Helping to prevent drowning at sea: understanding common factors in fatal incidents

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The RNLI’s Operations Research Unit commissioned this research to understand the causes of fatal incidents at sea. The research identified common issues in fatal incidents across 11 activities, and outlined interventions for tackling these issues. This research supports the RNLI’s commitment to halve coastal drowning in the UK and Ireland by 2024.

Summary

The RNLI aims to halve coastal drowning in the UK and Ireland by 2024, and to reduce drowning around the world where it’s a major risk.

Our Community Safety Team helps to achieve this by understanding the causes of fatalities, how to prevent them and how to improve survival chances. This paper summarises analysis of 390 fatal incidents from 2010 to 2013 involving 11 activities in the UK and Ireland. It also identifies interventions that could prevent deaths.

Research aims and objectives

Previous research analysed fatal incidents across 11 different activities to understand incident causes, who is most at risk, survival factors and locations. The activities were: commercial fishing; angling from the shore; walking; waterside and in-water play; powerboating; dinghy sailing; accessing yachts; yacht sailing; kayaking/canoeing; swimming and youth (under 19 years old).

The objectives of this, subsequent research, were to:
• draw out similarities and differences across the 11 activities
• identify examples of drowning prevention interventions addressing common issues.
Research methods and approach

The research used information from the RNLI’s Fatality Recording Database. It identified common issues between activities regarding:

- casualty and activity profile
- time of day, week and year
- causes and environmental factors
- factors affecting survival and rescue.

The research then explored drowning prevention in the UK, Ireland and internationally, and survival products that could address some of these issues, thus saving lives at sea.

Key findings

Casualty profiles
The research found a number of similarities in the profiles of casualties across all the 11 activities:

- MOSTLY MALE
- MANY AGED OVER 55 YEARS
- IN GROUPS OF FAMILY AND FRIENDS
- THE MOST COMMON SEASON IS SUMMER
- OFTEN AT WEEKENDS

There were similarities across some of the activities, including:

Swimming and waterside and in-water play:
- male and female participants
- often part of a group
- during the summer and throughout the week.

Angling from shore and commercial fishing:
- all male
- usually part of small groups
- similar levels of experience.

Small sailing boats and yacht sailing (access):
- all male
- typically aged more than 35 years
- were mostly experienced
- occurred throughout the week
- mostly occurred in small groups often friends.

The marina, slipway, dock and port as a location
These locations were the third most common areas for incidents. Many casualties were undertaking craft-related activities, were walking, or were youths. Frequent causes of incidents in these areas were:
- falling into the water when walking/waterside
- man overboard and craft capsizing while accessing vessels;
A number of these people who died were under the influence of alcohol.
Key findings

Environmental conditions and participant error

Low water temperature can increase the risk of cold water shock and fatigue. The sea state and sea swell were normal in most cases, and most casualties were experienced and familiar with the area. Risk-taking behaviour, use of drugs and alcohol were not cited as contributing factors to the deaths across most of the activities.

Common causes of incidents

Some common causes of incidents have been found among groups of activities:

• Craft-related activities: Common causes were man overboard (for mostly bigger crafts such as yachts and motor cruisers) and capsize of craft (for mostly smaller boats such as dinghies and tenders).
• Angling from shore, swimming, waterside and in-water play: Most of these fatalities were swept into or away by the water (by high waves or rip currents), or they were overcome by crashing waves and/or fatigue.
• Walking: The most common cause (51%) was falling from cliffs.
• Medical: Medical episodes, such as heart attacks, were reported for small sailing boats (44%); yacht sailing (36%); powerboating (18%); swimming (16%); kayaking or canoeing (13%); and walking (11%).

The extent to which the medical episode was the cause or result of an incident was unknown in most cases.

Other common points:
1. Being alone, alcohol and night time
In most activities, the casualties were not under the influence of alcohol, apart from some people walking and some young people. In particular, many of the people walking and youth fatalities were both alone and under the influence of alcohol. Most people who died while alone and under the influence of alcohol, died during the night time.

Difficulties in self-rescue and rescue by others

In some activities a high proportion of people who died were initially incapacitated (ie due to an injury), limiting their ability to rescue themselves. These activities included small sail boating, yacht sailing at sea, powerboating and walking. Many casualties took no action after entering the water and quickly disappeared. Age, being alone, cold water shock, fatigue, failure to right a capsized craft or to get back into a craft, and lack of a personal flotation device (PFD) limited self-rescue and rescue by others.

Average water temperature was below 15°C for all activities when fatalities entered water.

Injured fatalities that fell into the water often took no action and quickly disappeared under water.
Key findings

2. Being alone and no means for calling for help
Most people who were alone had nothing with which to call for help and were reported as unwitnessed (no one available to raise the alarm), apart from swimming incidents (as those who died were often swimming in public places).

3. Tenders for accessing sailing and power boating
Ten fatalities involved a tender, four accessing powerboats and six accessing yachts. Half involved capsize. Others were due to man overboard, leaking/swamping/sinking, medical illness, and the cause of one was unknown.

All the casualties from incidents involving tenders were male and over the age of 55 years.

Geographical locations

No particular hotspots were found for walking and youth fatal incidents, occurring across the UK. Some hotspots for other activities are shown here (right).
Interventions and products to address common issues

The second objective of this research project was to identify examples of drowning prevention interventions that address common issues. This section lists a number of potential interventions identified by the researchers.

Reduce drowning deaths

The Talk campaign
The Talk is an Australian national public awareness campaign designed to address drowning causes and risks for older people. It encourages older people’s relatives to talk to them about five main points: 1) know your limitations, 2) be aware of medical conditions, 3) no alcohol around water, 4) wear a lifejacket, and 5) learning lifesaving skills. The campaign involved water safety and lifesaving lessons (targeting people aged 55+); first aid classes, and launched the Adults Learn to Swim programme.

Stay on Top of It
This American programme aimed to increase lifejacket usage on boats, docks, beaches and swimming pools, and improve water safety awareness. It involved publicity (on television, radio, adverts etc); written materials (a booklet; factsheets etc); promotions (interactive displays at special events, discount coupons for life vests); and Life Jacket Loaner programmes.

Open Water Wisdom campaign
This campaign focused on promoting the use of PFDs. It provided promotional and educational materials to rural communities in Canada. In addition, they distributed lifejackets via community stakeholders to reach the most at-risk groups.

PFD/Life Jacket Loaner programme
Over 40 different state agencies and boating organisations set up Life Jacket Loaner programmes across America. The programme involves the provision of lifejackets for free, to members of the public. It’s reported that at least 24 children’s lives had been saved by use of loaned PFDs and increased use of lifejackets.

Promote safe alcohol behaviour

Don’t Drink and Drown
The UK campaign focuses on the risks of young people walking home at night and accidentally falling in. The campaign included print advertising; outdoor advertising; responsible service of alcohol training for sporting clubs; Don’t Drink and Drown promotions through pubs and clubs; exposure to Don’t Drink and Drown through interactive activities at community and sporting events; education sessions for Year 11 and 12 students.

Don’t Go Overboard with the booze
This New Zealand campaign raised awareness of the dangers of boating while under the influence of alcohol. It involved advertising safety messages on the media (radio, television, newspapers and so on). The campaign reported greater public awareness regarding the risks and changes in consuming alcohol while boating.
Interventions and products to address common issues

**Increase safety in harbours, marinas, docks and ports**

**Public Rescue Equipment (PRE)**
There are many examples of PRE being installed in harbours, marinas, docks and ports to aid self-rescue, including:
- liferings
- escape ladders, slipway or steps
- chains/ropes for access to ladders.

**Improve edge protection and falls prevention**

**Waterside risk assessment**
The Royal Society for the Prevention of Accidents conducted a water safety review for the City of York. The review identified methods to prevent falls including:
- clear paths and routes; lighting to improve visibility; warning signage; and edge protection
- PRE to allow self-rescue, such as lifebuoys, grab chains and escape ladders; along with regular inspections of PRE.
This intervention also prompted improved awareness of drowning hazards, through water safety and rescue training of staff in local businesses; awareness campaigns; launching of a Don’t Drink and Drown campaign; and supporting Street Angels patrols.

**Supporting survival, self-rescue and rescue of others**

**Personal locator beacons (PLBs)**
PLBs allow individuals who are in water and far from shore to call for help. The devices transmit signals that are picked up by satellite. They can locate the exact position of the individual in distress and relay the alert to the nearest rescue coordination centre.

**Man overboard recovery cradle**
This allows rapid and safe recovery of a person who has fallen overboard. It works as a scramble net, stretcher and a boarding ladder too. It allows casualties that are in the water to be quickly and safely rescued.

**Paddle float for self-rescue**
A paddle float can be attached to a spare paddle and used as a self-rescue product. They allow people that are struggling to get back into their vessel after it capsized. The paddle float provides stability of the tipped boat.
Medical episodes

Automated external defibrillator (AED)
An AED can analyse whether the individual requires an electric shock to restart their heart. If an electric shock is required, the AED has a shock button, which the rescuer pushes. AEDs are easy to use, lightweight, and users do not need to be trained.

Royal Yacht Association (RYA) First Aid Training
This example of first aid training is a one-day training course, designed to prepare boaters to apply first aid skills while on a vessel, until medical assistance arrives.

How the RNLI is using the evidence

The RNLI is using the findings to guide the development of lifesaving interventions.

Further reading


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Alexandra Michalaki, Michael Wright, Bruntha Pirapakaran

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