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International Life Saving Federation World Drowning Report 2007

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SPECIAL SECTION

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International Life Saving Federation World Drowning Report

2007 Edition

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The International Life Saving Federation (www.ilsf.org) is the global confederation of national nonprofit lifesaving organizations.

Preface: The International Life Saving Federation

The International Life Saving Federation is a global, non-profit federation of over 100 national lifesaving organisations around the world. The Federation (ILS) leads the worldwide effort to reduce injury and death in, on, or around the water. The goal of the ILS is *world water safety*™. The ILS pursues this goal through the work of its member lifesaving organisations and by

- Identifying and developing drowning prevention strategies
- Publicising and encouraging implementation of effective drowning prevention measures
- Exchanging information and research
- Conducting international educational congresses
- Establishing lifesaving organisations in areas where none exist
- Developing lifesaving through lifesaving sport
- Cooperating with other international bodies with shared goals

The Lifesaving Commission

The Lifesaving Commission (one of three ILS commissions) works to reduce the incidence of drowning and aquatic injuries throughout the world through

- The development of organised lifesaving in areas of the world where it does not exist
- Support for existing lifesaving organisations
- Support for standardised public information and education
- Tracking the incidence of drowning throughout the world and publishing this data
- Development and identification of best medical practices
- Reviewing, identification, and development of best practices in rescue
- Identification of best practices in the training, staffing, and equipping of lifesavers

The Drowning Report Committee

The Drowning Report Committee is one of five sub-committees of the Lifesaving Commission. The Drowning Report Committee's mandate is to track incidents of drowning and water-related injury and publish this data in the ILS World Drowning Report, thereby targeting areas of need and the importance of drowning prevention.

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Section 1: Executive Summary

The ILS World Drowning Report

This is the first ILS World Drowning Report. The report aims to

- Define the current global drowning problem
- Identify the current state of drowning mortality data collection
- Provide strategies to enhance and encourage better data collection
- Provide opportunities for global learning from case profiles of countries with well-developed reporting systems and mechanisms

The ongoing goal is to improve the quantity and quality of data collection. Most importantly, ILS intends that this report and its successors will assist in the development of intervention strategies to employ scarce resources toward the most effective drowning intervention strategies. The ultimate goal is a meaningful reduction in the incidence of drowning worldwide.

What Is Known About World Drowning?

In our world, things seem not to count unless they can be counted. Unfortunately, the collection of drowning data is a formidable challenge. Many countries do not have complete or reliable data on drowning fatalities. There is no data for many countries and regions—even from developed nations. As well, since the reliable data that is available excludes cataclysms, suicides, etc., tens of thousands of drowning deaths are not included in existing figures.

Currently, the World Health Organization (WHO) collates the most comprehensive global data on drowning mortality. Even while acknowledging that drowning deaths are significantly underreported, WHO identifies drowning as the third leading cause of unintentional injury death after motor vehicle collisions and falls. The World Health Organization estimated 409 272 people died from drowning in 2000,[1] and 382 000 in 2002.[2]

The drowning trends, factors and high-risk groups identified from the data from the 16 ILS Member Organisations represented in this report are consistent with those of the World Health Organization *Factsheet on drowning*.

Conclusions and Recommendations

Drowning is a serious threat to world health. United Nations world population projections mean we can anticipate that the drowning problem is going to get worse without significant intervention, especially in developing countries.[3] As the *world water safety* organisation, the International Life Saving Federation has an obligation to take a lead role in defining and articulating the drowning problem.

The International Life Saving Federation will provide leadership in communicating the nature and scope of the world drowning problem and provide guidance to Member Organisations, governments and partners concerning solutions to the drowning problem. Counting victims does not save lives or reduce drowning—but understanding the magnitude of the problem and identifying the risk factors does allow ILS to provide effective prevention actions to the highest risk populations, locations and activities. The International Lifesaving Federation plans to publish its World Drowning Report with regular frequency. ILS will work with its Member Organisations and others to initiate data collection where none exists and to improve the quality of data collection where it does exist.

In many countries drowning is a significant problem, but countries are not able to provide accurate counts of these deaths. Even so, the ILS World Drowning Report 2007 and subsequent editions will assist Member Organisations in deploying scarce resources for the most effective drowning intervention strategies aimed at high-risk target groups. The ultimate goal is a meaningful reduction in the incidence of drowning worldwide.

The International Life Saving Federation should adopt intervention models that can be used by its Member Organisations to raise awareness about measures that can be taken to provide proactive water safety programmes. Such models can include the World Health Organization's principles for drowning prevention identified in its *Factsheet on drowning*, and the "drowning chain" under development by the ILS Rescue Committee.

Prevention programmes should encompass strategies to address the needs of high-risk target groups and focus on

- Environmental modification: removing hazards or creating barriers
- Protecting those at risk: promoting change in risk-taking supervision; and promoting swim and lifesaving skills development
- Training the general community in water safety and resuscitation

Section 2: Introduction

Purpose

The International Life Saving Federation intends to publish its World Drowning Report on a regular basis. The report describes the magnitude of the burden of drowning based on best available data and modelled extrapolation.

ILS aims to increase the number of countries reporting drowning data in subsequent editions, and to encourage ongoing improvement in the quality and depth of data. The goal is to include, eventually, as many countries as possible.

ILS is prepared to provide the necessary advice and guidance to help Member and non-member Organisations and governments to develop reliable data collection programmes. The sharing and analysis of the data can assist and inspire optimal data collection and reporting methodologies worldwide. The ultimate goal is not merely to collect and report drowning data, but also to use the data to raise public awareness, to encourage and guide preventive initiatives, and to help ensure prevention efforts are effectively targeted.

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ILS will share its World Drowning Report with interested individuals, organisations and governments to provide the basis for strategic interventions to reduce drowning and water-related incidents. Identifying risk factors will allow focused public health initiatives to reduce drowning. This greater understanding of the burden of this injury will allow more effective approaches to saving lives. ILS believes that research, education and action each add value in the attack on the world drowning problem.

The collection of data on drowning deaths is a very challenging task. The International Life Saving Federation is grateful to the World Health Organization which provided data, expertise and encouragement to work as partners in the reduction of drowning.

The collection of data on non-fatal incidents is a considerably more challenging objective. ILS will not only count the victims but also promote the use of cohort and case study to enhance our understanding of aquatic injury and rescues. ILS will use contemporary scientific strategies in focused areas where knowledge is weak or lacking, to advance our understanding where confidence intervals are wide.

This inaugural ILS World Drowning Report reviews the current statistical data and literature on drowning mortality, and it provides an overview of research from 16 countries with ILS Member Organisations.

The report provides insight into the best available information from leading organisations such as the World Heath Organization, along with a summary of information collected from countries where reliable data were available.

The report is a first step in an ongoing and periodic process of describing the worldwide drowning problem. Regular publication of subsequent editions of the ILS World Drowning Report is important in keeping the drowning problem at the forefront of the world's attention. The International Life Saving Federation is committed to its role as the world water safety experts. Counting victims does not save lives or reduce drowning—but it does allow us to provide effective prevention actions to the highest risk populations, locations and activities. The ILS World Drowning Report 2007 and subsequent editions will assist Member Organisations in deploying scarce resources against the most effective drowning intervention strategies. The ultimate goal is a meaningful reduction in the incidence of drowning worldwide.

Scope

In analysing who drowns, it is important to define drowning. This report uses the definition adopted by the 2002 World Congress on Drowning (*Handbook on Drowning,* "Definition of Drowning," p. 46).[4] This is the same definition adopted by the World Heath Organization:

> Drowning is the process of experiencing respiratory impairment from submersion/immersion in liquid.

Outcomes of drowning may be: death, morbidity, or no morbidity. In other words, a person may die from drowning; be injured by a drowning episode; or escape from drowning through rescue or other means.

The ILS World Drowning Report 2007 focuses on drowning that resulted in death, because death is the most reliably reported outcome and because mortality data tend to drive public health policy. The report includes only information from countries from which reliable data could be readily accessed. "Reliable" means data published or endorsed by national governments.

This report presents drowning data for the year 2002 from the WHO Global Burden of Disease database (GBD 2002, V5)—the most recent estimate available from WHO—and summary data from the 2005 ILS survey (which represents 2003 data).

Methodology—The Data Collection Process

Data collection for the ILS World Drowning Report 2007 began with a survey of ILS Member Organisations to obtain an understanding of what data was available, how it was collected, and the key drowning issues within their jurisdictions. Data from 16 ILS member countries was accepted for this report. Many Member Organisations are doing excellent work in drowning prevention. Few are actively involved in the collection of drowning mortality data themselves or are aware of reliable sources for same. Some are recognised as a primary source for their county's drowning data. Others were able to provide direction to sources of reliable data, typically produced by government. Most ILS Member Organisations were unable to help.

A subsequent consultation with the World Health Organization confirmed that reliable injury data are scarce, and that many countries do not report at all. In its 2003 *Factsheet on drowning,* WHO relied on estimation, extrapolations and models as well as other published literature on the issue to give a global picture. Reliable data may be available from countries beyond those included in this report. Readers are encouraged to contact ILS with information that will expand future reports.

Section 3: Counting the Dead—The Challenge

Most reports on drowning injury note the difficulties and unreliability of data collection in developing countries. The 2003 WHO *Factsheet on drowning* notes that although mortality data is difficult to find, morbidity data is almost absent from most low- and middle-income countries.

The UNICEF/TASC (The Alliance for Safe Children) 2004 Report *Towards a World Safe for Children* notes,[5]

> It has become very clear to both UNICEF and TASC that there is a lack of representative data for injuries in most countries outside the developed world. Data that is available is usually unreliable. Most available data in developing countries comes from hospital-based reporting, counting injury deaths at a hospital, which does not reflect deaths at the community level.

The report further notes that many of the differences in reporting of drowning mortality are not small or incidental, but rather quite large, with significant policy implications regarding potentially mis-targeted resources.

WHO incorporates information from various data sources to develop internally consistent estimates of incidence. However, reporting is low from many low- and middle-income countries. WHO receives death registration data from 115 countries

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Table 1 Global Coverage of Death Registration Data (WHO presentation: "Mortality and causes of death")

	Developed countries	Sub-Saharan Africa	Latin America	Middle East	Asia and Pacific	Total
Data available	55	4	29	9	18	115
Data not available	2	42	4	12	17	77
Total	57	46	33	21	35	192

but data of good quality for only about two-thirds of them (Table 1) and little information is held for Africa and parts of Asia.[6]

Further discussion with WHO indicated that, in most cases, coverage is less than 90% complete for around 40 countries, and that the cause distribution may be biased in those countries with incomplete coverage as it is mostly the poorer and rural areas that usually have less coverage. Some countries classify higher proportions of deaths to ill-defined causes which limits the use of the data.

There is a clear connection between the quality of the data and the quality of the risk analysis. More reliable data should lead to more effective prevention strategies that are properly targeted to real needs.

Another WHO article on the assessment of global data on death registration concluded that few countries have good quality data on mortality that can be used to adequately support policy development and implementation. The report states that there is an urgent need for countries to implement death registration systems, even if only through sample registration, or to enhance their existing systems in order to rapidly improve knowledge about the most basic of health statistics: who dies from what?[8]

The data from the survey of ILS Member Organisations reflected in this World Drowning Report represents just 16 countries. This represents significantly fewer (25%) countries than the WHO average of 64 countries.

Section 4: Key International Data—Who Is Drowning?

The most comprehensive international level data collection on drowning is collated, projected and published by the World Heath Organization.

Other organisations collect and publish data. For example, The Alliance for Safe Children (TASC), a UNICEF-sponsored programme that targets Asia, has regional data from household surveys that estimates child morbidity data.

World Heath Organization Drowning Data

The World Heath Organization estimates that 382 312 people died from drowning in the year 2002. WHO noted that drowning is the third leading cause of unintentional injury death globally after road traffic injuries and falls (*World Health Report 2004*).

Table 2 Global Drowning Deaths by Sex and WHO Region (GBD 2002, version 5)

	World total	AFR	AMR	EMR	EUR	SEAR	WPR
Males	262 171	50 006	18 487	18 235	31 016	60 406	83 617
Females	120 141	15 190	4 211	7 470	6 971	37 700	48 329
Total	382 312	65 196	22 698	25 705	37 987	98 106	131 946
Sex ratio (M:F)	2.2:1	3.3:1	4.3:1	2.4:1	4.4:1	1.6:1	1.7:1
%	100	17.0	5.9	6.7	9.9	25.6	34.5
Rate per 100 000	6.2	9.7	2.7	5.1	4.3	6.1	7.7

Note. AFR = African region; AMR = Americas region; EMR = eastern Mediterranean region; EUR = European region; SEAR = southeastern Asian region; WPR = western Pacific region.

WHO acknowledges that the drowning problem is even greater because its data include only "accidental drowning and submersion." Cataclysms (floods), transport accidents, assaults, and suicide were specifically excluded. Cataclysms and transport accidents cause significant numbers of drowning deaths and are certainly unintentional.

Based on the 2002 WHO data

- Injuries accounted for over 9% of the total global mortality.
- Of these injury-related deaths, 7% were from unintentional drowning.
- Of these unintentional drowning deaths, 97% occurred in low- and middle-income countries.

International Life Saving Federation Data

The source of the data from the 16 countries represented in this report varied from coroners' offices (with a high degree of accuracy) to media, police and lifesaver reports with a lesser degree of accuracy and completeness. Nevertheless, the ILS Drowning Report Committee considered the data adequately reliable for purposes of this report. Table 5 provides a complete listing of the data sources and a grading of the data.

Partial data were included in cases where the data were incomplete or where it was not possible to merge (e.g., data from the United States was available in two data sets—boating and non-boating, and the age breaks were not compatible for merging).

This data represent a small sample of the world population (approximately 13%) and of the drowning problem (approximately 3% of the total for the year 2000 in WHO's *Factsheet on drowning* and its updated estimate for 2002).

More data are available from developed countries where effective reporting systems tend to be in place. But drowning is a greater problem in less developed countries; the very areas where the drowning problem is biggest are least likely to be represented in the data.

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Table 3 International Life Saving Federation Member Countries Data Source (ILS survey: see details Table 4)

	Population (000's)	Census year	Total unintentional drowning deaths	Drowning deaths (per 100 000)	Male %	Female %	Unknown %
Brazil	169 799	2000	5 983	3.5	N/A	N/A	
Finland	5 220	2003	176	3.4	85	15	
New Zealand	3 737	2001	125	3.3	74	26	
Czech Rep.	10 230	2001	244	2.4	69	31	
Bulgaria	7 974	2001	167	2.1	N/A	N/A	
Australia	18 972	2001	277	1.5	77	21	2
Canada	30 007	2001	450	1.5	84	16	
Sweden	8 883	2000	134	1.5	87	13	
Ireland	3 917	2002	51	1.3	76	24	
USA	281 422	2000	3 787	1.3	69	17	14
Singapore	4 018	2000	36	0.9	N/A	N/A	
Germany	82 532	2003	644	0.8	78	22	
St. Lucia	151	2001	1	0.7	100	0	
U.K.	58 789	2001	381	0.6	86	14	
Malaysia	23 270	2000	127	0.5	N/A	N/A	
Iran	69 515	2005	250	0.4	N/A	N/A	

Many of these countries (Canada, United States, United Kingdom, Australia, New Zealand, Ireland, Singapore, Sweden, Malaysia and the Czech Republic) report a decline in drowning deaths over the past five years. Iran reported an increase in drowning mortality in the past five years. All countries that provided data based on gender, reported significantly more men drowning than women, in many cases at a rate of 4:1.

In almost all countries that reported data by age, men aged 18–49 years had the highest drowning numbers and highest drowning rate. The absence of standardised age breakdowns made it difficult to compare precisely by age.

Swimming and boating were the activities that most men were engaged in when they drowned. In Canada and the United States, where data was available to target the issues, many of the men who died by drowning while boating were not wearing a lifejacket (over 80%) and had consumed alcohol (over 40%).

All data included in the report were unintentional drowning deaths: homicides or suicides were not included. Of note, in Ireland more people die by drowning as a result of suicide than they do as a result of accident. In 2003, 51 drowning deaths in Ireland were classified as accidental, but almost twice as many classified

as suicide (n = 90). This high representation of drowning suicide appears to be unique to Ireland and specific prevention strategies have been identified by the ILS Member Organisation from Ireland.

In many countries, children under five years of age had the second highest drowning risk. Importantly, many of the reporting countries noted progress in a reduction of drownings amongst this vulnerable age group.

Risk factors influencing the frequency of drowning in this age group were: the absence of parental supervision; and the absence of fencing around backyard pools.

Although the drowning mortality rate for children less than five years of age is declining in many countries (Canada, Australia, United States, United Kingdom), it remains a key target group for prevention strategies. In Canada and the United States, drowning remains the second leading cause of death for children under 14 years of age, after motor vehicle collisions. In Australia, drowning amongst these young children is the number one priority age group with key prevention strategies related to backyard pool safety (restricting access and close supervision).

In the case of all countries which provided data about the location of the drowning death, natural bodies of water (lakes, oceans, rivers, ponds and creeks) predominated. Some countries reported the propensity for drownings in pools (Germany, United Kingdom, Canada, Australia, United States, and Brazil) primarily among young children. Australia reported the highest incidence of drownings in backyard pools and this is linked to the higher drowning rate among children under the age of five years.

Section 5: Key Issues

This section attempts to relate the ILS data to the 2003 WHO *Factsheet on drowning* results. Limitations arise from the relatively low number of countries with ILS Member Organisations who responded to the ILS survey with data; the absence of extensive or complete data from many of those countries; the lower quality of data from some of these countries; and the absence of data from countries and regions with a high population and expected/projected high drowning problem (e.g., India, China, Africa).

Population Growth

The magnitude of the drowning problem is going to get worse, especially in Africa and Asia. The United Nations predicts:

> No major area is expected to experience as large a proportional increase in population as Africa. Africa's population is expected to increase from 794 million in 2000 to 2.0 billion in 2050, according to the medium fertility variant. Its share of the world population will increase from 13 per cent in 2000 to 21 per cent in 2050. In the same period, the European population is projected to decline from 727 million to 603 million and its share of the world population to drop from 12 to 6 per cent. So while the population of Europe was more than double that of Africa in 1950, the population of Africa

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> is expected to be more than triple that of Europe a century later. The share of the world population in other regions will experience less marked charges over the projection period.
>
> As a result of those changes, the world of 2050 is likely to be one in which Africa and Asia are home to more than 80 per cent of the population. China and India together will shelter about one third of the world population. (United Nations World Population Monitoring 2003, p. 10)

In the world of 2050, the drowning prevention challenge, let alone the drowning data collection challenge, for the ILS, its members and partners is formidable.

Sex

Males are significantly more likely to drown than females. This finding from the ILS study, is supported by data from the WHO report for similar reasons: increased exposure to water (particularly when boating, fishing and travelling for commercial and for daily living purposes) combined with higher risk behaviour, such as swimming alone, consuming alcohol prior to swimming and boating, not wearing a lifejacket when boating, and travelling faster and more recklessly in a boat.

Age

While most of the countries who replied to the ILS survey reported that men 18–49 years pose the highest drowning risk for the reasons listed above, children under the age of five are of high importance. The WHO *Factsheet on drowning* reports that children under five years of age have the highest drowning mortality rates worldwide.

Child drownings appear to be due largely to inadequate supervision. Importantly, some developed countries (Australia, Canada, United States) reported significant progress on the reduction of drownings amongst children under the age of five. They credit a concentrated effort of behavioural change strategies as a contributing factor.

The WHO *Factsheet on drowning* indicated that children under five years were the age group with the highest drowning risk. WHO references many low- and middle-income countries with high populations with this problem, such as China and Bangladesh.

Floods

The data collected by International Life Saving Federation excludes floods and catastrophic occurrences (such as a tsunami). This is consistent with WHO reporting and international convention for data gathering and reporting. It can be concluded that countries in which flooding is a regular occurrence would have high numbers of drowning fatalities. This raises an important policy question for epidemiologists. Why should drowning deaths from floods, which are inherently a result of accident, be excluded?

Transportation

Not wearing a lifejacket is a significant factor in drowning deaths amongst primarily male boaters. Canadian data indicate that 90% of boaters who died by drowning were found not to be wearing a lifejacket. Data from the United States supports this finding.

World Health Organization data suggest that people in vessels used in refugee transportation—that may be overcrowded and that venture out in poor weather—are at significantly higher risk.

Alcohol

The consumption of alcohol is a contributing factor to drownings. Alcohol affects judgement and decision-making. This fact has serious potential consequences for those operating boats, those swimming, and for those responsible for supervising children. This finding is consistent with the findings from the WHO *Factsheet on drowning*.

Access to Water

Many children who die by drowning suffer this outcome because they are in close proximity to water and are not sufficiently supervised by an adult. Many young children in highly developed countries such as the United States, Canada and Australia, die in backyard pools and at beaches.

The WHO *Factsheet on drowning* referenced the high risk for children in low- and medium-developed countries (e.g., Bangladesh, Mexico) and the incidence of child drownings in ditches, ponds, creeks and water wells. In developed countries (Australia, Canada, Germany, New Zealand, United Kingdom), the easy access to water; the emphasis on recreating in water; and the high predominance of new immigrants—many of whom are from countries without a culture of safety around water—heighten the risk of drowning.

Developing Versus Industrialised Countries

In industrialised countries, water is used for many recreational activities. Backyard pools, coastal beaches and inland rivers and lakes are used by the public in sporting and recreational pursuits. It could be suggested that swimming skills and water safety awareness form part of the dominant culture of the population.

In developing countries, water usually has a different focus—as part of the daily living routines of irrigation, transportation, etc. The UNICEF/TASC report covering major parts of Asia clearly indicates that many drowning deaths occur through routine activity such as falling into water ponds near the family home or other unsupervised water bodies near where children live. There is also a distinct lack of swimming skills and water safety awareness.

Section 6: Intervention

An article in the *Handbook on Drowning* stresses the importance of identifying risk factors leading to drowning if efficient and targeted drowning prevention strategies are to be developed.[9]

Risk factors can be divided into two groups; those related to human factors and those related to environmental factors. Examples of socio-demographic risk factors are gender, age and socioeconomic status. Environmental risk factors include place of occurrence, climatic conditions, safety equipment and safety policies. Behavioural risk factors include the use of alcohol and parental supervision.

The development of successful drowning prevention strategies requires the identification of these risk factors. In fact, socio-demographic risk factors assist in identifying key high priority target groups (i.e., young children under five years of age or men 18–49 years). Environmental risk factors assist in identifying the type of activity that should be considered in the intervention such as the use of safety devices amongst boaters who reside in countries susceptible to flooding.

Behavioural risk factors should influence the crafting of the prevention messages. These messages should be intended to elicit a change in behaviour by the at-risk individual or by the parent or caregiver in the case of young children. Behavioural change messages are different than messages that merely communicate the problem such as, "Children can drown very easily." For example, a behavioural change message for a caregiver or parent of a young child would be to "If you are not within arms' reach, you have gone too far."

The ILS survey data identified key demographic groups who were more susceptible to drowning. Specifically, the key factors are:

- Age (under five years and 18–49 years)
- Gender (male)
- Place of occurrence (lakes, oceans, rivers, creeks)
- Climate conditions (low water temperature)
- Safety equipment (no lifejacket)
- Use of alcohol (for men when boating and swimming)
- Parental supervision (lack thereof for young children)

The *Handbook on Drowning*[10] and the WHO *Factsheet on drowning* cite three routes for prevention of drowning:

- Remove, reduce or change the hazard
- Change risk-taking supervision or skills
- Prevent contact between people and the environment

The ILS Rescue Committee is working with a similar concept—"the drowning chain"—in which death by accidental drowning occurs through a sequence or chain of factors:

- Ignorance, disregard or misjudgement of danger
- Uninformed or unrestricted access to the hazard
- Lack of supervision/surveillance
- Inability to cope once in difficulty

The goal of many water safety organisations is to provide intervention strategies at each of these four stages through education, restriction of access, supervision and skill acquisition programmes.

Section 7: Conclusions and Recommendations

Globally, drowning is a leading cause of death. Its full impact may not be properly identified even in developed nations with relatively well-developed data gathering systems. It is widely acknowledged that drowning is highly underreported in developing nations. This underreporting may lead to a lack of focus and support for systems to address the problem.

The drowning problem is going to get worse, especially in Africa and Asia where the drowning rate is high. The United Nations projects that the world of 2050 is likely to be one in which Africa and Asia are home to more than 80% of the population. China and India together will shelter about one third of the world population.

In our world, things seem not to count unless they can be counted. The quality of preventive action seems impossible to determine and focus unless it can be measured and thereby evaluated. The interest of policy makers seems easily distracted without very current information. As the organisation dedicated to world water safety, the International Life Saving Federation has an obligation to take a leadership role to ensure the appropriate and reliable data are assembled and analysed.

Overall, this report provides a baseline for information that ILS members are currently able to provide. This is an initial step to provide an international count of drowning deaths, the strengths and weaknesses of current data, the challenges for future collection, and how this information can be used to help reduce the global burden of drowning. Much work remains to be done, but the data sources identified and included are likely to continue in future, while new data can and should be added to future editions.

The International Life Saving Federation now has the opportunity to embark on a journey as a research organisation to take steps to identify and understand the underlying patterns that are crucial to its core business—the saving of life.

In this embryonic stage the ILS will need to refine its role in drowning research and to strive to develop, improve, mentor and assist its Member Organisations through its global network. The ILS may be a small cog in a large risk-prevention wheel, but it has spectacular potential in shaping drowning prevention strategy, government policy, and public health initiatives.

This report should be used not only to encourage non-reporting nations to report, but also to encourage nations with weak reporting to make the reporting better and thus more reliable. Much of the data collected by ILS member countries

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is collected in various ways and displayed in varying styles. ILS has the opportunity to provide a benchmark standard for data collection for its Member Organisations based on much of the work from the "Utstein Style" guidelines.[11]

International Life Saving Federation membership is dominated by industrialised nations with much of its activity relating to drownings and water-related injuries in recreational pursuits. Developing nations, many without ILS membership, have a far more serious epidemic of drowning incidents. ILS has the opportunity though its ongoing development programmes to share its intervention strategies and to partner with other like-minded organisations in the pursuit of making aquatic environments safer.

Recommendations

1. The ILS World Drowning Report should be published with regular frequency.
   - All ILS Member Organisations should be contacted to provide data for the next edition. Eventually, this information will encompass non-fatal water-related data.
   - The International Life Saving Federation should work with developing and developed countries to initiate and improve the quality of their data collection.
   - Specifically, the International Life Saving Federation should strive to collect data from all countries that currently have death registration, but find ways to encourage the other countries, with the help of existing or new Member Organisations, to collect data as well. It is notable that in several countries, high quality data is being gathered not by government but by national life-saving groups.
2. The International Life Saving Federation should develop the gold standard for reporting by ILS member countries. This should include the Utstein Style and information consistent with the international statistical classification of diseases and related health problems (ICD-10). Specifically:
   - Total number of drownings; # male, # female by age groups (0–4; 5–12; 13–17; 18–34; 35–49; 50–64 and 65+); location of drowning (bathtub, pool, ocean/beach, lake/pond, river/stream/creek; time of year (May–August; September–April).
3. The International Life Saving Federation should adopt intervention models that can be used by its Member Organisations to raise awareness about methodical measures that can be taken to provide proactive water safety programmes. Such models can include the World Health Organization's four main principles for drowning prevention as identified in its *Factsheet on drowning*, and the "drowning chain/cycle" under development by the ILS Rescue Committee.
4. Prevention programmes should encompass strategies to address the needs of two high-risk target groups: Parents of children under five years and men 18–49 years.

- These messages should focus on behavioural change to be effective.
- Messages for parents of young children should focus on their responsibility to minimise and restrict water hazards and closely supervise their children when they are near water—"Stay within arms' reach."
- Messages for men should focus on communicating the need for abstaining from alcohol when swimming and boating; the need to wear lifejackets when boating; and the need to learn boating safety rules.

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Appendix B: Acknowledgments

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Table 4A World Drowning Report 2007—Unintentional Drowning Deaths in 2003

	Country							
	Australia	Brazil	Bulgaria	Canada	Czech Rep.	Finland	Germany	Iran
Population (000's)	18 972	169 799	7 974	30 007	10 230	5 220	82 532	69 515
Population census year	2001	2000	2001	2001	2001	2003	2003	2005
Total unintentional drowning deaths	277	5 983	167	450	244	176	644	250
Drowning rate (per 100,000 pop)	1.5	3.5	2.1	1.5	2.4	3.4	0.8	0.4
Male %	77	N/A	N/A	84	69	85	78	N/A
Female %	21	N/A	N/A	16	31	15	22	N/A
Unknown %	2							
Age								
0–4	40 (0–5)	N/A	N/A	16	N/A	N/A	34 (0–5)	N/A
5–12	8 (6–14)	N/A	N/A	22	N/A	N/A	18 (6–10)	N/A
13–17	31 (15–24)	N/A	N/A	24	N/A	N/A	51 (11–20)	N/A
18–34	44 (25–34)	N/A	N/A	117	N/A	N/A	116 (21–35)	N/A
35–49	38 (35–44)	N/A	N/A	124	N/A	N/A	140 (36–50)	N/A
50–64	73 (45–64)	N/A	N/A	78	N/A	N/A	138 (51–65)	N/A
65+	36 (65+)		N/A	69	N/A	N/A	112 (66+)	N/A
unknown	7						35	
Location								
bathtub	13	16	N/A	26	N/A	N/A		N/A
pool	42	131	N/A	37	N/A	N/A	35	N/A
ocean/beach	69		N/A	43	N/A	N/A	26	N/A
lake/pond	32	2 959	N/A	156	N/A	N/A	252	N/A
river/stream/creek	67		N/A	138	N/A	N/A	295	N/A
other/N/A	54	2 877	N/A	50	N/A	N/A	36	
Time of year								
May–August (%)	N/A	N/A	N/A	64		69	60	N/A
Sept.–April (%)	N/A	N/A	N/A	33		31	40	N/A
N/A (%)				3				

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Table 4B World Drowning Report 2007—Unintentional Drowning Deaths in 2003

	Country							
	Ireland	Malaysia	New Zealand	St. Lucia	Singapore	Sweden	U.K.	USA
Population (000's)	3 917	23 270	3 737	151	4 018	8 883	58 789	281 422
Population census year	2002	2000	2001	2001	2000	2000	2001	2000
Total unintentional drowning deaths	51	127	125	1	36	134	381	3 787
Drowning rate (per 100,000 pop)	1.3	0.5	3.3	0.7	0.9	1.5	0.6	1.3
Male %	76	N/A	74	100	N/A	87	86	69
Female %	24	N/A	26	0	N/A	13	14	17
Unknown %								14
Age								
0–4	1 (0–4)		9		N/A	5 (0–4)	16	N/A
5–12	1 (5–14)	20 (<10)	5		N/A	4 (5–14)	13	N/A
13–17	7 (15–19)		5		N/A	2 (15–18)	20	N/A
18–34	13 (20–34)	29 (11–18)	37		N/A	31 (19–39)	102	N/A
35–49	9	33 (19–30)	28		N/A	18 (40–49)	76	N/A
50–64	10	45 (>30)	26	1	N/A	49 (50–69)	78	N/A
65+	10		15		N/A	25 (70+)	54	N/A
unknown							22	
Location								
bathtub	N/A		8		N/A	N/A	18	N/A
pool	N/A	1	6		N/A	N/A	12	N/A
ocean/beach	N/A	53	65	1	N/A	N/A	105	N/A
lake/pond	N/A	16	13		N/A	N/A	68	N/A
river/stream/creek	N/A	51	33		N/A	N/A	175	N/A
other/N/A	N/A	6			N/A		3	N/A
Time of year								
May–August (%)	N/A	N/A	26	0	N/A	78	49	N/A
Sept.–April (%)	N/A	N/A	74	100	N/A	22	51	N/A
N/A (%)								

Table 5 World Drowning Report 2007—International Data Sources for Unintentional Drowning Deaths in 2003

	Country	Data source	Web reference	Data contact	Grade of data
1	Australia	National coroner's information system	www.royallifesaving.com.au	Richard Franklin: rfranklin@rlssa.org.au	A
2	Brazil	Hospitalisation and death data	www.datasus.gov.br	Dr. David Szpilman: david@szpilman.com	A
3	Bulgaria	Police, forensic medicine regionally. Generalise on national level	www.redcross.bg	Teodora Tomova: titomova@redcross.bg	B
4	Canada	Regional/provincial coroners' offices.	www.lifesaving.ca	Barbara Byers: barbarab@lifeguarding.com	A
5	Czech Republic	Government agency—death statistics, hospital, police data	www.vzs.cz	Pauel Procnaskavzscck@tiscall.cz	B
6	Finland	Newspapers; some police data	www.sun.fi	Reijovartia	B
7	Germany	Press, internet, reports from DLRG	www.dlrg.de	Martin Janssen: kommunikation.bgst.dlrg.de	A
8	Iran	Police and legal system—issue death certificate	www.irlsf.ir	Behrooz Esfandiari: behroozl@safineh.net	B

9	Ireland	Irish police force and coroners	www.lws.le	Roger Sweeney: rogersweeney@lws.le	A
10	Malaysia	Newspapers only (incomplete)	www.lifesavingmalasia.org.my	Ms. Tengsiew Lian: lssmhq@pd.jaring.my	C
11	New Zealand	Water Safety New Zealand	www.watersafety.org.nz	Sarah Tomlinson: sarah@watersafety.org.nz	A
12	St. Lucia	St. Lucia Lifesaving Association, marine police		Carol Devaux: caroldevaus@yahooo.com	A
13	Singapore	Government offices, coroner's office	www.slss.org.sg	Alam Kam: slss@pacific.net.sg	A
14	Sweden	Media, police reports, death statistics, hospital reports	www.sls.a.se	Anders Wernesten: anders@pir87.se	B
15	United Kingdom	ROSPA as central data source. Use coroner's data; avoid duplication	www.rospa.com	Danny Bryant: dbryan@surflifesavers.org.uk	A
16	United States of America	Centers for Disease Control and Prevention (CDC) for non-boating data; US Coast Guard Office of Boating Safety for boating data	www.cdc.gov and www.uscgboating.org	Richard Gould: rgould@santa-clarita.com Chris Brewster: cbrewster@lifesaver1.com	A