attraction and the vehicle to deliver water safety messages. This would be within the abilities of all of the stakeholder organizations and permit the launching of plans for 2016, at a national level.

The Water Safety Day will be held in October, 2015. A proposal to a major Tanzanian sponsor has been developed and interviews presenting the proposal are being held. The event will be held at an open water venue, in Dar es Salaam. An opening session of music will be followed by a drama carrying water safety messages. Immediately following this, the public will be released to randomly visit approximately 10 stands, each of which will either present a stakeholder organization or an activity with a hands on approach (CPR, reaching and throwing rescues, etc). Periodically, attention will be drawn to the shoreline where pre-announced demonstrations will take place. The day will close with a ceremony which highlights the water safety messages delivered during the day and a closing session of music.

In 2016, use will be made of the existing infrastructure of the Scout Association, which has local units in nearly all communities, nationwide. A local known person in each district will be charged with mobilizing local help, planning and carrying out their own local Water Safety Day, in the name of all stakeholder organizations.

References

Introduction
Fundraising is essential to sustaining efforts to prevent drowning deaths in low and middle income countries (LMICs). Grants are an excellent way to procure funding, yet many grants are too large for small-yet-effective drowning prevention campaigns typically found in the low-income areas most at-risk for drowning. Taking note of other effective micro financing programs, Lifeguards Without Borders (LWB) began a grant program aimed at smaller “passion projects” focused on reducing deaths by drowning.

Methods
Drowning prevention grants were researched using the Google search engine. Grants discovered with this method were typically limited in scope (USA Swimming Foundation only available in the US, Autism Speaks Swim Scholarships only for candidates dealing with Autism) or sums too large to be within the scale of most fledgling non-profits (Johns Hopkins International Injury Research Unit proposes $50,000 - $75,000 USD for innovative interventions for drowning prevention in LMICs.).

Opportunity apparent, LWB drafted an article on grants and scholarships into its bylaws. A review committee of 5 members was formed to vet applications and award funds annually by majority vote. The program is named in memory of late lifeguard and LWB member Dr Donald Martin Hedstrom III. LWB purchased a grant-specific url, www.martinhedstrom.org and promoted the program through Facebook, Twitter, Reddit, and other social media outlets.

Qualifying criteria are that the applicant uses the funds to reduce the global burden of drowning in a some way. Awards are given in three categories/amounts: a $500 undergraduate scholarship, a $1,000 postgraduate scholarship, and a $1,500 grant award. All amounts are in USD.

Results
LWB received 6 undergraduate applicants, 8 postgraduate applicants, and 12 grant project proposals. These submissions were evaluated by the review committee and discussed/voted via email and face-to-face meetings.

The undergraduate award was given to Hobart Beach, NY, lifeguard Alexandria Nieri to develop pediatric swimming programs and further her degree in physical education and aquatics at Slippery Rock University. A postgraduate scholarship was given to USC Physicians Asst. student Ross Monroe, former captain of Corolla Beach Ocean Rescue and contributor to the International Life Saving Association. Three projects grants were awarded: one to Catarina Queiroga to help establish the International Drowning Research Alliance, another to Nile Swimmers towards their work in Sudan, and another to the Amelia Island Lifesaving Association to provide public water safety clinics and swim instruction for low-income families.

Conclusions
Applicant responses support the assumption that smaller dollar awards are relevant in the effort to reduce drowning in low-income areas. As an unexpected benefit, many new collaborative and networking opportunities presented themselves to LWB allowing for non-monetary support of smaller projects even when we did not award direct funding. Further research is needed to quantify the reductions in mortality and morbidity that can be achieved with low cost interventions.
Canadian Red Cross and Chinese Red Cross-Partnering to Leverage Domestic Best Practices in Water Safety Abroad

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Partnerships 3, Tekulur, November 5, 2015, 3:30 PM - 5:30 PM

Introduction
When the Canadian Red Cross (CRC) began its water safety programs in 1946, 8/100,000 Canadians were victims of drowning. Based on years of drowning research, CRC developed the Red Cross Water Safety Program with prevention as a critical focus. Today, drowning claims the lives of fewer than 1.3/100,000 Canadians.

China has one of the highest drowning rates in the world and drowning is the leading cause of mortality among children aged 5-14. Water safety education is also a gap in China as swimming is predominantly perceived as a competitive sport. The Canadian Red Cross has a long-standing partnership with the Red Cross Society of China (RCSC) that has existed since the late 1990’s. In 2009, CRC and RCSC identified technical exchange as a new pillar of cooperation, providing an opportunity for CRC to respond to RCSC’s request for developing and implementing a Swimming and Water Safety program.

Methods
The initial three-year pilot phase (2010-2012) of the CRC-RCSC Water Safety Technical Exchange was implemented in the coastal city of Xiamen, China. In year one, a RCSC Xiamen delegation visited British Columbia, Canada to observe the CRC Water Safety Program and develop the partnership proposal. In year two, CRC translated a Water Safety Instructor Training manual in Chinese and 3 Canadian Red Cross Master Instructor Trainers trained 20 Chinese instructors on water safety principles and Canadian teaching methodologies in Xiamen. In year three, CRC returned to Xiamen and mentored instructors delivering training to 60 migrant-worker children based on an adapted swimming/water safety curriculum developed by Chinese instructors.

In phase 2 of the project the CRC embarked on a next three-year phase (2013-15) with the RCSC in Zhoushan, another coastal city in China with high drowning rates. Key components of Phase 2 in 2013 included, continued swimming and water safety training for migrant-worker children, leadership development for instructors, and a new branch of water safety training with new programs in dry-land water safety education for schools and fishing villages. In 2014 CRC staff and volunteers trained 10 water safety instructors in advanced Water Safety Instructor training as well as swimming and water safety training for 40 migrant children.

Results
As a result of this partnership, 15 out of the 20 trained Chinese instructors were certified in Xiamen, 22 out of 27 instructors were certified in Zhoushan; an adapted CRC Water Safety Instructor Training manual in Chinese was developed; CRC and RCSC also revised the adapted training curriculum for migrant-worker children. Moreover, RCSC Zhoushan is continuing training every year. CRC also gained valuable cultural knowledge for work with Chinese-Canadian communities.

As a result of the advanced instructor training in Zhoushan in 2014 the RCSC is now looking to develop and implement their own swimming and water safety instructor training program.

Zhoushan branch of the RCSC delivered dry land water safety training to 2000 children of migrant families. The branch also delivered water safety messaging to 40,000 fisherman. These water safety sessions were all completed in the first year of the partnership in Zhoushan.

Conclusions
Selection of exemplary instructor candidates, excellent facilities and high attention to translation were highlighted as key success factors during training. Strong local buy-in and relevant, context-specific content also contributed to the overall success of the initiative.
Influence of national partnerships at reducing the number of coastal drowning incidents

Rear Admiral Francisco Braz da Silva¹, Nuno Leitão¹, MSc Olga Marques¹

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Introduction
The Development of viable and sustainable drowning prevention projects is a concern of the National Lifesaving Institute (ISN – Instituto de Socorros a Náufragos) in Portugal. In order to ensure applicability and sustainability of the various projects ISN has established partnerships with major companies, as part of their social responsibility, enabling ISN: to access more sophisticated complementary water rescue resources, to implement prevention campaigns through the newspapers, to develop awareness campaigns targeting specific groups, to provide online and real time information about patrolled beaches, and to audit the beaches’ lifeguarding services.

The ISN currently has partnerships with: Vodafone Foundation, Allianz Insurance, Destak newspaper, Vehicles Import Company (SIVA), Lidl Portugal, L’Oréal and Zoo.

Each partnership is aimed at preventing and reducing the number of aquatic incidents.

Methodology
Organizations seek ISN presenting several projects to support. After careful consideration by the Chief of the Bathers Assistance Service and the Director of ISN, the partnership proposals are approved or rejected. As counterpart, and cautiously, ISN authorizes the advertising of the partners’ brands in aquatic spaces.

At the end of each bathing season, ISN makes an annual balance of all projects, presenting to the partners the results of their contributions, reflecting the importance of the support from partner organizations.

Results
In 2014, there were 37 awareness campaigns through the “Summer Champion Project” supported by the Vodafone Foundation, each with the participation of about 60 children. 17 prevention campaigns were carried out at elementary and secondary schools from across the country, reaching over 2000 children. Alongside, 43 rescues were made, 387 first aid interventions, 49 searches for lost children with the 4x4, 19 rescues with jet-skis and 25,000 minutes of emergency calls, provided by the Vodafone Foundation.

By partnering with Destak newspaper, ISN can disseminate a message of awareness and prevention during the bathing season, with a weekly paper edition being distributed free on the beaches.

In 2014, the project “Seawatch”, facilitated the distribution along the coast of 28 all-terrain vehicles, operated by qualified military staff. Assisted by this resource: 127 assistances to bathers, 426 first aid interventions and 71 searches for lost children on the beaches, were conducted.

The insurer Allianz Portugal, annually offers ISN 1.000 danger beach signage, according to ISO standards.

At Lisbon Zoo, a show is taking place at the Dolphinarium since 2013, concerning beach safety rules. It is estimated that annually 500 children attend the show, and we expect it to reach 1.500 children in the next years.

In 2014, L’Oréal provided 60 sunshades and 500 sunscreen face lotion (index-50). Lidl Portugal, supported the “Surf Save” project, being our most recent partner. The project started in 2014 with 34 training activities on Basic Life Support and basic rescue techniques with surfboards. Nearly 510 surfers have participated.

Conclusion
Partnerships established so far have been very relevant in reducing the number of deaths by drowning, because through them we are able to reach a broader audience and increase its awareness for coastal dangers. We also aim to attract partners to assist the implementation of beach security systems in developing Portuguese-speaking countries, assuring the sustainability of projects, in order to save more lives.
Relevant Social and Economic Impact of Lifesaving Social Economy Organizations worldwide

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Poster Session 1, Poster Foyer, November 4, 2015, 9:00 AM - 5:15 PM

Since the 18th century, several lifesaving organisations were established to assist those in need of rescue and revival and soon after started working together, to learn from each other, sharing techniques and experiences, although in an informal manner. A need for an international forum to exchange ideas and experiences was soon recognised. This led initially to the establishment of the “Fédération Internationale de Sauvetage Aquatique” and later to the formation of World Life Saving, which merged in 1993 into the International Lifesaving Federation.

The International Lifesaving Federation, along with other international organisations, differentiates and directs strategies and represents organisations with local to international interventions to save lives in emergency situations in various aquatic environments.

Social Economy Organizations, due to their nature and principles, are the most common type of organizations in this field of work and knowledge.

Because these organizations are focused on drowning prevention and the preservation of human life, they hold a significant social and economic impact that will be discussed during the presentation.

We will also:

• Present an inventory all organizations that position themselves in the large and diverse universe of Social Economy Organizations;
• Provide a balance on the Social Economy Organizations operational advantages in Drowning Prevention, Rescue and Treatment;
• Review the state-of-the-art of this issue at an international level, increasing internship opportunities for young people in the Lifesaving Social Economy Organizations;
• Structure organizational research projects preserving the identity of the Lifesaving Social Economy Organizations;
• Create incubation-promoting groups for social inclusion initiatives and intra-cooperative work, to act in the operational areas of quality systems.

This preliminary study aims to promote the participation of Lifesaving Social Economy Organizations, enhance the future dissemination of their work and promote their recognition, as well as facilitate access to financing solutions and support for their sustainable development, within a broader universe of entities focused on people and their happiness.
The right communication tools designed to engage the right audience

Kathryn Murray

1 Water Safety Council FIJI, Suva, Fiji

Poster Session 1, Poster Foyer, November 4, 2015, 9:00 AM - 5:15 PM

The Water Safety Council FIJI (WSCF) was established in 2014 following a series of national and international stakeholder engagements. This identified and motivated the formation of the WSCF to champion change in water safety measures through a collaborative, educational and research approach on the prevention of drowning. One year on since the official formation, the organisation is beginning to establish a sense of urgency in terms of understanding drowning and its key relevance to the community. This was largely due to the quality time spent on research, development and expansion of stakeholder engagement.

The paper will discuss several actions that have been implemented and how, following the release of the 2014 Annual Drowning Report in March 2015, it will potentially result in the newly recognised target audience gaining awareness, acknowledging and actively learning of the drowning issue in Fiji with the desire to make change. This would not be a likely outcome if the development of relationships were not identified and thoroughly maintained.

To date the relationship development has allowed the WSCF to gain approved accessibility and usage from several primary data-sources. Such sources have included: The Fiji Police Force, who are responsible for all official drowning recordings and reporting – both unintentional and intentional; national media outlets (press Fiji Times and Fiji Sun; television Fiji One; web Fiji Village; Fiji Live) for providing background stories on various incidents; and Fiji Meteorological Services who have provided a range of relevant weather statistics (rainfall, temperature). This has enabled the WSCF to readily acknowledge that the majority of drownings occurred over the cyclone months; that drowned children 1-5 years were predominantly unsupervised; students (5 – 19 years) drowned primarily in river locations; and men in their early 20’s to mid 30’s (who can swim) drowned on reef with bags of sea cucumber, abalone and fish tied to them. This information has illustrated the reason for the WSCF to gain a greater understanding of Fiji and its people.

Fiji is a low-income developing country; a collective society with high power distance that has a relatively pragmatic culture in terms of uncertainty avoidance. The majority of drownings occur in village/rural locations, meaning physical access to resources and technology can be limited. Taking the above into consideration, the final paper will illustrate how the required decision makers – primarily government (e.g. Ministries of Health, Education, and Youth and Sport), non-government (e.g. Fiji Red Cross Society), educational bodies (e.g. Fiji National University and the University of the South Pacific), sporting bodies and the wider community – will be notified, educated and driven to understand the need to transform Fiji and its behaviours in and around water and potentially reach out and drive the change across the islands (in particular the villages/rural areas) on water safety initiatives.

The intent in releasing the drowning report is to heighten the sense of urgency, thus enabling the WSCF to progress to Kotter’s stage two of the Leading Change Model and form a powerful guiding coalition by assembling a team with shared commitment, dedicated time and enough power to lead the change efforts. The objective is to bring the country one step closer to championing change in water safety measures, including the generation of a national water safety plan, as recommended by the World Health Organization (2014).

References

Current State and Future Challenges of Drowning Prevention in the Philippines

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Poster Session 1, Poster Foyer, November 4, 2015, 9:00 AM - 5:15 PM

Introduction
Drowning is a leading cause of death of children in the Philippines. However there is no research which comprehensively documents prevention strategies being implemented by government and non-government agencies at the national or local level in the Philippines.

Objectives
This research aimed to: Explore the current state and future challenges of drowning prevention in the Philippines; Determine what information is currently available in the Philippines in relation to drowning prevention policy, program(s) and research; and Explore drowning prevention strategies currently being implemented in the Philippines.

Methods and Materials
Key informant interviews were conducted among government and non-government agencies involved in drowning prevention and water safety programs. Documents related to drowning prevention programs, projects and activities from these agencies were reviewed.

Results
Different government and non-government agencies implement drowning prevention programs or strategies based on the mandate of their institutions. Most commonly cited were those related to education or information awareness, emergency and disaster preparedness, and basic swimming skills. It was revealed that each agency is relatively unaware of the programs of other agencies. The need for agencies to sit together to come up with a more comprehensive and coordinated program of activities for drowning prevention and water safety in the Philippines was identified.

Conclusions
A multispectral approach (MSA) is needed in order to develop coordinated and comprehensive programs and activities aimed at preventing drowning in the Philippines. In this way, the program or activities of one agency will complement the efforts of other similar-minded institutions and hopefully reduce the burden of drowning.
Drowning in Tourism ~ An Industry Opportunity to Lead the World

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Poster Session 2, Poster Foyer, November 5, 2015, 9:00 AM - 5:15 PM

Background
The global drowning epidemic takes at least a million lives each year. Tourists are naturally drawn to water-based facilities but, unfortunately, most host countries in the Tropical Zone are nations of non-swimmers and have epidemic levels of drowning in their own populations. For example, more United Kingdom children drowned in swimming pools while abroad than in the UK while, in a recent Philippine sample survey, over 70% of those who drowned in resort pools and beaches were tourists. Sri Lanka, ranked the 11th in the WHO Drowning League, has three times the numbers drowning of the UK, with one third of the population.

Methodology
This paper takes the form of an essay in which current drowning issues and drowning prevention measures developing around the world at the international, global level are reviewed. It also draws upon a decade of hands-on experience in the Sri Lanka Women’s Swimming Project, which has taught over 4,500 women and teenage girls to swim, on the premise that if a mother can swim, she will ensure her children will also.

Results
Research has shown that lifeguard effectiveness falls off rapidly after just twenty minutes of intense visual pool surveillance duty. Ideally, at this point, one duty lifeguard should be replaced by another, fresh individual. Multiplied across a full day, a team of lifeguards is needed to supervise a pool or a beach properly and, as a passive service, this is a manpower overhead which hotels and health clubs do their utmost to avoid by passing the safety buck to parents by generally not providing pool or beach lifeguards. Where lifeguards are provided, they often have secondary duties such tidying up poolside recliners or handing out towels, which distract them from pool or beach surveillance.

The paper advocates that a unique window of opportunity exists for the tourist industry to create a gold standard in aquatic Duty of Care of its clients and staff by providing self-financing swimming lessons using lifeguards upgraded to swimming teachers at their pools. This gives maximum staffing flexibility and a much more interesting and worthwhile working day to lifeguarding staff. Holidays abroad provide the perfect opportunity for child or adult customers to receive at least two or more lessons per day for a week or more, so progress can be rapid. Non-swimming adults can also be coached, ideally in a different pool at the same time as their children. In addition, in the low season, the resort swimming teachers can teach resort staff to swim, which is great for team-building, as well as identifying internal talent. Finally, the resort could also build immeasurably good local community relations by teaching local children in their pools in a controlled, philanthropic, closed-season model which, in turn, reduces national drowning statistics. Hotel and resort teacher coaching skills can be honed further by taking part in inter-resort competitions. A new paradigm to follow the Royal Lifesaving Society’s “Every Swimmer a Potential Lifesaver” is proposed: “Every Lifeguard a Potential Swimming Teacher”.

Conclusion
Drowning is bad for business. Nations do not like to see their drowning prevention measures negated by the high publicity given to foreign tourists drowning at their resorts. The lure of water is a powerful resource to attract tourists with; however, water can also be a potential death-trap, leading to costly bad publicity and possible litigation. On the other hand, if the tourist industry were to manage water safety as an opportunity, the industry could set a definitive standard of Duty of Care self-financed by the great earning potential of teaching tourists and hotel guests to swim. Without external legislation, however, it requires the industry to seize the initiative and head off government heavy-handed safety measures. Expensive restrictions are bound to follow in the face of currently worsening statistics and adverse publicity arising from tourists, both local and foreign, drowning on holiday. Coupling this initiative with philanthropic off-season swimming lessons for local children could make holiday swimming lessons a self-financing, high public relations win-win drowning prevention activity within the tourist industry.
Life Saving and Water Safety in Sri Lanka

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Affiliated Clubs & Services
Our affiliate Clubs are fully engaged in both Life Saving services and Lifesaving as a Sports. There are 3 main categories these clubs fall under. They are School Life Saving Clubs, Social Clubs, Police, Coast Guard and the 3 Armed Forces. These clubs have been engaged in carrying out duties since 1947 mainly focusing and providing their services on Sundays, Poya days and Public Holidays on voluntary basis. However, it is worth mentioning that the 3 Armed forces, Coast Guard and the police Life Saving Club carry out their duties around the clock throughout the year. During Poson week which is an important religious festival for Buddhists, pilgrims are rest assured with their safety while bathing in rivers and lakes in Anuradhapura, Polonnaruwa and Kandy. Besides, these volunteers provide this service on a need basis or may be on request knowing its value.

Challenges
The key challenge is to keep 75% of these Life Saving Clubs and Schools who perform their duties on voluntary basis, them motivated and engaged. Fortunately, Police, Coast Guard and 3 Armed are paid by their respective entities to continue on this service. Nevertheless, children who are less privileged, get involved with this service skipping their main meals or even without a meal knowing the importance for their personal growth. Not only skipping and forgetting their meals, but also accustoming to provide their service trusting their ability leaving a margin for life saving equipment. However, they are reminded to always carry rescue tubes and pocket masks as “Bear Minimum” to make sure that both the patient and the life savers are “Always” safe. It will certainly be help of if they could carry Rescue Boards, extra pockets masks, AED Machines, Rescue Tubes to handle difficult situations without a doubt or a fear. Further, not having or wearing proper uniforms to create good visibility has become a big challenge since the generic public treat them as novices to the service “Without the right capability” to run this service. As a result, they are not respected where they have been truly respected.

Reference, Encouragement and Support
We are grateful to the International Life Saving Federation (ILS), Surf Life Saving Australia (SLSA) and Life Saving Victoria (LSV) who stay behind very firmly making sure that these efforts and contributions are continued. Indisputably, the “ILS, SLSA and LSV” have become the shadow for Sri Lankan lifesaving and its growth for many years and wish to be the same for many years to come.

References
1. International Life Saving Federation (ILSF) http://www.ilsf.org/
Preparing volunteers and beach shops to water safety for tourists on the beach

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Each year in Thailand, there are a lot of domestic people and foreigners to travel to the sea. The some tourist went to swim in the sea, and they are not familiar to the sea or pool area unskilled. They had an accident, injuries and deaths annually. They were lack of timely helped. Drowning and near drowning in the sea of the beach can be found without effective helping respond. Intended to Prepare volunteers to provide assistance to victims sea. The workshop participants have been lectures with demonstrations and practice of volunteers. The volunteers training for emergency medical system can save life of the tourist. On along the beach, many traders and service providers such as the beach beverages, food, scooters, etc. They were participate workshop training for emergency medical system. 50 Volunteers were training how to save life and conducted supporting equipment during last year (2014).

After training, the organization Ta-phong to support budget the implementation of the district's beach and entertainment areas are producing the rescue with simple materials. Installed warning signboard 3 spot along the beach to a distance. The stores sell's volunteers have warning to be careful the water is dangerous. Provide volunteer is monitored walking along the beach, especially during weekends and special occasions. Provide volunteer could production and installed equipment by abundant local materials applied at along the beach.

Performance prepares the volunteer to make tourists confident and secure in life. The surveillance can assist victims of maritime occur more promptly. It should to track the performance is to be further improvement.
Treatment
Overview of the ILCOR Process and First Aid Treatment Recommendations Relevant to the Aquatic First Aid, Rescue and Resuscitation Environment

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Treatment 1, Serendit, November 4, 2015, 1:30 PM - 3:00 PM

For the first time, topics relevant to first aid have been included for the highest level of evidence appraisal by a specific first aid task force, under the International Liaison Committee on Resuscitation (ILCOR). Twenty two first aid topics have undergone international standard evidence based review and finalized with treatment recommendations. The world’s resuscitation and first aid experts representing the member organizations of ILCOR helped in finalizing systemic evidence evaluations during the 2015 cycle, in preparation for the Consensus on Science with Treatment Recommendations (CoSTR), scheduled for online publication on October 15, 2015.

A number of these first aid topics, in particular those relevant to the aquatic rescue and resuscitation and first aid arena will be reviewed in detail. Topics for discussion will include oxygen administration for first aid, positioning of the unconscious or shocked victim, haemorrhage control and spinal motion restriction.

The guideline process and controversies will be discussed along with final recommendations and applicability to the aquatic environment.
Lifeguards & Pool Responders Saving Lives with Automated External Defibrillators (AEDs) – Achieving Survival Rates of 86%

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Treatment 1, Serendit, November 4, 2015, 1:30 PM - 3:00 PM

David Lloyd Leisure installed Automated External Defibrillators (AEDs) in all clubs and swimming pools in 1998; survival rates from cardiac arrest to hospital discharge were good; ranging year-on-year from 56% to 72%. With a desire to increase survival rates a review of AED procedures and training was conducted in 2010.

The review focused on the business AED policy, training and twenty-one AED usage events, which occurred in the previous 2 years. During the review it was established that the AED incident response was excellent with the AED arriving on the scene of the majority of incidents within 30 seconds. Although achieving high survival rates it was felt that the training programme lacked direct focus on the core survival outcome drivers. A high percentage of training time was spent on topics that, although informative, were not relied upon by rescuers in real events and did not influence potential survival outcomes.

As a result of the review a new AED training programme was instigated purely based on the guidance expressed by the Resuscitation Council UK, the European Resuscitation Council and medical research in the resuscitation field. The new AED programme is focused on the things that make a difference in real life events with the majority of the focused training time spent hands on to instil confidence and competence of would be rescuers. The programme also includes a full post incident review, to provide support and guidance to the AED usage team and to ensure that the learnings from the event influence and further develop future AED programmes. The programme was launched in January 2011 with 100 trainers being updated and 1750 Lifeguards and Pool Responders being trained in the new programme.

To evaluate the effectiveness of the new training programme a study was undertaken to review cardiac arrests that occurred over a 4 year period form 1st January 2011 to 31st December 2014. The study was undertaken by reviewing detailed incident reports that were compiled following each cardiac arrest, AED download data, Resuscitation Council UK event submissions and patient follow up notes. In all incidents casualties were attended to by at least two Lifeguards or Pool Responders trained in CPR and AED and the AED electrodes were placed on the casualty’s chest rapidly.

During the 4 year period under study Lifeguards and Pool Responders attended to 35 cardiac arrests with 30 casualties surviving to hospital discharge generating an overall survival rate of 86%. Survival rates peaked in 2014 with Lifeguards & Pool Responders providing immediate assistance to 6 casualties in cardiac arrest with all 6 surviving to hospital discharge.

The study demonstrates that Lifeguards and Pool Responders can achieve exceptionally high out of hospital cardiac arrest survival rates, of at least 86%, by having a robust AED policy in place and a clear and focused training programme.
Computer Simulation of Drowning Physiology and Resuscitation Strategies

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Introduction
Drowning begins with submersion, apnea, and water aspiration. Lung oxygen stores support aerobic metabolism transiently, although aspiration alters pulmonary gas exchange. A diving response activates, but is of limited and inconsistent survival value. The victim proceeds into asphyxia, defined as failure of respiratory gas exchange causing cellular hypoxia, hypercapnia, and acidosis. Lifesaving personnel are tasked with reversing this cascade. Decisions must be made on optimal initiation and sequences of artificial ventilation, chest compressions, and transport to a stable platform for ongoing resuscitation. Data suggests that in-water ventilation improves survival over transport alone. There is imperative for a scientific foundation upon which to base practical rescue strategies. Many variables affect physiological reserve, cellular stress, and potential for recovery. Computer models are being applied to clinical decision support, and may be useful for exploring drowning resuscitation strategies through realistic physiological simulation.

Methods
The model is a hydraulic representation of the heart and circulation that tracks beat-to-beat blood pressures and flows through the lungs and peripheral vasculature. Immersion induces blood shift into the chest. Heart rate, contractility, and peripheral vasoconstriction are controlled by an autonomic module integrating water temperature, face immersion, and chemoreceptor sensing to induce a diving response with sympathetic and parasym pathetic contributions. Brain, heart, muscle and splanchnic organ compartments incorporate oxidative and glycolytic pathways to track aerobic and anaerobic metabolism according to ATP demand and mitochondrial oxygen levels. Oxygen and carbon dioxide exchange between lungs, blood, and tissues follow mass-balance equations during breathing, apnea, and artificial ventilation. Aspiration due to gasping induces alveolar perfusion and diffusion mismatching causing pulmonary shunt. A ventilatory drive module integrates respiratory gas levels, and stimulates diaphragmatic contractions and agonal breathing according to severity of hypoxia and hypercapnia. Tissue and blood pH follows respiratory and metabolic acidosis with lactate production. External chest compressions close heart valves and induce forward blood flow during cardiac arrest, incorporating cardiac compression and thoracic pump mechanisms of CPR. Model parameters were calibrated using a vast body of published physiological data on voluntary apnea, breath-hold diving, asphyxia, cardiac arrest, and drowning experiments with animals.

Results
Submersion triggers transient stress tachycardia followed by bradycardia induced by the diving response. Hypoxia and hypercapnia develop over the next several minutes. Loss of consciousness occurs when arterial oxygen partial pressure drops below 30 mmHg. The rate of drop depends on initial lung volume, pulmonary shunt, oxygen consumption, and peripheral perfusion. Hypoxemia and diminished cardiac output reduce brain oxygen delivery. Oxygen debt caused by cerebral hypoxia correlates with degree of brain injury through a dose-response relationship. Arterial hypoxemia augments bradycardia through chemoreceptor response. Myocardial hypoxia triggers heart block, diminished contractility, and eventual asystole. Resuscitation starts with victim contact or removal from water. Variables include rate and volume of in-water ventilation with expired air, positive pressure oxygen ventilation, passive apneic oxygenation, compression-only CPR, and ventilation-to-compression ratios. Hypoxia and hypercapnia reverse according to cardiac output, oxygen delivery, and carbon dioxide washout. Cellular acidosis is partially corrected. Key physiological outcome measures are total oxygen debt incurred in the brain and heart, and degree of reversal. Probability of survival depends on downtime, return of spontaneous circulation, and restoration of brain metabolic derangement.

Conclusion
This model is one of the most advanced cardiopulmonary simulations yet developed, and is uniquely adapted for applications in drowning and resuscitation research. Physiological changes in the body are tracked over time, allowing variables sensitive to resuscitation interventions to be compared and optimized. A comprehensive and modifiable framework has been established to corroborate experimental results and field observations with physiological dynamics. The model will be a useful tool for basic research, development of lifesaving guidelines, and medical education.
Team Focused, “Pit Crew” Drowning Resuscitation: Case Reports and a Novel Approach for Pre-Hospital Providers

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Treatment 1, Serendit, November 4, 2015, 1:30 PM - 3:00 PM

Objectives
The 2010 American Heart Association (AHA) guidelines for cardiopulmonary resuscitation (CPR) emphasize early, effective chest compressions with minimal interruptions and early defibrillation. To achieve these goals, numerous Emergency Medical Services (EMS) agencies have implemented “Team Focused” or “Pit Crew” CPR programs. These are designed, pre-assigned roles to EMS providers during out of hospital cardiac arrest (OHCA), thus decreasing confusion of role assignment and increasing the chest compression fraction. Historically, survival to hospital discharge with good neurological outcome from OHCA averages 8%. Choreographed approaches to CPR have shown increase in survival to hospital discharge in OHCA with some areas in the USA demonstrating survival rates as high as 39%. To date, there are no published protocols or case reports on the use of team focused or pit crew CPR in the resuscitation of drowning patients.

Methods
After receiving training on drowning resuscitation, Wrightsville Beach Ocean Rescue (Wrightsville Beach, NC, USA) developed and implemented a Team-Focused Drowning Resuscitation Protocol that emphasized early oxygenation, ventilation, and effective chest compressions. The first two cases in which it was used and the protocol are presented.

Roles are assigned to the first five rescuers to arrive on scene, in order of arrival, but can be performed with 2 rescuers. The first rescuer to arrive positions themselves at the patients head and carries only the bag valve mask (BVM) and immediately delivers five ventilations. The second rescuer positions themselves on the patients right side and brings all resuscitation equipment from the ambulance and checks the patients pulse, initiating chest compressions as necessary. The third rescuer positions themselves on the patients left side and checks the patients pulse and alternates chest compressions every two minutes as necessary with the second rescuer. The fourth rescuer does not have a specific position and inserts two nasopharyngeal and one oropharyngeal airways into the patient as indicated, attaches the Automated External Defibrillator (AED), and places a supraglottic airway (King Airway, ©King Systems, USA 2010) as indicated. The fifth rescuer is the supervising officer and coordinates care, contacts other responding agencies as needed, and coordinates movement of the patient.

Results
The first two patients, a 58 year old female and a 22 year old male, both pulseless and apneic initially, to receive Team-Focused CPR for drowning resuscitation after implementation of the new protocol survived to hospital discharge with no observable neurologic deficit.

Conclusion
Team-Focused CPR, though initially developed for cardiac arrest due to witnessed, OHCA, can be adapted to drowning resuscitation to ensure immediate ventilation and oxygenation. Pre hospital providers, including lifeguards and EMS, are encouraged to develop resuscitation protocols specific to drowning resuscitation.

Future Direction
Further prospective research is needed to identify best practices for pre-hospital drowning resuscitation.

References
First, do no harm: Old and new paradigms in rescue, resuscitation and trauma prevention

Professor John Pearn\textsuperscript{1,3}, Associate Professor Richard Franklin\textsuperscript{1,2}

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Treatment 1, Serendit, November 4, 2015, 1:30 PM - 3:00 PM

The balance between benefit and risk is central to the work of all who are involved in rescue, first aid training and trauma prevention advocacy. Risk is a common term in today’s society and refers to the potential to lose something of value, it can be found in the common lexicon of: financial loss/gain (risk of losing money), health (risk of ill health), workplace health & safety (risk of injury), technology (risk of losing data), insurance, and gambling. With each risks taken there is a perceived benefit from taking the risk otherwise it is unlikely the risk would not be taken, for example I will risk $1,000 on shares in a company as I expect that the benefit to me will be an increase in the price of the shares, you would not buy the shares if you thought you were going to lose money. Often the higher the risk, the greater the potential gain or loss. It also implies that you do not have all of the information available to know the exact likelihood of an outcome, a common situation where rescue, first aid and resuscitation are undertaken.

The Hippocratic exhortation of ‘Primum Non Nocere’, ‘First, do no harm’ is an axiom with a history of 2,000 years. Superficially, all would support this dictum; but harm can result from not doing something. The balance between inadequate or no intervention on the one hand, and proactive intervention with iatrogenic risk is thus a complex one. There has been a 180-degree reversal of intervention philosophy and practical doctrine in the domain of resuscitation teaching and practice, over the past 30 years. For example, the Australian Resuscitation Council (ARC) today has as it central moto ‘Any attempt at resuscitation is better than no attempt’, this in stark contrast to earlier standard first aid conservatism embodied in such phrases as ‘don’t do anything for which you are untrained’. Subject of risk-benefit ratios is a topical one; and one which requires regular reappraisal as new research is published.
Intentional Hyperventilation prior to breathhold and submersion – hypoxia or arrhythmia as the killer?

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Symposium 2 - Hypoxic Blackout, Serendit, November 5, 2015, 1:30 PM - 3:00 PM

Breath holding and submersion with prior intentional hyperventilation has been associated with loss of consciousness and subsequent mortality(1, 2). During hyperventilation the partial pressure of arterial carbon dioxide (CO₂) is reduced. As the main stimulant for respiratory drive, a reduction in CO₂ will prolong breath hold time. With prior hyperventilation the stimulus to break breath hold and breathe may occur after the individual has utilised available oxygen thereby becoming hypoxic with resultant loss of consciousness.

The aim of our study was to examine the cardio-respiratory responses to breath holding with prior intentional hyperventilation and subsequent submersion.

The study used a within subject repeated measures design, each participant being their own control. Six participants completed a series of tests in 3 environmental conditions. Air (20°C), Immersed (25°C) (head above the water), Submerged (25°C) (head below). Three experimental comparisons were performed in each of the conditions. This consisted of maximum breath hold time followed by re-breathing (total time 75 seconds); +/-3 minutes of light exercise that continued during breath holding and re-breathing; +/-1 minute of prior hyperventilation to an average end-tidal fractional concentration of CO₂(FETCO₂[%]) of 3%. All breath holds commenced following a measured volume inspired from end-expiratory lung volume (75% of the inspiratory capacity). Inspiratory volume, respiratory rate, fractional end-tidal carbon dioxide (FETCO₂), fractional end-tidal oxygen (FETO₂), pulse-oximetry (SpO₂) and electrocardiography (ECG) were measured.

Examination of breath hold times demonstrated that hyperventilation increases the duration of breath hold in all conditions (mean[SD] data: Air 56.3[20.6]s cf. 95.5[18.5]s; Immersion 38.2[8.6]s cf. 64.2[15.8]s; Submersion 28.1[10.9]s cf. 50.5[28.8]s).

Additionally the FETO₂ levels at break of breath hold were lower following hyperventilation compared with no breath hold alone (mean[SD] data: Immersion 96.23[9.71]mmHg cf 85.08[21.07]mmHg; Submersion 107.49[20.47]mmHg cf 102.00[25.56]mmHg), and the FETCO₂ was lower in the hyperventilation tests following hyperventilation to an FETCO₂ of 3% in both conditions (mean[SD] data: Immersion 50.46[2.02]mmHg cf 45.05[1.94]mmHg; Submersion 46.43[2.93]mmHg cf 41.04[3.41]mmHg). No subjects were hypoxic during any of the immersion or submersion conditions (lowest SpO₂ 95.5% with Immersion breath hold, hyperventilation and no exercise). No participant subjectively described symptoms close to “blacking out”.

Multiple significant junctional arrhythmias were seen in two participants during submersion with prior hyperventilation and breath hold. Minor arrhythmias of atrial or sinus node origin were seen in all participants immediately prior to, or within 20 seconds of the break of breath hold. No arrhythmias were described as symptomatic by any participants. This would be consistent with the observation of arrhythmias associated with the break of breath hold in previous studies(3).

This study suggests that an isolated episode of, non-competitive, moderate hyperventilation prior to breath hold and submersion or immersion is not associated with loss of consciousness due to hypoxia, despite hyperventilation increasing the duration of a breath hold in all experimental conditions. This study did not examine extreme hyperventilation in a competitive context and the potential for hypoxia as a result. Hyperventilation was associated with a higher incidence of cardiac arrhythmias; this observation may explain episodes of sudden cardiac death in water following intentional hyperventilation prior to immersion or submersion, thus supporting the theory of autonomic conflict.(4)

References
Shallow water blackout - risks and prevention

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Treatment 2, Serendit, November 4, 2015, 3:30 PM - 5:30 PM

Coronial records and clinical experience have long identified that group of immersion fatalities where a competent swimmer does not surface in calm water, one cause of this tragic syndrome is ‘Shallow Water Blackout’ (SWB). SWB is a term commonly used to describe the loss of consciousness underwater caused by a lack of oxygen to the brain following breath-holding. Whilst uncommon, there is strong evidence to suggest the pre-immersion hyperventilation is one preventable cause. The activity of breath-holding is common and often perceived to be an essential part of some underwater sports, such as underwater hockey, synchronised swimming, lifesaving and freediving (the activity of seeing how deep a person can swim on one breath). It is also common recreationally, as many would remember from their childhood, trying to swim as far as possible underwater on a single breath. In the past, endurance underwater swimming has been a featured event of swimming carnivals - with one school awarding the ‘Long Dive’ medal to the boy who won. Pre-dive hyperventilation is also used by some occupationally such as to fish, gather pearls and make repairs to boats. SWB occurs because the normal, protective ‘breakpoints’ – the irresistible urge to breath – have not been triggered before unconsciousness (due to cerebral hypoxia). There are two chemical sensors in the body which detect the levels of oxygen and carbon dioxide (CO2) which protect us from a lack of oxygen. The CO2 sensor is the most sensitive. Hyperventilation, i.e. ‘blowing off’ too much CO2 before submerging can interfere with the sensor, which is not triggered early enough to prevent blackout. All who work, volunteer and serve in the aquatic industries can be advocates to highlight the danger of pre-immersion hyperventilation to aid endurance swimming or diving. This presentation will explore the physiology of breath holding, the development of preventative stratagems and safety policies. We posit that all members of the aquatic world can develop and promote policies which will reduce the incidence of the preventable cause of drowning.
Evaluation of the first 4 years of automated external defibrillators (AED) at lifeboats

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Treatment 2, Serendit, November 4, 2015, 3:30 PM - 5:30 PM

Automated External Defibrillators (AED's) increase survival rates of out-of-hospital cardiac arrests and the stored electronic information of AED's can be used for the analysis of the quality of resuscitation. In 2011, the Royal Dutch Lifeboat Institution (KNRM) received a donation to purchase 65 AED's for each of their lifeboats. As far as we know, nothing is known about the efficiency of AED's on lifeboats. Therefore, all resuscitations by lifeboat crews since 2011 have been investigated and the AED rhythm strips have been analysed for quality purposes.

Setting
The Royal Dutch Lifeboat Institution (KNRM) covers the North sea and most large open waters in the Netherlands by 45 lifeboat stations and 1300 volunteers.

Results
Between July 2011 and January 2015, the KNRM has been involved in 16 resuscitations. In 15 cases sufficient data is available for evaluation. Victims are located in open water (n=8), sea (n=6) and on land (n=1). Twelve resuscitations (80%) take place in (very) unfavourable weather conditions: wind speeds up to 7 Beaufort and wave heights up to 4 meters. Mean age of the victims is 42.4 years (95%CI 30 – 54), 87% is male (n=13). After the alarm call, it takes 17 minutes (95%CI 7 – 27) for the lifeboat crew to arrive on-site; Average time between arrest and start of Basic Life Support by KNRM, by other services or bystanders, has been 22 minutes (95% CI 7 – 38).

Nine victims have been declared dead on-site after resuscitation attempts were taken over by ambulance crew or helicopter doctor. Six victims have been admitted to a hospital; three with return of spontaneous circulation (ROSC) on-site, one with no ROSC during transport to hospital and unknown ROSC for two victims. Three admitted victims have been declared dead in the hospital, one survived to hospital discharge; of two victims it is unknown if they have survived.

The KNRM AED's have been used during the resuscitation of eight victims (53% of all resuscitations). The average time between alarm call and attachment of the AED was 43 minutes (95%CI 19 – 67). Seven victims where the AED has been used have been declared dead on-site; one victim is transported by ambulance; it is unknown whether this patient had ROSC.

Eleven of the resuscitated victims are drowning victims (73% of the resuscitations); six are declared dead on-site and five are admitted to hospital. Two with ROSC on site, one with no ROSC and unknown in two. One of the drowning victims with ROSC on-site survived to hospital discharge. The AED was used in 5 drowning victims (45%). One automated shock was delivered during the course of one resuscitation, but without ROSC. No shock was delivered in 4 victims; none had ROSC.

The electronic data of all eight AED applications could be retrieved and analysed which resulted in information relevant for feedback and resuscitation training. This includes information on delay in AED attachment, compression frequencies, compression / ventilation ratios and CPR pause times.

Conclusion
The frequency of the application of an AED by lifeboat crews is very low. It occurs under more difficult conditions and in a different population than most out-of-hospital resuscitation. We have found prolonged call times and delays in the attachment of the AED. During the first 3.5 years, the AEDs on KNRM lifeboats did not contributed to survival in the first eight victims where the AED has been used. At the same time, it the electronic stored information in the AEDs is useful to evaluate the quality of the resuscitation incidents.
Pre-Hospital Drowning Resuscitation: A Novel Statewide EMS Protocol

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Objectives

Drowning remains a leading cause of accidental injury death in the United States and is associated with significant morbidity. Since the morbidity and mortality of drowning are secondary to hypoxemia and cerebral anoxia, emergent treatment requires prompt delivery of oxygen and appropriate ventilation. The 2010 Emergency Cardiovascular Care cardiopulmonary resuscitation (CPR) guidelines for Basic Life Support (BLS) and Advanced Life Support (ACLS) emphasize chest compressions and automated external defibrillator (AED) use for cardiac arrest patients and present a Compression, Airway, Breathing (CAB) paradigm to be utilized over the traditional Airway, Breathing, Circulation (ABC).

Likely due to the radical change in thinking of the pre-hospital provider, extensive training has occurred on the CAB protocol, which has caused many training officers to overlook that drowning is treated as a special case and requires the ABC approach. A group of Emergency Medical Services (EMS) medical directors, created a statewide drowning protocol to address this need and it was summarily approved by the state Office of EMS. This presentation will discuss the physiology of drowning and the protocol that was developed. It is the authors intent that this protocol serve as a model for other pre hospital and lifeguards agencies.

Methods

Utilizing an online Delphi method, a group of EMS Medical Directors created a new statewide EMS protocol that emphasized early oxygenation and ventilation while addressing many of the myths and misconceptions about drowning resuscitation. There was a de-emphasis on spinal immobilization, defibrillation, and airway suctioning.

Results

The proposed protocol was approved by the State Office of EMS and implemented immediately for the over 35,000 credentialed First Responder, Emergency Medical Technician, and Paramedic practitioners in the state.

Patent assessment is broken into 3 categories, awake and alert, awake but with altered mental status (AMS), and unresponsive. For the awake and alert patient, the first step is supplemental oxygen as tolerated by non-invasive methods, then selective spinal immobilization as indicated, removal of wet clothing and warming the patient, then monitoring and reassessment. Transport is encouraged for asymptomatic and minimally symptomatic patients who have been rescued from drowning. Asymptomatic pts are encouraged to seek care if they becoming symptomatic within 6 hours.

For patients that are awake with AMS, initial treatment is 5 ventilations via mouth to mouth or bag valve mask ventilator (BVM). If patient has adequate respiratory effort, the BVM is stopped and non-invasive supplemental oxygen is initiated via partial rebreather mask or nasal cannula. The age appropriate airway protocol is initiated, which may include CPAP, supraglottic airway, or endotracheal intubation. Next, the age appropriate AMS protocol is utilized, which includes screening of blood glucose levels. The patient is then warmed and dried, then intravenous line established, and the age appropriate respiratory distress protocol as needed. The patient is then transported to the age appropriate receiving hospital.

For patients that are unresponsive, the initial treatment is 5 ventilations via mouth to mouth or BVM. The next step is to check for a pulse, and if absent, the age appropriate cardiac arrest and selective spinal immobilization protocol initiated. If patient has a pulse, then the age appropriate airway protocol is utilized, then the remainder of the algorithm is the same as awake with AMS.

Conclusion

Once prevention fails and the rescue has been performed, drowning resuscitation requires early attention to reversal of hypoxemia and cerebral anoxia. A practical drowning resuscitation protocol requires emphasis on early oxygenation and ventilation instead of early chest compressions as in cardiac arrest of cardiac etiologies. This protocol serves as a starting point for other EMS, lifeguard, police, fire, and rescue agencies seeking to update their drowning protocol.
Comparison of supraglottic airways to standard techniques for ventilation during simulated cardiac arrest by Australian surf lifesavers

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Treatment 2, Serendit, November 4, 2015, 3:30 PM - 5:30 PM

Background
Surf Lifesavers are taught to use standard techniques for ventilation during Cardiac Pulmonary resuscitation (CPR), such as pocket mask rescue breathing (PM) and Bag Valve Mask (BVM). The ability to train Surf Lifesavers to use supraglottic airways has not been previously assessed.

Methods
113 Surf Lifesavers, trained in Advanced Resuscitation Techniques, were exposed to a training intervention on the use of supraglottic airways (the iGel and LMA Supreme) in simulated cardiac arrest.

The primary outcomes: mean time to first effective ventilation, absolute failure of ventilation (defined as no effective ventilations in a cycle -2 minutes of CPR), proportion of times ventilation was attempted and was successful, and total hands off time (interruption of CPR due to ventilation) was compared for each device as well as a number of secondary outcomes.

Non-parametric non-inferiority between devices compared to the Bag Valve Mask (current standard of Australian Lifesaving care) was tested using the Mann-Whitney U test. Correlations between demographic factors and the primary outcomes were assessed using Spearman rank.

Results
Ventilation performed by surf lifesavers in simulated cardiac arrest was superior with Pocket Mask compared to ventilation performed with Bag Mask Valve and both supraglottic airways (iGel and LMA Supreme).

The mean time to first effective ventilation was significantly lower with PM (17.89 seconds) compared with BVM (20.34 seconds), LMA (36.5 seconds) and iGel (22.52 seconds) (p values 0.08, 0.0001, 0.0001 respectively).

The PM outperformed BVM and iGel in achieving at least one effective ventilation in a resuscitation cycle (absolute failure of ventilation was defined as no effective ventilations in a cycle (p values 0.03, 0.03 respectively). The ability to achieve one effective ventilation per cycle was equivalent between PM and LMA.

However the total hands off time (interruption of CPR due to ventilation) was greatest with the PM (13.51 seconds) compared with BVM (10.84 seconds), LMA (10.85 seconds) and iGel (10.41 seconds) (p values 0.0001, 0.0001, 0.0001 respectively).

Conclusions
The study demonstrates that Lifesavers can be trained to successfully use advanced airway devices used by other healthcare professionals.

In this study of simulated cardiac arrest PM was superior in measures of ventilation compared with the BVM and iGel. However the use of PM was associated with a longer interruption of CPR due to ventilation. Determining the superiority of any one device requires consideration of time taken to first effective ventilation, the likelihood of successful insertion and the ease of use of the device in the arrest situation.
Underwater resuscitation

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Introduction
Airway management, mechanical ventilation and resuscitation can be performed even in space but not under water. The present study assessed the technical feasibility of resuscitation under water.

Methods
Airway management was assessed in a water-filled hyperbaric chamber at 20m of depth using a video laryngoscope, an optical stylet and an intubating laryngeal mask. Mechanical ventilation was successful to a maximum depth of 50 meters using a modified resuscitator. Chest compressions were performed to a maximum depth of 50 meters using the LUCAS.

Results
Endotracheal intubation was possible within less than one minute with all approaches evaluated. However, removal of water from the airways was inefficient with the suction system used in this study. Mechanical ventilation was possible from the surface to the maximum depth of 50m but the ventilation rates, minute volumes and tidal volumes changed with increasing depth. The LUCAS was operating at 50m depth but the compression rate around 230 bpm was far too high for efficient chest compressions.

Conclusions
Underwater airway management appears generally possible and also mechanical ventilation succeeded with the device used. In contrast, fundamental improvements are required for the suction system and the LUCAS chest compression device.
Effectiveness of first-aid program for drowning prevention in rural areas of Bangladesh

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Background

For any health care system first aid service is an important part, by providing first aid in time it is often possible to minimize the progress of severity as well long-term morbidity or mortality. The availability of rural health care providers and medical services is very limited and challenging in most developing countries. Bangladeshi people exposes to water bodies, like ponds, ditches, rivers and lakes in their daily life so mortality and morbidity due to drowning is higher than any other causes and the percentage of child deaths due to drowning after infancy is 28%. “SwimSafe” program was designed in 2005 to prevent child drowning in Bangladesh and UNICEF Bangladesh has been providing financial support for implementing this program in Bangladesh. In 2012 community first responder development was incorporated as a part of SwimSafe program to provide first responder services during swimming teaching and in any emergency situations. In this paper first aid in managing drowning causalities provided by volunteers who worked as Community Swimming Instructors were described.

Objective

Assessment of the first aid services in management of drowning causalities provided by community based volunteers in rural areas of Bangladesh.

Methodology

To deliver first aid services through community volunteers in any emergency health situations first aid training was incorporated in SwimSafe program in 2012, till date total 104 training were conducted to train 1644 volunteers in 17 different districts of Bangladesh. Among the volunteers 741 were male and 903 were female. All volunteers were selected from the community and trained intensively for 2 days. Trainers and manual were adopted from IDRC-B. During the training all trainees had access of enough manikins for the practice of CPR. After successfully completing the training all instructors were delivered a manual and a record-book. All volunteers were also trained on record keeping about the first aid services they provided in the community. For collecting information on drowning casualties a pre-tested questioner was used. All the training were conducted in between May to September of the year. In the end of the each year data was collected for analysis.

Results

During this period 844 instructors reported that they provided first responder services to 4,648 causalities, among them 79 were due to drowning (male-44 and female-35). Out of all drowning casualties 89% (n=70) were children. Among the drowning causalities 23 were provided CPR in site and 56 were treated with keeping recovery positions. Out of 23 casualties (children-21 adult-2) who needed CPR 16 survived and 7 died. Of all 21 children 76% (n=16) survived and 24% (n=5) died (2 boys & 3 girls). All the children were within 10 years of age. Volunteers treated 56 drowning casualties with keeping recovery position after rescuing victims from water, of them 30 were boys and 26 were girls. Among the 56 causalities 80% (n=49) were children and mostly within 10 years of age (27-boys, 22-girls). Among all drowning causalities 48 were referred for further treatment.

Conclusion

Due to geographical position of Bangladesh massive destructive natural disaster like cyclone, flood, and earthquake affect every year and cause significant number of lives. The access of health care providers is very difficult in rural areas of Bangladesh so by developing adolescent based first responder volunteers in the community it is possible to reduce drowning related mortality, morbidity and long term disability.

Acknowledgement

UNICEF Bangladesh has been providing financial assistance for implementing SwimSafe program since 2005.
The new 2015 ILCOR guidelines for drowning situations and the impact on resuscitation courses for lifesavers

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Session 5 - Day Two Plenary, Grand Ballroom, November 5, 2015, 8:45 AM - 10:15 AM

Millions of lay-people have been trained in cardio-pulmonary resuscitation (CPR) during the last decades. CPR courses have become shorter, more effective, more hands-on, and more evidence-based in content and educational methods. The courses aim at the primarily cardiac arrest victim. This includes compression-only CPR and the immediate attachment of an Automated External Defibrillator (AED). Diagnosis of circulation, the pulse check, is excluded. The students learn single-person CPR in a classroom environment and know that ambulances take over within 15 minutes.

The 2015 ILCOR guidelines emphasise that standard courses may not be appropriate for lay-people with a duty to respond in the aquatic environment, such as lifesavers and lifeboat crews. These persons relatively often encounter submersion, immersion and hypothermic patients who suffer from respiratory or temperature problems.

Based on the understanding of the physiology of drowning, the standard CPR method is not advised in drowning victims. Drowning is first of all a lethal problem due to the lack of oxygen. At the same time, problems are encountered during CPR that are not addressed in the standardised CPR courses. Such difficulties include the possibility that there may still be circulation in a lifeless person and that high inflation pressures sometimes make ventilation almost impossible. Other related issues that are typical and important under these circumstances are for example: how to perform CPR in a moving craft while wearing survival suits, or, how to perform CPR as a team during an extended period of time.

At the same time, lifesavers and lifeboat crews are not anonymous and the public has a high expectation of their skills and expertise. This means that during and after resuscitation they have to deal with all kind of other issues, such as providing information, taking care of family members of the victim, and post-incident analysis.

This presentation reports on the content and organisation of the current teach-the-teacher training program (called: EHBOplus) for lifeboat crewmembers. The EHBOplus course includes all the above elements to allow the crewmembers to be optimally prepared and to deal with the situations they may be confronted with. The presentation will also reflect on the challenges and barriers to initiate such a drowning-related course and the quality measures that can increase the efficacy of the course.
I-gel supraglottic airway use in cardiac arrest secondary to drowning – a case series from UK search and rescue

Dr Paddy Morgan1,2,4, Dr Linda Dykes3,4

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Poster Session 1, Poster Foyer, November 4, 2015, 9:00 AM - 5:15 PM

Objectives & Background

The UK maintains a 24-hr search & rescue (SAR) helicopter service covering UK land & surrounding maritime areas. There are currently 12 helicopter bases, both military & civilian. Medical provision is currently paramedic or technician-level crew.

Tracheal intubation is considered the gold standard for airway management/ventilation in drowning casualties, but alternative methods are required when intubation is unsuccessful/impractical or for technician-level winchmen. Current options for UK SAR include Bag-Valve-Mask (BVM) ventilation +/- adjuncts or the I-gel (Intersurgical Ltd) supraglottic airway device (SAD).

For the drowning casualty early positive pressure ventilation, preferably with oxygen, aims to treat the hypoxaemia thereby improving survival(1). There is growing interest in the use of SADs for those not competent in tracheal intubation(2,3). Conversely there is opinion that they are not fit for purpose as the pressure required to overcome the decreased compliance of “drowned” lungs is greater than the seal pressure of the device(4) and that they “won’t work” in drowned patients.

We present a case series of drowning casualties where an I-gel was used, in order to establish the efficacy of the device in this scenario.

Methods

The crews of all UK SAR helicopters were contacted by email in Jan 2015 & asked to report cases where I-gels had been used during resuscitation of drowned casualties. Specifically:

- Was ventilation achieved?
- Did the I-gel “float” out & how well did it work to ventilate the casualty?

Results

We received 11 replies (2 duplicates, 9 cases). Indications for insertion were first choice device (N=5); unable to ventilate with BVM (N=2); failed intubation (N=2). Ventilation via the I-gel was achieved in 100% (N=9) of cases.

Chest rise was described as “very good” (N=1), “good” (N=4), “small” (N=2) & not commented upon in the remainder. 27% (N=3) had problems: dislodged with CPR (N=1) & excessive suction required due to water-logged airway (N=2). Whilst not requested, crews volunteered that one casualty survived to discharge & one died. Outcome of the remainder is unknown.

Conclusion

This series confirms that the I-gel can achieve ventilations in a casualty in cardiac arrest due to drowning.

Water in the oropharynx is common during these events: first-generation SADs reportedly “float” out, but this seemed less of a problem with the I-gel.

It also highlighted that the gastric port of the I-gel was rarely used for suction/drainage of gastric/oropharyngeal water. This later point suggests that practitioners should be competent in I-gel insertion and oropharyngeal/gastric port suction.

We conclude that the I-gels is appropriate for airway management in drowning casualties, should tracheal intubation be unavailable/impractical or as an airway rescue device. However, training should include use of the oropharyngeal and gastric port suction.

References


Swimming and water activities are highly valued by millions of people worldwide including those with disabilities for whom water may serve as “leveling the playing field.” Persons who have tracheostomies perhaps face the greatest challenges when participating safely in or around the water. The risk of water entering the lungs via the stoma is very real and many organizations and agencies have taken a strong stand that risks outweigh any benefits gained through aquatic participation. Other groups including respiratory therapists advocate that aquatic activities can be acceptably safe as well as very beneficial therapeutically. The purpose of this paper is to review current published research on water activities for individuals with tracheostomies with the goal of determining whether or not evidence-based recommendations for therapeutic and recreational aquatic practice can adequately balance risks and benefits to the satisfaction of the medical community, facility operators, families and participants. We searched four databases (i.e., Medline, PubMed, CINAHL, EMBASE) using search terms “tracheostomy OR laryngectomy” AND “aquatic OR aquatic therapy OR swim OR swimming.” Initially 50 articles were identified. Exclusion criteria were applied after which ten published articles remained. The articles reviewed identified facts and issues such as undisputed risks exist for aquatic activities by individuals who have a tracheostomy, ranging from aspiration to drowning. Some medical professionals and laypersons believe reasonable measures can improve the safety of aquatic activities for this population, providing increased therapeutic, health, and recreational benefits (e.g., improved health-related fitness; enhanced quality of life; decreased likelihood of drowning) [1]. Two very distinct schools of thought exist for how to improve safety and drowning prevention for participation in aquatic activities for individuals who have a tracheostomy. One approach advocates use of “swimming aids,” an external device attached to the stoma. One clinical trial demonstrated the ‘Larkel Swimming Aid’ was safest and most effective. The second approach involves preventing water from entering the tracheostomy tube through the use of “digital occlusion” and/or “slow exhalation while underwater.” Of the articles reviewed, only one [2] refers to these strategies with limited documentation. The Chartered Society of Physiotherapy (CSP) [3] developed Aquatic Therapy for Clients with a Tracheostomy that considers conditions related to the water facility being used (depth, methods for entry, number of people in the pool) as well as staffing, equipment and access to medical support in the event of an emergency. Importantly, [3] provides a Risk Assessment Tool Pathway that uses specific prompts. The tool outlines recommended equipment which should be available during the aquatic session. In “Swimming after Laryngectomy,” the National Association of Laryngectomee Clubs (NALC) [4] outlines specific recommendations for supervision, equipment and general environment that differ from the CSP because it provides fewer recommendations, does not suggest screening, and assumes that a swimming aid is used. Within the supportive literature a consensus exists that at least one person must be on the pool deck and at least one other in the pool with the participant, both of whom have knowledge and emergency training. Aquatic activities for individuals who have a tracheostomy can never be truly “safe” given the very real and highly exacerbated risk to their airway that a stoma presents. The literature and anecdotal evidence confirm that this population is participating to varying degrees in aquatic activities and health care providers and aquatic facility operators are being asked by parents and participants for advice and recommendations. Consistent recommendations or guidelines based on evidence for persons with tracheostomies to participate in aquatic activities is clearly lacking and desperately needs to be developed.
Mobile Centre of Coordination and Pre-hospital Care: better working conditions, greater productivity, and increased efficiency of assistance

Dr (PhD) Paula Xavier¹, BSc Rodrigo Gomes Leal¹
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Poster Session 3, Poster Foyer, November 6, 2015, 9:00 AM - 5:15 PM

The role of lifeguards, well-recognized as a priority, includes assessing environments intended for beach use, assisting beachgoers at risk, and deterring beachgoers from acts that pose serious risks to their health or physical integrity. But working conditions in which they perform their duties, aren't always the best, and there're still many gaps in Occupational Hygiene, Health and Safety, namely: prolonged sun exposure, lack of appropriate place for breaks and meals, lack of appropriate location for treatment of victims and lack of hygienic conditions regarding the use of toilets and personal property protection.

This is an innovative concept in Portugal, developed in order to improve the working conditions of the professionals involved in the assistance of beachgoers, enforcing the Portuguese and European Union law and regulations of OHS and at the same time provide better assistance to beachgoers, nautical sports and recreational boating.

We propose the creation of a Mobile Centre of Coordination and Pre-hospital Care meeting the legal and regulatory requirements in terms of working conditions, providing facilities with climate control systems with extraction and supply air, natural and artificial light, toilets, dining and changing rooms with showers and hot water.

Only lifesaving professionals will use the facilities, in particular lifeguards and team coordinators, which will never need to use the public facilities.

With the creation of this centre, we intend to further improve the service conditions for beachgoers equipping the facilities not only with an appropriate Medical Office with first aid materials and specific BLS for the most common occurrences at beaches, but also with an Advanced System of Fixed and Mobile Communications, which will facilitate communication and operational consistency among professionals working at the beach and others involved in the operational and emergency plans.

We propose a compact design and easily transportable infrastructure that can take three different formats, considering the characteristics of the deployment location.

Linear format - size 15 - A single module with 15m² area. The interior consists of a Help Desk equipped with a medical office appropriate for the assistance to be provided; a Communication Desk equipped with an advanced system of fixed and mobile communications, including maritime VHF portable radios and telephones; one Dining Room equipped with a small kitchen for quick meal and drinking water; and Sanitary private Facilities, equipped with changing rooms with hot showers and individual lockers.

Linear format - size 22 - A single module with 22m² area. The interior has the same features of the linear format - size 15, with larger areas.

T-shaped - Consists of a module of linear format (Size 15 or 22), plus another module with 6 m², made of glass and coupled to the first. In this solution the Communication Desk is installed in the coupled module, which will also serve as beach lookout station, equipped with telescoping tower with long range and high definition video surveillance, with all the remaining features on the linear format module.

This centre will achieve; “Better working conditions, greater productivity, and increased efficiency of assistance” With the implementation of this project we expect to improve the professional working conditions, improving their wellbeing and, consequently, their productivity and efficiency in their duties and responsibilities towards assistance of beachgoers.

The planned implementation of such infrastructures, that consider the optimization of lifeguards’ OHS, will minimize distractions, reduce the periods of absence from working and increase the feeling of security of beachgoers and water sports practitioners.
Disaster
Lessons Learnt to Improve Disaster Risk Reduction

Mr Andrew Gissing¹
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Session 5 - Day Two Plenary, Grand Ballroom, November 5, 2015, 8:45 AM - 10:15 AM

Disasters globally continue to grow in their scale and complexity as human development interacts with the forces of nature’s extremes. The Sendai Framework for Disaster Risk Reduction 2015-2030 was adopted at the Third United Nations World Conference on Disaster Risk Reduction and outlines international priorities for the reduction of disaster risk, including: understanding disaster risk; strengthening disaster risk governance; investing in disaster risk reduction for resilience; and enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction.

This presentation will outline key lessons learnt regarding risk assessments, warning systems, community engagement, emergency preparedness, land use planning and mitigation from recent global flood disasters which have resulted in loss of life and significant damages. Lessons will be drawn from events including the UK 2007, Australian 2011 and various Asian floods; the Asian 2004, Samoan 2009 and, Chilean 2010 and 2015 Tsunamis; and Hurricane Sandy in 2012. Lessons outlined will provide delegates with useful insights into how to design and implement approaches to enhance disaster risk reduction strategies and ultimately reduce the instances of drowning related deaths from flooding.
A Case Study: A third Sector UK Flood/Technical Rescue Academy to train and support volunteers for flood rescue

Mr Adrian Mayhew
Surf Life Saving Great Britain, Evesham, United Kingdom

Disaster 1, Tekulur, November 5, 2015, 3:30 PM - 5:30 PM

A UK Government study undertaken by Chief Fire Officers Association in 2002 identified that the two biggest threats to civil security are flood and pandemic disease. Changes to weather patterns have seen dramatically increased incidents of severe flooding. The principal United Kingdom SAR services are under increasing pressure to provide flood rescue responders. These same agencies have been and will continue to be under huge financial pressure due to central government expenditure cuts resulting in reduction of manpower.

More volunteers are urgently required to support the UK population in flood emergencies.

The requirements to be flood responders are a lot more than a pair of waterproof boots. Flood operations are managed under a raft of civil regulations and controlled by the blue light services. Not only are there high levels of trained competency requirements but a complex command structure must be understood and followed. To be deployable in flood rescue operations volunteers must be trained to the blue light professional standards.

Surf Life Saving GB was founded in 1955. Our Chief Patron is H.R.H. The Duke of Edinburgh. We are an organisation as defined by the Charities Act 2006.

The main activity of the Charity is aquatic life saving undertaken by 7,800 members in our 62 clubs. We currently have over 900 qualified lifeguards trained to the National Vocational Standard. Many of the UK professional lifeguards are recruited from our community. Within our membership we have a significant number employed by the Blue Light Services. (Category 1 Responders)

The skills and prior learning of a lifeguard are ideally suited as a platform for further training. They are severe weather and water aware, accustomed to and actively use the dynamic risk assessment process, have advanced resuscitation and first aid skills and those who use IRB’s have advanced boat handling and control skills.

The ingrained traditions of Lifesaving have nurtured a culture of voluntary service to the community. There is strong appetite to respond to the need for a community led flood response service.

The establishment of the College is intended as the creation a strategic national asset for the development of best practice in SAR specialising in Flood Response, primarily to support and sustain the development of a third sector Flood Response Service.

Adrian’s presentation will cover how the Flood College has been established including the need to meet all the civil regulatory requirements and the duty of care to the volunteers. He will describe how it is managed and financed and will illustrate the first year of operations, the lessons learned and how this has impacted the prevention of drowning.
Flood rescue as a means to mitigate aquatic disasters

Rear Admiral Purushottam Sharma
1Rear Admiral Purushottam Dutt Sharma, PUNE, India

Disaster 1, Tekulur, November 5, 2015, 3:30 PM - 5:30 PM

India faces disasters at frightening regulatory. These comprise, havocs created by cyclonic storms, tsunamis, cloud bursts, avalanches, earthquakes, landslides and floods during the Monsoons when practically every river is in spate inundating large areas of urban and rural habitation in the country. The administration has been fighting these disasters on an ad hoc basis frequently calling upon the Armed Forces to assist in rescue and rehabilitation. It’s only now that a new administration has been created specifically to deal with disasters. At the national level it is the National Disaster Response Force or NDRF with its headquarters in Delhi. The teams have been trained to deal with different types of calamites, equipped and drilled to move to disaster areas with alacrity and expertise. They have their own Standard Operating Procedures to deal with different types of disasters. India is vast and there are multiple disasters happening at the same time stretching NDRF resources. To supplement this effort, states have begun to create their own State Disaster Response Forces (SDRF) again equipped and trained to deal with different types of calamities both natural and manmade.

Our planet is beautiful blue 4/5th covered with water. Water is forever beautiful, in a hurry to reach the ocean, sometime violent and swift, occasionally calm and placid but always mysterious. Waterfalls, mountain river and streams, lakes and reservoirs, surf and the oceans are pleasant sights when they at peace. It is best to remember that they can be frightening when they unleash their anger and ferocity. No wonder, therefore, that most disasters have an element of water in their core, that leads to flooding, inundation and death. To deal with these disasters, training in “Flood Rescue” should become an important part of a lifesaver’s training.

Flood rescue training comprises 4 levels. Phase 1 consists of training in at least 30 protocols of First Aid, refining swimming abilities, water-man-ship and introduction to lifesaving drills in relatively safe environment of a swimming pool. Phase 2 extends the earlier training in open still and flowing waters and in addition imparts training of rescue teams in watercraft operations and use of flood rescue equipment including rescue boards, rescue tubes, ropes and personal flotation gear. Phase 3 includes training in the surf and goes through the procedures learnt during Phase 2 including use of water craft such as rescue relief boats, inflatable rubber boats (IRBs) and jet skis. The 4th phase prepares a lifesaver to undertake underwater rescue using specialised gear and equipment.

Being numerous, varied and religious following different faiths, the people of India frequently congregate at rivers, lakes or the sea to perform rituals in very large numbers. Deployment of flood rescue teams to prevent drowning is being done increasingly to preserve and protect life of these devotees, who are not safety conscious or informed about dangers and how to overcome them. The examples are the “Mass Festival” at riverside or the sea where people gather to seek a dip in the water in millions. The formation of rescue teams at the National level or the State is the outcome of a declared policy to enhanced safety of people in the country.

The Huddud Tropical Cyclone with winds up to 180 miles per hour ravaged the coastal town of Vishakhapatnam in November 2014 causing high tides, flooding and debris in the air besides uprooting hundreds of trees. Deployed to deal with the calamity, the recently trained Flood Rescue Teams of the SDRF of Andhra Pradesh were visible, attending to various aspects of rescue at the end of which, although there was extensive damage to property there was minimal loss of life.
START method as a triage tool for aquatic disaster situations

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¹SOBRASA, Brazil, ²ISN, Portugal

Disaster 1, Tekulur, November 5, 2015, 3:30 PM - 5:30 PM

One of the biggest challenges of a rescuer is coping with a disaster situation, which by definition is when the capacity or preparation of the rescuer and its team is overcome by the occurrence. START method was created to address the difficulty of triage in pre-hospital emergency situations and so prioritize those with the greatest chance of benefit from the being assisted first, separating the victims of trauma by category, establishing for each one a different colour. Disasters in the aquatic environment are emergencies requiring a faster triage under the careful scrutiny of rescuers, because on top of being hard to overcome their operational capacity, decision should be fast to prevent drowning.

Correct triage of each case is essential to the operation’s success. This type of occurrence can be found in a shipwreck, falling of an aircraft or more frequently at beaches where multiple victims drown and lifeguards must perform this triage under physical and emotional stress. In Brazil, the classification of drowning is established as: rescue(no aspiration), drowning(aspiration) grades from 1 to 6 and already dead, based on the severity and focusing on the treatment. However it’s essential to lifeguards, working in situations where the occurrence of multiple victims and the decision of who to rescue first is a constant, to have a tool to mitigate drowning through a good triage and early rescue. Furthermore lifeguards must be able to anticipate and recognize at-risk bathers implementing preventive measures instead of reactive actions.

The objective of this work is to propose a simple and fast classification system, based on the known START method, for the recognition and triage of victims of water disasters.

The study were based on the analysis of occurrences, considering victim behaviour, retrieved at the system of the Military Fire Brigade of Santa Catarina (CBMSC) for a period of 5 years, at the beach of “Ingleses” - the highest number of occurrences at the state. Data was used to formulate a triage hypothesis tool for these events. In this study, we’ve assigned a colour system analogous to the START method that matches the level of rescue urgency related to victim’s behaviour to facilitate training and the work of lifeguards.

Based on the analysis of occurrences and their characteristics we proposed the following triage system by rescue priority level:

1. RED: victim in critical stage to submerge.
   a. Time estimation to be submerged: less than 1 minute
   b. Behaviour: victims with erratic swimming without displacement, with frightened facial expression, sinking several times which does not obey simple orders and may try to grab the lifeguard due to emotional stress;
   c. Rescue: NON-COLLABORATIVE
   d. Medical severity: Rescue to drowning degree 4.
2. YELLOW: Victim in danger to submerge
   a. Time estimation to be submerged: 1 to 5 minutes
   b. Behaviour: Victim with some or no displacement, yet able to float
   c. Rescue: COLLABORATIVE
   d. Medical severity: rescue to grade 1.
3. 3rd Priority – GREEN: Victim unaware of the drowning’s risk
   a. Time estimation to be submerged: > 5 minutes
   b. Behaviour: Victim seems conformable with some water displacement 1. or able to float
   c. Rescue: COLLABORATIVE
   d. Medical severity: rescue.
4. BLACK: motionless victims in the water.
   a. Time estimation to be submerged: zero
   b. Behaviour: motionless in the water usually with face down or submerged
   c. Rescue: NON-COLLABORATIVE
   d. Medical severity: Grade 5 or 6

Conclusion
The formulation of a new triage method to attend multiple victims of water distress can contribute with the standardization of care and the priority assistance of multiple victims. The next step in progress is testing scientific validation of these new triage methods. The results will be shared during the presentation.
Maritime and Aquatic Life Support (MALS) is recently developed maritime and aquatic emergency medical response training in Thailand. Cooperation's among the responsible organizations in Thailand leading by the Royal Thai Navy Medical Department (RTNMD) and the National Institute for Emergency Medicine Service (NIEMS) have developed the course aim in bridging the gap of competency and understanding in handling aquatic casualties provided by public safety rescuers, first responders and higher level of emergency medical personnel and safety prevention for both patients and medical personnel.

Since 2010 we conducted 10 standard 30-hour courses and several basic courses covering almost all the country. We have developed the 4 chains of survival in water-related casualties which are aquatic prevention, aquatic rescue, aquatic casualties care and aquatic transportation. Integration of the practical theories and best practices in each chains of survival has facilitated the students to have knowledge and requisite skills. Practices were tailored for the specific aquatic rescues of their region including maritime environment, surface water, surf water, swift water, diving rescue and water-related disasters such as flood. MALS would be an appropriate requisite knowledge and skills for the emergency medical personnel confronting the aquatic emergencies in Thailand.
Community Lifesavers Program in Santa Fe, Cebu Philippines A Proven Approach in effecting Preparedness among locals during Haiyan Disaster

Mr. Larry Joie Alag¹
¹Philippine Life Saving Society, Pasig, Philippines

Disaster 1, Tekulur, November 5, 2015, 3:30 PM - 5:30 PM

The gravity of drowning related deaths among filipino children aged 14 years old and below which reached at 3,000 per year led Philippine Life Saving to launch a community based approach in teaching drowning prevention, water safety, resuscitation and emergency care to the remote islands in the Philippines.(1)

Adopting Santa Fe Cebu.
Santa Fe, is a thriving tourism island in the northern part of Cebu Philippines known for its prestine white sand beaches and clear waters was adopted by Philippine Life Saving by training beach lifeguards more than a year prior typhoon haiyan devastated this beautiful island.(2) By then, there is a huge gap in emergency response in Santa Fe and all of its islets. With 36,000 populace Santa Fe, by then do not have emergency responders and or rescue volunteers available in times of need. In most cases a life threatening emergency situations will have to be brought to Cebu City an hour by ferry ride and four (4) hours travel by land.(3)

The Role of Local Government
The role of local government in making sure the program is delivered to the community is very crucial. Political will and the need for all political leaders to harmonized is a greater challenge in order to sustain and achieved a wider reach of impact of programs in the community. Since PLS intervention in the island proper coordination with the local executive and officials is sought. With this, PLS were able to continue to build capacity training among locals through various programs especially on Community Based Disaster Preparedness and Resiliency training to the existing 10 Barangays. Training twelve (12) volunteers to eventually become a barangay volunteer responder(s). After a tidious one (1) month of training covering the 10 barangays, the team were able to produce 120 volunteers ready to be engage in times of emergencies.

Landfall of typhoon haiyan
Just in time, by fate, and the determination and support of the local executive and the entire local officials, Santa Fe’s newly engaged Barangay Volunteer Emergency Response Team (BVERT) faced the biggest typhoon to ever hit the planet. Armed with the dedication and newly acquired lifesaving skills. All 120 volunteers conducted risks assessment, information drive, identify evacuation centers, and effect force evacuation for all the coastal residents three days prior to the landfall of typhoon haiyan.

With renewed mindset and with high spirits, the volunteers manage to convince most residence to transfer to identified evacuation centers for safety. Some volunteers faced the gruesome power of haiyan in order to save the lives of those people trapped in the streets. Relief distribution efforts of NGO & INGO’s were made easy because of the presence of the volunteers.

At present, the Barangay Volunteer Emergency Response Team (BVERT) of Santa Fe, Cebu is continually growing in numbers and in technical lifesaving skills such as scuba diving and high angle rescue.

The same program was replicated and impacted Gigantes Island, Carles Iloilo Province supported by Action Medeor and Germany’s Relief Coalition. A six (6) months long Community Based Disaster Preparedness and Resiliency Training program. Philippine Life Saving is encouraging other interested INGO’s to support the continued efforts in making the vulnerable island communities in the Philippines to be more resilient.(4)

References:
(2) Losorata, Jessica S., Santa Fe trains Lifeguard to boosts tourism, Sunstar Cebu, 13, July 2013
Responding to floods in low-income countries: the development of training materials for rescue and humanitarian organisations

Mr Darren Williams¹, Mr Tom Mecrow¹, Mr James Vaughan¹
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Disaster 1, Tekulur, November 5, 2015, 3:30 PM - 5:30 PM

The problem/ issue
Floods are the most prevalent natural disaster and the leading cause of natural disaster fatalities worldwide. Drowning is the leading cause of death during such events, accounting for 75% of fatalities.

The impact of drowning is felt most in low-income countries, where the ability to warn, evacuate, protect or rescue people from a flood is weakest.

Rescue organisations in low-income countries are often untrained and ill-equipped to deal with the immediate response, rendering them ineffective.

Humanitarian organisations operating in the post-flood environment are routinely deployed without adequate water safety training, putting their own safety and the safety of those around them at risk.

Aim of the presentation
The aim of the presentation is to describe the development of two training packages aimed at increasing the effectiveness and safety of rescue and humanitarian organisations operating in the flood environment.

Solution
The RNLI are a leading provider of flood rescue training in the UK, and have significant experience in responding to flood disasters.

The RNLI are in the process of working with partners to develop two training packages aimed at meeting the needs of those responding to floods with limited resources:

1) Flood Rescue: The RNLI have been working with the Bangladesh Fire and Rescue Service to develop and pilot a 2 day Flood Rescue training programme. Despite being responsible for flood rescue in Bangladesh, the service had inadequate formal flood rescue training.

2) Flood Safety: The RNLI have been working with Save the Children International to develop a 1 day Water Safety programme to ensure humanitarian responders are able to operate safely in a flood environment.

The programme has been piloted in Bangladesh with the help of Save the Children Bangladesh and Practical Action Bangladesh.

The training packages have been designed for a low-literacy setting, and include largely pictorial manuals and teaching materials.

Organisational outcomes
The RNLI and its partners better understand training needs of organisations in low-income countries operating in the flood environment, and have suitable training packages that can be implement to reduce risk and save lives.

Learning outcomes for attendees
Attendees will have a better understanding of the flood rescue and flood safety training resources for low-income countries, and how they have been developed.
Utilising a continuum of measures to reduce flood fatalities

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¹Risk Frontiers, Macquarie University, Sydney, Australia, ²Bushfire and Natural Hazards Cooperative Research Centre, Melbourne, Australia

Disaster 2, Serendit, November 6, 2015, 9:00 AM - 10:30 AM

This presentation provides an overview of the analysis of the social and environmental circumstances surrounding fatalities due to inland flooding, drawing on the global literature and research regarding flood deaths in Australia from 1900 to 2015. Key themes will be explored regarding demographics (age, gender), seasonality and circumstances surrounding the fatalities (e.g. factors around the decisions or actions which led to death). This analysis is fundamental to providing an evidence base for future disaster management policy, practice and resource allocation and to enable efficient and strategic risk reduction strategies.

Recommendations for disaster management policy and practice will be discussed, focusing on the need for an approach which accounts for a continuum of measures including regulation and incentive, education and awareness, structural intervention and consequence management. Possible improvements in each of these areas will be outlined for further consideration and assessment.
Disaster Resilience - A project to enhance Hotel Resilience and safer destinations for tourism

Jayne MacDougall
Le Meridien Phuket Beach Resort, Phuket, Thailand

Abstract- World Conference on Drowning Prevention
Presentation title:- Hotel Resilient - Strengthening the Resilience of the Tourism sector- A project driven by The United Nations Office for Disaster Risk Reduction, Pacific Asia Travel Association, Global Initiative on Disaster Risk Management, GIZ - with stakeholder and consultant involvement across the tourism and local government community.

Rationale
Recognizing that hotels have vast resources to deal with an emergency but generally do not deal well with a larger disaster event (1). This is an initiative to develop community resilience and resources and build systems and skillsets to enhance resilience to disaster.

Aims and Objectives
To create a toolbox of guidelines developed by professionals and introduce a consistent, replicable, auditable system to support the low cost implementation of Disaster Preparedness measures to increase the resilience of hotels to disaster, reduce the impact of disasters and minimize the “downtime” and loss (human and financial) associated with disasters. This would also mean that tourists or visitors to an area have a safer experience as a guest / visitor.

Target group
Hotels Small and Medium Enterprises (SME) that lack access to resources and have limited or no access to specialists.

Target area

Implementation
The organizing committee works closely with the stakeholder group that includes tourist organization representatives, hotel representatives, Risk management specialists from within hotel chains, government representatives. This project is in the development phase and aims to use the expertise of hotels that have good and tested disaster preparedness to follow the project to implementation.

Currently in the development phase
Le Meridien is a model for an active “Hotel Resilient” program in place- we note that we are prepared for many kinds of incidents and emergencies of a minor to extreme nature. We have built resilience and training into the daily life of employees- developed professional lifeguard programs, training to staff in first aid and emergency care, have a well-developed Hotel Incident Management Structure, manuals and guidelines with regularly updated critical data and conduct regular and frequent training exercises, drills and simulations to keep our team on their toes and current and confident. The preparation is for natural disasters and includes threat and terrorism and biological crisis.

Discussion
From research into this topic(2) and presentations at the World Conference on Disaster Risk Reduction in Sendai, it was noted that the business sector are interested to work together with regard to Disaster Risk Reduction. In general SME’s lack access to these resources and do not allocate funds to use in this manner. It was noted that strategies do not cost a lot of money, but need to be consistent and directed to maximize the outcome. This means that the same types of signage, the same way of communicating with the guests, the same training packages for staff, consistency of trainings for lifeguards, first aiders, etc. would not only be a useful tool but would allow the traveler to more easily fit into the safety environment and understand evacuation points, and other messages the hotel or business is trying to convey.

This program will allow hotels to self-audit, to seek support, to offer support to others, to have more control over the risks inherent to their destination. It will eventually, we hope, offer external audits or certifications.

The attractive features of the program are its portability and low cost for implementation, that it is developed by professionals and therefore avoid the high costs to small hotels wanting to develop their own programs.

References
1. UN Global Assessment Report in 2013 “From Shared Risk to Shared Value: the Business Case for Disaster Risk Reduction”
The impact of tsunami in the Indian and Pacific basin over recent years has been staggering. The 2004 Indian Ocean tsunami resulted in more than 220,000 deaths, and the 2011 Japan tsunami saw more than 15,000 lives lost. The risk of similar tsunami events exists year round.

The Joint Australian Tsunami Warning Centre (JATWC) provides warnings of impending tsunami to minimise loss of life and damage. The Australian Tsunami Advisory Group (ATAG) faces a challenge to educate the public about the low-frequency, high-impact tsunami threat, the warning system and where to find accurate information.

In 2011, the Australian Federal Government launched the National Strategy for Disaster Resilience. It stated resilience is not solely the domain of emergency management agencies; rather, it is a shared responsibility between governments, communities, businesses and individuals. The purpose of the strategy is to provide high-level guidance on disaster management to federal, state, territory and local governments, business and community leaders, and the not-for-profit sector.

Under the auspices of this strategy, ATAG developed a national community education strategy to improve awareness of tsunami. Key elements include:

- The Australian Disaster Forum

Managed by Surf Life Saving Australia (SLSA) under ATAG and in collaboration with all jurisdictions, the toolkit is comprehensive and accessible. It provides nationally consistent information to improve awareness of the tsunami threat, warnings and preparedness to foster community resilience to the hazard.

There was not a comprehensive online source of tsunami information with an Australian focus. Tsunami: The Ultimate Guide fills this information gap, and, with its ATAG imprimatur, it is the authoritative reference for tsunami in Australia.

The project demonstrated a partnership between government and key stakeholders in all jurisdictions to develop, promote and enhance national disaster resilience resources for tsunami. Managed by SLSA, the online resources were designed and created through an iterative collaboration process with ATAG. It brought together scientific experts, government, emergency practitioners, community organisations and publishing professionals to create a resource that provides authoritative, nationally consistent information that is innovative and appealing.

The education strategy recognised that public awareness information must be web-based and easily accessible. Tsunami: The Ultimate Guide presents free, open-access information in a highly visual manner with an emphasis on videos, interviews, animations, maps, interactive photo slideshows and graphics. The design concept focuses on visual elements and limits the text to accessible pieces, which ensures the material is understandable by school children and adults alike.

The guide fulfils two roles. It provides an overview of tsunami and each resource is individually downloadable for use by teachers or school children and also for dissemination by emergency services or community organisations via social media and other websites.

Tsunami: The Ultimate Guide is recognised as an example of best practice in disaster resilience community education. In 2014, it received a Resilient Australia Award (Highly Commended in the Projects of National Significance category) and the Australian Geography Teachers Association awarded the Guide a Highly Commended in the digital category.

The Guide was produced in a national framework and the material created in a format that can be replicated across other hazards. Lessons from this project could assist other jurisdictions (in particular developing nations at risk of tsunami) to implement best-practice community awareness programs to assist with increasing disaster resilience.
Child’s Rights to Drowning Prevention and Participation in Disaster Risk Reduction Management

RSW Danielle Saique¹

¹CSWDO and AKAP-BATA, Philippines, Brgy Burol-2, Dasmarinas City, Philippines

Disaster 2, Serendit, November 6, 2015, 9:00 AM - 10:30 AM

Introduction
Philippines is a disaster-prone country where the strongest tropical cyclone typhoon “Haiyan” (Yolanda for local) was ever-recorded on November 6, 2013. The tsunami-like Haiyan killed more than 7,000 people and swept-off dwellings, trees and hurled buildings and ships by his 7-feet waves from the sea. Drowning of children is seen as the 2nd. leading cause of death among the children in the Philippines. This paper reveals more or less 10,000 children die yearly from drowning and 35.6% of them are ages 0 to 12 years old. Since children are the victims, there is a need to exercise their rights to participation to save their dear, innocent, vulnerable, young and precious lives.

Objectives
1. Sustain the creation of child-based disaster risk reduction management of drowning prevention.
2. Decrease vulnerability of children to drowning by increasing life saving capacity such as swimming activities, emergency drills, rescues, etc.
3. Increase safety nets, provision of life-saving equipment and skills preparedness of children in the events of emergencies, natural and man-made disasters and in the evacuation centers.

Scope/Limitation
Group participants: Day care children ages 3-4; their siblings (ages 5-12); Day Care Workers; and parents in the service areas of the local City Social Welfare and Development Office (CSWDO) of the City of Dasmariñas and in the various projects of AKAP-BATA in Metro Manila.

Methodology
CSWDO and City Health Offices tied-up in their life-saving programs and services created the “Child–Based Disaster Risk Reduction Management” by integrating it to the Early Child Care and Development (ECCD) curriculum through its on-going Day care activities and incorporated with the City Disaster Risk Reduction and Management Coordinating Council (CDRRMCC) as the implementing arm of this program.

Findings/Assessment
1) More or less 10,000 children ages 0-12 were drowned from: floods caused by typhoon and flash flood; pail drowning and unguided swimming activities in the pools, rivers, beaches and seas.
2) Children drowning happened in floating communities along the straits or seashores because as early as 4 y/o, the parents engaged their children in collecting floating plastic trashes as means of livelihood thru recycling.
3) Drowning incident of children is attributed to poverty, lack of saving life skills and lack of life-saving equipments.
4) Life-saving is a lesser conscious effort of the adults, society and the government.
5) In the National Capital Region, millions of urban poor families reside in shanties located at the river banks, dams, open canals, creeks, “esteros”, etc ...
6) In Mindanao and Visayan Regions in the south, floating houses are the usual scenery especially those “Badjao” communities.
7) 75% of 100 million Filipinos are living below poverty line and most of them are informal settlers in urban poor and rural poor communities along rivers, lakes, canals, creeks and open seas.

Conclusion/Recommendation
Drowning prevention for children is a major concern of the Stakeholders by emphasizing child protection from drowning and child participation and protection of their rights to save life. Child’s Rights is being guaranteed by the United Nations Convention on the Rights of the Child. Philippines is a signatory of the UNCRC. Philippines is therefore obliged to protect more than 40 million Filipino children by strengthening further the child-based disaster risk reduction management in drowning prevention in the provinces, cities, municipalities down to the day care centers in the local areas.

References
1) Safety Kids, Philippines
2) Citizen’s Disaster Response Center, Philippines
3) AKAP-BATA, Philippines
4) DSWD, Philippines
5) Child’s Rights (UNCRC)
Drowning mitigation in swift water situation at Parana State, Brazil

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Disaster 2, Serendit, November 6, 2015, 9:00 AM - 10:30 AM

According to the intergovernmental climate change panel, the world temperature will increase up to two-Celsius degrees in one hundred years. The higher global temperature probably going to cause extreme weather scenarios like flash floods. Urban growing and soil impermeabilization are others important factors associated to the swift water phenomenon, as inordinate city growing too. All of those scenarios facility the human susceptibility to the natural disasters. Parana shore, South Brazil, is too much susceptible to flash floods according different factors: there are a lot of mountains and rivers in the area and a high-standardized precipitation index. A research realized at the local fire department data base between 2005 January until 2015 March, have shown that third one (31) people died from drowning in swift water situations (floods or not) in Parana shore rivers. The average is three persons each year, almost all of them in the same town, Morretes.

For a long time, in Parana shore, there was not countermeasures systems like: monitoring, alert and alarm system to predict flash floods. In 2011, a big disaster happened in the area, when landslides and floods hit the local population, while the authorities and community were not completely prepared for that. As a result, studies and researches were realized and many disaster mitigation improvements started:

1) The Parana Civilian Defence partnership with Estate Meteorological Institute developed a precipitation and hydrological monitoring system. Currently, in the state shore, there are twenty seven (27) monitoring stations, providing real time information;
2) Also, the Parana Civilian Defence created the web tool On Line Contingency Plan; the municipalities are able to insert all of disaster relevant issues and possibly answers in these plan;
3) Three: The cities strengthened their local Civilian Defence by low;
4) Four: All of flash food susceptible areas were indexed on contingency plan.

The Parana shore fire department is the regional civilian defence agency and for this reason, implemented important actions to drowning flood mitigation:

- Swift water technical equipment’s were acquired;
- Half of personal had specific swift water training;
- A flood alert and alarm protocol was created;
- Flash floods risk areas are signalized.

All of these actions certainly keep contributing to flood drowning mitigation in Parana Shore. However, the present scientific article identified some good practical to decrease flood drowning like:

- Community education and sensitization improvement;
- More public information about the flash floods risks;
- And Community risk areas training.

Finally this article, bring some relevant information about floods drowning. For many years, the local authorities and population only carry about ocean drowning, now we propose a new point of view about flood and flash floods drowning, over view the mitigation.
National Alliance for Aquatic Safety & Disaster Preparedness (NAASDIP): A Civil Society Organization for Drowning Prevention Capacity Building in Mindanao, Philippines

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Disaster 2, Serendit, November 6, 2015, 9:00 AM - 10:30 AM

The continuing deaths in thousands due to drowning in floodwaters caused by typhoons in Mindanao and Visayas regions of the Philippines, notwithstanding the passing of Republic Act (RA) 10121 adopting a comprehensive disaster risk reduction & management (DRRM) plan for the entire country, indicates the continuing incapacity of the state and local government units (LGUs) to put in place sustainable programs designed to reduce vulnerabilities of people in high-risk communities from deaths due to drowning in the onslaught of disasters.

Philippine LGUs have not yet to fully implement efficient disaster preparedness, raising probability of loss of life in disaster-stricken communities to higher levels (Norwegian Refugee Council, 2013). Moreover, deaths from drowning caused by maritime disasters have risen to an estimate of 4,341 from 1980 to 2013 (Wikipedia, 2013). Recently, on July 2, 2015, 36 people died from drowning when a boat capsized in Central Philippines (Francisco, July 3, 2015), and later the fatalities rose to 61 (Napallaoan and Gaviota, July 7, 2015). Meanwhile, death from accidental drowning especially among children has retained its high statistics as reported in 2011.

In recognition of the foregoing, RA 10121 and other Philippine national policies have provided mechanisms for civil society organizations to participate in DRRM activities, particularly in building capacities for disaster preparedness and drowning prevention through advocacy and water safety training.

In consideration of these premises, this paper intends to highlight the development and participation of a civil society/volunteer group, the National Alliance for Aquatic Safety and Disaster Preparedness (NAASDIP), currently operating in northern Mindanao, Philippines in implementing skill-based disaster preparedness and response programs to capacitate people in communities – adults, children, men & women – to survive and save themselves from drowning during floods, storm surges and under normal conditions. Moreover, this paper aims to bring to the fore and to humbly share NAASDIP’s experiences and achievements thus far in its efforts to teach people simple yet effective techniques in drown proofing in times of disasters and accidents under normal conditions.

NAASDIP, a non-stock, non-profit civil society organization registered with the Philippine Stock Exchange Commission with its Certificate of Incorporation issued on August 26, 2014, is founded and headed by Dr. Cesar T. Miguel, a Royal Life Saving Society Australia-trained Bronze Medallion Instructor of Philippine Life Saving and currently a sports and safety education professor of Mindanao State University-Iligan Institute of Technology in Iligan City, Philippines. Its Board of Directors and members is composed of professionals and students well trained in water safety, swim for life, flood survival/rope rescue and in sea rescue.

NAASDIP has three (3) core programs which are as follows: a) Training of Trainers with 9 competency-based modules from basic water safety to flood and sea survival & rescue; b) Water Safety Program for Everyone with 5 modules from children's swim for fun, recreational aquatics, to flood & sea survival & rescue; and c) Community Extension. In the future, NAASDIP intends to take part in community-based safety and disaster preparedness program, rescue skills competitions (rescuelympics), and research & field studies in various areas of drowning prevention and disaster preparedness.

The organization has conducted competency-based training on water safety, flood survival & rescue to its own members and to personnel of member industries of the Iligan Bay Chamber of Industries (IBCI) as well as to college students of various schools in Northern Mindanao, Philippines in partnership with the Disaster Risk Reduction & Management Office of Iligan City, the Philippine Coast Guard and the Philippine Coast Guard Auxiliary. Also, in partnership with other civic organizations, NAASDIP has extended advocacy and non-competency trainings to barangay/community residents teaching them among others, how to do survival swim, rope knots and slips to save themselves and others from drowning during floods including use of readily available things as flotation devices. It prepares to enter into agreements with tertiary schools for an outcome-based teaching of water safety and flood survival.

Key Words:
NAASDIP, civil society, capacity building, drowning prevention, Northern Mindanao, Philippines

References


Personal Tsunami Survival Story and Proposal of the “Uitemate” (“Float and Wait”) Method for Drowning Prevention

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Disaster 2, Serendit, November 6, 2015, 9:00 AM - 10:30 AM

The Great Eastern Japan Earthquake occurred on March 11th, 2011 at 2:46 p.m. Its magnitude was recorded at 9.0. This was so strong that some Japanese seismologists labeled it a “Once in a millennium” event. The earthquake triggered powerful tsunami waves, recorded at heights of up to ten meters. The waves reached the eastern coast of Japan, mainly in the Tohoku region, approximately an hour later. Nearly 20,000 people perished or are still missing. Over 400,000 residences were severely damaged by the tsunami. The World Bank believes that the financial loss incurred is the largest amount of any disaster in history.

My wife and I were working in an office near the shore, when the earthquake, lasting three minutes struck. After the earthquake people started fleeing to safety, feeling relieved upon reaching what they considered a safe place. Few gave consideration to the tsunami that was to follow. Within an hour, the waves had inundated our town.

When the tsunami hit, my wife and I gave little heed to our office building, held on to the floating debris, and ended up going about seven kilometers upstream. We were seriously injured, but fortunately still alive. Many others who fled the tsunami did not survive. This caused me, like many others who lived, to suffer from “survivor’s guilt”.

As a tsunami survivor, I humbly submit a new method of drowning prevention. In Japanese it’s called “Uitemate”. Its English translation is: “To float and wait.” It does not require special equipment or a high level of swimming ability. Education in it can help ordinary people, children, and the elderly to survive water disasters. I will explain this method in further detail in my presentation.
Can a lack of domestic water trigger an imminent drowning disaster?

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Poster Session 1, Poster Foyer, November 4, 2015, 9:00 AM - 5:15 PM

In 2012, drowning was responsible for 6,369 deaths (3,3/100,000 inhabitants) and was the second leading cause of death for children aged 1 to 9 years old, 49% occurring at home. Domestic aquatic environments, in and around the household, were responsible for 1,4% of all deaths and 56% of those occurred in children aged under 9 years old.

Although Brazil is known to have one of the largest water resources in the planet, the treatment for human use and the distribution of this water to where it is most needed has never been efficiently achieved. Population is used to the concept of having a water container and cistern to store water, but just enough to meet their daily needs.

Summer season in Brazil is known to be a rainy period but, the southeast region of Brazil, the most rich and populous area, has suffered a summer trough in 2015, the most sunny and torrid weather of the last 87 years. The lack of water for consumption was never assumed or informed by the government, despite the warnings of the scientific community since 2006. The result is that 80 million people are not getting enough water to meet their basic daily consumption and a new risky behavior is becoming prevalent. People, especially from low-income settings, started storing water in buckets, sinks, bathtubs, water-tanks, wells and other sorts of recipients.

This new behavior of storing water in and around house can trigger a disastrous increase in the number of drowning deaths, since the officials aren’t communicating any warning or safety measures regarding how people should deal with this constraint and to prevent drowning in this circumstance.

Children, especially those under 5 years old, explore their homes to discover their world, learning how to move and walk and they are particularly curious and attracted by water. This combination of lack of experience to evaluate the risk and their curiosity about the water is the recipe for disaster – putting them at great risk of domestic drowning.

Parents need to be warned to the risks of this new behavior and the way to prevent them. Taking these elements in consideration SOBRASA has started a “drowning warning campaign” where messages were disseminated in 3 different ways adjusted to different domestic locations and especially targeting children under 5 years old through their parents. The message common to all is: Pay 100% attention to your child while bathing and near any water recipient; keeping them at an arm distance.

**AT-HOME**

Any bucket, basin, bathtub, small pool, water-tank and other water recipients should be covered or kept empty.

Occlude the access to any water storage by closing doors and using fences with self-locking gates.

Occlude the access to the outside

**BACKYARD**

Occlude the access to any pool, water storage, nearby stream and ponds, by closing doors, using fences and self-locking gates.

Keep any cistern, water tank, and other water recipient covered and fenced or empty.

Avoid toys and other attractive objects for children inside or near water.

The only safe flotation device is a LIFEJACKET – be careful!

Teach your child how to swim but understand that swimming is not drown-proof.

**POOLS**

Occlude the access to pools using fences and self-locking gates.

Suction – Avoid it – Provide ways to turn off the pump while using it and have an anti-hair drain.

In case of pool parties, elect one shift for each parent as the water safety keeper for children

If prevention fails, ought to learn for free how to act when a drowning happens at Sobrasa.

http://www.sobrasa.org/curso-de-emergencias-aquaticas-10-h/
National Security Force’s role in mitigation of aquatic disasters in Brazil

Specialist Arthur Vieira\textsuperscript{1,2,3}, Dr., MD David Szpilman\textsuperscript{2}
\textsuperscript{1}Military Fire Department of Paraíba, João Pessoa, Brazil, \textsuperscript{2}SOBRASA - Brazilian Lifesaving Society, Rio de Janeiro, Brazil, \textsuperscript{3}National Public Security Force, Brasilia, Brazil

Poster Session 2, Poster Foyer, November 5, 2015, 9:00 AM - 5:15 PM

The tropical climate, the immense aquatic extension, the alarming number of recorded drownings in the country and the impossibility of providing water safety at major events and disasters, reinforce the importance of federal government intervention. In 2012, drowning was the second leading cause of death in children 1-9 years old and the third in people aged 10 to 19 years, in Brazil. Nearly 6500 people die each year by drowning, averaging almost 18 deaths/day. Brazil has hosted several major events, attracting a significant number of visitors.

As relevant events we highlight the World Youth Day that, in 2013, gathered more than 2 million people at Copacabana’s beach (Rio de Janeiro) to attend the Holy Mass held by the Pope. The Fire Department rescued 304 people from drowning along the 5 days of the event. During the FIFA World Cup (2014, Brazil), 15.2 million of people circulated in Brazilian airports – an increase of 132% compared to the same period in 2013. Additionally, there are the permanent events of the calendar, such as New Year’s Eve, that in 2015 gathered more than 2 million people at Copacabana’s beach alone; and the carnival, attracting 1 million tourists and gathering more than 5 million people in the city. Our next event will be the Olympics (2016), which has the expectation of receiving 1 million foreign tourists in the city of Rio de Janeiro. Among the constitutional duties of the state, are the protection and the defence of its citizens. One of the agents responsible for ensuring such duty is the Fire Department.

The National Security Force was created from a federal agreement between the States and the Federal Government, in order to meet the demands of the State, to support any atypical event that exceeds their individual capacity. It’s composed of military from the Brazilian states, which receive specialized training to operate in disasters.

Because of the World Cup event, 111 lifeguards from 18 Fire Departments were asked to perform a centralized retraining in the capital of the country, requiring 110 hours to address the issue concerning the training of lifeguards and were sent to the Rio Grande do Norte State, during the period of the event, as requested by the state’s government, in order to strengthen the lifeguards contingent.

During the period from 8Jun to 13jul2014, there were 5,259 preventive actions and 55 rescues. The figures compiled during the period of permanence of National Force’s lifeguards, show a very significant increase in the number of preventive actions, which resulted in a significant reduction of drowning cases. During the 35 days of operation, the number of preventive actions was 98.18% higher than the same period of 2013, with more rescues (+90.9%), culminating in a reduction of 71.42% drowning deaths. 81% of the cases were attended by the National Force, while the remaining were attended by the Rio Grande do Norte Fire Department. Resources involved: 13 vehicles, 5 quads, 3 IRBs, 100 pairs of flippers, 100 rescue floaters, 10 binoculars, 50 sunshades, 25 radio communicators, 7 mobile phones. The coastal extension of operation comprised 145km, divided into 19 observation posts.

Through this work we demonstrate how the National Force can take on an important role, given the difficulty of timely response from the government, towards events that overtake their capacity of human and material resources, and in particular concerning to water safety.
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