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Organization

Hidden depths

The global investment case for
drowning prevention



Hidden depths: the global investment case for drowning prevention

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Key statistics: **benefits of scaling up drowning prevention measures**

Scaling up investment for two drowning prevention measures – day-care for pre-school children and teaching school-age children basic swimming skills¹ – could help protect millions of young lives in countries with high rates of drowning.

BY 2050, INCREASING INVESTMENT FOR DROWNING PREVENTION MEASURES IN HIGH-BURDEN COUNTRIES² COULD:



SAVE THE LIVES OF OVER
774 000 CHILDREN



PREVENT ALMOST
1 MILLION NONFATAL CHILD DROWNINGS

PREVENT
178 000 NONFATAL CHILD DROWNING VICTIMS
SUSTAINING SEVERE, LIFE-LIMITING INJURIES



AVERT MORE THAN
US\$ 400 BILLION
IN POTENTIAL ECONOMIC COSTS OF
PREMATURE DEATHS AND MORBIDITY



CUMULATIVELY PROVIDE BENEFITS VALUED
AT AROUND US\$ 9
FOR EACH US\$ 1 INVESTED

- ¹ As described and defined in the *WHO guideline on the prevention of drowning through provision of day-care, and basic swimming and water safety skills* (1).
- ² The analysis for this report includes 50 low- and middle-income countries (LMICs) with the highest drowning burden, estimated through a composite index detailed in the Web Annex.

Foreword

Drowning inevitably means the abrupt and tragic loss of a loved one: an infant son or daughter, a parent providing for their family, a much-loved relative. And when many people drown at once, such as in floods or ferry disasters, entire communities are shattered. The toll taken by this preventable killer is relentless and high. Yet despite this, it is also hidden. Drowning remains a neglected public health issue.

Most victims of drowning are young children. This fact alone should act as an urgent spur to action. But in addition – for the first time on a global scale – this report also shows the clear economic returns from implementing effective drowning prevention strategies.

There are several evidence-based interventions to prevent drowning. This report examines two of these interventions with good evidence of cost-effectiveness and finds healthy returns on investment in a large majority of countries analysed. These interventions are providing day-care for pre-school children and teaching school-age children basic swimming skills.

Investing in drowning prevention has never been more important, nor the economic returns from investments better understood. Each year almost 236 000 deaths are caused by drowning, but many of these could be averted by scaling interventions to cover even just 50% of the populations in countries with a high drowning burden. What's more, these estimates are conservative: the benefits could be even greater.

Investing in and promoting the two evidence-based measures in this report could significantly reduce the human and economic losses caused by drowning. We hope our findings will shine a light on this neglected area of public health and enable policy-makers, leaders and donors worldwide to make a strong case for action.

Dr Ailan Li
Assistant Director-General
Division of UHC/Healthier Populations
World Health Organization



FIVE REASONS WHY DROWNING DEMANDS GREATER ACTION

Every year almost 236 000 people lose their lives to drowning. The overwhelming majority of these deaths (91%) occur in low- and middle-income countries. The human, social and economic toll of these losses is intolerably high and entirely preventable.

1. Most victims are young children

The statistics tell a story of heart-breaking loss: most victims are children. In eight countries within the WHO African Region, at least 70% of drowning deaths from 2020 to 2050 are projected to be among children aged 1–9 years.³ In at least 14 more countries, children in the same age group are expected to comprise over half of drowning deaths in the same period.

A deeper look at the statistics reveals that globally, some of the highest drowning rates occur among children aged 9 years and younger (2). In many countries in the South-East Asia Region and the Western Pacific Region, drowning is one of the leading causes of death for very young children, and in a considerable number of countries it is the leading cause of death among all children up to the age of 14 years.

Worldwide, drowning is the sixth leading cause of death for those aged 5–14 years, and in four of the six WHO regions, drowning is one of the top 10 causes of death among people younger than 25 years (2).

2. Many survivors endure lifelong impacts on their health and well-being

Those who survive drowning are sometimes left with catastrophic brain damage and long-term disability. This can create a potentially overwhelming challenge of care and financial cost for their families – particularly in high-burden countries.

3. Many incidents go unreported

Deaths in flood-related disasters are overwhelmingly due to drowning, but these deaths are often not registered as drowning deaths. This can also apply to deaths following accidents arising from transport on water. Finally, many drowning victims never reach a medical facility where their death could have been recorded. The rapid burial of drowning victims (for cultural reasons) is another cause of many deaths from drowning going unreported.

³ Based on analyses performed for this report



4. The true scale of drowning is not known

Drowning statistics likely underestimate the true scale of the problem in many settings where drownings occur. Even where reliable surveillance data do exist, cause-of-death categories mean drowning deaths from disasters (such as floods), transport-related deaths on water (including where vessels carrying migrants, refugees and stateless people capsize) and intentional drowning deaths (suicides or homicides) are not recorded as cases of drowning.

Data from high-income countries suggest such categorization can result in underrepresentation of the full drowning toll by up to 50% (3). This lack of data on drowning contributes to a vicious circle of inadequate national and international attention to the scale of the problem.

5. Drowning is an equity issue

Drowning is exacerbating health and socioeconomic inequalities. Poorer communities in all countries generally bear the greatest burden in terms of lives lost and economic pressures, while having the least resources available to improve the safety of their immediate environments. Drowning is also a development issue, with some countries losing the equivalent of about 3% of their annual Gross Domestic Product (GDP) to fatal and nonfatal drownings.⁴



The first United Nations General Assembly resolution on global drowning prevention, adopted in April 2021 (4), put the need for better understanding of drowning and how to reduce it at the forefront of Sustainable Development Goal (SDG) 10: reduce inequality within and among countries.

4 Based on analyses performed for this report

COST-EFFECTIVE STRATEGIES TO PREVENT DROWNING

This report presents the investment case for two interventions in 50 high-burden countries: providing day-care for children under 6 years of age and teaching basic swimming skills and water safety to children aged 6 years or older (1).

These two drowning prevention interventions are the first for which cost-effectiveness analyses have been done (5,6). There are additional drowning prevention interventions and strategies outlined in the *WHO Global report on drowning: preventing a leading killer* (7; see Box 1). While these other interventions have a strong evidence base, their cost-effectiveness analyses are not yet available.

Provide safe places away from water for pre-school children, with capable childcare

Why? Globally, children aged 1–4 years are the most vulnerable to drowning as they can fall into open sources of water from which they cannot get out. Lack of parental awareness of childhood drowning and how to prevent it, inadequate supervision and extensive exposure to water are the main risk factors for drowning in this age group (8).

In low- and middle-income countries, drowning in this age group tends to be closely associated with lapses in adult supervision during parents' and guardians' busy hours, when they are doing housework or other daily tasks. Community-based institutional supervision of children during the hours when they are most likely to drown is therefore an important way to protect them from drowning. It can also help ensure older children do not lose out on their education through having to supervise younger siblings.

Provide basic swimming skills and water safety training to children aged 6 years or older

Why? Drowning is a leading cause of child death in countries of all income levels, but the burden is largely in low- and middle-income countries, which account for over 91% of child drowning globally (2). This has led to increased interest in teaching swimming skills and water safety as a way to prevent drowning.

Teaching a child to swim can be hazardous if not done safely. Recognizing this, high-income countries have developed formal programmes to teach children swimming that are often supported by governments, reinforced by school curricula, certified by appropriate bodies, taught by trained and accredited instructors, evaluated for learning effectiveness, and tested for safety.

In general, children taking part are aged 6 years or older, screened for risks (such as epilepsy, asthma, disability) and taught in clean, clear, shallow water, with highly visible boundaries. Swimming is taught as one component of a programme including water safety and safe rescue, and knowledge and attitudes to water.⁵

However, these programs are not often prioritized for implementation in countries with fewer resources.

Box 1. How to prevent drowning

Practical, evidence-based ways to prevent drowning are outlined in the *WHO Global report on drowning: preventing a leading killer (7)*. These may be categorized as community-based action, appropriate policies and legislation, and research that refines best practice and identifies new ways to protect people. Identified interventions and strategies have worked in high-income countries and some low- and middle-income countries, and scaling them up could prevent many deaths.

WHO's 10 evidence-based actions to prevent drowning are as follows:

Community-based action:

1. Teach school-age children basic swimming, water safety and safe rescue skills.
2. Train bystanders in safe rescue and resuscitation.
3. Install barriers controlling access to water.
4. Provide safe places (e.g. a crèche) away from water for pre-school children, with capable child care.
5. Strengthen public awareness and highlight children's vulnerability to drowning.

Effective policies and legislation

6. Set and enforce safe boating, shipping and ferry regulations.
7. Build resilience and manage flood risks and other hazards locally and nationally.
8. Coordinate drowning prevention efforts with the work of other sectors and agendas – e.g. providing safe water and sanitation.
9. Develop a national water safety plan.

Further research

10. Address priority research questions with well-designed studies.

⁵ In low- and middle-income countries, conditions such as malnutrition, birth injury with physical and/or mental disability, asthma and epilepsy are common before the age of 6 years and are hard to screen for in these settings. This makes assessing safety for learning to swim even more challenging.

WHAT IF WE CONTINUE WITH BUSINESS AS USUAL?

Conservative estimates of the costs of inaction on drowning between now and 2050 can be made based on what we already know about the world's drowning prevention efforts, strengthened by data collated for this report. A full description of the methodology for the analysis can be found in the Web Annex.

Costs of inaction: 7.2 million deaths and US\$ 4 trillion lost

In terms of the human costs, if drowning prevention investment continues at its current inadequate level, by 2050:

- over 7.2 million people, mainly children, could die; and
- almost 19.1 million people could survive nonfatal drowning incidents but sustain injuries so severe that around 3.4 million will be left with long-term disabilities.

In terms of the economic burden, by 2050:

- fatal and nonfatal drowning incidents could generate total economic losses of about US\$ 4 trillion, or an average of US\$ 133 billion annually in high-burden countries

Country estimates of annual economic losses associated with drowning show a substantial burden. Analyses for this report reveal that on average, high-burden countries lose the equivalent of around 1% of their 2020 GDP due to drowning.

These figures represent a tremendous health and economic burden that have remained hidden thus far, particularly for low- and middle-income countries. Drowning exacts a heavy toll that demands more attention, requiring a significant global scale-up in investment to prevent it.

WHAT CAN BE ACHIEVED WITH MORE INVESTMENT?

Scaling up investment in the two drowning prevention interventions analysed in this report will have a positive impact in terms of lives saved, cases of severe child disability avoided and economic benefits. The health outcomes and returns on investment for high-burden low- and middle-income countries are as follows.

Lives saved: 774 000 child deaths averted and 178 000 cases of severe child disability avoided

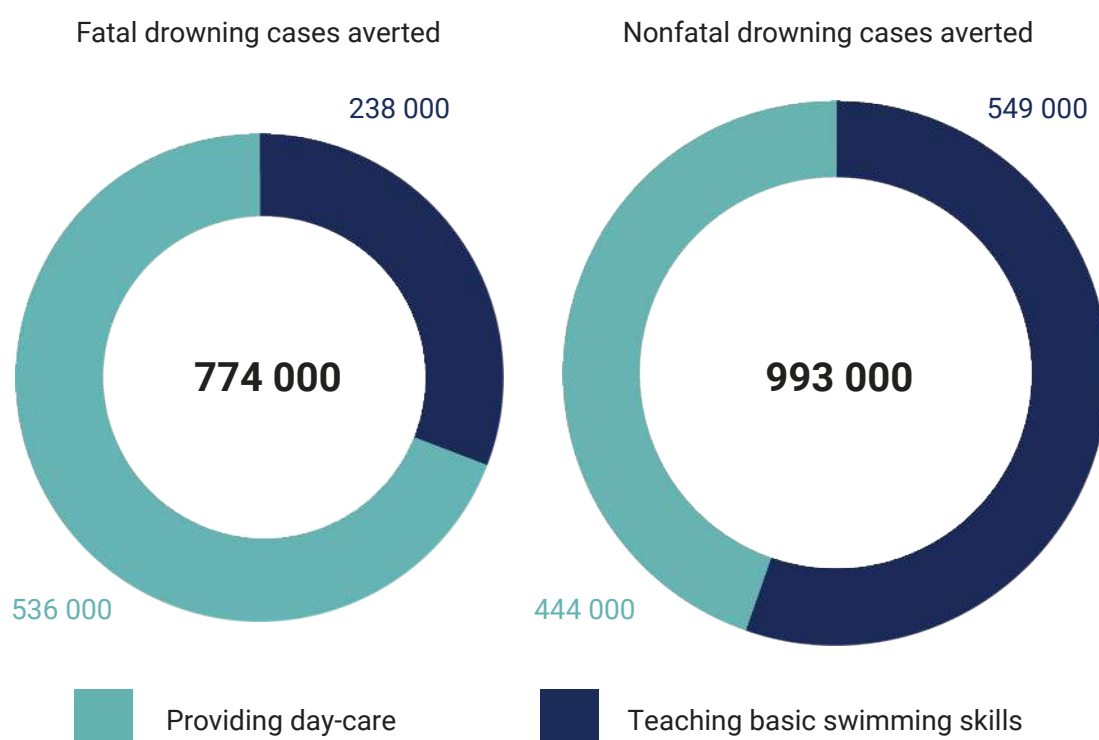
Scaling-up investment to cover half the target population across the high-burden countries would prevent considerable numbers of fatal and nonfatal drownings (Fig. 1). The two interventions combined could prevent about 774 000 fatal drownings in children aged 1–9 years and about 993 000 nonfatal drowning incidents in the same age group, of which about 178 000 cases would potentially have resulted in severe long-term disabilities.

Looking at each intervention, providing basic swimming and water safety skills training could prevent about 238 000 fatal and 549 000 nonfatal drownings by 2050, while providing day-care could prevent about 536 000 drowning deaths and 444 000 nonfatal drownings by 2050.



The greatest potential for the prevention of fatal and nonfatal drownings from implementing both interventions is predicted to be in India, China, Nigeria and the Democratic Republic of the Congo.

Fig. 1. Summary of health impact from scaling up drowning prevention interventions, high-burden countries, 2020–2050



Box 2. Drowning prevention in action: day-care prevents drowning deaths in Bangladesh

In Bangladesh, 40 children drown every day.^a In response, the Royal National Lifeboat Institution (RNLI) is working with the Centre for Injury Prevention and Research, Bangladesh, to keep pre-school children safe by supporting village crèches during peak drowning times of day and by training the women who run the crèches in vital life-saving skills.

Rima Akter lives in Barishal in rural Bangladesh, where child drowning deaths are three times the national average. Rima runs a crèche (or Anchal as they are called locally) in her village. Having learned vital cardio-pulmonary resuscitation (CPR) as part of her training, she was able to save the life of her own 3-year-old son, Tawhidul, when he fell into a pond in 2017 and lost consciousness. Rima, having received her CPR training just a month before, says: “If I hadn’t got my CPR training, I don’t know what would have happened, maybe by the time he reached hospital he would have died. I can’t even think of that situation.”

Thousands of women are now involved in running the crèches in Barishal. In 2019 almost 9000 children regularly attended community-operated crèches supported by the RNLI.

“The Anchal is very important for this village, if it wasn’t here the children would often drown and casualties would be much more,” says Rima. “Mothers now feel confident the children are safe – the children are not only safe from injury, they also get to learn a lot more things.”

^aCountry-reported figure.

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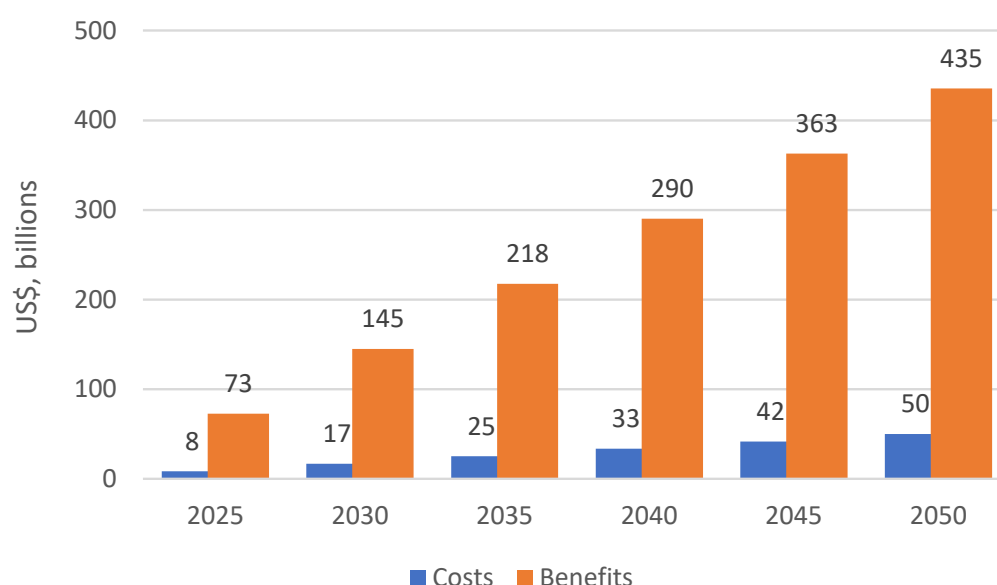
Economic benefits: US\$ 435 billion in averted losses over 30 years, equivalent to US\$ 14 billion losses averted annually

The averted fatal and nonfatal drownings cumulatively add up to substantial savings in future economic burden, through prevented economic losses from premature deaths and severe injury to survivors.

The two interventions could reduce losses by approximately US\$ 435 billion, or about US\$ 14 billion each year in high-burden countries (Fig. 2).

The largest economic impact from scaling up both interventions are expected to be in China, followed by India, and Nigeria.

Fig. 2. Cumulative intervention costs and economic benefits from scaling up drowning prevention interventions, high-burden countries, 2020–2050



“Investing in and promoting the two evidence-based measures in this report could significantly **reduce the human and economic losses caused by drowning.**”

WHAT ARE THE COSTS TO IMPLEMENT THESE LIFE-SAVING INTERVENTIONS?

The initial estimated cost to implement the basic swimming and water safety skills intervention is US\$ 16.66 for each participating child, while the day-care intervention is estimated to cost US\$ 26.34 per participating child.

Modelling an ambitious scale-up scenario that immediately covers half of all children in the identified high-burden countries, implementing both interventions would cost about US\$ 50 billion dollars to maintain that coverage level over the next three decades (the total cost for the day-care intervention would be US\$ 33 billion and teaching basic swimming and water safety skills would cost US\$ 17 billion) (Fig. 2).

While these may seem considerable, the actual additional costs could be lower if existing facilities for day-care or teaching basic swimming skills were not accounted for in the baseline scenario. Taking advantage of efficiencies from streamlining programmes could also help lower costs (see Box 3).



Box 3. Drowning prevention in action: swimming-skills programme reaches high-burden communities in South Africa

The National Sea Rescue Institute (NSRI) in South Africa launched its Survival Swimming Programme in 2019. Four years later, it is expanding and becoming more cost-effective, thanks to partnerships with local government.

The City of Cape Town's Recreation and Parks Department invested approximately 97 000 rand (US\$ 6700) to establish the programme, which is now providing free swimming-skills lessons in 24 locations across the Western Cape – the region with the fourth highest drowning rate in the country.

“Only 15% of South Africans can swim,” explains Dr Jill Fortuin, Executive Director of Drowning Prevention at the NSRI. “This is the result of social and economic factors that can influence certain population groups not being able to swim, as well as a lack of infrastructure in particular places, and the long-term impacts of apartheid. These drivers, together with WHO’s framework for drowning prevention, are the key motivating factors in NSRI’s drive to improve swimming skills and decrease the incidence of drowning in South Africa.”

The programme has expanded since its inception, growing from just seven volunteer instructors providing 20-minute lessons in 2019 to 55 volunteer instructors and 17 professional instructors providing lessons lasting 30–45 minutes. The number of lessons taught has also increased, from just over 150 in 2019 to over 13 500 in 2022. And costs per lesson have fallen from R74 (US\$ 5) in 2019 to R54 (US\$ 3) in 2022 as the programme has been streamlined and made more cost-effective.

“Our main aim is to leave the kids with water safety knowledge and survival swimming skills,” Jill says. “If children fall in the water, they should be able to get themselves to safety. We are expanding rapidly in the Western Cape, though this is dependent on the willingness of facility managers to participate, as well as patrons and surrounding schools.”



AN INVESTMENT THAT YIELDS POSITIVE LONG-TERM RETURNS

*On average, these two interventions are estimated to generate a return on investment of **US\$ 9 for each dollar invested** over a 30-year timeframe (Fig. 3).*

Although most of the economic benefits are expected to be realized years into the future, this report demonstrates that measures to prevent drowning are great investments to protect children's health. It provides policy-makers with a strong economic case to seriously consider implementing these interventions.

Investment in drowning prevention is economically viable in almost all high-burden countries

Being economically viable in this context means that an intervention will provide economic returns that are at least equivalent to the investment made.

Estimates suggest that teaching basic swimming and water safety skills is economically viable in 41 of the 50 high-burden countries modelled for this report, while the day-care intervention is economically viable in 46 of these countries.

A higher cost-benefit ratio could be realized if countries were able to take advantage of lower implementation costs, which merits further examination particularly for countries with results at the lower end of the analysis.



Fig. 3. Summary of key results from the analysis of 50 high-burden countries, 2020–2050

Investing in drowning prevention

Increasing coverage to 50% of children aged 1–9 years will initially cost

US\$ 16.66

per child to teach basic swimming skills



US\$ 26.34

per child each year to provide day-care



By 2050

almost

1 million

nonfatal child drownings

774 000

lives saved



including

178 000

severe cases with life-limiting injury

US\$ 400 billion

in economic benefits



US\$ 9

return for each dollar invested

A CALL TO ACTION: DROWNING IS AN URGENT ISSUE

- *The cost of drowning in terms of lives, livelihoods and lifelong disability – especially in low- and middle-income countries – demands urgent action.*
- *It is a major burden that is entirely preventable.*
- *Children aged 1–9 years are the most likely to die from drowning and must be protected.*

Drowning is an entirely preventable tragedy. It is also an issue of inequity: poorer communities in all countries generally bear the greatest burden. Drowning is also a development issue, with some countries losing the equivalent of about 3% of their annual GDP to fatal and nonfatal drownings.

The estimates in this investment case are conservative. They do not account for the possible co-benefits to be gained from the two interventions, such as more children in education, other negative cost consequences such as out-of-pocket health care expenditures for households, or productivity losses at work. Yet even with these limitations, the two interventions have already been shown to be cost-effective and with high economic returns.

Everyone should have safe access to water and be able to enjoy water safely. This investment case helps guide the global community towards recognizing that right.

Acting together with urgency, utilizing these two preventive measures could avert considerable numbers of premature deaths and injuries, and ensure economic benefits for households, health systems and the global community.

It's time to step up their use.



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