

KENYA LIFESAVING FEDERATION

DROWNING PREVENTION STRATEGIES

*A framework to reduce drowning deaths in the
aquatic environment for counties/regions by KLF
branches engaged in lifesaving*
2015 Edition



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ADOPTED FROM

INTERNATIONAL LIFESAVING FEDERATION

KENYA LIFESAVING FEDERATION DROWNING PREVENTION STRATEGIES

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PREFACE

The KENYA LIFESAVING FEDERATION (KLF) is reviewing drowning prevention strategies. This edition of *Drowning Prevention Strategies, A framework to reduce drowning deaths in the aquatic environment for counties/regions by KLF branches engaged in lifesaving*, reviews strategies that have been introduced within member branches.

The framework articulated within this document has been developed from the perspective of developed countries/regions and ILS branches with well-developed lifesaving practices.

KLF has further explore strategies and frameworks from the perspective of counties/regions and KLF branches, and where applicable has integrated the findings into this comprehensive drowning prevention strategy/framework.

THE KENYA LIFESAVING FEDERATION

KLF is a National, non-profit federation of 47 county lifesaving branches in Kenya. KLF leads the nationwide effort to reduce injury and death in, on, or around the water. The goal of the KLF is *nation water safety*[™]. The KLF pursues this goal through the work of its member lifesaving branches 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 KLF commissions) works to reduce the incidence of drowning and aquatic injuries throughout the country:

- through the development of organised lifesaving in areas of the country where it does not exist
- support for existing lifesaving organisations
- support for standardised public information and education
- tracking the incidence of drowning throughout the country 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 PREVENTION COMMISSION

The KLF Drowning Prevention Commission provides leadership in the national effort to prevent drowning with an emphasis on reducing drowning of children, in developing countries, regions and populations with high drowning mortality and drowning as a result of aquatic disasters. The Commission will achieve this by;

- leveraging the drowning prevention expertise of the KLF and member federations
- providing evidence and information about drowning
- leading collaborations that aim to reduce national drowning
- advocate for the issues that reduce national drowning

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- establishing an KLF National Drowning Prevention or Reduction Network consisting of the people, products, processes, research, thinking and knowledge

THE RESCUE AND EDUCATION COMMITTEES

The Rescue and Education Committees are two of sub-committees of the Lifesaving Commission. The Rescue Committee's mandate is to identify, review and develop best practice in relation to rescue and the training and equipping of lifesavers, while the Education Committee's mandate is to standardize public information and education.

Drowning Prevention Strategies, A framework to reduce drowning deaths in the aquatic environment for counties/regions by KLF branches engaged in lifesaving, was adopted from ILS Drowning prevention strategies from the perspective of lifesaving rescue and education.

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FOREWORD – HOW TO USE THIS INFORMATION

The KENYA LIFESAVING FEDERATION (KLF) has developed a framework to assist counties and organizations to provide the best response to drowning reduction. This framework can be used in more than one way and the choice of how it is used depends on the setting and identified issues within a target population.

For counties/regions and KLF branches with established lifesaving structures and an effective drowning reduction programme, the framework is intended to assist in the fine-tuning of the drowning prevention strategies employed. The programmes and strategies that are currently in place should be listed against the section of the framework that they relate to. The planner can then identify gaps in drowning prevention strategies and refer to the lists of strategies that are in place elsewhere in the country. It is intended that a planner can follow the links in the Drowning Prevention Strategy framework back to the source country and collect the detail of how each strategy or programme is applied there. The objective is to refine the range of activities that are used to further reduce the incidence of death by drowning.

For counties/regions and KLF branches without an established drowning prevention or lifesaving structures, the framework identifies the factors that cause people to drown and provides evidenced based measures to prevent and treat. The document breaks out the causes and the broad responses that can be made for each cause. To help you establish a Drowning Prevention Strategy, there are lists of responses presented that have been used in other counties/regions and KLF branches to deal with each cause. Not all of these will be appropriate in your county, but considering all the possibilities should help you to refine your thinking. In most cases, links have been provided to the county of origin, so you get the opportunity to consider the context in which the strategy or programme was developed, as well as the detail of how it works.

It is helpful to understand the drowning problem and at risk populations. The research will assist in determining the target and prevention strategies that would be most effective.

Active measures to prevent death by drowning, that have been shown to be evidenced-based in a population that is most similar to the target population should be considered with highest priority.

If you need assistance with this process at any time, you should make contact with KLF HQ and volunteers who advocate and focus on Drowning Prevention, by experts, committees and working groups.

Working together we can make a difference.

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EXECUTIVE SUMMARY

The World Health Organisation (WHO) Guidelines for safe recreational water environments suggest that "recreational water activities can bring health benefits to users, including exercise and relaxation. Effective management can control potential adverse health consequences that can be associated with the use of unsafe recreational water environments. Different stakeholders play different roles in the management of the recreational water environment." Further, "the development of approaches to controlling hazards that may be encountered in recreational environments" can be through the use of Guidelines such as those available through WHO.

The ongoing goal of the KENYA LIFESAVING FEDERATION (KLF) is to reduce death by drowning countrywide. Most importantly, KLF will assist in the development of control measures (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 countrywide.

Death by drowning is a serious threat to country health. United Nations country population projections suggest that we can anticipate that the drowning problem is going to get worse without significant intervention, especially in developing countries.

As the *country water safety* organisation, KLF has an obligation to take a lead role in defining and articulating solutions to reduce the drowning problem. KLF will provide leadership in communicating the nature and scope of the country drowning problem and provide guidance to member organisations, governments and partners concerning solutions to the drowning problem.

Identifying the contributing factors allows KLF to provide effective prevention actions to the highest risk populations, locations and activities via its member federations. KLF plans to update these strategies with regular frequency. KLF will work with its member organisations and others to assist in finding effective solutions to assist in the reduction of drowning, either as a national project or as a development aid programme.

Drowning Prevention Strategies, A framework to reduce drowning deaths in the aquatic environment for counties/regions by KLF branches engaged in lifesaving, 2015 and subsequent editions will assist member branches in deploying their resources for the most effective drowning control measures aimed at high-risk target groups.

Prevention programmes in the most counties/regions by KLF branches 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;
- Promoting swim and lifesaving skills development
- Training the general community in water safety and resuscitation.
- Provision of trained lifeguards to conduct patron surveillance and supervision at aquatic facilities and beach areas

In the less developed counties/regions and KLF branches establishing primary education and public health systems, to elevate literacy and awareness, saves lives. This also enhanced the economic and health capacity of the population. Drowning prevention strategies in these settings will be social adaptations such as the provision of day care, and the provision of structured school. Social change strategies are effective for unintended injury reduction, including drowning prevention.

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Interventional strategies are most effective when they are conceived, enacted and researched by culturally sensitive persons (native/local leadership) from within the target nation, population, and region. The building of internal empowerment, expanding capacity and confidence, within the nation/region is important to have the initiative systematic, substantial, sustained, and service linked.

This document is not meant to imply that a control measure listed here will have the same impact in another nation/region. This document is designed to list ideas that have worked in different parts of the world that may assist in developing strategies to prevent drowning in other counties/regions and KLF branches. KLF is not attempting to tell you what we think that you need, but rather allowing you to decide and develop research to determine your needs. This document is designed to facilitate ideas to assist you in the determination of those needs.

More importantly, the reader should note that this document has been adopted from the ILS through the lens of well-established lifesaving countries. KLF acknowledges that significant work needs to be done to understand and articulate appropriate control measures to assist counties and its member branches. This work is currently being scoped by the KLF Drowning Prevention Commission.

Control measures work. This document is the first step in setting out a range of control measures that will assist in reducing death by drowning in counties/regions and KLF branches.

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BACKGROUND

What is "Drowning" (a definition?)

Drowning is "The process of experiencing respiratory impairment from submersion/immersion in liquid". Where that impairment leads to death, we note that the person has drowned. This report sets out control measures that both reduce the likelihood of a person experiencing "drowning" and more importantly, death by drowning. ⁽²⁷⁾

What is known about world drowning?

In 2002, WHO reported a review of drowning based on data from the year 2000. These global burden of disease (GBD) figures underestimate drowning deaths since it excludes drowning due to disasters and, transportation accidents. The data from some nations/regions and ILS branches was modelled to estimate the global burden of drowning death. 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. WHO estimated 409 272 people died from drowning in 2000,

The first Kenya Drowning data published by KLF in 2012 and second data in 2015 includes an analysis of data from Reelforge media monitoring company, identifies drowning trends, factors and high-risk groups.

UNICEF published Child Mortality and Injury in Asia in 2007. This series summarizes the finding of 6 national and sub-national surveys in Asia, in Bangladesh, China, Philippines, Thailand and Vietnam. The results show that traditional health system data misses most injury deaths in this region. Death by drowning, greatly under-estimated using traditional methods of surveillance is the leading injury cause, being responsible for over half of all injury deaths in children. These surveys show that injury claims a significant share of the 10.5 million deaths reported in children under-five. Over ½ of all deaths under age 18 are due to injury. In Bangladesh 29% of the classifiable mortality age 1-4 was caused by injury. Drowning is the overwhelming cause of fatality in this age group.

The most recent data to be presented at the WCPD 2015 in Malaysia showed that most death by drowning in the country is unrecorded by health information systems. As a result, the current best estimates are that at least nine out of ten people who drown nationally occur in the remote parts of the country. Most of these are due to floods related issues as the largest portion. The newest evidence shows that death by drowning is a public health epidemic on a national scale.

The cost of drowning

Unintentional death by drowning and non-fatal drowning incidents place a burden on society, both in human terms (loss of life, loss of quality of life, pain and suffering) and also direct costs to society (treatment and ongoing care along with lost productivity due to death or incapacity).

"In America, the National Safety Council (1997) sets the economic cost of an accidental death at \$US0.8 million. Included in the components of the economic loss are wage and productivity losses, medical expenses, administrative expense, legal fees and insurance, and employer costs." ⁽¹⁹⁾

"Australian studies examining the cost of unintentional drowning deaths estimate an average cost between \$A0.6 and \$A1.6 million per person."

A further study by The Allen Consulting Group in Australia, Valuing an Australian Icon – The Economic and Social Contribution of Surf Lifesaving in Australia (2005), noted that the Australian Institute of Criminology (in 2004 terms), valued a life at \$A1.7 million.

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A study by PricewaterhouseCoopers in New Zealand, "Valuing the Benefits of Lifeguarding" (2003), noted that the value attributed to a statistical life is \$NZ2.6 million.

A study by Mintel Group in the UK, The Economic Value of Lifeguarding, A research study exploring the value of providing lifeguarding services in the UK (2007), determined that the economic cost of death by drowning as GBP£2,109,486 and the comprehensive cost GBP£3,085,850.

While the estimates vary according to the underlying assumptions, it is clear that the burden placed on society in developed counties/regions and KLF branches are large. The methodology adopted is largely based on productive capacity and taxation. It is not so clear what the methodology within the developing counties/regions and KLF branches would show, or indeed whether the methodology is relevant. When a child dies by drowning there is a significant social and economic impact to a family and a community. When an adult dies by drowning this may result in orphan children and reduced capacity to support the remaining family. These costs are beyond scope and ability to estimate.

The cost of prevention

The UNICEF report on Child Mortality and Injury in Asia , has explored the cost of injury mortality and the association with poverty. They have determined the cost of maintaining the household survey techniques at an average of \$US2 per household per survey. This is less than the cost of accepted immunization programmes. The population intervention cost adds a cost that keeps the research and implementation costs below infection disease programme cost.

Contributing factors

Contributing factors include age, gender, supervision, ethnicity, and medical conditions.

Many studies show that males are more likely to drown than females due to risk taking behaviour, and under estimation of the hazard.

In developed nations/regions and ILS branches, alcohol is often associated with drowning deaths and increases the likelihood of immersion resulting in drowning when recreating around water. Not wearing a personal floatation device or lifejacket when required to do so (such as boating, rock fishing etc) has also been cited as a contributing factor to unintentional death by drowning.

In developing nations/regions and ILS branches, the effect of illiteracy, lack of risk awareness and need urgency can lead to overcrowding on poorly equipped water craft leads to drowning deaths. Awareness education and water craft regulations may be a powerful influence to reduce drowning deaths.

Drowning deaths across the various life stages

Different physical capabilities, interests, influences and maturity bring different challenges and risks associated with drowning. In order to prevent death by drowning, and water related injuries, we need to target people at each stage of life in different ways. This means that different intervention strategies may be needed for people of different ages. For example, Life Saving Victoria ⁽¹⁸⁾ has the following prevention programmes available for people of different ages.

Age	Prevention Strategy
Infants and Toddlers (Age 0-4)	<input type="checkbox"/> Keep Watch – remain within arms distance <input type="checkbox"/> Provision of barriers <input type="checkbox"/> Familiarise your child with the water

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	<input type="checkbox"/> Learn Resuscitation
Children and Young adolescents (Age 5-14)	<input type="checkbox"/> Learn Resuscitation ("Resuscitate a mate") <input type="checkbox"/> Learn to swim ("Swim and Survive") <input type="checkbox"/> Awareness programmes ("Beach to Bush") <input type="checkbox"/> Junior Lifeguard clubs
Young Adults (Age 15-24)	<input type="checkbox"/> Learn Resuscitation <input type="checkbox"/> Learn to swim ("Bronze Rescue") <input type="checkbox"/> Awareness programmes ("Swim Safe Roos")
Adults (Age 25-34)	<input type="checkbox"/> Boating safety <input type="checkbox"/> Lifejacket Regulations
Adults (Age 35-59)	<input type="checkbox"/> Rock Fishing Safety programme <input type="checkbox"/> Boating Safety and Education
Older Adults (Age 60 plus)	<input type="checkbox"/> A combination of all of the above programmes

In Germany, the DLRG has a detailed programme of preventive strategies across all age groups which can be accessed by their website. (www.dlrg.de)

Partnering with other organisations

An effective way to ensure that the drowning prevention message is widely distributed is through partnering. An example of this is the United States Lifesaving Association partnering with NOAA National Weather Service and national Sea Grant Programme which raises awareness of rip currents. Research is also being conducted in order to develop and improve the ability to predict the occurrence and strength of rip currents. The goal of the awareness campaign and research is to reduce the number of rip current related fatalities.

In Brazil the ILS member federation affiliated with ILS, coinciding with increased local capacity to save lives. In South East Asia, the Centre of Injury Prevention and Research, Bangladesh (CIPRB) have effectively partnered with The Alliance for Safe Children (TASC) and UNIFEF with assistance from RLSSA to undertake drowning reduction strategies with evidence that their programme is preventing drowning death.

In Australia, the Federal Government has set up the Australian Water safety Council consisting of the major water safety organisations within Australia to leverage ideas and programmes of work.

Various Government agencies (Health, Sport, Recreation) and companies (Insurance) have a stake in the reduction of death and injury through drowning and should be engaged as partners.

Evidence based principles

KLF is committed to using evidence based practices within its policies and statements. This means using best available research evidence to guide our services, and using this information in combination with the preferences of clients, and the judgment and experience of professionals.

KLF strongly recommends that the strategies adopted from ILS by member federations, and as outlined within this document, be the subject of continuous assessment and that monitoring, documenting and reporting of the effectiveness or otherwise of such control measures/intervention strategies be conducted to add weight and prioritization to the control measures/intervention strategies mentioned within.

This document refers to drowning data throughout to help identify and understand the issues to develop a prevention plan. As is noted in the definition of drowning, this data refers to both fatal and non fatal

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incident data. It is important that both fatal and non fatal incidents are recorded and analysed to help focus attention and identify trends. Reducing accidents will in turn reduce death by drowning.

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PREVENTIVE MEASURES

Drowning is a major public health issue and taking a public health response to prevention is an imperative.

Traditionally there are four key steps in designing a public health response to any threat to wellbeing.

These are:

1. Defining and monitoring the extent of the problem
2. Identifying the causes of a problem
3. Formulating and testing ways of dealing with the problem, and
4. Applying widely the measures that are found to work.

Public health interventions are traditionally described in three levels of prevention; primary, secondary and tertiary. When applied to water safety these levels of interventions can take the form of:

1. **Universal interventions** - approaches aimed at large groups or the general population without regard to individual risk
2. **Selected interventions** - approaches aimed at those considered to be a heightened risk
3. **Individual interventions** - approaches aimed at those known to be of a heightened risk or at locations of known high risk.

"Providing people with the skills and knowledge to be able to manage risk and prevent them being in risky situations in the first place lies at the heart of preventing people drowning or being injured. However, if things do go wrong there is also a need to have people and organisations that can help people in trouble⁽⁵⁾"

Primary Measures

Primary prevention avoids the development of a disease. Most population-based health promotion activities are primary preventive measures.

"Primary prevention refers to activities designed to prevent drowning or minimise the risk of dangerous events happening."

Primary Drowning Prevention measures include:

- Remove the Hazard
 - drain unnecessary accumulations of water (baths, ponds, bucket etc)
- Create Barriers
 - Build flood control embankments in flood-prone areas
 - Implement and enforce mandatory isolation fencing for pools, ponds, ditches, etc.
 - Encourage fencing around rural homes/schools in proximity to water
 - Encourage the use of grills over water wells
- Protect those at risk
 - Promote survival swimming for primary school children
 - Increase access to learn to swim programmes
 - Swimming and water safety skills
 - Increase awareness of need to supervise children
 - Instruct children to avoid entering fast flowing streams and not to swim alone
 - Train lifeguards for deployment in supervised swimming locations

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- Harmonize internationally the flags and symbols used for beach safety
- Educate and legislate against consumption of alcohol while boating or around water.
- Increase education in boat safety regulations and Personal Floatation Device (PFD) use
- All boats and larger vessels should be safety inspected regularly including load limit controls.

"Rescue agencies often refer to these activities as 'indirect interventions'."

Secondary Measures

Secondary prevention activities are aimed at increasing opportunities for interventions to prevent progression of the public health issue and emergence of symptoms.

"Secondary prevention focuses on preventing injuries and deaths happening once a person is in a dangerous situation. Rescue services are examples of secondary prevention activities (the agencies refer to them as 'direct interventions')"

Secondary prevention includes having onboard communication equipment to call or signal for help, provision of rescue equipment or swimming with others who can alert rescue services if a person gets caught in a rip.

Other secondary drowning prevention measures include:

- Swimming and lifesaving education
- Train the general community in resuscitation
- Transferring drowning victims with ICU needs to tertiary facilities

Tertiary Measures

Tertiary prevention reduces the negative impact of an already established public health issue through proactive intervention and reducing risk of death and injury.

Tertiary prevention focuses on the level of after care once a rescue or direct intervention has been applied (e.g. First aid, referral to paramedic, general practitioner or hospital). Depending on ones interpretation, the teaching of swimming, water safety, and lifesaving may also be considered a tertiary prevention.

Prevention programmes should take into consideration:

- risk taking behaviours,
- levels of activity,
- degree of access,
- legislation,
- standardization,
- enforcement of regulations,
- skill development,
- education,
- environmental modification (barriers etc),
- product modification,
- promotion of safety devices,
- availability of rescue services,
- Socio-economic status.

Death by drowning can be reduced

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Death by drowning can be reduced through an appropriate combination of intervention strategies. A goal of some lifesaving organisations is "Zero Preventable Drowning", in other words, the introduction of appropriate control measures that lead to no unintentional or accidental drowning.

The above objective is aspirational. Counties/regions and KLF branches should aim to reduce death by drowning through the implementation of appropriate strategies. Any strategy to reduce death by drowning should be encouraged. Many countries measure success through linking the percentage of death by drowning to the population to see if their prevention strategies are effective. Other measurements include measuring changes in behaviour and/or awareness of the high risk groups/factors.

The lowest known drowning mortality rate is in the Netherlands at 0.3/100,000. The highest drowning rates are in the South East Asian region with total population rates above 10/100,000 and rates for children 0-17 years in excess of 39/100,000 in some regions. The magnitude and density of drowning in some parts of the country is such that small advances in evidence based interventions could save 100,000's of lives per year.

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THE DROWNING PREVENTION CHAIN

The KLF have identified 4 factors that lead to a drowning.

These are:

1. Lack of knowledge, disregard or misjudgement of the hazard
2. Uninformed, unprotected or unrestricted access to the hazard
3. Lack of supervision or surveillance
4. An inability to cope once in difficulty.

Any of the above by themselves or a combination of the factors, could lead to a death by drowning.

To reduce drowning an understanding of which factors are the prime contributors is very helpful to focus prevention strategies. In some counties/regions and KLF branches, a multiple factor approach would be needed. In other counties/regions and KLF branches a focus on one factor may be the best use of available resources. In each case endpoint outcome research is very valuable to determine the programmes value.

KLF has addressed these issues by developing *Drowning Prevention Strategies, A framework to reduce drowning deaths in the aquatic environment for counties/regions and KLF branches engaged in lifesaving.*

This helps us identify the gaps, and also enables priorities to be set. It is important to remember that not all strategies will be appropriate in all locations. This report sets out a range of initiatives that have been successful throughout the country in various member organisations and are included in the form of a "shopping list" to enable the reader to select the most appropriate initiatives for their location.

The strategies that have been identified to address each of the 4 aspects of the drowning prevention chain are:

- (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

The role of risk assessments

A risk assessment should be conducted to analyse the impact of each alternative and a cost benefit analysis completed to ensure that the most effective strategies are introduced.

In its Guidelines for safe recreational water environments, the Country Health Organisation states "Assessment of hazard and risk inform the development of policies for controlling and managing risks to health and well-being in water recreation The assessment of a beach or water should take into account several key considerations including:

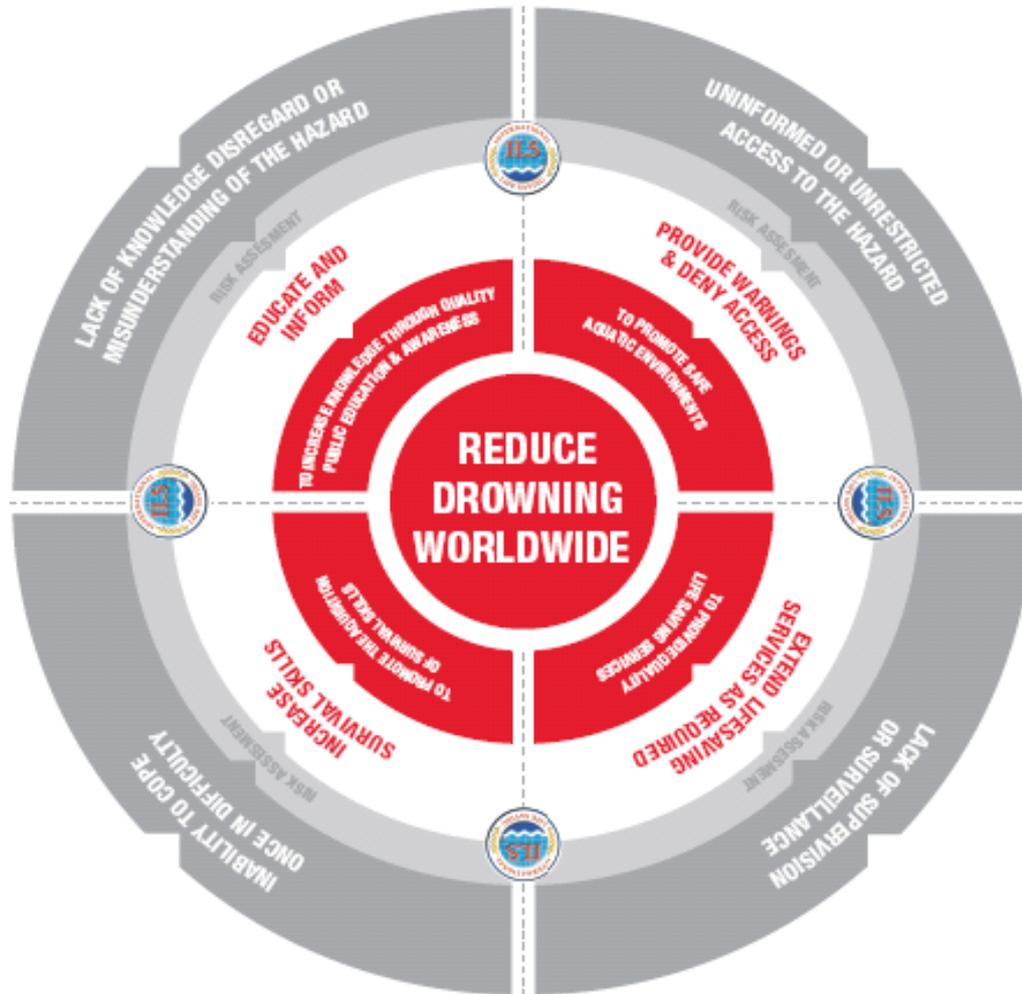
- The presence and nature of natural or artificial hazards
- The severity of the hazard as related to health outcomes
- The availability and applicability of remedial actions
- The frequency and density of use
- The level of development

"Chain"

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Please note that while KLF has used the word “chain” within this document, we do not imply that the relationship between the 4 factors is linear. Each factor has an individual contribution to death by drowning and drowning prevention. We use the word “chain” to indicate that an appropriate control measure (intervention strategy) introduced at an appropriate point within the chain will lead to a reduction in drowning. The word “cycle” is sometimes used in lieu of the word “chain”.

PICTORIAL REPRESENTATION OF THE DROWNING PREVENTION CHAIN



Picture 1 – The Drowning Prevention Chain and strategies to reduce drowning

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THE DROWNING PREVENTION CHAIN – SUMMARY OF CONTROL MEASURES

The Sequence	Counter Measure	Risk Assessment	Control Measures	Applications
Factor One Lack of knowledge, disregard or misjudgement of the danger	Education and information	Note: <i>In order to make a decision in relation to the most appropriate control measure, a formal risk assessment should be conducted</i>	Community Education	<input type="checkbox"/> School Education <input type="checkbox"/> Electronic & Digital Media <input type="checkbox"/> Leaflets / Brochures <input type="checkbox"/> Awareness Programmes
			Arrival information	<input type="checkbox"/> Information Signage
			On-site Education	<input type="checkbox"/> Public Address Systems <input type="checkbox"/> Face-to-face
Factor Two Uninformed, unprotected or unrestricted access to the hazard	Denial of access and/or provision of warnings	Note: <i>In order to make a decision in relation to the most appropriate control measure, a formal risk assessment should be conducted</i>	Barriers	<input type="checkbox"/> Access barriers <input type="checkbox"/> Booms <input type="checkbox"/> Buoy lines
			Signage	<input type="checkbox"/> Information Signage <input type="checkbox"/> Warning Signage <input type="checkbox"/> Prohibition Signage <input type="checkbox"/> Flags
			Regulations	<input type="checkbox"/> Formal Regulatory Arrangements <input type="checkbox"/> Improvement of Infrastructure <input type="checkbox"/> Recognition of Life Saving Services
			Activity Management	<input type="checkbox"/> Club / Group Registration <input type="checkbox"/> Self Regulation Programmes <input type="checkbox"/> Permit Systems
Factor Three Lack of Supervision	Provision of supervision	Note: <i>In order to make a decision in relation to the most appropriate control measure, a formal risk assessment should be conducted</i>	Trained Observers	<input type="checkbox"/> Trained Activity Supervisors <input type="checkbox"/> Coaches & Instructors
			Parental/Carer Supervision	<input type="checkbox"/> Promotion of importance of parental/carers supervision of children in all aquatic environments
			First Aid Facilities	<input type="checkbox"/> Portable First Aid Kits <input type="checkbox"/> Permanent / Fixed Facilities
			Lifeguard Services	<input type="checkbox"/> International Assistance Initiatives <input type="checkbox"/> Paid Lifeguards <input type="checkbox"/> Volunteer Systems <input type="checkbox"/> Intermittent (Roving) <input type="checkbox"/> Surveillance <input type="checkbox"/> Full Service (Between the Flags or Open Beach) <input type="checkbox"/> After Hours Call-out <input type="checkbox"/> Operational Support

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			Activity Restrictions	<input type="checkbox"/> Zoning <input type="checkbox"/> Beach / Water Closure
Factor Four Inability to cope once in difficulty	Acquisition of survival skills	<i>Note: In order to make a decision in relation to the most appropriate control measure, a formal risk assessment should be conducted</i>	Community Education	<input type="checkbox"/> Survival Skills <input type="checkbox"/> Self Rescue Skills <input type="checkbox"/> Rescue Skills
			Emergency Communications	<input type="checkbox"/> Public Telephone <input type="checkbox"/> Outpost Alarms <input type="checkbox"/> Dedicated Emergency Telephone <input type="checkbox"/> Radio
			Public Rescue Equipment	<input type="checkbox"/> Lifebuoys <input type="checkbox"/> Throw Lines <input type="checkbox"/> Other extraction equipment and fixtures
			Floatation Devices	<input type="checkbox"/> Personal Floatation Devices

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SUMMARY OF CONTROL MEASURES (INTERVENTION STRATEGIES) BEST GLOBAL PRACTICES

THE DROWNING PREVENTION CHAIN

FACTOR ONE

LACK OF KNOWLEDGE, DISREGARD OR MISJUDGEMENT OF THE HAZARD

INITIATIVE	DESCRIPTION	ORGANISATION	Resource/Website link
1. COMMUNITY EDUCATION			
□ School Education			
□ Get Safe For Summer	Educational activity day targeting primary school children before the school summer holidays	RLSS UK & ASA	www.getsafe4summer.org/
□ Rookie Lifeguard (dry awards)	The dry awards of the Rookie Lifeguard programme are designed to be compatible with classroom learning	RLSS UK	www.lifesavers.org.uk
□ Beach to City	Aimed at high risk child groups. Lifeguards visit schools normally at inner city locations and provide surf safety information to students.	RNLI	www.rnli.org.uk
□ Primary School Teachers (PAWS and JAWS)	Training for primary school teachers which include a water safety module. In addition each school is provided with a water safety DVD.	Irish Water Safety	www.iws.ie
□ lifesaving children Vacation time (Colonia de Férias)	Water and Lifesaving activities for a weekend during summer time, from 5 to 15 years-old. 1 week long, 3 hours a day.	SOBRASA	www.sobrasa.org
□ Lifesaving School	Lifesaving and water sports activities every weekend day in the morning at the beach for above 5 years-old	SOBRASA	www.sobrasa.org
□ Lifesaving workshops at the pool	Lifesaving with prevention tips and lifeguard rescues demonstration as a show at public pools and water leisure	SOBRASA	www.sobrasa.org
□ First Aid Training in Schools, clubs and malls	Formal first aid, 4 hours training for students in schools	SOBRASA	www.sobrasa.org

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THE DROWNING PREVENTION CHAIN

FACTOR TWO

UNINFORMED, UNPROTECTED OR UNRESTRICTED ACCESS TO THE HAZARD

INITIATIVE	DESCRIPTION	ORGANISATION	Resource/Website link
1. BARRIERS			
<input type="checkbox"/> Access Barriers			
<input type="checkbox"/> Pool Fencing	Guidelines for Safe Pool Operation	RLSSA	www.poolsafety.royallifesaving.com.au
<input type="checkbox"/> Pool Fencing	Fact Sheet – Fencing	RLSSA	www.royallifesaving.com.au
<input type="checkbox"/> Pool Fencing, barrier or cover	By law, is an obligation to every public pool to have a barrier that enable to isolate the pool from entrance.	SOBRASA	www.sobrasa.org
<input type="checkbox"/> Zebra stripe	A stripe yellow/black colour are used to indicate, isolate and highlight the attention of the public to hazards at the beach	SOBRASA	www.sobrasa.org
<input type="checkbox"/> Booms	Used to divide a swimming pool or waterway into various areas for different swimming ability or to prevent access to certain areas of water		
<input type="checkbox"/> Barriers:	Based on the risk assessment done by the beach / pool administrator preventing from falling into deep water or going to forbidden areas, marking of the swimming area by buoy lines	The Finnish Association for Swimming Instruction and Life Saving (FSL)	www.suh.fi/in_english/
<input type="checkbox"/> Buoy Lines			
<input type="checkbox"/> Buoy Lines	Used as a marker within a pool or other aquatic area including a beach to indicate the area in which the public should swim	RNLI	www.rnli.org.uk/beachlifeguards
2. SIGNAGE			
<input type="checkbox"/> Signage			
<input type="checkbox"/> International Standard	Draft standard being developed by the International Organisation for Standardisation (ISO TC 145/SC 3)	ISO (Draft)	Not yet available to the public
<input type="checkbox"/> Standard Aquatic Signage	National Aquatic and Recreational Signage Style Guide	SLSA best practice guide	www.lifesavingvictoria.com.au

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□ Standard Aquatic Signage	A Guide to beach safety signs, flags and symbols	RNLI best practice guide	www.rnli.org.uk/beachlifeguards
□ Standard Aquatic Signage	A risk assessment process followed by a signage prescription to local territorial authorities.	SLSNZ	www.surflifesaving.org.nz
□ Acrylic signage	Signage of hazards as: rip current, danger, marine animals, surf area, boat area, inappropriate for bathing.	SOBRASA	www.sobrasa.org

THE DROWNING PREVENTION CHAIN FACTOR THREE LACK OF SUPERVISION

INITIATIVE	DESCRIPTION	ORGANISATION	Resource/Website link
1. TRAINED OBSERVORS			
□ Trained Activity Supervisors			
□ Supervisory Qualifications	A complete range of supervisory qualifications are available including, National Pool Lifeguard, National Beach Lifeguard, National Rescue Award for Swimming Teachers and Coaches, National Rescue Award for Supervisors of Swimmers with Disabilities, and Emergency - Response Activity Supervisor	RLSS UK	www.lifesavers.org.uk
□ SLSNZ Qualifications Framework	A full framework of qualifications, pathways and training for lifeguards in New Zealand. Incorporates training manuals and resources as part of training programmes within the framework.	SLSNZ	www.surflifesaving.org.nz SLSNZ Lifeguard Manual SLSNZ IRB Manual SLSNZ Instructor Manual
□ DLRG Qualifications Framework	A full framework of qualifications, pathways and training for lifeguards in Germany. Incorporates training manuals and resources as part of training programmes within the framework.	DLRG	www.dlrg.de
□ Trained observers	Trained activity supervisors: qualifications framework of the Finnish association for Swimming Instruction and Life Saving; A full framework of qualifications, pathways and training for lifeguards in Finland. Incorporates training manuals and	The Finnish Association for Swimming Instruction and Life Saving (FSL)	www.suh.fi/in_english/

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resources as part of training programs within the framework.

□ Irish Water Safety Qualifications Framework	A full framework of qualifications, pathways and training for lifeguards in Ireland. Incorporates training manuals and resources as part of training programmes within the framework.	Irish Water Safety	www.iws.ie DVD – use of spinal stretchers Lifeguard Manual
□ Lifeguard Training Programme	Lifeguards trained for 80 hours. Includes physical testing, rescue training. In progress of making DVD to assist with training,	South Korea LSS	Lifeguard Manual LG Training DVD – In Production
□ SLSGB Qualifications Framework	A full framework of qualifications, pathways and training for lifeguards in UK. Incorporates training manuals and resources as part of training programmes within the framework. External organisations accredited to deliver training on behalf of SLSGB.	SLSGB	www.surflifesaving.org.uk
□ USLA Standards	A full framework of qualifications, pathways and training for lifeguards in USA	USLA	www.usla.org/Train%2BCert/
□ Aqua naught / Elementary / Bronze Medallion Framework	A pathway for the development of lifesaving skills for members to develop lifesaving skills.	LSS Malaysia	Zaidchelva03@yahoo.com
□ Pool Lifeguard Programme	Vocational training programme aimed at lifeguards in an aquatic centre environment	RLSS Australia	www.royallifesaving.com.au
□ Lifeguard Training Resources	Published several lifeguard – water safety books for lifeguards, instructors, general public. Also produced 2 DVD resources.	ELA Greece	Under construction
□ SLSA Qualifications Framework	A full framework of qualifications, pathways and training for lifeguards in Australia. Incorporates training manuals and resources as part of training programmes within the framework.	SLSA	www.slsa.com.au
□ Surf Lifeguard Training Programme	Lifeguards full trained for 110 hours.	Sobrasa	http://www.sobrasa.org/cursos/cursos.
□ Poll Lifeguard Training Programme	Lifeguards full trained for 55 hours.	Sobrasa	http://www.sobrasa.org/cursos/cursos.
□ River Lifeguard Training Programme	Lifeguards full trained for 80 hours	Sobrasa	http://www.sobrasa.org/cursos/cursos.
□ Jet Ski Lifeguard	32 hours (also international trained in Portugal to ISN)	Sobrasa	http://www.sobrasa.org/cursos/cursos.

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rescue course

THE DROWNING PREVENTION CHAIN FACTOR FOUR INABILITY TO COPE ONCE IN DIFFICULTY

INITIATIVE	DESCRIPTION	ORGANISATION	Resource/Website link
1. COMMUNITY EDUCATION			
<ul style="list-style-type: none"> □ Survival Skills Education for Public □ Range of Lifesaving awards for the public 	<p>A range of Lifesaving awards covering water safety, personal survival, self rescue, public rescue, and Lifesaving sport.</p>	RLSS UK	www.lifesavers.org.uk
<ul style="list-style-type: none"> □ Range of community education programs 	<p>A full range of lifestage specific programs and targeted at risk population programs to educate on surf safety principles and develop aquatic skills.</p>	SLSA	www.slsa.asn.au
<ul style="list-style-type: none"> □ Public Lifesaving Education 	<p>Lifesaving training/education classes provided for members of the public by Irish Water Safety volunteers. System of various swimming awards and lifesaving awards in place. Available on IWS website.</p>	Irish Water Safety	www.iws.ie
<ul style="list-style-type: none"> □ Hit the Surf Programme 	<p>1 day water based surf education scheme aimed at 8-12 year olds.</p>	RNLI	www.rnli.org.uk
<ul style="list-style-type: none"> □ Sea Survival □ Swimming / 	<p>Under Development Delivered to adults in cities mainly</p>	RNLI Trinidad and	www.rnli.org.uk

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- **Public rescue skills** Junior Lifesaver clubs, which are for children/young people between the ages of 8 to 15. Club members will learn the water safety and anticipation of situations and to respect the water element.

The Finnish Association for Swimming Instruction and Life Saving (FSL) educate instructors.
- The Finnish Association for Swimming Instruction and Life Saving (FSL) www.suh.fi/in_english/

APPENDIX

Risk Assessment

Principles

KLF sees the implementation of risk assessments for all aquatic locations as a key element of the strategies to reduce injury and loss of life or other adverse impact in the aquatic environment.

A generic framework and the main elements of the risk management process identified are:

- Communication and consultation
- Establish the context
- Risk identification
- Risk analysis
- Risk evaluation
- Development of a risk mitigation plan
- Monitor and review

The risk assessment should ideally:

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- 0 Provide a systematic framework for the evaluation of hazards and risk
- 0 Comply with relevant legal and regulatory requirements and international norms
- 0 Be proactive rather than reactive
- 0 Meet the needs of lifesaving services in the submitting nation
- 0 Be based on the best available information
- 0 Be based on best practice and where possible make use of sound science

Framework for the endorsement of risk assessment

The model should address the following:

1. Communication and consultation

Key stakeholders both internal and external are identified and engaged
A responsible person or persons are identified
The option of establishing a working group considered

2. Establish the context

Identify any historical data and statistics
Determine the legislative framework
Determine if there are any other advisory standards or guidelines
Determine if there are any other criteria to be achieved
Determine technical expertise required
Identify benchmarks
Identify the need for external advice / consultancy

3. Conduct the risk assessment

3a. Risk identification

Establish the operational environment
Establish a systematic framework for identifying hazards

3b. Risk analysis

Determine what can happen
Determine who might be harmed and how
Identify other potential negative impacts
Determine likelihood and consequences

3c. Risk evaluation

Establish a 'risk score'
Set risk priorities

4. Development of a risk mitigation plan

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Identify existing control measures (if any)
Evaluate existing control measures
Identify other treatment options
Evaluate treatment options

5. Monitor and review

Establish review date(s)
Establish criteria for an immediate re-evaluation

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CONCLUSIONS

1. Drowning is a leading cause of injury mortality in many parts of the country.
2. This document has been developed from the perspective of developed countries with a well established lifeguard framework. Additional research is needed to better understand the appropriate framework for counties/regions and KLF branches. This is currently being scoped by the KLF Drowning Prevention Commission.
3. KLF has determined that people drown within counties/regions and KLF branches due to one or a combination of preventable factors described in this document as the Drowning Prevention Chain.
4. Death by drowning can be reduced through a combination of appropriate control measures. For example, the Centres for Disease Control and Prevention report "Lifeguard Effectiveness: A Report of the Working Group" states that "Most drownings are preventable through such means as restricting swimming areas, posting warning signs, and fencing perimeters of pools and waterways. Two important preventive strategies are providing lifeguards in public areas where swimmers frequent, and encouraging use of such protected areas."
5. There is evidence to support some drowning prevention measures. These measures, where applicable, may form the core activities of drowning prevention.
6. It is important to review an intervention strategy in relation to its cost effectiveness in relation to the particular circumstance of that nation/region.
7. It is important that a risk assessment is carried out in relation to each intervention strategy before it is introduced.
8. It is important that outcome research is carried out to determine and document the effectiveness of drowning prevention measures in your nation/region.
9. Not all control measures contained within this document will necessarily work in each county/region, or indeed within different areas of the same county/region. The effectiveness of the introduction of an intervention strategy should be monitored over time and modified as appropriate.
10. Drowning reduction/prevention is a cost effective strategy, comparable with traditional infectious disease public health initiatives.

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RECOMMENDATIONS

1. Drowning prevention strategies should be introduced into societies' educational, social, vocational and recreational systems including school curricula.
2. Research on the effectiveness (or otherwise) of strategies to prevent drowning should be undertaken.
3. That the *Drowning Prevention Strategies, A framework to reduce drowning deaths in the aquatic environment for counties/regions and KLF branches engaged in lifesaving*, be the subject of continuous improvement with member federations advising the KLF Rescue Committee of initiatives so that those initiatives can be added to the document in a co-ordinated and on a regular basis.
4. That the *Drowning Prevention Strategies, A framework to reduce drowning deaths in the aquatic environment for counties/regions and KLF branches engaged in lifesaving*, be reviewed in its entirety by the KLF Drowning Prevention Commission to further enhance the effectiveness/relevance of the framework from a developing nation/region perspective.
5. That the *Drowning Prevention Strategies, A framework to reduce drowning deaths in the aquatic environment for counties/regions and KLF branches engaged in lifesaving*, be reviewed at least every 4 years by the Rescue Committee. It is anticipated that this review would be conducted in conjunction with the Country Water Safety Conference.
6. That when an intervention strategy is introduced, a review of the effectiveness over time be conducted so that additional evidence as to the effectiveness of that intervention strategy can be determined and added to the data available in the fight against death by drowning.
7. That Member branches review their drowning reduction/prevention strategies, monitor the effectiveness or otherwise of those strategies, and report their findings to the KLF Rescue Committee. This report can be enhanced and updated with initiatives prioritised according to the effectiveness of those initiatives. It is recognised that each country/region is different and what works in one area will not necessarily work in another e.g. the volunteer lifesaver system in Australia will not necessarily work in other countries with different cultures. Additional scientific study will enhance the effectiveness of this framework.
8. Bilateral knowledge transfer is encouraged. Counties and regions with well established drowning prevention strategies should facilitate others to research and create effective drowning prevention strategies.
9. Data should be widely shared. International conferences such as the Country Water Safety Conference conducted by the KLF, is one way to encourage the sharing of knowledge. The establishment of both formal and informal networks as well as partnerships can strengthen individual capacity.

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REFERENCES

International Lifesaving Federation Drowning prevention strategies

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