WORLD CONFERENCE ON DROWNING PREVENTION

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WELCOME 01

Official Welcome of Minister of Youth and Sports of Egypt

H.E. Prof. Dr. Ashraf Sobhy

Ministry of Youth and Sports in Egypt

The Ministry of Youth and Sports is pleased to welcome all delegates, speakers, and partners to the World Conference on Drowning Prevention 2025 in Sharm El Sheikh, Egypt. Hosting this year's conference reflects Egypt's commitment to supporting international collaboration in public health, youth development, and the advancement of safe practices around water environments.

Drowning prevention is a global priority that requires strong cooperation between governments, academic institutions, civil society organizations, and local communities. By bringing together experts and practitioners from around the world, this conference serves as an important platform for sharing evidence, exchanging experiences, and strengthening coordinated efforts to reduce drowning incidents and promote water safety.

Egypt has a long-standing connection to water through the Nile River and its coastal regions and recognizes the responsibility of ensuring safe and inclusive access for all individuals, particularly young people. The Ministry continues to support initiatives that encourage education, physical activity, and community resilience in aquatic environments.

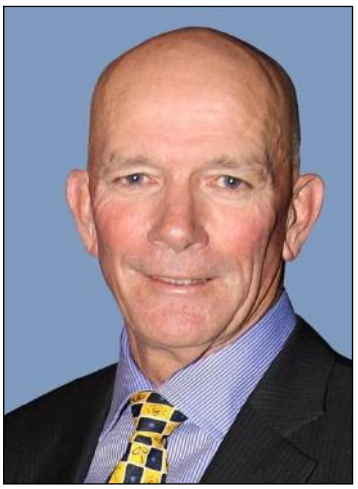
We extend our appreciation to all partners and organizing bodies contributing to the success of this global gathering. We wish all participants a productive and meaningful conference experience in Egypt.

WELCOME 02

Official Welcome of the ILS President Mr. Graham Ford AO

Graham Ford AO

International Life Saving Federation, Leuven, Belgium



Welcome to Sharm El-Sheikh, Egypt, and the World Conference on Drowning Prevention 2025.
On behalf of the International Life Saving Federation (ILS), I am delighted to welcome all participants to the World Conference on Drowning Prevention 2025 (WCDP 2025).
The World Conference on Drowning Prevention is the flagship educational event of the International Life Saving Federation. This biennial gathering brings together the world's leading experts, research, systems, and information on drowning prevention, rescue, lifesaving, lifeguarding, and water safety.
The exchange of ideas, debate, and discussion is focused on finding ways to reduce further drowning deaths and injuries in all aquatic environments worldwide.
Drowning remains a major global public health issue, larger than many recognize or accept, and is almost entirely preventable. The vision of the ILS is "A world free from drowning."
The theme for the WCDP 2025, "Waves of Change", reminds us that the world around us is changing, and so must we. Climate change, rapid urbanization, and increased interaction with water bring new risks. These waves test our systems and push us to become more innovative, more collaborative, and to combine our efforts for collective action.
The ILS is once again incredibly proud and grateful to the World Health Organization (WHO) for co-sponsoring the WCDP 2025. We deeply appreciate this co-sponsorship. WHO leads the world in raising global, regional, and national awareness of drowning and its prevention.
The strategic goals of the ILS for the 2025-2028 quadrennium will be discussed and further developed during WCDP 2025 to continue promoting global best practices in water safety, lifesaving, lifeguarding, and broader drowning prevention issues.
The ILS will also discuss its role in Disaster Recovery and Emergency Management, in which many of our National Federations are actively involved. At WCDP 2025, the Lifesaving Academy Flood Course is set to debut. It brings together global experts in flood rescue, disaster logistics, and crisis management. With floods increasing in frequency and severity worldwide, this is a groundbreaking initiative.
On behalf of the ILS, I would like to thank President Sameh El Shazly and the Egyptian Diving and Lifesaving Federation for hosting the World Conference on Drowning Prevention 2025.
WCDP 2025 offers a great chance to contribute to and support the global effort to reduce drowning, and I look forward to meeting all the participants at the conference.

WELCOME 03

Official Welcome of the Egyptian Diving and Life Saving President

Sameh El Shazly

Egyptian Diving and Lifesaving Federation

The Egyptian Diving and Lifesaving Federation is proud to host the World Conference on Drowning Prevention 2025 in Sharm El Sheikh.
This gathering represents far more than a professional convening; it is a shared commitment by practitioners, educators, policymakers, and community advocates to safeguard lives in and around water. The collective knowledge and dedication present at this conference reflects a global determination to transform research and experience into meaningful, sustainable impact.
Egypt has a deep cultural and historical relationship with water, from the Nile to the Red Sea.
With this connection comes a responsibility to ensure that individuals, families, and communities can experience water safely. The Federation continues to work alongside national and international partners to expand training programs, develop capacity at local levels, and promote water safety education as a foundation for prevention and empowerment.
We extend our gratitude to all delegates for contributing their expertise, time, and collaboration to this important field. We hope that your participation leads to new partnerships, strengthened networks, and a renewed shared commitment to reducing drowning worldwide. We wish you a productive and inspiring conference, and a meaningful stay here in Egypt.

WELCOME 04

Official Welcome of the World Health Organization delivered by Dr David Meddings

David Meddings

World Health Organization, Geneva, Switzerland

The International Life Saving Federation and the Egyptian Diving and Lifesaving Federation are delighted to announce that the World Conference on Drowning Prevention 2025 (WCDP 2025), to be held in Sharm El Sheikh, Egypt, from 21–23 November 2025, is officially co-sponsored by the World Health Organization (WHO). WHO's ongoing global leadership in drowning prevention, following its pivotal reports and support for United Nations and World Health Assembly resolutions, continues to shape the future of drowning prevention and water safety.

WCDP 2025, themed "Waves of Change," will unite leading experts, practitioners, researchers, and policymakers in drowning prevention, lifesaving, and aquatic safety from across the globe. The Egyptian Diving and Lifesaving Federation (EDLF) is honored to bring this flagship event to Egypt and the Middle East/North Africa region for the first time, amplifying global and regional impact on drowning prevention.

Since the last global conference, the world has witnessed growing momentum through the continued celebration of World Drowning Prevention Day on 25 July, the launch of the WHO's first Global Status Report on Drowning, the establishment of the Global Alliance for Drowning Prevention and the development of the first Global Strategy for Drowning Prevention. Every year, over 300,000 people lose their lives to drowning, with the burden highest in low- and middle-income countries, including those in Africa and around the Mediterranean.

Dr David Meddings, from WHO's Department of Health Determinants, Promotion and Prevention, remarks: "Bringing WCDP to Egypt highlights drowning as a critical, but neglected, public health issue in this region and worldwide. The continued WHO partnership ensures the conference fosters real action towards reducing these preventable deaths, especially where the need is greatest."

International Life Saving Federation (ILS) President Graham Ford AO commented: "WCDP 2025's arrival in Egypt reflects the evolving leadership in drowning prevention and the importance of engaging new regions. WHO's co-sponsorship energizes our mission to galvanize governments, civil society, and the aquatic community for lasting, life-saving change."

WELCOME 05

Egypt National Water Safety Strategy 2030

Mr. Sameh ElShazly – Prof.Ass. Hazem ElRouby – Ms.Ingy ElShazly

Egyptian Diving and Lifesaving Federation

Drowning is a preventable yet critical public health concern in Egypt, disproportionately affecting children, adolescents, and young adults across urban and rural environments. The Egypt National Water Safety Strategy 2030 establishes a comprehensive, evidence-based national framework aimed at reducing drowning fatalities, promoting a culture of water safety, and embedding preventive measures into policy and community practice. Central to the Strategy is the National Water Safety Authority (NWSA), which coordinates governance, enforces safety standards across rivers, canals, lakes, and coastal zones, and leads multi-sector interventions. The Strategy is organized around six pillars: governance and legislation, prevention and public awareness, safe infrastructure, professional training and capacity development, research and innovation, and emergency preparedness and response. Implementation is phased over 2025–2030, from institutional establishment and targeted awareness campaigns, to nationwide integration and system expansion, culminating in sustainable national operations. Targets include a ≥40% reduction in drowning fatalities, universal access to basic water safety education, professionalization of lifeguard and rescue services, and operationalization of the National Drowning Data System for evidence-based planning. Aligned with Egypt Vision 2030 and UN Sustainable Development Goals, the Strategy emphasizes health, resilient communities, climate adaptation, and responsible resource management. Egypt also aims to serve as a regional hub for maritime safety, search and rescue, and humanitarian cooperation, fostering knowledge exchange and cross-border partnerships. By combining governance, data-driven planning, public awareness, and sustainable financing, the Strategy transforms water safety from reactive measures into a preventive, enduring national system that safeguards lives and instills a conscious culture of safety around water.

Plenary

PLENARY 01

WHO Global Status Report on Drowning Prevention - Creating a Wave of Change

Dr Caroline Lukaszyk

World Health Organization, Geneva, Switzerland

Background: Drowning remains a major and preventable cause of death worldwide, particularly among children and young people. The recently published Global status report on drowning prevention 2024 (1) provides the first comprehensive global benchmark for drowning prevention efforts, supporting strategic planning, multisectoral collaboration, and allowing for monitoring of efforts over time.
Methods: The report presents data gathered through a standardized questionnaire completed by teams of multisectoral national collaborators from 139 Member States and Territories represent 85% of the global population. Evidence of national-level action for Drowning prevention was investigated across five domains: (1) governance and coordination. (2) policy and legislation; (3) community-level interventions; (4) awareness-raising; and (5) data and research. The report includes a descriptive analysis of drowning burden, based on WHO Global Health Estimate data from 2021.
Results: In 2021, an estimated 300,000 people died from drowning globally. Over 40% of Drowning deaths occurred among children aged less than 15 years of age, and over 90% occurred in low- and middle-income countries. The global drowning death rate has declined by 38% from 2000 to 2021. Many countries have made strong progress in implementing WHO-recommended drowning prevention measures, with widespread availability of weather alerts and community flood risk management efforts. However, interventions targeting children remain limited: fewer than one in four countries include swimming and water safety education in school curricula, and less than one third provide national childcare programs offering safe spaces for preschool-aged children. Only 26% of countries report having a national drowning prevention strategy.
Conclusions: The report shows that although drowning deaths are declining globally, the issue remains widely overlooked and marked by deep inequities. The framework established through the Global status report offers a new foundation for tracking progress and guiding investment. To accelerate impact, countries must strengthen cross-sector coordination, expand proven, scalable interventions and integrate drowning prevention into broader development agendas.
Implications for policy & practice: This first Global status report offers decision makers actionable evidence to prioritize drowning prevention, align with United Nations and WHO resolutions, and catalyze action across health, education, transportation, disaster risk reduction and other related sectors.

PLENARY 02

The Global Strategy for Drowning Prevention - unite for drowning prevention

Dr Justin Scarr[1,2,3], Dr David Meddings[4,3], Dr Caroline Lukaszyk[4,3]

1Royal Life Saving Society - Australia, Sydney, Australia. 2International Life Saving Federation, Leuven, Belgium. 3Global Alliance for Drowning Prevention, Geneva, Switzerland. 4World Health Organization, Geneva, Switzerland

The Global Strategy for Drowning Prevention represents a landmark, multisectoral approach to address one of the world's most preventable causes of death and disability. Drowning claims more than 300,000 lives annually, disproportionately affecting children, youth, and disadvantaged populations—especially in low- and middle-income countries.

This panel will review the vision, goals, and operational pillars of the strategy, which seeks to achieve a 35% reduction in global drowning rates by 2035 through people-centered, equity-driven, and community-owned actions.

Key elements include strengthening governance and leadership, fostering multisectoral collaboration, improving data and reporting, enhancing advocacy and awareness, mobilizing sustainable financing, and advancing research and innovation. Ten priority interventions, such as promoting supervision of children, expanding water safety and survival skills, improving infrastructure, enforcing boating and maritime safety, and integrating drowning risk with disaster reduction, are central to building resilience across people, places, and contexts.

The session will highlight successful case studies, operational frameworks, and global benchmarks for progress, emphasizing the importance of local leadership, global cooperation, and accountability. Participants will gain practical insights on implementing the Global Strategy for Drowning Prevention to save lives, promote health, and advance sustainable human development.

PLENARY 03

Putting Affected Communities at the Centre: Equitable Partnerships in Drowning Prevention

Colleen Saunders[1], Abigail Hamwada[2], Asante Sefa-Boakye[3], Sujoy Roy[4], Muhammad Said[5]

1Division of Emergency Medicine, University of Cape Town, Cape Town, South Africa. 2Design without Borders Africa Ltd, Kampala, Uganda. 3Black Star Polo, San Diego, USA. 4Child in Need Institute, West Bengal, India. 5The Panje Project, Zanzibar, Tanzania, United Republic of

How do we move beyond consultation to genuine collaboration with communities most affected by drowning? This panel brings together global voices to explore what equitable partnerships look like in practice.
Panelists will share experiences in co-designing community-based interventions. Join us as we unpack strategies for shifting power, fostering trust, and ensuring that drowning prevention efforts are inclusive, sustainable, and driven by those who know the risks best.
Abigail Hamwada is the Managing Director at Design without Borders Africa, where she leads multidisciplinary teams to co-create community-driven solutions that improve health, safety, and livelihoods for under-served populations. Abigail and her team are implementing the Enhancing Fisherfolk Safety initiative in Uganda, funded by Bloomberg Philanthropies, which aims to reduce drowning risk among fisherfolk through the design and local manufacturing of flotation devices and improved access to weather information.
Asante Sefa-Boakye is the founder and CEO of Black Star Polo, a nonprofit dedicated to increasing aquatic access and water safety in African and African-American communities. A San Diego native and global advocate, his work has empowered youth through culturally rooted water safety education and aquatic programming. As both a water polo coach and hip-hop artist, Asante blends creativity and activism to build a more inclusive future in aquatics.
Sujoy Roy is the National Advocacy Officer at the Child in Need Institute (CINI), who implement community-led drowning prevention initiatives across West Bengal, India — especially in the climate-vulnerable Sundarbans region. Their approach is centered on equitable partnerships with women's self-help groups, local governments, and community volunteers to co-design solutions such as KAVACH crèches, pond fencing, and first-responder training.
Muhammad Said is the Grants Manager for The Panje Project in Zanzibar, a non-governmental organization working with the local community in Nungwi to improve quality of life. Since it started in 2013, The Panje Project has taught swimming skills, aquatics safety and drowning prevention techniques for more than 10,000 inhabitants of the archipelago and has trained more than 1000 teachers at government schools to deliver lessons on staying stay safe in and around the water.

PLENARY 04

Youth-led advocacy for drowning prevention: adapting lessons from road safety participation models

Sana'a Ramez Khasawneh

YOURS Youth for Road Safety, Culemborg, Netherlands

Drowning is one of the leading causes of death among young people worldwide, yet youth remain largely excluded from efforts to prevent it. In contrast, the field of road safety has advanced by placing youth at the center of structured advocacy strategies, grassroots mobilization, and global coalition-building. This abstract explores how such models can be adapted to strengthen youth leadership in drowning prevention.

Youth-centered approaches emphasize meaningful participation as a continuous, supported process that embeds young people's perspectives across all stages of policy and program development. Rather than token involvement, these frameworks champion intergenerational collaboration, capacity-building, and youth-driven solutions that respond directly to lived realities. They position youth not only as stakeholders but as credible advocates and agents of change.

Applying this model to drowning prevention offers several strategic advantages. Young people—often among the most affected by drowning risk factors are uniquely placed to co-design and lead targeted interventions. Through structured training, campaign planning, peer-to-peer outreach, and storytelling, they can generate public support, shift behaviors, and elevate the visibility of water safety issues in policy agendas. The road safety sector has demonstrated that youth-led campaigns, when grounded in evidence and strategy, are highly effective in mobilizing communities and shaping public discourse.

Equally essential is youth engagement in policymaking. Systematic inclusion of young leaders in governance via consultations, youth advisory roles, and joint agenda-setting yields more inclusive and context-specific policy outcomes. It also fosters institutional trust and social accountability, especially where youths have historically been marginalized in decision-making processes.

This approach aligns with global commitments such as the UN Convention on the Rights of the Child and the Sustainable Development Goals, which affirm youth rights to participate. Drawing on the structured strategies used in road safety; the drowning prevention field has an opportunity to catalyze a youth-led movement rooted in advocacy, coalition-building, and civic empowerment to address one of the most urgent and preventable causes of youth mortality.

PLENARY 05

Plenary Panel: Boosting youth leadership for drowning prevention

Sana'a Ramez Khasawneh[1], Ryo Shimada[2], Briar McCaw[3], Farida Osman[4], Jagnoor Jagnoor[5]

1YOURS Coalition for Road Safety, Amsterdam, Netherlands. 2CHUO UNIVERSITY, Tokyo, Japan. 3Brock University, Toronto, Canada. 4Egyptian Swimming, Cairo, Egypt, 5The George Institute for Global Health, Sydney, Australia

Youth leadership in drowning prevention is a driving force for transformative change. This panel will showcase how young leaders are innovating, advocating, and partnering to combat the persistent risks of drowning in their communities and globally. Drawing from the expertise of the YOURS (Youth for Road Safety) Coalition's Advocacy Manager, *Sana'a Ramez Khasawneh,* the session will emphasize the critical importance of empowering youth as equal stakeholders in prevention efforts. Through their global road safety campaigns, YOURS has demonstrated the power of youth-driven mobilization, peer education, and policy advocacy to achieve legislative and behavioural change.

Panellists will share lessons learned from youth-led actions that bridge the worlds of road and water safety, offering unique perspectives on cross-sector collaboration and community engagement. Highlighting skills in peer-to-peer communication, campaign design, and stakeholder negotiation, the panel will inspire new partnerships and equip attendees with tools to support youth inclusion in aquatic safety initiatives. By positioning youth not as recipients but as leaders and co-designers of prevention solutions, the session will advance the global vision—mobilizing the next generation to eliminate drowning and advance the Sustainable Development Goals worldwide.

PLENARY 06

ILS Life Saving Academy

Joost Bierens

International Life Saving Federation, Leuven, Belgium

Global developments in the field of drowning prevention have created refreshing awareness within the International Lifesaving Federation (ILS) leadership that drowning prevention extends beyond the border's areas supervised by ILS-linked lifeguards. At the same time, the joint capacity, knowledge and experiences in this field are greater within the ILS than in any another organization. This situation provides a challenge and an opportunity. The ILS-International Lifesaving Academy (ILS-ILA) is exploring the solid basis of lifesaving and Rescue expertise can contribute to prevention in societies at large while also improving the professional status of lifesavers. Meetings with ILS regions and commissions provided positive feedback. The process also requires connecting with academic institutions, (non)governmental organizations and sponsors. The executive board of the ILS-ILA is exploring various sources of existing knowledge, skills, experience and research can be integrated in global efforts to reduce drowning.
Established just last year, the short-term objective of ILS-ILA is organizing high-end continuous education courses on generic topics that support lifesaving professionalism. Preparations are in an advanced stage to have multi-day courses in 2026 and 2027 on leadership in lifesaving, open water safety, emotional burden of lifesaving and elite-lifeguards. If there is interest, the inaugural course on flood rescue will also be scheduled again. Other plans are in the incubator. During the World Drowning Prevention Conference 2025, an interactive session will explore the opportunities if the ILS-ILA can serve as a hub for academic professors and leadership in lifesaving research. The long-term objective of the ILS-ILA is establishing the content for an international qualification framework (QF) level 4-6 course for a water safety officer (working title) and to introduce this course to universities and institution for vocational education. The profession of water safety officer would allow structural attention to drowning prevention at local, regional and national level and the wide variety of professional and recreational organizations where water safety is of concern. As such, the future water safety officer will also serve as the hands and brains for the many governmental initiatives to be taken in the wake of the WHO global drowning prevention report.

PLENARY 07

Plenary Panel: Integrating drowning prevention with climate and disaster

William Koon1, Bertha Kusimi2, Adrian Mayhew3, Dr Amy Peden4

1Royal Life Saving Society - Australia, Sydney, Australia, 2National Disaster Management Organization, Accra, Ghana, 3Surf Life Saving Great Britain, Exeter, United Kingdom, 4School of Population Health, UNSW Sydney, Kensington, Australia

A fast and engaging session exploring the integration of drowning prevention with the climate change and disaster risk reduction agendas. Panellists will each bring one interesting fact to the stage, then we dive in together for a quick round of rapid-fire insights, smart context, and the big takeaways.
What are the drivers and pressures of drowning in the context of climate change and extreme weather events? How can we position into relevant agendas? Add layers of prevention further upstream? Reach those affected most? Reframe the existing discourse with a nexus to drowning prevention?
No long PowerPoint lectures, just curiosity, open minded discussion, and diverse viewpoints to drive the conversation forward. You will leave entertained with a few new ideas, ready to continue the dialogue throughout the rest of the day!

PLENARY 08

Plenary Panel: Opportunities to strengthen rescue systems

William Koon[1], Samantha Fien[2], Yeasir Iftekhar[3], Joanna Talbot[4]

1Royal Life Saving Society - Australia, Sydney, Australia, 2Surf Life Saving Queensland, Brisbane, Australia, 3Centre for Injury Prevention and Research, Dhaka, Bangladesh, 4Royal Life Saving Society UK, Worcester, United Kingdom

A fast and engaging session exploring how we can strengthen rescue and lifeguarding systems. Panellists will each bring one interesting fact to the stage, then we dive in together for a quick round of rapid-fire insights, smart context, and the big takeaways.
Expect a few surprising insights from the latest research, a story or two with practical insight, and spirited debate on the things that matter most for enhancing lifeguard systems.
No long PowerPoint lectures, just curiosity, open minded discussion, and diverse viewpoints to drive the conversation forward. You will leave entertained with a few new ideas, ready to continue the dialogue throughout the rest of the day!

PLENARY 09

Plenary Panel: Boosting swimming, water safety and self-rescue skills

Ana Catarina Queiroga[1], Léa Mekkaoui[2], Aminath Zuna[3], Jon Sundan[4], Danielle Obe[5]

1IDRA - International Drowning Researchers Alliance, Kuna, USA, 2Department of Sports Sciences and Physical Education - University of Lille, France, 3Salted Ventures Swimmers, Male, Maldives, 4Norwegian University of Science and Technology, Trondheim, Norway, 5Black Swimmers Association, United Kingdom

This Plenary Panel at WCDP 2025 critically advances the global drowning prevention strategy by focusing on boosting swimming, water safety, and self-rescue skills. Drawing on diverse perspectives from high-income and low-middle income countries, the session traces what is known—evidence-based delivery models and proven interventions—and spotlights what remains unknown, including persistent equity barriers, data gaps, and populations still being missed. Facilitated with a short, high-impact slide set, the panel will highlight current evidence, identify glaring gaps, interrogate equity, and explore scalable models from various settings.

Each panellist will reflect for ninety seconds, responding to stimulus questions, before joining a facilitator-driven thematic discussion on: effective practices, knowledge gaps, and risks or opportunities related to scaling up interventions. The discussion underscores the urgent need for inclusive, sustainable approaches, particularly in resource-limited settings where most drowning deaths occur, and where formal swim instruction is often lacking. The panel concludes with actionable priorities—such as strengthening global frameworks, expanding school-based and community programs, ensuring local ownership, investing in teacher capacity, and fostering multisector alliances. These priorities set a bold agenda for reaching underserved groups and accelerating universal access to life-saving aquatic skills before WCDP 2027.

PLENARY 10

Plenary Panel: Reducing occupational exposure to drowning

Rebecca Sindall[1], Frederick Oporia[2], Caroline Lucaszyk[3], Tanja Krangnes[4]

1RNLI, Poole, United Kingdon, 2Makerere University School of Public Health, Kampala, Uganda, 3World Health Organization, Geneva, Switzerland, 4Norwegian Society of Sea Rescue, Oslo, Norway

Reducing occupational exposure to drowning is a critical commitment highlighted in the Global Strategy for Drowning Prevention, particularly for those whose work brings them in, on, or around water across sectors such as fisheries, aquaculture, agriculture, transport, and construction. Workers in these settings—especially within informal sectors—face a substantially higher risk of drowning compared to the general population, impacting not only individuals but also their families and communities.

This plenary panel explores effective measures to mitigate these risks, including the development of robust legal frameworks, national workplace safety policies, and licensing and inspection systems. Priorities include the mandatory implementation of safety training, routine risk assessments, consistent use of protective gear like lifejackets, and fostering strong safety cultures through worker-led programmes and local initiatives. Global actors are urged to advocate for strengthened international labour conventions and support capacity building, while countries are encouraged to establish comprehensive reporting and dedicate resources to these efforts. Community and individual engagement is essential to ensure compliance and normalization of safety practices. Ultimately, effective workplace drowning prevention leads to reduced fatalities and injuries, promotes productivity, and supports economic sustainability

Disaster

DISASTER 01

Examining environmental factors and natural hazards as determinants of injury and mortality in the context of climate change: A scoping review

Sean Kelly[1,2], Jaz Lawes[2], Amy Peden[1]

1University of New South Wales, Sydney, Australia. 2Surf Life Saving Australia, Sydney, Australia

Background:
The global burden of injury and mortality occurring in aquatic environments is significant. Environmental factors such as weather, climatic conditions, and associated natural hazards, are generally understood as determinants of aquatic injury and mortality. Climate change is profoundly altering the frequency and intensity of extreme weather events and water related disasters in a way that is both increasing exposure to waterways and the hazardousness of water-related disasters. Building a comprehensive understanding of the environmental factors that drive exposure and risk in aquatic environments and how these factors are expected to change in the context of climate change is essential to understand present and future risk for those who live and recreate around water.
Method:
This scoping review followed methodology described by Arksey and O'Malley (1), incorporating recommendations from Levac et al. (2). The objective was to determine the primary environmental drivers of injury and mortality risk among recreational water users and those who enter the water unintentionally, contextualizing this information within the understanding of the future impacts of climate change.
Results:
Results of the scoping review will be presented. Preliminary analyses have shown changes in ambient temperature is a major concern for aquatic injury risk, with drowning deaths projected to increase more than any other type of unintentional injury death as a result global heating. Other drivers such as waves, rip current, floods, and extreme storms are also significant drivers of aquatic injury, however, the impact of climate change on these factors are less certain and region specific.
Discussion:
Left unabated, climate change is predicted to significantly increase the risk of aquatic injury and mortality in the future, with implications for the water safety sector, risk management, and broader public health systems and infrastructure. We will discuss environmental factors as drivers of aquatic injury and death, describe the burden attributable to each of these factors, and discuss how these impacts are likely to alter into the future as a result of climate change.

DISASTER 02

Emerging Issues in Disaster Risk Reduction and Drowning Prevention: Developments Challenges, and Policy Solutions in Wusuta, North Dayi District, Ghana.

Bertha Kusimi[1], Prosper Ninorb Gmakikube[2]

1National Disaster Management Organization, Accra, Ghana. 2University of Education, Winneba, Winneba, Ghana

Ghanaians are becoming more concerned about disaster risk reduction and drowning prevention, especially in the North Dayi District situated along the Volta Lake and River Dayi in Ghana's Volta Region. Recurring drowning incidents affects local communities due to their proximity to the Volta Lake, the largest manmade lake in the world, making them susceptible to water-related hazards. Increased emerging issues such as urbanization, climate change, and extreme weather events are some drivers of drowning. These risk drivers and pressures now bridge the gap between disaster risk reduction and drowning prevention. The limited public awareness of water safety measures heightens the vulnerability of drowning further exacerbating the problem.
In understanding the drowning risk of Wusuta, this project advocated for an in-depth study of local risk factors, community resilience, and policy gaps which are critical role players in progressing drowning prevention. The project further explored the **developments,** challenges, and policy solutions in drowning preparedness within broader disaster management frameworks. The project evaluated the gaps in stakeholder coordination, weak local disaster response frameworks and resource allocation identifying them as strong concepts that underpins drowning prevention and disaster risk reduction. It also explored the roles of traditional knowledge, individual attitudes and behaviors, community-led initiatives, and modern technological interventions that have been barriers in addressing drowning risk.
The engagement process revealed several critical insights for effective water safety planning including the police protocols in handling drowning cases in the communities. The integration of traditional knowledge with modern safety practices proved essential for community acceptance and implementation, demonstrating the value of local wisdom in risk management. Practical demonstrations and simulations emerged as more effective learning tools compared to theoretical training alone, significantly improving community preparedness and response capabilities.
These systems must be strengthened by multi-stakeholder cooperation, with a focus on integrated policies, better emergency responder training, and community-driven projects. Improving response and readiness with practical example and simulations, which develops community involvement and comprehension of drowning prevention techniques.

DISASTER 03

Perilous future for coastal communities: Examining climate change impacts on drowning in the eastern coastal zone of Ghana

John Kusimi

University of Ghana, Accra, Ghana

The increasing frequency and severity of floods and tropical storms due to climate change are increasing the drowning risks of coastal communities and urban localities especially in the developing world. Ironically, studies on the impact of climate change on drowning have been insignificant globally despite it having become a public health concern because of the injuries and deaths that arise from these climatologically related disasters. A larger percentage of these drownings occur in low and middle-income countries owing to the vulnerable state of the poor and the lack of institutional capacity and policies on drowning prevention. In Ghana, climate change impacts are increasing the risks of the drowning of fisherfolks who go out fishing in perilous dug-out canoes and are forced to go further into deep seas today because of the migration of small pelagic fishes into deep waters. Flash and tidal floods have also been ruthlessly plaguing coastal communities and towns increasing the exposure of residents to drowning hazards in Ghana. This study explored the relationship between climate change and drowning, the typology of drowning, and the causes in the coastal enclave of the Volta Region in Ghana, highlighting the need for improved early warning systems, enhanced infrastructure, and community-based adaptation strategies. This is part of a broader study on the impacts of climate change on the livelihoods of coastal communities in three West African countries including Ghana. The methods included desk-top study, in-depth interviews, and focus group discussions with community leaders, residents, fishermen and their leaders, leaders of state institutions, and NGOs using semi-structured interview guide. Bad weather conditions were listed as one of the main causes of unintentional drowning in the ocean and rivers and the illegal migration across the Mediterranean Sea, a grey area that needs further research. The system and dissemination of early warnings on extreme weather events in Ghana are poor and not curbing drowning related disasters in the country. By integrating climate resilience measures with water safety education, the locality and the country in general can mitigate the growing threat of climate-induced drowning and safeguard its population.

DISASTER 04

Strengthening community resilience through drowning prevention in Lake Victoria: Lessons from a climate-informed project in Tanzania

Editrudith Lukanga

EMEDO, Mwanza, Tanzania, United Republic of

Drowning is a major cause of death in small-scale fishing communities around Lake Victoria, with climate change—such as stronger storms, winds, and fluctuating water levels—intensifying the risks. In response, EMEDO and RNLI launched a community-based drowning prevention project in seven Tanzanian lakeside communities, aiming to reduce drowning and build climate resilience. Using a participatory, human-centered approach, the project introduced several sustainable safety interventions. These included distributing subsidized life jackets through a co-payment model, piloting low-cost buoyancy aids, and training local tailors to produce flotation devices from recycled bottles. Community engagement was fostered through culturally tailored awareness campaigns involving theater, sports, mobile cinema, and interactive events.
To improve preparedness, fishers received training in weather forecasting and rescue skills, supported by local “weather champions” who updated community weatherboards. Community safety committees were formed to manage these efforts, integrating safety into local fishing practices and development plans. The project also collaborated with local governments to align initiatives with policy frameworks, including reviewing by-laws and embedding drowning prevention in annual village and district plans.
The project operates in a challenging context of inadequate infrastructure, weak regulation, and increasing climate threats. Nevertheless, it shows that combining drowning prevention with climate adaptation can improve safety behavior, local accountability, and resilience. Women fish workers played a key role as safety champions, enhancing gender inclusion and community trust. Despite successes, challenges remain in maintaining access to quality safety gear and extending training to more remote communities. Still, the Lake Victoria project offers a scalable model for other inland and coastal regions facing similar risks. By integrating drowning prevention into broader climate and disaster risk frameworks, such initiatives can deliver significant public health and resilience benefits in high-risk, low-resource settings. Sustained investment and policy support are essential to deepen and expand these impacts.

DISASTER 05

Impact of Heatwaves on Ambulance Transport Drowning in Queensland

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Background
Globally, temperatures are increasing, with extreme weather becoming more common, leading to more heatwaves of greater severity for longer periods. It has previously been demonstrated that heatwaves increase the likelihood of drowning deaths occurring, noting that this was for unintentional drowning and not boating-related or intentional drowning. Groups that are at risk of fatal drowning are males, and older people [1]. In this study we use Ambulance data to explore the impact of heatwaves on ambulance attended drowning incidents.

Methods
We undertook a retrospective, total population study of all ambulance-attended drowning incidents in Queensland between 1-Jan-2010 and 31-Dec-2019 for the warmer months of October to March. Heatwaves were defined using the Excess Heat Factor (EHF) developed by the Australian Bureau of Meteorology. Ambulance and climate data were linked at the postcode level. The incident rate of drowning ambulance attendance on heatwave days was compared with the incident rate for non-heatwave days to calculate incident rate ratio and 95% confidence intervals.

Results
Heatwaves were associated with an increase in drowning incidence, with an overall incidence rate ratio (IRR) of 1.57 (95% CI: 1.47 to 1.68). Females had a higher increase on heatwave days (1.78, 95% CI: 1.59 to 1.98) compared to males (1.43, 95% CI: 1.30 to 1.57). The 0-14 years age group had the highest IRR at 1.84 (95% CI: 1.66 to 2.04), followed by the 15-24 years group at 1.61 (95% CI: 1.36 to 1.91). In terms of rurality, remote areas showed the greatest increases in drowning incidence with an IRR of 1.78 (95% CI: 1.26 to 2.52).

Conclusion
Heatwaves pose a significant risk for drowning and there is a need for lifesaving, ambulance and hospitals to prepare for more cases during heatwaves. There may also be a need to change lifesaving services to meet the changing weather conditions, such as being available for longer periods. This study also shows that females, young people and those living in remote locations had the greatest increase in incidence compared to non-heatwave days. Future work will need to address these vulnerable groups to reduce the impact heatwaves will bring.

DISASTER 06

Lifeguards Response in Flood Disasters

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Background - Rise in global flood disaster intensity and occurrence, including recently in Libya, Turkey, Brazil, South Africa, North America, the UK, Germany, and Australia, call for increased efforts in disaster risk reduction. Prevention measures are important to prevent loss of life, communities, nations, and protection of livelihoods, health, cultural heritage, socioeconomic assets, and ecosystem, enhancing global resilience.
Interventions - Countering this emerging threat necessitates sophisticated and scalable aquatic rescue knowledge. Global organisations, including Surf Life Saving Australia, have invested significantly in the previous decade in enhancing disaster response amid floods. Lifesavers and aquatic rescue practitioners have inherent competence in aquatic rescues, advanced communication, risk identification, and superior fitness that qualify them as valuable assets in the occurrence of floods.(1) A global shortfall, however, remains in integrating this specialised aquatic rescue knowledge into the broader civil emergency plans in enhancing overall response amid worsening flood conditions and escalating community risk. Recent research, including in Australia and the United Kingdom, explores lifeguards' capabilities in supporting during the four phases of floods: Pre-flooding; Flash flooding; Flood expansion; and Flood recovery.
Conclusions - The 2025 World Conference on Prevention of Drowning presents a timely opportunity to review and share experiences in incorporating aquatic rescue capability into flood response. This session will feature tangible results and learnings from Australia's considerable investment, upskilling, and operational exposure. Acknowledging the considerable funds that regularly go into post-disaster recovery, there's an urgent need to promote increased pre-disaster spending on the specialised knowledge of lifeguards and aquatic rescue organisations around the world. This session intends to provoke active delegate engagement, collecting learnings on investments and outputs from organisations around the world. The end result is to stimulate and hasten an interdependent global collaborative network (2) on effective flood disaster relief, with the creation of mutuality and operational continuity across international borders.

DISASTER 07

Floods in Valencia 2024 - Chronology of a natural disaster

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Background
The DANA (isolated depression at high levels) is a meteorological phenomenon produced by a cold air current in high layers that, when descending over other layers of air at a higher temperature, produces great atmospheric disturbances accompanied by very intense rainfall.
On October 29, 2024, this phenomenon caused an extraordinary episode of rainfall that reached 771 l/m² in 24 hours, of which 185 accumulated in just one hour in some towns near Valencia, leaving behind more than 220 dead and several missing.
Objectives
To analyse the events of the phenomenon chronologically
To identify the preventive measures that were carried out as well as their suitability.
To analyse the actions of the alarm and emergency services mobilised in response to the event
What happened?
On 24 October, the State Meteorological Agency (AEMET) warned of a possible isolated depression, pointing to Valencia as one of the main affected areas
On 27 October, the Generalitat Valenciana disseminates messages indicating that the community will be affected by the DANA.
On 28 October, Emergencies recommends keeping "downpipes and terraces clean to avoid flooding, avoiding taking the car if it is not necessary and flood-prone areas such as ravines, channels or rivers"
On 29 October
6:45h AEMET issued its first orange warning, which means a potential danger for usual activities in the region.
7:30h-8:00h Red alert, the highest level in the weather alert system, which implies extreme caution.
7:32-7:52-9:37 Several sections of public transport are suspended
Some municipalities suspend school
12:10 AEMET informs the media of the red alert and that flooding is already occurring. People are asked to take shelter and get out of danger.
18:30 overflow of a ravine that affected several municipalities
20:12 Civil Protection alert to the population
After the disaster
Months after the disaster, it is time to analyse:
Could the tragedy have been avoided?
Were the right protocols applied?
Was the right action taken?
Were the necessary means activated before, during and after?
All these questions will be analysed and answered during the presentation

DISASTER 08

Surf Life Saving – an emerging leader in floodwater response, evacuation and rescue

Michael Bonnici[1], Shane Daw[1,2], Jaz Lawes[1,2], Sean Kelly[1]

1Surf Life Saving Australia, Bondi, Australia. 2Beach Safety Research Group, UNSW, Australia

Background:
Climate change directly impacts on flood risk through increasing rainfall, sea levels and unpredictable weather patterns. Since 2019, Australia has faced multiple floods each year, with varying degrees of severity and impacts on communities, infrastructure, and environment. The repeated flood events over this period devastated Australian communities, causing mass displacement requiring the evacuation and rescue of thousands of Australians and the loss of 78 lives since July 2019. Surf Life Saving (SLS) was a vital part of the national crisis response, supporting other more traditional flood response organisations.

Description:
SLS members have a unique skills set and are well versed in aquatic rescue. SLS provide supportive resources in emergencies, with nationally distributed water and air response equipment available and accessible to assist. It is fitting that SLS response capabilities have now extended into supporting inland and floodwater emergency rescue and response. With almost 1,200 members purposefully trained in flood and swift water response, this significantly increases the collective emergency response abilities, with members rescue-ready to assist other emergency services when required.

Lessons learned:
Between July 2021 and June 2024, a total of 1,301 SLS members* worked to support the flood emergency effort. SLS personnel volunteered almost 45,000 hours, and responded to 1,138 callouts. There were 285 Inflatable Rescue Boat activations, and 55 UAVs used in the response effort, and helicopter operations. In total, SLS personnel aided in the rescue and evacuation of over 1,600 people. As SLS floodwater response teams are collectively being enhanced and improved, specific lessons learned regarding best practice, systems and techniques will be presented.

Conclusions:
Multisectoral collaborations that benefit from collective skillsets and capabilities are vital to optimise emergency responses. As flooding events are predicted to increase in frequency, intensity and unpredictability in the future, emergency response organisation need to build a strong, integrated and collaborative national emergency response capability. This can effectively minimise impacts on individuals and communities. With an inherent community-centred mindset and skilled workforce, Surf Life Saving represents an integral part of Australia's national emergency response infrastructure, with these efforts reaffirming their relevance within the national emergency response domain.

DISASTER 09

After the flood: lessons learned and changes made

Dirk Bissinger

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After the dramatic floodings in Germany in summer 2021, many things started to change, and efforts were taken to advance and improve different aspects of disaster prevention and flood rescue. This spans from introducing of new technologies, enhancing existing rescue and personal protection equipment etc. as well as diversified approaches to (public) learning and communication. This presentation will be based on the developments in the last years and range from initiatives driven by the government, activities led by NGO like the water rescue organizations and enhancements in overall approaches towards water safety, disaster prevention and flood rescue by all organizations involved.
As additional step, the European Union has started to raise some of these developments to a transnational level. Insights will be granted into this quite new development.
Finally, with the recent floodings in 2023 and 2024 across Europe, selected examples will be presented and evaluated towards how efficient the actions have been implemented and executed and define further needs.
These descriptions can be applied to other countries if needed and the presentation will include recommendations on how to raise the level of readiness across the globe.

DISASTER 10

Flood deaths related to unintentional drowning, United States 2018 to 2023

Briana Moreland, Tessa Clemens

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Introduction: From 2018 to 2023 there were 95 flood disasters declared in the United States (1). Flood related deaths are often caused by drowning. An average of 4,300 unintentional drowning deaths are reported every year in the United States (2), however flood deaths are not typically included in this number due to the way death certificates are coded and analyzed. The objective of this study was to estimate the percentage of flood deaths that were related to drowning in the United States to inform drowning surveillance efforts.
Methods: We analyzed data from the National Vital Statistics System from 2018 to 2023. Deaths were considered flood-related if the International Classification of Disease 10th revision (ICD-10) code X38 was selected as the underlying cause of death. Flood deaths were considered drowning-related if there was a drowning ICD-10 code (T75.1, V90, V92, W65-W74) listed as one of 20 multiple causes of death.
Results: Of the 304 flood deaths from 2018 to 2023 in the United States, 92.8% had drowning listed as a multiple cause of death. The percentage of flood deaths related to drowning differed by year ranging from 70.9% in 2022 to 100% in 2018 and 2020. Among residents of urban areas, drowning was listed as a multiple cause of death in 97.1% of flood deaths while drowning was listed as a multiple cause of death for only 87.2% of flood deaths that occurred among residents of rural areas. Drowning was listed as a multiple cause of death for 100% of the flood deaths among people aged 15 to 34 years, but only 86.7% of flood deaths among children aged 1 to 4 years, 85.7% among children aged 5 to 14 years, and 87.8% among people aged 45 to 54 years.
Conclusion: Although flood deaths are relatively uncommon in the United States, when they do occur, most are related to drowning. Drowning, including flood-related drowning, is preventable. Researchers and drowning prevention experts analyzing the burden of drowning may want to consider including deaths where the underlying cause was listed as flood-related in their analysis.

DISASTER 11

Effects of climate change on the 2024 floods in Brazil: an analysis of prevention and public management failures.

Jeferson Franca

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Context: Climate change has caused extreme weather events, and Brazil was seriously affected by floods in 2024, particularly in the state of Rio Grande do Sul. This study aims to investigate the causes, impacts and failures in preventing natural disasters, highlighting the responsibilities of the State in risk management and protection infrastructures.
Methods: A descriptive and critical analysis of flood events that occurred between January and May 2024 was carried out, with an emphasis on material and human damage, response actions, and the assessment of prevention infrastructure. Data was collected through official government reports, interviews with disaster management experts, and analysis of media reports.
Results: The study identified that 90.9% of municipalities in Rio Grande do Sul were affected, with 183 deaths, in addition to 2.1 million people impacted. The tragedy revealed critical flaws in Porto Alegre's drainage and pumping infrastructure, which were not properly maintained, despite previous warnings. Furthermore, the state government did not prioritize investments in preventive measures, with an agenda focused on austerity and privatization policies.
Conclusions: The tragedy exposes the vulnerability of urban and rural areas in Brazil to the effects of climate change, worsened by neglect in public prevention and infrastructure policies. The results reinforce the urgent need for investments in disaster prevention, maintenance of critical infrastructure and public management planning that prioritizes the protection of vulnerable populations. Such measures are essential to mitigate the impacts of future climate catastrophes, in addition to demonstrating that solidarity, although fundamental, does not replace State action.

DISASTER 12

Investigating The Neglect of Drowning in Global Disaster Risk Reduction Framework.

Bertha Kusimi

National Disaster Management Organisation, Accra, Ghana

Drowning is the third most common cause of unintentional injury-related deaths worldwide, making it one of the deadliest yet most ignored disasters. Drowning disasters are given little consideration in disaster risk reduction frameworks, such as the Sendai Framework for Disaster Risk Reduction (SFDRR) 2015–2030, despite their enormous impact. Urban flooding, incidents involving rivers and lakes, coastal drowning, child fatalities in water bodies, and unsafe water transportation all contribute to Ghana's ongoing drowning risk. Using document analysis, this study evaluates policy gaps, response tactics, and the implications for disaster risk management in Ghana as it critically examines the Sendai Framework's disregard for drowning disasters.

The results show that although the Sendai Framework places a strong emphasis on flood risks, Earthquakes and tsunamis, drowning is not considered a separate disaster. This results in poor policy enforcement, few risk assessments, and insufficient funding for water safety measures. A review of international and national disaster reduction and management documents also shows that Ghana's disaster management organizations, NADMO, have high mortality rates during urban floods and water transport accidents because there is inadequate coordinated emergency response, GIS-based risk mapping, and comprehensive drowning prevention strategies.

This study contends that in international and national disaster frameworks, drowning ought to be acknowledged as a separate disaster risk. The study suggests incorporating drowning risk assessment into national disaster management plans, identifying high-risk areas through GIS-based mapping, and implementing comprehensive water safety measures like community-level preparedness programs, life jacket requirements, and swimming instruction

Further reducing the risk would be public awareness campaigns on drowning prevention and improved emergency response training for water rescue operations. Ghana can better align its drowning policies with multi-hazard disaster risk reduction principles of the Sendai Framework by incorporating these measures into the larger framework for disaster management.

This collaboration should include mainstreaming drowning prevention and fortifying water safety regulations into national and international disaster policies. With this all-encompassing approach, drowning will no longer be a neglected disaster risk; rather, it will be prioritized within Ghana's larger disaster management strategy, improving emergency response capabilities in accordance with the Sendai Framework's multi-hazard approach.

DISASTER 13

National Life Saviour Force: A Scalable Model for Flood-Related Drowning Prevention in India

SEBASTIAN RAJ SANTHANAM

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Background: India faces an escalating drowning crisis due to recurrent and severe flood disasters, exacerbated by climate change and inadequate preparedness. Traditional response mechanisms struggle with manpower shortages and lack of trained personnel. The National Life Saviour Force (NLSF) is proposed as a dedicated, scalable initiative to train youth and communities in flood rescue and drowning prevention.

Description:

The NLSF is designed as a structured, multi-tiered program with the following key components:

1. Training Centers & Youth Engagement:
- Establish regional training centers in flood-prone states.
- Engage schools, universities, and National Service Schemes (NSS) to train youth in water safety, rescue, and survival skills.
- Provide government-certified training in flood rescue techniques, lifeguarding, CPR, and emergency response.

2. Community-Based Preparedness & Rapid Response Network:
- Develop a national database of trained responders for rapid mobilization during floods.
- Implement an AI-based mobile app for real-time emergency alerts, volunteer activation, and GIS-based flood tracking.
- Conduct community awareness programs on flood risk management and self-rescue techniques.

3. Public-Private Partnerships & Sustainability:
- Collaborate with NDMA, SDRF, NGOs, and corporate CSR programs for funding and resource mobilization.
- Partner with private organizations to develop cost-effective rescue equipment and technology solutions.
- Advocate for policy integration of flood rescue training in educational curriculums.

Lessons Learned:
- Initial pilot programs in Tamil Nadu and Kerala demonstrated that structured training significantly improved rescue efficiency and reduced drowning fatalities.
- Community involvement and local governance support are critical for the successful deployment of trained responders.
- Digital tools enhance coordination and reduce response time during flood emergencies.

Conclusions:

The NLSF model presents a sustainable and scalable approach to drowning prevention in flood-prone areas. By integrating youth training, technology, and community engagement, this initiative strengthens India’s disaster resilience. Scaling this project nationwide will save thousands of lives annually and create a new generation of skilled first responders. Policymakers and stakeholders are encouraged to support its expansion and institutionalization.

DISASTER 14

Reframing rip currents as a perpetual natural disaster: An update on the Australian context

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Background:
Natural hazards are environmental phenomena that arise from natural processes and have the potential to cause significant harm to human populations, infrastructure, and ecosystems. They become disasters when they intersect with human activities, leading to loss of life, economic damage, and environmental degradation. Rip currents are prominent features on many beaches and are one of the leading causes of coastal drowning incidents worldwide. Rip currents are also a major cause of coastal erosion during large swell or storm events, transporting sediments (sand) considerable distances offshore. This paper extends our understanding of beach characteristics that lead to rip current drowning death and explores rip currents in the context of other natural hazards.
Methods:
Using 20 years of rip current drowning deaths, we describe beach environmental characteristics and hazard ratings. To explore the prevalence of rip-related drowning in relation to other natural hazards, we compared 10-years of rip drowning deaths to deaths caused by other external forces of nature [1].
Results:
Over 20 years rip currents were responsible for at least 22 drowning deaths each year. Beaches that recorded rip current drowning deaths were longer and wider, with higher modal wave heights and longer wave periods. Their dominant hazard rating was intermediately hazardous (rating = 5). Natural hazard mortality differed significantly ($F_{12,117}$=33.75 ; $p<0.001$), rip currents recorded the highest annual average of 22.2 deaths (±1.74 SEM). Annual average rip current mortality was significantly higher than all external forces of nature except excessive natural heat [X30], remaining higher than annual deaths caused by sharks, crocodiles, lightning, floods and cyclones combined.
Conclusions:
This study reaffirms previous research reporting that rip currents account for more deaths in Australia than sharks, floods and cyclones combined [2]. This reignites calls to reframe rip current drowning as a natural hazard in a similar context to other hazards (i.e. heatwaves). As the leading natural hazard for aquatic fatalities in Australia, higher prioritisation and profile should be given to rip currents by funding providers and other decision-makers. Rip currents, as a recurrent coastal hazard with lethal consequences and significant costs, should be appropriate recognised as a perpetual natural disaster.

DISASTER 15

An organisational resilience approach to understand climate change risk and safeguard Australian communities

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Background:
Climate change is already transforming Australia's coastline. Surf Life Saving faces significant and
accelerating challenges that demand timely action. Rising sea levels, intensifying severe weather events, and changing coastal dynamics are not future scenarios – they are current realities affecting
SLS's operations, assets, and service delivery capability.
Description:
SLS's extensive network of facilities, skilled volunteers, and trusted community position represent a unique and valuable resource for Australia's coastal resilience. Government agencies, emergency services, and communities increasingly depend on SLS's assets and capabilities during crises. While these challenges are substantial, they also present a strategic opportunity for SLS to strengthen its position as a leader in coastal safety and community resilience.
Lessons learned:
Through site visits and active club engagement, the project team documented previous hazard experiences and identified service delivery vulnerabilities, which informed the development of a comprehensive resilience assessment tool for all Australian SLSCs. This process culminated in a suite of recommendations and potential future projects at club, state, and national levels, aimed at
improving resilience to natural hazards and climate change. The national recommendations have been developed into six interconnected themes each containing an overarching recommendation with further details and suggested actions to support their implementation.
Conclusions:
The time for incremental responses has passed. SLS must act comprehensively and strategically to maintain, support and grow the movement as the impacts of climate change occur. The project has provided SLS with a deeper understanding of natural hazard risks and vulnerabilities, establishing a baseline for future impact measurements and helping to guide strategic decisions about future service and resource capacity for the organisation.

DISASTER 16

beyond the beach: expanding the role of disaster management in surf lifesaving

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Background: The Future of Disaster Management survey was conducted to gather insight from Surf Life Saving Queensland (SLSQ) members to assess current capabilities, identify key challenges, and explore opportunities for growth in disaster and emergency response. The feedback collected is intended to inform strategic planning and support the development of a more resilient and capable response framework for SLSQ into the future.
Methods: A total of 145 individuals participated in the survey, representing a wide range of roles across SLSQ, including lifesaver volunteers, club administrators, Emergency Response Group (ERG) members, and employees. The survey was conducted early 2025 and collected both quantitative and qualitative data to assess confidence levels, identify challenges, and gather recommendations for future directions.
Results: Findings show that 60% of respondents are confident in SLSQ's current ability to respond to disasters, while only 7% expressed a lack of confidence. Nearly half (47%) have participated in disaster or emergency response activities. Key challenges identified were training and skills development (73%), volunteer recruitment and retention (49%), and collaboration with other emergency services (41%). Notably, 89% support expansion of SLSQ's disaster and emergency response role, with top areas of interest including flood water response (81%), marine rescue support (73%), and UAV search and rescue operations (59%). Structurally, 42% of respondents preferred disaster management to sit under Operational Support, while 40% supported a standalone department.
Conclusion: Survey participants envision a future in which SLSQ plays an expanded role in disaster response, supported by enhanced training programs, dedicated emergency response teams, and strengthened interagency collaboration. In the next five years, respondents prioritised enhancing training, developing emergency response teams, and strengthening partnerships. Resources identified as necessary included additional training, upgraded equipment, and increased staffing. Innovations such as AI-driven analytics, drone technology, and gamified training platforms were also suggested. This presentation would also include SLSQ's direction following this survey and a where to next that is occurring from a volunteer and staff perspective.

Medical

MEDICAL 01

2025 revised Utstein-Style Recommended Guidelines for Uniform Reporting of Data From Drowning Resuscitation: An ILCOR Advisory Statement

Niklas Breindahl[1,2,3,4], Freddy Lippert[2], Joos Bierens[5,3,6], The Utstein Style For Drowning Collaborative .[1]

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Background
Despite efforts to reduce drowning incidence, challenges remain in collecting standardized, comparable data across different settings. The Utstein Style for Drowning (USFD) guidelines, published in 2003 and revised in 2015, provide a structured framework for uniform data reporting in drowning resuscitation. However, inconsistencies in variable reporting and a lack of precise definitions have been identified. Additionally, variations in data availability across healthcare systems limit the guidelines' applicability. Given the increasing number of studies utilizing the USFD guidelines, a revision is necessary to ensure clinically relevant and scientifically robust data collection.
Methods
This study employs a modified Delphi process to achieve expert consensus on revising the USFD guidelines. The Delphi method consists of three iterative rounds of online surveys, allowing participation from a diverse group of experts in drowning resuscitation, guideline development, and emergency medical service. Participants will be identified through purposive and snowball sampling.
In **Round 1**, participants will suggest relevant variables, including definitions and coding categories. In **Round 2**, they will rate each variable's importance and availability for inclusion in a preliminary data extraction template. In **Round 3**, a final vote will determine consensus on the revised template, with repeated rounds as necessary to reach an agreement.
Results
The study is ongoing, with data collection expected to be completed before the conference. We anticipate developing a revised data extraction template incorporating the most clinically relevant and feasible variables for drowning resuscitation research. The updated template aims to improve data standardization and facilitate multi-center collaboration.
Conclusion
This revision of the USFD guidelines will enhance the consistency and comparability of drowning resuscitation data. Using an established consensus process, this study will produce a scientifically rigorous and practical template to guide future research and improve drowning outcomes. The findings will contribute to refining global drowning resuscitation practices and support the continued evolution of evidence-based guidelines.

MEDICAL 02

European resuscitation guidelines 2025 - what is new, what remains the same and what should be done

Joost Bierens

International Life Saving Federation, Leuven, Belgium

The 2015 resuscitation guidelines by the European Resuscitation Council (ERC) are published as part of the section special circumstances in resuscitation, which is an extension of advanced life support (ALS). In contrast to guidelines for basic life support (BLS) and the more common ALS, this section is a consensus document, based on systematic and scoping reviews, additional relevant research, public feedback and ERC endorsement. Compared to the 2021 ERC guidelines, the role of first responders, such as lifesavers, is more prominent, while clarifications have been made on the role of safe rescue techniques by bystanders and first responders, avoiding resuscitation delay for spinal stabilization and the emphasis of the importance of starting with 5 ventilations, and if possible 100% oxygen. Airways and ventilation equipment can be used by first responder when trained appropriately. In case of high insufflation pressure, common in drowning, ventilation pressure needs to be increased gradually to overcome counterproductive gastric inflation. The use of extracorporeal cardiopulmonary resuscitation (ECPR) should be considered in health systems where available. Hypothermic drowned persons should be treated according to the hypothermia protocol that is also included in special circumstances section. The ERC 2025 drowning resuscitation guidelines consolidate the importance of ventilation, oxygen and the use of ventilation equipment while acknowledging that first responders as lifesavers represent a dedicated group of laypersons able to provide more than BLS. At the same time, this responsibility can only be taken when training programs result in ALS competencies at the level of medical professionals. The weak scientific basis of the guidelines emphases the need for more resuscitation research with rigorous methodologies that can be instrumental for future guidelines.

Lott C, Karageorgos V, Abelairas-Gomez C, et al (2025) European Resuscitation Council Guidelines 2025 Special Circumstances in Resuscitation. Resuscitation 215 Suppl 1:110753. doi: 10.1016/j.resuscitation.2025.110753.

MEDICAL 03

Rapid Triage for Drowning (RTD): A New Drowning Triage Model to Optimize Rescue Management

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Drowning is a major global health emergency, causing approximately 300,000 deaths annually. However, only 5% of cases receive medical care, and just 0.5% require CPR. This highlights the vast number of rescue interventions occurring worldwide, often in multiple-casualty scenarios, necessitating a specific triage system for water rescue.
Triage prioritizes patients based on the severity of their condition. The START model (Simple Triage And Rapid Treatment) can be adapted for drowning, as respiratory failure is the primary issue. Similar to START—where airway clearance or hemorrhage control is prioritized—drowning triage emphasizes five rescue breaths in cases of respiratory arrest.
Clinical Presentations
Drowning severity classification is crucial for effective triage:
Mild impairment (Grade 1): Conscious, normal breathing or coughing.
Possible mild pulmonary edema (Grade 2): Isolated rales.
Moderate pulmonary edema, risk of deterioration (Grade 3): Diffuse rales, tachypnea.
Severe respiratory failure (Grade 4): No breathing but a palpable pulse, requiring immediate ventilation.
Cardiac arrest (Grade 5): No breathing or pulse, requiring resuscitation.
Critical prognosis (Grade 6): Prolonged submersion (>1 hour) in extreme conditions, ineffective resuscitation.
RTD Model for Drowning Triage
The Rapid Triage for Drowning (RTD) allows for quick classification based on key questions:
Is the patient breathing normally?
Are diffuse rales present?
Is breathing absent?
Is a pulse present?
The RTD system assigns priority codes for intervention:
Green (Mild, Grade 1-2): Normal breathing, coughing, or isolated rales.
Yellow (Moderate, Grade 3): Diffuse rales, tachypnea, evolving pulmonary edema.
Red (Severe, Grade 4-5): Severe respiratory distress or absent breathing with a pulse.
Black (Critical, Grade 6 - Prolonged Submersion): Submersion >1h, frozen chest, water <5°C, unsafe scene.
Blue (Critical, Non-medical responders): Same as black but for non-medical personnel.
Conclusions
A rapid, standardized drowning triage system improves rescue efficiency, resource allocation, and survival rates. The RTD model helps prioritize care and enhances emergency response. Training rescuers and increasing public awareness remain essential in preventing and managing drowning incidents

MEDICAL 04

Is it time to move away from abstinence only education? A novel protocol and call for research on safe underwater breath holding practices

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Background:
Underwater breath hold (BH) training is required by numerous civilian, military, and recreational industries. Indigenous underwater food gathering and recreation practices date back millennia[1].

Blackout from hypoxemia, cardiac dysrhythmias, or other etiologies occurs in healthy persons and is always a risk of BH training[2]. Intentional hyperventilation prior to BH causes hypocapnemia and reduces the hypercapnemic urge to breathe, leading to hypoxic blackout. There are numerous drowning deaths annually in otherwise healthy athletes or military hopefuls due to unsafe breath holding practices[3].

These risks have driven “abstinence only” for breath holding practices without addressing the need for safe training spaces.

Description:
We present a novel protocol from a US based international lifeguard training and risk management company to allow BH training in the context of formal training programs with adequate safety personnel. The company serves over 400 client organizations operating over 1000 facilities in 31 countries including pools, waterparks, and protected beachfronts.
“It is extremely important to be aware of the dangers of blackout. Enact and enforce policies that prohibit BH contests, underwater swimming contests, and underwater hypoxic training drills (breath-holding while swimming). Be especially vigilant for patrons stating that they are training for freediving, military qualification exams, or other physical fitness programs. The only allowance for breath holding activities is during scheduled, organized underwater fitness programs”[4]

Lessons Learned: The program was implemented in January 2024 and there is currently one fitness program operating in an urban center with 45 person hours/week with no adverse events. Training is ongoing for all our facilities to educate them on the new protocol. Unlike SCUBA or swim courses with clear instructor certifications, no such certification exists for BH training programs. Currently, contracts are evaluated on a case-by-case basis to ensure that they meet high standards of safety.

Conclusion:
Safe spaces for BH training are needed. More research is needed on safe BH practices and how lifeguards can be trained to contribute to the layers of safety. Intentional hyperventilation is always prohibited. Lifeguards should have sufficient training and awareness to identify and mitigate risks when supervising these courses.

MEDICAL 05

SALAD Technique for Intubation in Drowning Cases: an advanced approach for managing contaminated airways

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Introduction
Drowning presents a significant challenge for advanced airway management due to massive contamination of the airways with water and debris. The **SALAD (Suction Assisted Laryngoscopy and Airway Decontamination)** technique was developed to improve secretion clearance in emergency situations, facilitating safer and more effective intubation. This study introduces an adaptation of the SALAD technique for drowning victims, focusing on the removal of intrapulmonary fluid and airway protection.
Methods
The implementation of the SALAD technique in drowning patients involves continuous suction during laryngoscopy to rapidly clear water and debris. The adapted protocol includes:
Pre-intubation active suction, using a high-flow suction catheter to quickly clear the oropharynx.
Continuous suction-assisted laryngoscopy, integrating suction to optimize glottic visualization.
Intubation with pulmonary protection, with immediate cuff inflation to reduce further airway contamination.
The technique has been tested in **real-life drowning cases**, as well as in **advanced simulations and on manikins** with irrigation systems designed to replicate drowning conditions.
Results
Preliminary data suggest that using the SALAD technique significantly reduces intubation time and improves glottic visualization compared to traditional methods. Additionally, there is a notable decrease in the spread of contaminated material into the lower airways, reducing the risk of secondary aspiration and pulmonary complications.
Conclusions
Adapting the SALAD technique for drowning scenarios represents a significant advancement in emergency airway management. A live demonstration will highlight the effectiveness of this approach and its potential integration into advanced rescue protocols.

MEDICAL 06

Mental Health Incidents on Australian Beaches 2000-2020

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Background
Surf Life Savers patrol Australian beaches and provide the initial emergency and first aid response to incidents. 43% of people aged 16-85 had experienced a mental disorder at some time in their life, and 21.5% of people had a 12-month mental disorder[1]. Historically little training has been provided to first aiders regarding the management of mental health presentations. The frequency and outcomes from mental health presentations to first aid providers have not been reported. We aimed to characterise the experience of Australian Surf Life Savers in providing care for patients with mental health complaints.

Methods
We conducted a retrospective cohort study of patients who presented to Surf Life Savers between 2000 - 2020 where an incident report was available. We report exposures including age, sex, alcohol and drug use, and the involvement of ambulance and police services. We recorded outcomes including transport to hospital and mortality.

Results
We found 341 cases involving psychiatric, drug or alcohol related presentations. The median age was 29 years (IQR 20 – 44). 49 (14%) were female, 88 (26%) were male, and 205 (60%) were not recorded. Of the cases, 121 (35%) involved a response to a suicide attempt, 57 (17%) involved alcohol intoxication and 122 (36%) involved the use of non-prescription drugs. Ambulance transport to hospital was required in 249 (73%) cases, and police attended 159 (47%) incidents. CPR was performed in 13 (4%) cases and mortality occurred in 34 (10%) cases.

Conclusion
Mental health presentations have increased in frequency and are associated with a high mortality rate compared to other first aid presentations.

MEDICAL 07

Critical incident stress in aquatic personnel: A gap analysis

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Background: Aquatic personnel (lifeguards, lifesavers, and allied aquatic professionals) have been called the “forgotten first responder”, traditionally considered recreational employees (1). Research among emergency response personnel shows that critical incident stress (CIS) is associated with psychological sequelae such as depression, anxiety, PTSD, poor physical health, and diminished work-related wellbeing (2). Emerging evidence suggests similar consequences may exist in aquatic personnel, but more research is needed to understand CIS in this population (3). This review summarizes existing literature on CIS among aquatic personnel to identify knowledge gaps and guide future research directions.

Methods: A literature search strategy was performed including the following terms “critical incident stress", “lifeguard”, "post-traumatic stress", "aquatic rescue", "occupational stress", "drowning prevention", "mental health", "water rescue", "emergency responders", and "traumatic incidents" on EBSCOhost.

Results: The search strategy yielded 385 articles. Upon reviewing titles and abstracts, only four were relevant. Common reasons for exclusion included: the study focused on the performance of the aquatic personnel during a critical incident (e.g., visual scanning technique, CPR effectiveness, training or technology to enhance performance; n=88), rather than their subsequent psychological response, the study focused on individual or environmental characteristics preceding a critical incident (e.g. guest risk-taking, parental supervision, alcohol use; n=72) or the study focused on the occupational injuries and illness (e.g. asthma, sun exposure, heat stroke; n=62). These search results, compared to over 115,000 initial results for a search strategy geared towards other emergency response personnel, confirm the status of aquatic professionals as the “forgotten first responder.” Preliminary evidence suggests that gender, age, individual factors, and environmental factors influence CIS risk and response (4). However, these findings are limited by narrow occupational and geographic samples.

Conclusions: Understanding and mitigating the psychological risks to aquatic personnel first requires an understanding the scope of the problem. Further research is needed to identify the prevalence of CIS and their impact on aquatic professionals’ mental health, physical health, and work-related wellbeing. The contextual factors that influence the relationship between CIS and its’ impact warrants investigation. Such research would promote the health of the aquatic personnel, and by extension, the patrons that they serve.

MEDICAL 08

Behind the Rescue: the psychological impact on Surf Life Saving Queensland Lifesavers and Lifeguards

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Since 1909, Surf Life Saving Queensland (SLSQ) has served as a vital frontline service, with its iconic 'red and yellow' lifesavers and lifeguards safeguarding Queensland's beaches and waterways. Their mission is to prevent all avoidable deaths across 8,000 km of coastline; however, the human cost of delivering this vital service, particularly the psychological toll on its providers, is often overlooked.

Each year, SLSQ's 34,474 trained personnel contribute over 295,000 patrol hours across 57 clubs. Their expertise in aquatic rescue and cardiopulmonary resuscitation (CPR) is instrumental in saving lives. Yet, the intense nature of this work routinely exposes them to emotionally traumatic situations, including drownings (fatal or non-fatal), fatalities, and instances of intentional self-harm. Factors such as drug and alcohol involvement further exacerbate the psychological burden faced by rescuers.

While CPR is executed in accordance with best practice guidelines, its emotional and psychological aftermath can be significant. A PhD research project involving 20 semi-structured interviews (10 lifeguards and 10 lifesavers) examined the mental and emotional impacts of performing resuscitations. The study is still undergoing thematic analysis, but early findings reveal the depth of vicarious trauma experienced by SLSQ members, as well as the emotional resilience they develop in response.

This resilience is not innate but rather developed over time, fostered through repeated exposure to high-pressure situations, comprehensive training, peer support, team camaraderie, structured debriefing, and effective strategies to manage the often intense scrutiny from the public and media.

As these findings emerge, they will contribute valuable insights into how lifesavers and lifeguards process trauma, protect their mental health, and maintain their capacity to serve. Ultimately, this research aims to inform and enhance psychological support systems, not only for SLSQ personnel but for all frontline responders ensuring they are equipped to manage the ongoing demands of their lifesaving roles.

MEDICAL 09

Protective factors in potential trauma for adolescent surf lifesavers

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Introduction:
Surf lifesavers form a key part of Australia's first responder workforce. Patrolling members can start from 13 years of age with potential exposure to traumatic incidents. Protective factors can mitigate impacts of trauma exposure. This study investigated protective factors associated with mental health outcomes among adolescent surf lifesavers (13-17 years), including in response to exposure to potentially traumatic events.

Methods:
An anonymous online survey developed for adolescent surf lifesavers collected data from Australian surf lifesavers aged 13 to 17 years. Measures included demographic factors, stressful life events, post-traumatic stress symptoms (PTSS), self-efficacy, social support, and attitudes towards mental health problems. Hierarchical regressions and moderation analyses explored the relationships between variables.

Results:
118 responses were collected with overall mean age 15.4 years (SD = 1.3). PTSS was moderately to strongly correlated with all trauma domains, but was lower with higher levels of self-efficacy ($r(116) = -.30$, $p = .001$) and social support ($r(116) = -.53$, $p = .002$). Hierarchical regression revealed that attitudes towards mental health problems explained 11% of the variance, where increased negative attitudes were positively correlated to PTSS, while social support and self-efficacy respectively explained 9% and 8% of the variation and were both negatively correlated to PTSS.

Conclusions:
This study highlights the critical and protective roles social support, self-efficacy, and mental health attitudes in mitigating the adverse effects of trauma exposure among adolescent surf lifesavers. The findings will guide the development of targeted interventions to support younger patrolling members with an emphasis on supportive interventions to improve resilience and wellbeing in young emergency service personnel exposed to trauma. This study emphasises the importance of promoting protective factors with young individuals in emergency service roles, with practical implications for mental health professionals, surf lifesaving organisations, and policymakers interested in promoting the wellbeing of adolescent emergency service personnel.

MEDICAL 10

Analysis of effective Surf Lifesaving resuscitation in response to drownings in Queensland waterways

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Background: Early rescue and resuscitation by trained first responders are critical determinants of survival following drowning. In Queensland, Australia, volunteer surf lifesavers and paid lifeguards within Surf Life Saving Queensland (SLSQ) play a pivotal role in aquatic rescue and resuscitation across diverse waterways, where drowning remains a major public health concern. This study aims to provide a descriptive analysis of resuscitation outcomes and associated factors among SLSQ members (lifesavers and lifeguards) from 2001 to 2023.
Methods: Following ethical approval, de-identified incident reports from SLSQ spanning 2001–2023 were accessed. Cases involving cardio-pulmonary resuscitation (CPR) performed were extracted for analysis. Descriptive data were collated to examine the characteristics of resuscitation events, their effectiveness, and factors contributing to successful outcomes. Additional coronial data from the National Coronial Information System (NCIS) were integrated to provide further insight into causes of death, resuscitation details, and contributing contextual factors.
Results: Data analysis is ongoing; however, the study will present the findings on the scope of resuscitations conducted by SLSQ members. Emerging trends and relationships between demographic, environmental, and operational variables will be highlighted to inform understanding of resuscitation outcomes in surf lifesaving contexts.
Conclusions: Preliminary analyses suggest that SLSQ members perform resuscitations across a broad range of scenarios, including cardiac arrests occurring beyond traditional patrol zones. The findings from this study will contribute to a modern evidence base on resuscitation practices, supporting the development of targeted training and preventative strategies to enhance survival outcomes across Queensland's waterways.

MEDICAL 11

DIY manikins for teaching CPR: (Where) should they be used?

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Background: Bystander CPR is a critical community skill with the potential to save millions of lives. Do-it-yourself (DIY) manikins, crafted from materials commonly available in the home, may expand the reach of existing CPR education programs for different communities around the world by addressing barriers to learning basic lifesaving skills. However, their evidence-base is weak. At the previous WCDP (2023), a novel research program and network, dedicated to investing the potential use of do-it-yourself (DIY) manikins in teaching basic CPR, was introduced. This presentation discusses the first study led by this network, which explores expert opinions on the feasibility, effectiveness, and integration of homemade manikins in CPR training.
Methods: Semi-structured interviews were conducted with experts from four key areas: medical (n = 7), pedagogical (n = 6), professional CPR instruction (n = 15), and socio-cultural/public health & equity (6). The standardized interview guide included questions regarding DIY manikin effectiveness specific to the participant's field, possible requirements to enhance efficacy, possible concerns regarding applicability, and methods of integration into current CPR training within their field of expertise. All interviews were transcribed verbatim, de-identified and thematically analyzed.
Results: Framework analysis revealed four overarching themes: The viability of DIY manikins, potential benefits, and concerns and challenges, with a total of eight subthemes. The wide range of identified strengths and challenges underlines that the usefulness of DIY may depend on the goals within each setting. Most participants agreed that DIY manikins would be appropriate in less formal training areas, such as in a school or community group, rather than in a hospital or medical setting.
Conclusion: The study shows the importance of striking a balance between the quality of CPR education and equitable access to it. These findings will serve as a basis for future research, aiming to derive criteria by which different DIY solutions and their effectiveness may be assessed, depending on the setting and targeted learning outcomes in any given situation.

MEDICAL 12

Community-based rescue and resuscitation: A lifesaving initiative in the Sundarbans

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Background
In the Sundarbans district of West Bengal, India, drowning is a leading cause of childhood death (1). Timely response to a drowning incident is crucial to ensure survival and reduce morbidity. However, Sundarbans is a predominantly rural area, with limited rescue and response services (2, 3).
Traditional resuscitation methods for drowning include potentially harmful practices, such as spinning the body (2). Widely held superstitions include a belief that a drowned child would die if touched by the mother.
To improve response times for drowning, and to tackle harmful practices, the Child In Need Institute have piloted a community-based Rescue and Resuscitation training project across 3 Blocks in the Sundarbans district. With technical support from the Royal National Lifeboat Institution and The George Institute for Global Health, CINI have trained 20 master trainers to deliver training in basic life support, prioritising provision of early ventilations for drowning incidents. Since 2023 the trainers have trained over 500 ‘front line’ workers, including community health workers and police, and over 1500 community members, including caregivers. 500 have since been retrained.
A monitoring system has been implemented to collect data on participant perceptions of resuscitation, assessment pass/fail rates and feedback on the training.
The project was completed in February 2025.
Methods
Following the completion of the project, an internal review was undertaken to help understand the barriers and facilitators to implementation. The review consisted of a workshop held with 20 project staff in Kolkata.
Results
Project staff highlighted key learnings including:
Constant repetition and reinforcement of messaging increased acceptance of CPR within targeted communities
Training of females and equipping them with CPR skills empowered them to take ownership of drowning prevention initiatives in the community
Smaller batch sizes provided more opportunity to conduct a comprehensive assessment of participant skills
Assessment data is being analysed and will be shared at the conference.
Conclusion
Insights gained from the review of this project provide useful lessons to inform future scale-up of rescue and resuscitation programmes in West Bengal. It demonstrates the need for strong community engagement and local adaptation to overcome embedded traditional practices.

MEDICAL 13

Is CPR quality training feasible with a low-cost DIY manikin (LoCoBaby) versus a standard manikin: a quasi-experimental study?

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Training the general population in CPR is one of the most effective strategies to improve survival following cardiac arrest (1,2). First aid training for teachers working with children is also a proven measure to enhance response to emergencies. However, one of the main barriers to training is the availability of manikins, due to their high cost and maintenance requirements (3).
In recent years, handmade manikins have been developed for teaching and learning CPR (4-6).
The aim of this study was to assess the CPR skills acquired for infant resuscitation using a low-cost manikin (LoCobaby) compared to a conventional manikin.

Methods

A quasi-experimental study was conducted with 40 early childhood education teachers, who were randomly assigned to two groups. The LoCobaby group received training through an integrative approach combining science and physical education (PE) and practiced on a handmade manikin. The control group followed a traditional training approach using a commercial manikin (Resusci Baby, Laerdal, Norway). All participants completed one hands-on practice session before performing a post-test on an instrumented CPR manikin.

Results

The results showed that the LoCobaby group achieved a significantly higher percentage of compressions with complete chest recoil compared to the conventional manikin group (73; IQR:43–92 vs. 21;IQR:11–27%; p=0.006; ES =0.49). Additionally, the LoCobaby group performed at a lower mean compression rate (111;IQR:99–119 vs. 117; IQR:110–127 compressions/min; p=0.013; ES=0.97). For the remaining chest compression quality variables, the LoCobaby group demonstrated non-inferior results compared to the control group ($p > 0.05$).
Regarding ventilations, the LoCobaby group delivered a higher number of excessive-volume ventilations (5;IQR:2–14 vs. 0; IQR: 0–3ventilations; p=0.023; ES=0.40).

Conclusion

The low-cost LoCobaby manikin may serve as a viable alternative for teaching and learning infant CPR in settings where access to commercial manikins is limited.

MEDICAL 14

Integrated Emergency Response and Medical Care in Life-Saving Operations: Bridging the Gap Between Rescue and Treatment

Sherif Kamal

Tawasol, Cairo, Egypt

Abstract:
Timely and coordinated emergency medical care is a critical component of effective life-saving operations. In many disaster and mass casualty scenarios, there is often a crucial gap between rescue efforts and the initiation of life-preserving medical interventions. This presentation explores the integration of emergency response systems with frontline medical care to enhance survival outcomes during crises.

We examine global best practices—including the Incident Command System (ICS), helicopter emergency medical services (HEMS), and the use of digital triage tools—and highlight real-world challenges such as delays in medical evacuation, poor communication between agencies, and insufficient field-level clinical training. The presentation also discusses innovative technologies such as drones, telemedicine, and AI-powered triage systems that can optimize the response chain from point-of-rescue to definitive care.

Through a multidisciplinary lens, we propose actionable strategies to strengthen collaboration between rescue teams, emergency medical services (EMS), and hospital networks. These include the establishment of unified protocols, regular joint simulations, and the deployment of advanced mobile medical units. Ultimately, the presentation underscores that saving lives requires not only swift rescue but also seamless transition to high-quality medical intervention.

MEDICAL 15

Emergency Response Readiness for Drowning Incidents: Gaps in Community Training and First Aid Awareness

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Background: Drowning remains the leading cause of injury-related deaths among children in Bangladesh, yet community awareness and capacity for effective first response and resuscitation remain critically low. Timely and appropriate first aid interventions, including Cardiopulmonary Resuscitation (CPR), can significantly reduce drowning fatalities, but outdated and ineffective traditional methods persist. This study assesses gaps in emergency response preparedness, first aid knowledge, and trained responder availability within communities covered under the Integrated Community-Based Center for Childcare, Protection, and SwimSafe Facilities (ICBC) Project.
Methods: A cross-sectional household survey was conducted across 133,387 households in 45 upazilas across 16 districts. The survey assessed caregivers' knowledge of first aid techniques, response behaviors during drowning incidents, and the availability of trained first responders. Additionally, 24 Focus Group Discussions (FGDs) were conducted with community leaders, caregivers, and health workers to explore perceptions, barriers, and community-level interventions for emergency response improvement.
Results: Findings revealed critical gaps in first aid training and emergency preparedness in the rural community of Bangladesh. Only 12.4% of caregivers had received any formal first aid training, indicating widespread lack of preparedness. Over 85% of respondents relied on traditional resuscitation techniques such as spinning the victim over the head (70.2%) and abdominal pressing (48.4%), both of which lack scientific efficacy. Less than 10% of drowning victims received immediate CPR, reflecting a severe gap in life-saving knowledge and skills within communities. In 52.9% of drowning cases, no one was present to attempt a rescue, emphasizing the need for community-based first responder networks. Household responsibilities (64.0%) and lack of supervision were common factors preventing immediate response.
Conclusions: To improve survival outcomes in drowning cases, integrating first aid training into drowning prevention programs, school curriculums, and community health initiatives is essential. Community-based first responder networks, CPR awareness campaigns, and capacity-building for caregivers and health workers should be prioritized. Establishing trained first responders in high-risk areas, such as villages with high drowning mortality rates and schools near water bodies, can bridge the response gap and increase survival rates.

MEDICAL 16

Bridging Competency Gaps in Maritime and Aquatic Emergency Medical Services: A 15-Year Evaluation of the MALS Program in Thailand

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Background: The Maritime and Aquatic Life Support (MALS) program, initiated in 2010, is a collaborative effort between Thailand's Naval Medical Department and the National Institute for Emergency Medicine (NIEM). The primary aim is to enhance healthcare teams' skills in managing medical emergencies in aquatic environments, particularly following catastrophic events.

Description: MALS began as a pilot project in Surat Thani province after a severe flooding incident and has grown into a nationwide educational framework. It offers three courses: MALS-HCP, BMALS, and AMALS, targeting healthcare providers and emergency medical technicians. The curriculum includes modules on Aquatic Casualty Care, Rescue, and Medical Transportation, using laboratory rotations for experiential learning. Training has spanned across Thailand, impacting public health regions and promoting inter-agency collaboration.

Lessons Learned: The program has successfully trained thousands of personnel, leading to a notable decline in drowning incidents. It has bolstered healthcare teams' confidence in aquatic emergency responses and inspired further safety initiatives for children and merit makers. The dynamic nature of the program, with regular curriculum updates and new modules like swift-water and flood rescue, addresses evolving challenges and improves preparedness.

Conclusions: The MALS program highlights the significance of specialized training in reducing drowning incidents and enhancing emergency response in aquatic settings. Its ongoing expansion and integration into various healthcare training curricula promise to fill existing competency gaps. Future initiatives focus on continuous improvement through research and collaboration, ensuring the safety and efficacy of aquatic emergency responses in Thailand and potentially serving as a model for similar global programs.

MEDICAL 17

Evidence in the use of the tourniquet in the aquatic setting. A line of research

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Massive hemorrhage (MH) is a time-critical emergency that can be life-threatening. One of the most rapid and effective interventions is the application of a tourniquet.
Although often overlooked, aquatic environments are not exempt from such risks. Recreational activities involving boats, water sports, sliding water sports, or even marine animal attacks (e.g., sharks or alligators) can potentially lead to MH (1).

Objective

To evaluate the use of tourniquets by aquatic lifeguards during professional rescues in aquatic settings.

Methods

A research line was developed to assess the use of different types of tourniquets and their application in rescue craft (2,3). Two randomized crossover studies were conducted involving aquatic lifeguards as participants. Performance was evaluated using a checklist based on the Tactical Combat Casualty Care (TCCC) guidelines for tourniquet application (4).

Results

Tourniquet application on a Rescue Water Craft (RWC) was, on average, 11 seconds slower than on the beach (BT-TQ: 35.7 ± 8.0 s vs. 46.1 ± 10.9 s; $p < 0.001$). Tourniquet placement was more effective on the beach than on the RWC.
The T-OMNA tourniquet was applied faster (174 vs. 177 seconds; $p = 0.55$) and more effectively (46% vs. 21%; $p = 0.015$) in water compared to the CAT-T tourniquet.

Conclusions

The rescuers in this study demonstrated the ability to use the tourniquet during water rescue and under fatigued conditions in a reasonable time.
The tourniquet with ratchet closure system controlled bleeding in less time compared to the windlass-type tourniquet.
The placement of a tourniquet on a RWC navigating at 20 knots is feasible

MEDICAL 18

DROWN: An Experimental Handoff Tool for Lifeguards and Emergency Medical Services During Drowning Scenarios

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Historically, we identified a disconnect between lifeguards, first responders, and others in the patient care continuum. While individual training and unit response were excellent, a lack of collaborative, inter-agency training resulted in inefficient emergency responses and posed an obstacle to providing high-quality patient care. Initially, the challenge was creating an opportunity for simulations to occur, allowing the different teams to collaborate to practice a coordinated response. Through integrated training, the challenges that responders face as a patient transitions from lifeguard care in the field to definitive care at the hospital were examined and improved. These exchanges between on-scene personnel mirror the handoffs between EMS and in-hospital providers or between providers at shift changes. The existing base of literature on effective handoff tools can be implemented into the interactions between EMS and lifeguards to provide a standardized response to the scenario, along with a road map for the communication between them (2). We propose the acronym DROWN to share the essential information in these situations. This stands for Down time, Resuscitation information, Objectives, What has been done (interventions), and the Next steps (1). Integrating the DROWN tool into the existing simulation training that has been conducted over the past decade creates the opportunity for design and development and potential for improved care. Further, the debriefs after the simulations provide a space for collaboration and communication in the development of DROWN. Existing literature demonstrates the effectiveness of handoff tools in improving both patient outcomes and provider perception in the interaction (3,4,5). Continuing the literature also elucidates the instrumental elements in existing hand-off guidelines, providing a baseline for developing a device specialized for lifeguards (2,6). These include proper training with an outline that would fit into the existing training curriculum. While implementation is ongoing, the team aims to have a reviewed tool for presentation following the Summer of 2025. The tool will be scalable alongside other agencies' existing simulation training techniques.

MEDICAL 19

Lifesaving CPR: A pilot evaluation of a targeted educational intervention to improve CPR provision in volunteer Surf Lifesavers

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Background
Approximately 26,000 out-of-hospital cardiac arrests (OHCA) occur in Australia each year (1), and only 13% of patients survive their event to return home (2). Variation in survival from OHCA can be explained by a range of factors including bystanders performing basic life support (BLS) (3). The quality of BLS provided is a significant factor, with evidence supporting improved chest compression quality, depth, rate and full chest recoil (4-11), minimising interruptions to chest compressions and maximising time on the chest (12-15). Achieving the optimal ventilation rate and volume (13, 16-18) and using devices that provide real-time feedback to the operator on the quality of their CPR (17, 19, 20) are also promoted as important factors in improving outcomes from out of hospital cardiac arrest (OHCA).
Surf Life Saving Australia members respond to approximately 65 cardiac arrests per year in the community while on duty and have successfully resuscitated many beachgoers over the years. In addition to this, members frequently respond to cardiac arrest events in community settings as first responders.
Objective
The objective of this research was to measure CPR improvements in Australian Surf Lifesavers following a targeted education intervention.
Methods
Recruiting Australian Surf Life Savers we conducted a multi-centre before-and-after educational intervention cohort study of those who had previously been trained in CPR.
Results
Following the targeted education intervention, chest compression fraction, compression rate, total pause time and longest pause all demonstrated statistically significant improvements. The results demonstrate that community CPR providers can improve CPR metrics through a targeted education intervention.
Conclusion
A targeted education intervention has the potential to improve lay-persons CPR performance. To the best of our knowledge, this is the first demonstration of a targeted educational intervention improving the technical skills of volunteers providing basic life support. If the improvements demonstrated in this data can be maintained through to clinical care, survival after out of hospital cardiac arrest should improve for patients cared for by Australian Surf Lifesavers. Given that the participants were community members (lay responders) there is an opportunity to expand high-performance CPR education interventions to further improve prehospital cardiac arrest outcomes.

MEDICAL 20

Role of Pharmacists in Primary Healthcare Facilities in Providing Rescue and Life-Saving Activities

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Background
Pharmacists are often underutilized in emergency response and life-saving activities, particularly in primary healthcare settings. In Egypt, the Healthcare Authority oversees emergency preparedness, yet there is limited integration of pharmacists in these critical interventions. This study aims to explore the role of pharmacists in primary healthcare facilities across Sharm El Sheikh, Luxor, Aswan, Ismailia, Port Said, and Suez in providing emergency rescue support, cardiopulmonary resuscitation (CPR), and other life-saving interventions.

Methods
A cross-sectional study was conducted across primary healthcare facilities in the mentioned cities between January and March 2025 Data collection involved structured interviews with pharmacists, healthcare administrators, and emergency response teams, alongside a review of existing policies within the Egypt Healthcare Authority. Additionally, training participation rates, CPR certifications, and pharmacists' involvement in emergency scenarios were analyzed. Quantitative data were statistically analyzed, while qualitative responses provided contextual insights into barriers and opportunities for pharmacist engagement in life-saving activities.

Results

Conclusions
Pharmacists in primary healthcare settings have the potential to play a crucial role in emergency rescue and life-saving interventions. Integrating pharmacists into structured CPR training programs and emergency response frameworks could enhance survival rates and improve emergency preparedness within the Egypt Healthcare Authority. Future policy recommendations should focus on mandatory life-saving training for pharmacists, policy revisions to include their role in emergency protocols, and increased interdisciplinary collaboration in primary healthcare facilities.

MEDICAL 21

Debating spinal injury management in aquatic environment: aligning evidence with best practice. ILS Medical Committee Members´ Panel

Leonardo Manino[1,2], Niklas Breindahl[3,4], Natalie Hood[5]

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Context

Traumatic spinal cord injury (TSCI) in aquatic environments accounts for approximately 10% of all TSCIs, with diving into shallow water being the most significant risk factor. Lifeguards and prehospital personnel must be competent in handling suspected in-water spinal injuries. However, specific evidence is limited, and there is variability in current training protocols. A recently published expert consensus [1] provides standardized recommendations for in-water spinal motion restriction (SMR) and extrication, raising critical questions about best practices and implementation challenges.

Description

This debate session will bring together experts from the ILS Medical Committee to discuss the latest evidence-based recommendations in aquatic environments including:

Recognition and Assessment:

Identifying potential TSCIs based on trauma history and symptom assessment.

Differentiating situations requiring rapid rescue versus SMR and extrication.

Spinal Motion Restriction and Extrication Methods:

Discussing the effectiveness of different SMR techniques.

The role of cervical collars and extrication devices and their application.

Challenges in adapting techniques to diverse settings.

Management on Land:

The balance between airway management and spinal stabilization in critical drowned persons.

Collaboration with EMS for seamless transition to definitive care.

Gaps in Research and Future Directions:

Identifying areas for further research on effectiveness and safety.

Exploring international variations in lifeguard training and implementation challenges.

Key Discussion Points

Standardization: To what extent should global guidelines be applied universally, and when should local adaptations take precedence?

Balancing Risks and Benefits: How can lifeguards minimize the risk while ensuring timely rescue and patient stabilization?

Evidence-Based Practices: What research gaps exist, and how can future studies enhance our understanding of in-water SMR techniques?

Integration with Prehospital Care: How can lifeguard protocols align effectively with EMS response to improve patient outcomes?

Conclusions

This debate will provide a platform for discussing the complexities of management TSCI´s in aquatic settings, analyzing the latest international recommendations including the ILS Medical position statement 21, and exploring practical considerations for implementation. By engaging experts from the ILS Medical Committee , the session aims to refine best practices, identify

knowledge gaps, and contribute to the ongoing development of evidence-based spinal injury management in lifeguard training and prehospital care.

MEDICAL 22

Debating the standardized approach to drowning resuscitation: aligning evidence with practice. ILS Medical Committee Members´ Panel

Leonardo Manino[1], Justin Sempsrott[2], Natalie Hood[3]

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Context:
Drowning-related cardiac arrest differs from cardiac-origin arrests due to its primary hypoxic nature. Yet, universal resuscitation guidelines generally follow out-of-hospital cardiac arrest (OHCA) protocols, emphasizing early defibrillation and chest compressions-only. However, in drowning resuscitation growing evidence [1] suggests that early oxygenation—via ventilations with or without supplemental oxygen—are more critical in reversing hypoxia and improving survival. This underscores the need to adapt drowning resuscitation protocols for lifeguards and professional responders to prioritize an airway-first approach.

Description:
Recent reviews by the International Liaison Committee on Resuscitation [ILCOR] BLS/AED Task Force,highlight the importance of ventilations and oxygen administration over defibrillation in drowning resuscitation. While universal CPR guidelines promote defibrillation and compressions-first protocols for simplicity, drowning presents a distinct pathophysiology, where hypoxia must be reversed as early as possible. Evidence suggests that ventilations improve survival and neurological outcomes.
Additionally, while defibrillation remains a cornerstone of OHCA resuscitation, the predominance of non-shockable rhythms in drowning suggests that early conventional CPR, with ventilations, should take precedence over immediate defibrillation. This could be critical in preventing the progression from respiratory arrest to cardiac arrest. However, practical challenges arise in determining when and how to integrate oxygen administration effectively, especially in varied prehospital resuscitation settings.

Lessons Learned:
Despite increasing recognition of drowning's unique resuscitation needs, current guidelines largely mirror cardiac-origin protocols, potentially overlooking the role of early ventilation - oxygenation. While a uniform CPR approach simplifies public training, lifeguards and professional responders may require a different strategy that prioritizes ventilations and oxygen administration when feasible. The debate focuses on balancing scientific evidence, feasibility, and guideline consistency.

Conclusions:
Given the hypoxic nature of drowning-related cardiac arrest, drowning resuscitation should break away from the universal OHCA model to emphasize airway management and early oxygenation through ventilations during CPR. Developing an evidence-based, standardized approach that aligns best practices and expert consensus with drowning physiology while maintaining clarity for both lay people and professionals could improve survival, however, further research is needed. Therefore, a live debate featuring medical experts from the ILS Medical Committee on stage will be both crucial and engaging for the WCDP 2025 audience.

MEDICAL 23

Tissue Oxygen Debt as a Biomarker of Drowning Mortality

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Background

Drowning causes changes in cell physiology and biochemistry. These are reversible to varying degrees with resuscitation and recovery. A biomarker is a quantitative physiological index of disease severity. An example is muscle enzyme levels to gauge myocardial necrosis. It would be useful to have a biomarker that gauges physiological insult due to drowning, and predicts reversibility according to resuscitation inputs. Survival prognosis could be estimated. The inverse solution would allow design of optimal resuscitation. We hypothesize that tissue oxygen debt in the heart and brain correlate with loss of cardiac viability and severity of brain injury. We propose a new biomarker called 'estimated oxygen debt' (EOD) that correlates with published survival statistics. This concept is demonstrated here using a physiological simulation model.

Methods

Cells obtain energy from glucose and fat stores using oxygen (aerobic), but there is limited capacity to metabolize without oxygen (anaerobic). EOD is the cumulative area under the curve of oxygen demand minus supply, which quantifies anaerobic contribution and accumulation of waste products. We used a large-scale computer simulation called the 'Halifax Drowning Simulator', which has cardiovascular and gas exchange modules to track oxygen transport to the heart and brain during drowning, and tissue modules for cellular metabolism via aerobic and anaerobic pathways. EOD was calculated dynamically during various scenarios of downtime and resuscitation.

Results

Drowning is simulated by sudden apnea with an initial metabolic rate. EOD rises as oxygen stores in the lungs and blood are gradually depleted. Cardiovascular responses reduce cardiac output, tissue perfusion, and metabolic rate. Carbon dioxide, lactate, and tissue energy intermediates accumulate. Percent mortality follows a sigmoidal curve extending up to 20 minutes. Resuscitation interventions of rescue breaths and chest compressions slow or halt cumulative EOD. Survival increments follow extracted time curves analogous to impulse response functions used in system dynamics.

Conclusions

Tracking EOD during drowning and resuscitation may allow mortality prediction and design of optimal resuscitation strategies that minimize EOD. This framework establishes a potential quantitative link between specific resuscitation interventions and number of lives saved. Further drowning outcome data is needed for concept validation.

MEDICAL 24

emergency treatment-seeking behavior in drowning cases: insights from the ICBC baseline survey in Bangladesh

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Background: Drowning remains a major public health concern in Bangladesh, contributing significantly to injury-related mortality. Timely access to emergency medical care can play a crucial role in reducing fatality rates. This study analyzes the emergency treatment-seeking behavior of drowning incidents, utilizing data from the Integrated Community-Based Center for Childcare, Protection, and SwimSafe Facilities (ICBC) Baseline Survey.
Methods: A cross-sectional survey was conducted in 16 districts and 45 upazilas in Bangladesh as part of the ICBC project. Data were collected from 133,387 households, covering a population of 525,649 individuals. Among these, 13,324 respondents participated in a Knowledge, Attitude, and Practice (KAP) survey on childhood injury prevention, including drowning. The study assessed emergency response patterns, healthcare utilization, and gaps in treatment-seeking behavior using structured interviews and validated tools.
Results: The study included 51.6% male and 48.4% female participants among the respondents. Drowning was the leading cause of injury-related death, accounting for 58.75% of cases among all others injury.
Only 38.3% of drowning victims received health consultations, while 61.7% did not seek any treatment. Among those who received care, 46.4% were treated by registered doctors, followed by 15.1% by SACMO medical assistants, and 11.4% by medicine shopkeepers or village doctors. Regarding treatment facilities, the majority (46.72%) received care at Upazila Health Complexes, followed by 15.28% at district hospitals and 12.23% at pharmacies or medicine shops. Hospital admission was low, with only 27.7% of treated drowning victims being admitted.
Alarmingly, 39.5% of drowning deaths occurred in water bodies before victims could be rescued, while 33.5% died at home, and 22.4% in hospitals. This highlights gaps in emergency responses, especially timely rescue and emergency response by bystander eg. CPR.
Conclusion: The study reveals critical gaps in emergency response and treatment-seeking behavior for drowning cases in Bangladesh. Despite drowning being the leading cause of injury-related death, healthcare utilization remains low. Limited hospital admissions and delayed interventions further exacerbate fatality risks. Strengthening community awareness, timely rescue efforts, and access to emergency medical care, including CPR, are essential to reducing drowning-related mortality and improving healthcare response in affected communities.

MEDICAL 25

Prehospital guidelines on in-water traumatic spinal injuries for lifeguards and prehospital Emergency Medical Services: an international Delphi consensus study

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Purpose: Traumatic spinal cord injury is defined as damage to the spinal cord following external physical impact (1). Trauma guidelines on spinal motion restriction have changed drastically in recent years (2-3). This study aimed to develop guidelines on spinal motion restriction performed by trained lifeguards and prehospital Emergency Medical Services (EMS) following in-water traumatic spinal cord injury.
Materials and methods: From October 2022 to October 2023, an international three-round Delphi process gathered opinions from medical experts with expertise on in-water traumatic spinal cord injury. In Delphi round one, brainstorming resulted in an exhaustive list of recommendations for handling patients with suspected in-water traumatic spinal cord injury. The list was also used to construct a preliminary flowchart for in-water spinal motion restriction. In Delphi round two, three levels of agreement for each recommendation and the flowchart were established. Recommendations with strong consensus (≥85% agreement) underwent minor revisions and entered round three; recommendations with moderate consensus (75-85% agreement) underwent major revisions in two consecutive phases; and recommendations with weak consensus (<75% agreement) were excluded. In Delphi round 3, the level of consensus for each of the final recommendations and each of the routes in the flowchart was tested using the same procedure as in Delphi round 2.
Results: Twenty-four experts participated in Delphi round one. The response rates for Delphi rounds two and three were 92% and 88%, respectively. The study resulted in 25 recommendations and one flowchart with four flowchart paths; 24 recommendations received strong consensus (≥85%), and one recommendation received moderate consensus (81%). Each of the four paths in the flowchart received strong consensus (90-95%). The integral flowchart received strong consensus (93%).
Conclusions: This study produced expert consensus on 25 recommendations and a flowchart on handling patients with suspected in-water traumatic spinal cord injury by trained lifeguards and prehospital EMS. These results provide clear and simple guidelines on spinal motion restriction, which can standardise training and guidelines on spinal motion restriction performed by trained lifeguards or prehospital EMS.

MEDICAL 26

Envenomation on Australian Beaches 2000-2020

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Background
Australian beaches are home to a wide variety of marine life, many of which are poisonous. Treatment recommendations for marine envenomation are based on very limited literature, predominantly featuring species found in overseas waters or on pre-clinical data, giving clinicians and first aiders a very low certainty of evidence to rely upon[1]. We sought to characterise the experience of envenomation and treatments provided by surf lifesavers, as well as the outcomes recorded

Methods
We conducted a retrospective cohort study of patients who were envenomed on Australian beaches between 2000 - 2020 and where an incident report was available. We report exposures including age, sex, the cause of envenomation and treatment. We recorded outcomes including CPR and transport to hospital.

Results
We found 4 261 records involving marine envenomation. The median age was 13 years (IQR 9 – 22). 1888 (44%) were female, 1730 (41%) were male, and 637 (15%) were not recorded. A total of 4 150 involved jellyfish, 41 of which were presumed to be caused by chironex fleckeri, 157 demonstrated Irukandji syndrome and 111 were caused by stingray barbs. Of this cohort, 38 (2%) were treated with vinegar, 2247 (96%) with ice, 49 (2%) with hot water. 391 patients received oxygen, ten methoxyflurane, and three patients received CPR. Ambulance transport to hospital was required in 205 cases. There were three deaths.

Conclusion
Marine envenomation is common, and currently available first aid treatments may not substantially change the outcomes from treatment.

MEDICAL 27

The Elliott Walsh Defibrillator Fund: Increasing Public Access to Defibrillators and lifesaving training in the Kingdom of Bahrain

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The Elliott Walsh Defibrillator Fund was established to improve access to life-saving defibrillators in memory of Elliott Walsh, a child who tragically passed away due to sudden cardiac arrest. The initiative was established in partnership with Elliott's family, and aims to raise awareness of sudden cardiac arrest, increase defibrillator availability in community spaces, and ensure the public is trained in their use.

Description:

The fund operates by identifying high-footfall public areas lacking defibrillators and providing fully automated external defibrillators (AEDs) through community fundraising and strategic partnerships, along with providing free training in their use to employees in these locations. Key locations include schools, sports facilities, mosques and community centres. In addition to installation, the fund supports education initiatives, offering CPR and AED training to the general public, with a focus on young people and sports teams. Recipients sign an agreement to maintain the equipment and training, while also facilitating and encouraging their own communities to participate in low cost lifesaving workshops for children and adults to increase community awareness and confidence in lifesaving skills. All income generated from these workshops goes back to the fund to pay for further defibrillators in other communities.

Lessons learned:

The initiative has demonstrated the effectiveness of targeted community engagement in increasing defibrillator coverage and public confidence in their use. Awareness campaigns and training sessions have improved understanding of cardiac emergencies, empowering individuals to act swiftly in life-threatening situations. Challenges include sustaining long-term funding for maintenance and ensuring continued public engagement, as well as encouraging government to legislate access to defibrillators in public spaces.

Conclusions:

The Elliott Walsh Defibrillator Fund plays a critical role in drowning and cardiac arrest prevention by ensuring rapid access to AEDs, particularly in high-risk locations such as sports facilities and swimming areas. The initiative’s success highlights the importance of combining equipment provision with public education. Future efforts will focus on expanding coverage, developing a national database of all AED's in Bahrain, integrating AED training into school curricula, and working towards policy changes that mandate AED availability in public venues.

MEDICAL 28

Smartglasses as a Tool to Assist Rescuers and Connectivity with the Dispatch Center for Emergencies in Aquatic Environments.

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In recent years, many emergency services have started to use smart technology to assist with protocols, especially in aquatic environments where fast response is critical. Lifeguards and rescuers are often dealing with drowning incidents, so smartglasses with augmented reality and real-time connectivity offer a unique tool to maintain hands-free contact with dispatch for emergency situations. This research investigates the potential for smartglasses to provide hands-free contact with dispatch in emergency situations on beaches, and discusses benefits in terms of situational awareness and decision making.
This work presents the lessons learned in two situations (one frequent and the other less frequent) that rescuers may face (1,2). It describes the management of an out-of-hospital cardiac arrest with the help of a dispatcher, and the out-of-hospital delivery of a pregnant woman with the aid of rescuers (assisted by a dispatcher).
One of the major advantages of using smartglasses in emergency situations is that they keep the responder's hands free so he can continue the physical intervention with the drowning victim. Using radios or smartphones, the responder must free hands to operate the communication device, which may delay the action to save the victim. However, with smartglasses the responder is able to use voice-command to establish communication with the dispatch center so he can continue the intervention and, at the same time, communicate with the dispatch center.

MEDICAL 29

Drowning resuscitation strategies for resource-limited settings: enhancing training, response and data collection

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Context

The World Health Organization (WHO) estimates that more than 90% of fatal drowning occurs in Low and Middle Income Countries (LMIC). In these regions lifeguards often lack national certification, standardized resuscitation protocols and access to essential training resources. Education may be based on outdated techniques, local customs, or insufficient access to evidence-based drowning resuscitation [1]. Additionally, many LMIC lack systematic reporting of resuscitation incidents, hindering efforts to assess the drowning burden. Moreover, effective integration with the Emergency Medical System (EMS) is essential.

Description

This abstract highlights challenges and recommendations from the ILS Medical Position Statement MPS-23[1] on drowning resuscitation in resource-limited settings:

Training and Certification Gaps: Lifeguards training should follow ILS MPSs and ILCOR guidelines, emphasizing locally adapted and self-sustainable training models.

Alternative Training Strategies: Training should focus on local conditions and resources, adopting a “Train the Trainer” model with hands-on practice on real-life scenarios.

Risk Assessment and Emergency Planning: Lifeguard services should establish structured emergency action plans that include coordinated EMS activation , team working and hands off .

Initiation and Termination of CPR: Considerations should be based on local resources, cultural practices, medico-legal requirements, and ethical concerns. Local practices and rescuers´s safety in volatile situations should be considered.

Data Collection and Reporting: Agencies should document fatal and non-fatal drowning incidents following structured reporting guidelines.

Lessons Learned

Regular refresher training improves CPR performance and ensures high-quality resuscitation skills.

Drowning resuscitation protocols should be adapted to local realities, including integration with EMS resources when available.

Improved incident reporting supports better resource planning and advocacy for lifesaving services in LMIC.

Conclusions

Guidelines are often tailored to high-resource environments, which can be challenging to implement, so there is a need to develop international guidelines more applicable in low-resource settings.[2]Drowning resuscitation cases in LMIC require context-specific strategies that prioritize training, response and data collection over costly interventions. Strengthening lifeguard education and improving emergency response coordination will enhance survival outcomes. A standardized but adaptable approach, integrating best practices from the ILS Medical Position Statements, can help bridge critical gaps in the drowning chain of survival.

MEDICAL 30

Evaluation of Drowning related EMS calls: What is the true burden of disease?

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Background: In Ontario, non-fatal drowning data is collected from hospital visits, however there are a portion of drowning patients assessed by paramedics who refuse transport to the hospital and are not captured in the data. For every fatal drowning there may be as many as 3 times that number of non-fatal drowning incidents.
Objective: Complete a retrospective chart review of drowning related ambulance calls in a single SW Ontario county and determine if data from the provincial non-fatal drowning(1) could be augmented.
Methods: Between 2019/01/01 and 2022/12/31 over 400,000 ambulance calls were reviewed and 58 were identified (17 fatal, 41 non-fatal) as drowning patients, by paramedic coding and keyword such in the incident history.
Results: 10% of the non-fatal drowning patients refused to be transported and they would not have been captured in the annual data. 65.5% of the calls did not list drowning as a primary or secondary problem code and only had keywords of interest in their incident history.
Limitations: We only looked at a small sample of ambulance calls from a single land-locked county.
Conclusion: Our study has demonstrated cases (10%) that refused transport, as well as cases (65.5%) with inaccurate coding, all of which would not be captured with the current data collection method. Our study also presents an opportunity for further paramedic education and change in the call report coding utilized by the province of Ontario.

MEDICAL 31

help that comes from the sky: cbmerj helicopters on water rescue missions

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Introduction: According to the Military Fire Department of the State of Rio de Janeiro (CBMERJ), on January 1st alone, 1,138 ocean rescues were carried out throughout the state. This is the reality of a sunny holiday with hot weather and warm ocean water in Rio de Janeiro. On days like this, specialized resources such as jet skis, rescue boats, ambulances, drones and rescue helicopters are deployed to support lifeguards on the beaches. The Air Operations Department(GOA) provides this ocean rescue support.
However, there is limited detailed data on how these rescues are carried out and the support provided by rescue helicopters. The aim of the study was to describe the data on ocean rescue operations by helicopters.
Method: A descriptive study divided into two stages:(1)data from flight records of GOA (January-1st-2015-to-December-31st-2023), considering exclusively water rescue missions (WRM), and (2)quantitative analysis of the data, presented in absolute and relative values.
Results: The GOA helicopters carried out a total of 7,478 missions(TTM), of which 17.4%(1,302) were WRM, with an annual average of 748 and 130. The GOA flew 13,406 hours in TTM, with 8.5%(1,145h) allocated to WRM, resulting in an annual average of 1,341h and 115h.A total of 4,553 patients were assisted, with 24.7%(1,125) in WRM, averaging 455 and 113 annually. The rescue rate was 0.86 patient per WRM and 0.98 per flight hour. From the group of WRM, 70.4%(916) were ocean rescue missions, accounting for 56.3%(645) of the flight hours, and 93.3%(1,050) of all victims were rescued. Ocean patrols represented 8.8%(115), with 9.9%(113) of the hours and 2.1%(24) of the patient rescued. Ocean searches also accounted for 20.8%(271), with 33.8%(388) of the hours and 4.5%(51) of the patient rescued.
Conclusion: The study highlighted the importance of using helicopters to support rescues on beaches, demonstrating a high annual average and significant percentages dedicated to the protection and rescue of drowning patient. The impressive number of lives saved underscores the importance of this rescue resource. Future studies will expand knowledge on the use of water rescue aircraft, contributing to save more lives.

MEDICAL 32

MYCoast Beacons: satellite-enabled infrastructure to enhance coastal safety & emergency response

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Background:
In 2022–23, Australia recorded 281 coastal drowning deaths, its highest toll in over a decade [1]. The UK reported 236 unintentional water-related fatalities in 2022, with over half occurring in coastal or open water settings [2]. Globally, drowning remains one of the top five causes of death for people aged 1–24 years, and a leading cause of unintentional injury death overall [3]. Many of these incidents are preventable, yet delayed emergency response, lack of real-time hazard visibility and limited connectivity continue to hinder efforts to improve safety. Innovative, satellite-enabled solutions are urgently needed to enhance coastal monitoring, support faster interventions, and ultimately save lives.

Description:
MyCoast has developed a new, satellite-enabled solution to address these challenges, building upon the success of the MyCoast app, with the creation of physical infrastructure to support coastal safety and emergency response.
MyCoast Beacons are standalone units designed for deployment in unpatrolled and high-risk locations. Each beacon integrates:
- AI-powered cameras for automated rip current and swimmer detection
- GNSS-IR sensors for tidal and wave monitoring
- IoT sensors capturing environmental data such as wind, UV, and air quality
- Satellite-enabled emergency relays to restore connectivity in black spots
- Digital displays and audio alerts to deliver live warnings to beach users

By combining these technologies, the beacons act as real-time eyes and ears on the beach, bridging critical gaps in emergency response, even when lifeguards are not present.
Funded by the European Space Agency (ESA), a feasibility study engaged over 600 users and multiple Search & Rescue and environmental organisations globally. Next, demonstration trials are planned for both the UK and Australia, in collaboration with partners across both hemispheres, funded in part by both ESA and the UK Space Agency.

Lessons learned:
Stakeholder engagement has been critical to designing a practical and scalable solution. Satellite-enabled technologies are transformative, but effective implementation depends on regulatory collaboration, continued funding, and international partnerships.

Conclusions:
MyCoast Beacons offer a new generation of life-saving coastal infrastructure, combining AI, IoT, and satellite-enabled technologies. They are designed to improve incident detection, deliver timely warnings, and restore emergency connectivity—empowering both the public and first responders.

Policy

POLICY 01

Viet Nam Policy for Long Term and Sustainable Child Drowning Prevention Program and the way forward

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Background: Drowning remains the leading cause of death among children under 16 years in Viet Nam. Recognizing its public health significance and in alignment with United Nations resolutions, the Government of Viet Nam has demonstrated strong political commitment and substantial investment by implementing evidence-based interventions and developing a sustainable policy framework for long-term child drowning prevention.
Description: In December 2024, the Prime Minister formally approved the National Program on Strengthening Child Drowning Prevention in the Educational System (2025–2035). The program establishes ambitious and measurable national targets: by 2030, 70% of students will receive formal water safety training, increasing to 90% by 2035. Swimming proficiency benchmarks include at least 55% of grade five and 65% of grade nine students by 2030, rising to 70% and 80% respectively by 2035. Infrastructure goals require that by 2030, at least 20% of primary and 15% of secondary schools will have swimming pools, expanding to 30% and 25% by 2035. Local governments are mandated to secure significant investment, mobilize community pools for child survival swim programs, and ensure schools invest in capacity strengthening of teachers and health staff, including certification for swimming instruction and drowning first aid.
The comprehensive strategies include: (1) the first-ever integration of drowning prevention into the compulsory life skills and physical education curriculum for students aged 6–18; (2) establishment of financial mechanisms through subsidies, public–private partnerships, and standardized cost norms for swimming lessons; and (3) systematic capacity strengthening of schoolteachers and health staff, supported by standardized teaching resources and first aid training.
Lessons learned: The program demonstrates that data-driven policymaking, strong policy champions, a child rights–based approach, strategic advocacy, and robust monitoring systems are critical enablers of policy development and implementation.
Conclusions: This landmark, dedicated national policy institutionalizes child drowning prevention within the educational system and establishes tangible 10-year indicators. The integration of survival swimming and water safety education provides sustainable momentum for nationwide scale-up and offers a replicable model for other low- and middle-income countries.

POLICY 02

Responding to the United Nations resolution on global drowning prevention: A prospective stakeholder analysis in South Africa

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Background: The 2021 United Nations (UN) Resolution on Global Drowning Prevention calls for several actions at a national level to develop a coordinated global response to drowning. These actions include, amongst others, appointing a national focal point for drowning prevention, developing a national drowning prevention plan containing a measurable set of targets and integrating such plan into wider national plans, policies, and programmes and existing disaster risk reduction programmes. Importantly, the resolution emphasises the need for urgent multisectoral action to improve water safety.

Objective: The aim of this study was to explore stakeholders' current perceptions and context related to drowning prevention initiatives in South Africa.

Methods: A qualitative exploration of stakeholders' perceptions and context related to drowning prevention in South Africa was conducted through semi-structured interviews. The modified Shiffman and Smith (2007) agenda setting framework was applied to identify opportunities for placing drowning prevention on the South African policy agenda.

Results: A total of 7 participants consented to interviews, and represented both the civil society and government sector. Participants provided rich insights into the context of drowning and drowning prevention interventions in South Africa and observed that (i) Drowning is recognised as important but is not prioritised; (ii) National policy is critical to prioritising drowning prevention; (iii) Clear policy targets can be identified; (iv) The multisectoral nature of drowning risk and prevention is a barrier to action and accountability; (v) Collaboration and strong stakeholder partnerships are crucial to addressing the issue, and (vi) Global policy instruments are useful for advocacy but do not guarantee local action

Conclusions: The findings of this study indicate that the burden of drowning is currently under-recognised in South Africa. The drowning prevention community is small with limited power and action will require mobilisation of neutral actors with high power. High level resolutions and reports are useful tools for advocacy but require localised communication strategies for impact.

POLICY 03

Scotland's Drowning Prevention Strategy – Looking back and forward

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Background

Scotland carries a disproportionate number of drowning fatalities in comparison to its UK and European neighbours (1). However, with the introduction of Scotland's Drowning Prevention Strategy (SDPS) in 2018, there has been a decrease in accidental water-related fatalities in Scotland(2). This multifaceted strategy, led by Water Safety Scotland and supported by Scottish Government, has implemented a nationwide programme to help improve water safety and drowning prevention in Scotland.

Description

Water Safety Scotland is a national partnership organisation that works across the length and breadth of Scotland with key aims and objectives as outlined within SDPS. In order to implement these strategic objectives, Water Safety Scotland has created several workstreams to take forward different aspects of the strategy including communications and water safety advice, education, recreational activity and improving data and insights.

Lesson learned

The most recent six-year review of SPDS(2) revealed that accidental water-related fatalities, on average, have reduced by 10 per cent since the original strategy's baseline data (2013-2015). The Introduction of the Drowning and Incident Review (DIR) process has also allowed for water-related fatalities to be tracked in a live real time system. Current insights, discovered from the DIR process and tracking system, suggest that water-related fatalities are further decreasing. This presentation will provide insights into this data but will also discuss some of the key projects and workstreams that have been implemented in Scotland – in particular- curriculum aligned water safety education resources in schools, consistent communications across partner agencies, and the creation of local and regional water safety groups.

Conclusions

The creation of SDPS has been instrumental in increasing water safety awareness in Scotland as well as ensuring strong support from Scottish Government and partner agencies. As a result, Water Safety Scotland's workstreams and the strategy have been successfully implemented with encouraging trends. Much of the learning from SDPS will be used in the next iteration of a strategy which is due to be released in 2026. Additionally, learning from the strategy may provide useful insights for other regions across the world.

POLICY 04

the zanzibar multisectoral drowning prevention national action plan

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Background

The Multisectoral Action plan was developed by the government of Zanzibar in response to the World Health Organization's (WHO) recommendations for national strategies to prevent drowning. This is due to the recognizing the increasing burden of drowning in Zanzibar, the Royal National Lifeboat Institution (RNLI) and The Panje Project implementing drowning prevention interventions since 2014, which led to broader government collaborations. Over time, this groundwork set the stage for a formalized, multisectoral action plan aimed at enhancing national coordination and drowning prevention measures.

Description

Zanzibar, a semi-autonomous region of Tanzania, is highly dependent on marine-based activities, including fishing, seaweed farming, and tourism. Despite frequent interactions with open water, limited swimming skills and lack of life-saving equipment have contributed to drowning incidents, making national intervention necessary. The plan's development was shaped by community action, where local drowning prevention initiatives raised awareness and successfully engaged the government. Political influences such as large-scale maritime disasters and growing global momentum following the United Nations General Assembly resolution on drowning prevention further solidified the urgency for policy intervention.

Lesson Learned and conclusion

Through multisectoral coordination, the plan was crafted via stakeholder consultations, technical guidance from drowning prevention experts, and direct government participation. The official launch in July 2024 marked a significant milestone, outlining objectives such as strengthening policy frameworks, implementing 09, and improving Zanzibar's capacity for drowning response and rescue operations. The plan aligns with national development priorities, ensuring sustainability and long-term commitment.

The Zanzibar experience exemplifies how local advocacy, government partnerships, and global momentum can drive policy change. Lessons from this journey including community-driven initiatives, multisectoral collaboration, and sustained political engagement provide valuable insights for other regions seeking to develop national drowning prevention strategies.

POLICY 05

Making every moment count: the power of marketing in drowning prevention - a government approach to building a culture of water safety awareness

Roger Sweeney

Water Safety Ireland, Galway, Ireland

Background: Water offers opportunities for joy, connection, and lifelong memories, yet drowning remains a significant public health challenge in Ireland, accounting for nearly 40% of all combined road and water deaths over a five-year period. Water Safety Ireland recognized the need for a proactive approach, launching a national public awareness campaign that reframed water safety as an enabler of positive experiences rather than a restriction.
Description: The campaign leveraged multi-channel marketing strategies—including digital platforms, radio, print media, and community outreach—to promote the message that memorable moments are made possible by practicing water safety. Research conducted across age, gender, regional, and socioeconomic demographics provided critical insights into public attitudes and behaviors. The campaign emphasized swimming as a life skill (recognized by 84% as essential, up 6% from 2023) and reinforced the importance of water education (90% deeming it necessary, a 7% increase from 2023). The results also showed a significant rise in overall water safety knowledge among adults (76%, up 19% from 2023), and 72% of parents reported improved safety awareness among children.
Lessons Learned: The campaign effectively prompted action, with 74% of respondents taking at least one safety measure after exposure to water safety messaging. The most common response was heightened vigilance when swimming with family and friends (43%). These findings underscore the role of positive, action-driven messaging in encouraging behavior change. While lifejacket usage declined (70% in 2024 vs. 80% in 2023), the data highlights an opportunity for future campaigns to reinforce their importance through targeted messaging.
Conclusions: The success of this campaign demonstrates the power of well-crafted public messaging in shaping water safety behaviors. By positioning safety as a means of protecting cherished experiences, governments can foster long-term engagement with water safety education. Future efforts should build on this momentum by enhancing digital outreach and sustaining investment in research-driven campaigns that empower communities to make safe choices in and around water.

POLICY 06

The state of drowning prevention in the WHO European Region: Insights from the European regional status report on drowning prevention

Ana Catarina Queiroga[1,2], Jonathon Passmore[1]

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Background:
This presentation analyzes drowning prevention efforts in the WHO European Region, based on the European Regional Status Report. It provides an overview of drowning statistics, risk factors, and the effectiveness of prevention strategies within the context of global efforts.
Description:
The presentation synthesizes data from various sources, including national health statistics and case studies, to examine the burden of drowning in Europe. It will explore key risk factors such as environmental hazards, behavioral risks, and socio-demographic factors. It will highlight the effectiveness of existing drowning prevention efforts in Europe, showcasing successful governance models from countries like the UK and Ireland; and address the challenges of fragmented data collection, cultural differences, and the expected impact of climate change on drowning risks.
Lessons learned:
Key insights include the persistent vulnerability of adults aged 30–49 and 50–69, where drowning remains a leading cause of death by injury. The report stresses the importance of addressing environmental and behavioral risk factors, such as alcohol-related drownings and lack of aquatic literacy. It also highlights the gaps in governance, where authority and strategies for drowning prevention are often absent. Furthermore, the analysis revealed a disconnect between available evidence on drowning risks and public perceptions. Progress in interventions has been inconsistent. Existing legislation is not keeping pace with the growing scale of the drowning challenge.
Challenges and Barriers:
The presentation will discuss key barriers to effective drowning prevention, including inconsistent and fragmented data collection across countries, cultural and regional differences in program implementation, and varying levels of resources. It will also explore the expected impact of climate change, with more frequent extreme weather events exacerbating drowning risks.
Guidance and Future Directions:
The report recommends policy action to develop and enforce legislation aligned with evolving drowning risks. Improve capacity building to enhance local authority resources, and cross-border collaboration for sharing best practices. Research and innovation should focus on developing new technologies and strategies to improve drowning prevention.
Conclusions:
The findings underscore the importance of continued efforts to reduce drowning fatalities in Europe, with a focus on improving surveillance, addressing climate change impacts, and prioritising high-risk populations.

POLICY 07

Strengthening inter-agency coordination for drowning prevention in Uganda: a mixed-methods approach

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1Global Health Advocacy Incubator, Kampala, Uganda. 2Virginia Commonwealth University-VCU, Richmond, USA. 3xx, xx, Uganda

Drowning is a significant yet under-researched public health issue in Uganda, disproportionately affecting children and young men due to the country's extensive water bodies and reliance on water-based activities. Globally, there were an estimated 300 000 drowning deaths in 2021 – this is equivalent to more than 30 people losing their lives to drowning every hour of every day. In Uganda , between 3000-5000 people die every year on different water bodies, Placing Uganda among the countries with some of the highest drowning rates globally. Despite the severity of the problem, drowning prevention has received limited attention in national health and safety policies. Existing research highlights the importance of inter-agency coordination in mitigating drowning risks, yet its effectiveness in low- and middle-income countries remains poorly understood.
This study aims to examine the role of inter-agency collaboration in Uganda's drowning prevention efforts. Using a mixed-methods approach, the research will analyze data from Uganda's Ministry of Health, local authorities, and non-governmental organizations to assess the effectiveness of government-led interventions. Semi-structured interviews with key stakeholders—including government agencies, NGOs, and community organizations—will provide qualitative insights into coordination mechanisms, barriers to collaboration, and best practices for multi-sectoral engagement. Additionally, quantitative analysis of drowning incident data from 2020 to 2024 will help evaluate the impact of inter-agency partnerships on drowning prevention outcomes.
The study seeks to identify challenges such as resource constraints, unclear role delineation, and communication gaps that hinder effective coordination. It will also explore opportunities for strengthening institutional frameworks, improving information-sharing protocols, and developing sustainable funding mechanisms. Findings from this research will contribute to evidence-based policy recommendations aimed at enhancing inter-agency coordination, ultimately supporting more effective drowning prevention initiatives in Uganda. The insights gained may also inform broader strategies for improving water safety in similar resource-limited settings.

POLICY 08

National Policy Interventions to Prevent Drowning

Vandana Shah, Lexi Bullick

Global Health Advocacy Incubator, Washington DC, USA

Background: Drowning is the sixth leading cause of death worldwide for children aged 5-14 years, making it an urgent issue for many countries. However, over 90% of drowning deaths occur in low- and middle-income countries where resources are limited and there are competing national priorities. This can be addressed through national policies that offer cost-effective, sustainable solutions to prevent drowning.
Description: While some countries may have taken small steps towards preventing drowning, such as acknowledging World Drowning Prevention Day or having knowledge campaigns on the danger of drowning, their actions are often uncoordinated and unmandated. Having a national policy or program in place allows for the formal coordination of drowning prevention efforts by a lead government agency.
Lessons Learned: In Vietnam, the 10-Year National Program on Child Injury Prevention was signed in July 2021, and the Department of Child Affairs was named as the lead agency in charge of implementing the program. Ministries and agencies at the national and provincial levels were assigned roles in the program and the DCA was given the mandate to coordinate them all. As we approach the halfway mark of the 10-Year Program, the power of the policy has already been seen in increased funding at the provincial levels for drowning prevention efforts and the expansion of responsibility for drowning prevention to the educational system. Without a central policy guiding the execution of drowning prevention strategies, the efforts would have remained disjointed and ineffective.
Conclusion: The lessons learned in Vietnam can be applied to other LMICs who are facing similar issues with drowning prevention. For example, in Uganda, the government is pursuing their own national policy for drowning prevention, the Uganda National Drowning Prevention and Water Safety Strategic Plan (2021-2028). The passage of this Strategic Plan will unify the efforts of government agencies and civil society organizations in Uganda who are addressing water safety and drowning prevention through their own efforts.

POLICY 09

Developing and Driving Thailand's Drowning Prevention Policy to Achieve the 20-Year National Strategic Plan Goals.

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Background
Thailand has achieved significant progress in reducing drowning deaths among children under 15. However, recent data show an increasing trend of drowning fatalities among adults and the elderly, with those aged 45 and above accounting for 52.6% of all deaths. This shift presents a new challenge requiring targeted policies and measures. This study aimed to examine and provide recommendations for developing and implementing drowning prevention policies in Thailand, focusing on adults, the elderly, and children with disabilities, in line with Phase 3 of the 20-Year National Strategic Plan.

Methods
A mixed-method policy research approach was employed, consisting of three stages: (1) documentary research to analyze the latest drowning statistics and relevant policies; (2) qualitative research through in-depth interviews with key experts and stakeholders, and focus group discussions with target groups in high-risk areas; and (3) the Delphi technique to collect and build consensus among experts on key and feasible policy recommendations.

Results
The study found that the primary causes of drowning among adults and the elderly were largely related to behavioral factors, such as occupational activities near water, alcohol consumption, and underlying health conditions. Moreover, current drowning prevention policies remain predominantly child-focused, leaving many measures misaligned with the behaviors and risks of adults, the elderly, and children with disabilities. The policy recommendations derived from this study cover four main areas: (1) developing a clear policy coordination mechanism with an emphasis on targeted risk communication for adults and the elderly; (2) promoting relevant laws and regulations for surveillance and the installation of safety equipment in high-risk areas frequently used by the working-age population; (3) implementing drowning prevention interventions for children with intellectual disabilities and autism; and (4) encouraging community and local government participation in developing local drowning prevention plans, taking into account the economic, social, and health factors of the elderly across all age groups.

Conclusions
Achieving the 20-Year National Strategic Plan goals requires comprehensive, integrated, and evidence-informed policies. The study's recommendations provide essential guidance for policymakers and practitioners to implement sustainable and effective measures to protect public lives, promote equity, and achieve long-term public health and sustainable development goals.

POLICY 10

Nordic Lifesaving Drowning Prevention And Water Safety Collaboration

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The Nordic Lifesaving Countries have in decades collaborated in all level of lifesaving, drowning prevention, education, water safety, lifeguarding and lifesaving sport.
The countries involve in this long term collaboration are: Denmark, Finland, Faroe Island, Iceland, Norway and Sweden. We have been collaboration with Estonia, Lithaunia and Latvia as well.
Our collaboration expands from sharing good practice and developing educational materials to colloaborating in different activities within our field.
We have conducted some project together for instance "Summer camp" where youngsters come together in an exchange program where they have a week of lifesaving experience and knowledge sharing. This project was conducted between Sweden & Norway.
Other activities is collaborating in conferences conducted by one of the Nordic countries. The collaboration expands to participating and also presenting.
Collaboration within lifesaving sport is one of the fields that the Nordic has had its focus on. We have created our own relay called Nordic Relay. We organize common training camps as well and welcome our athletes in respective countries' national championships.
The Nordic collaboration has resulted in a common definition of swimming ability, which is often being referred to.
In education the Nordic has collaborated in best practise exchange of knowledge and syllabus that is in use for all level of our activity, for instance baby swimming.
In lifeguarding our collaboration expands to the level of sharing knowledge but also to the level where education and development is being conducted by one country. An example for this is Denmark educating Norwegian in use of IRB for lifeguarding.
The Nordic is strong in sharing knowledge but also in creating common ground when we work on prevention. One specific area that the Nordic has colloborated strongly in is the risk assessment of bathing area, marinas, harbour, open water area and pool. We conduct common use of campaign materials to promote water safety and drowning prevention.
The strength in this collaboration is the common force in promoting water safety and drowning prevetion in areas that are similar within the Nordic. Also it gives us a voice to be heard within our regions political body.

POLICY 11

Local Water Safety Plans – Empowering local communities to lead drowning prevention across Australia

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Background:
On average, 278 people drown every year in Australia, the majority males, with over one-third living locally (within 50km) of where they drowned (1). The Australian Water Safety Strategy 2030 (2) highlights the need for Local Water Safety Plans as key strategy for reducing drowning at the local community level. Local Water Safety Plans have been developed across Australia, with local stakeholders to identify the key issues and prioritize areas of water safety and drowning prevention specific to each community.

Description:
A Local Water Safety Plan outlines existing and future community-based drowning prevention actions tailored to individual community contexts. The approach emphasizes the role of evidence-based solutions, multi-sectoral collaboration and the capabilities and needs of stakeholders, including community and government organisations.
Steps for developing a local water safety plan include:
evidence-based interventions
multi-stakeholder collaboration and coordination
no-blame approach to problem solving
representation from across local government and a range of community organisations
collective agreement on strategies that all interests and agendas can align to for the greater good
This presentation will provide practical examples of how Local Water Safety Plans are being implemented across Australia, including metro and regional contexts.

Lessons learned
Each region or area has a unique drowning profile and priorities for drowning prevention differ depending on the stakeholders and resources available, requiring a different approach for the development of each Local Water Safety Plan.
Having a common vision of building collaborative momentum towards preventing drowning in the region is what unites people to come together when developing these plans.
Incorporating a holistic approach to planning, review, monitoring activities, local intelligence, stakeholder communication and consultation and ongoing monitoring and review is need for successful, sustainable implementation.

Conclusion
No single organisation, government or advocate can prevent all drowning alone. keys to success when developing and implementing Water Safety Plans at all levels include collective action, alignment with other sectors, and having a shared vision to reduce drowning.

POLICY 12

Collaboration to enhance implementation of day-care to prevent child drowning in low- and middle-income settings

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Background
Provision of day-care for children aged 1-4 years is one of the WHO's recommended community-based interventions to reduce drowning in low- and middle-income country (LMIC) settings [1]. To support accelerated efforts to prevent drowning [2,3], the WHO produced Practical Guidance on the implementation of day-care to prevent drowning. [4,5], although the specific application and impact of this guidance within the Early Childhood Development (ECD) sector remains largely unexplored. This research leverages insights from a multi-country workshop to enhance understanding of the challenges and opportunities in implementing day-care interventions for drowning prevention in LMIC settings.

Methods
Representatives from 22 organizations across 14 countries, involved in day-care services or policy development in LMIC settings, attended a facilitated workshop in Chiang Mai, Thailand. The workshop was co-hosted by the Royal National Lifeboat Institution (RNLI), WHO, and the Thai Ministry of Public Health. Over three days, participants with expertise in ECD explored the opportunities and challenges of integrating drowning prevention policies and practices. The discussions centred on four areas from WHO's practical guidance
Integrating drowning prevention awareness into ECD programs and policies
Ensuring safe routes to day-care centres and mitigating environmental risks
Training caregivers in water safety, rescue, and resuscitation
Engaging communities in drowning prevention awareness
Thematic analysis identified emerging themes.

Results
The workshop highlighted three key areas to help organisations in LMIC settings implement drowning prevention-sensitive policies and practices in accordance with the WHO practical guidance:
Global Policy: Integration of drowning prevention measures into global ECD frameworks, including within the Nurturing Care Framework.
Standardised ECD Guidelines: Development of guidelines to standardise caregiver training, including drowning risk assessment and risk management, and safe rescue and resuscitation.
Community Engagement: Actively engaging caregivers, parents, and wider community members on drowning risks, including educating them on keeping children safe when traveling to and from the day-care centre, and while at home.

Conclusions
Findings from this research have resulted in 'action plans' for workshop participants. Researchers will work with policy makers and practitioners to develop recommendations to support other organisations looking to implement day-care as a drowning prevention intervention in LMIC settings.

POLICY 13

Rescued by Design: A Proposed Hybrid Approach to an Intervention Development Framework

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Human-Centred Design (HCD) methods can and have been employed to reduce risks and prevent drowning in many contexts. These and similar principles have been utilised for many years in designing consumer products and, more recently, in the fields of health and social systems.

Bazzo et al. [1] Identify core conflicts between design-centered methodologies and conventional health research frameworks. Design approaches like HCD prioritise iterative processes, embrace uncertainty, and focus on quick prototype development. In contrast, established health research traditions rely on hypothesis testing and evidence-based protocols. This methodological divide frequently leads public health researchers to view design approaches as deficient in thorough analysis and scholarly rigor.

Case studies from studies in Bangladesh and Tanzania illustrate how the process is being employed with communities to co-develop interventions aimed at reducing the risk of drowning among artisanal fishers and vulnerable children.

The authors propose a framework that integrates design methodology and traditional research methodologies, creating a more user-centred and multidimensional approach to intervention design. Outputs of the process include user risk journeys, stakeholder mapping and systems diagrams that can be used with communities and wider stakeholders to visualise the problem and bring to life the environment in which interventions are to be designed. These outputs can also be utilised for advocacy and donor engagement.

The proposed framework provides a mechanism for closer collaboration between researchers, practitioners, and communities to work together to co-design context-specific solutions that are culturally and environmentally appropriate.

Integrating the design process into drowning prevention provides an opportunity to ensure that interventions are grounded within the realities of daily life and are owned by the communities most affected.

POLICY 14

Water safety and drowning prevention impacts of a co-designed farm injury prevention online game for adolescents

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Background: Drowning risk is elevated in rural areas [1] due in part to a range of aquatic locations. For those living on rural properties farm dams, as well as creeks, water troughs, water tanks and irrigation channels, can pose a high drowning risk for children and young people [2,3]. To improve safety on farms (including preventing drowning), an online educational game was co-designed with adolescents attending rural high schools in Australia. Alongside modules on vehicle, paddock and workshop safety, a module on water safety was produced. This presentation will document and discuss the co-design process, including qualitative insights identified during the design phase, as well as the self-reported impact on students' water safety knowledge.
Methods: During the design phase, nine mixed gender focus groups were held with 12-14 year old students attending four rural high schools which had an agricultural focus. Insights fed into game content development and design, after which time, adolescents from three of the four schools tested the game and undertook pre and post-game play surveys to determine satisfaction with content and design, as-well-as changes in self-reported knowledge.
Results: At the beginning of the co-design process, focus group insights indicated many students were using dams and creeks on farms, sometimes with peers and sometimes with family. The risks of these locations were downplayed as adolescents felt they were safe as they knew how to swim. Students were interested in water safety, in particular learning about cardiopulmonary resuscitation (CPR). The water safety module of the Calm Your Farm game (www.calmfarm.education) features mini games on dam, irrigation and river hazards, the importance of not swimming alone, when to call for help, and steps of CPR.
Pre/post surveys identified statistically significant improvements against baseline in self-reported knowledge for the water safety module (X^2=3.89; p=0.049), especially among boys (X^2=4.98; p =0.026) [4].
Conclusions: The co-design process resulted in a more relevant, fun and engaging resource, providing information on water safety to rural dwelling adolescents, a population at increased drowning risk. Future efforts should be targeted at promotion of the resource via the education system to expand reach and impact.

POLICY 15

Evaluation of Governmental Responsibility for Drowning Prevention and Water Safety in the Hawaiian Islands

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This five(5) step process for drowning prevention and water safety is presented as a model for other government agencies to follow:
1. Public education commitment to funding and conducting learn to swim programs for children of in all primary/elementary education schools.
2. Inclusion of water safety/junior lifeguard training in secondary/high school physical education programs.
3. Provision of professional ocean safety lifeguards at highly accessible/hazardous beaches based on risk assessment factors.
4. Dissemination of information and educational materials to all visitors and military personnel regarding ocean and beach safety.
5. Budgeting and allocation of sufficient operating and capital improvement funding in order to provide the programs and services listed.
These programs are at various stages of development in the Hawaiian Islands, but in order to keep our residents and visitors safe, it is imperative that we continue to progress in our efforts to advance them.
It is also important to communicate these efforts on a global basis so that other governmental agencies can learn from some of the pitfalls experienced along the way.
Government programs in Hawaii can be categorized into federal-funded (United States) programs, state-funded (Hawaii), and county-funded (Hawaii, Maui, Oahu, and Kauai). There is often overlapping, jurisdictional issues which arise between the various entities which can hinder progress.

POLICY 16

Impact of government investment policies on drowning prevention in the Lake Victoria basin

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Drowning is a major but neglected public health crisis in Lake Victoria's fishing communities, claiming approximately 5,000 fisherfolk's lives annually across Kenya, Uganda, and Tanzania. Despite the fishery sector's $600 million annual value, less than 0.3% of national health budgets are allocated to water safety. This study examines the relationship between government investment policies and drowning-related fatalities, addressing critical knowledge gaps in effective prevention strategies for resource-limited settings.

This quantitative study utilized WHO Global Status Drowning Mortality data across the three Lake Victoria countries. The investigation employed multivariate regression analysis to examine the impact of government interventions, specifically focusing on legislation mandating lifejacket use and vessel safety regulations as primary independent variables. Additional control variables included search and rescue services, weather warning systems, and community resilience measures. Cross-country comparisons were conducted to identify contextual factors influencing policy effectiveness.

Bivariate analysis revealed that lifejacket legislation was significantly associated with reduced drowning mortality rates (34.09% variation explained, $p<0.05$), while vessel safety legislation showed no significant effect. In the comprehensive multivariate model, search and rescue services emerged as the strongest predictor of reduced drowning rates when controlling for other factors. Strong country-specific effects indicated that national contexts substantially influenced intervention effectiveness. The analysis demonstrated that successful drowning prevention requires integrated approaches rather than standalone regulatory policies, with emergency response systems playing a crucial role alongside preventative measures.

This study contributes valuable empirical evidence on drowning prevention effectiveness in East African contexts, highlighting the importance of balancing preventative regulations with responsive emergency systems. For policymakers, findings suggest prioritising investments in search and rescue infrastructure while strengthening enforcement of preventative regulations. The significant country-specific effects underscore the need for tailored approaches rather than one-size-fits-all regional policies. Future research should explore non-linear relationships between interventions and outcomes, investigate country-level differences in greater depth, and employ sophisticated temporal analysis to strengthen causal inferences regarding policy effectiveness.

POLICY 17

Program Sustainability Score Card: Viet Nam Pilot and Lesson Learned for LMICs

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Background: Since 2019, Viet Nam, with support from the Global Health Advocacy Incubator (GHAI) and government ministries, has implemented survival swimming and water safety education for children under 15. To date, over 60,000 children have enrolled, swimming ability has doubled, and child drowning mortality has fallen by 16%. Local co-funding and national policy adoption involving nine ministries highlight strong political commitment. To guide long-term planning, GHAI developed a sustainability scorecard based on the Program Sustainability Assessment Tool (PSAT) and piloted it in Quang Tri province, one of the poorest regions.
Description: Thirty-two schools participated in the pilot. The questionnaire assessed eight domains, each with five items scored on a five-point Likert scale. Mean scores and positive response rates were calculated. *Communication* (4.36) and *Monitoring and Evaluation* (4.17) scored highest, followed by *Enabled Environment*, *Organizational Capacity*, *Intervention Adjustment*, and *Strategic Planning* (all >4.0). The lowest scores were *Financial Sustainability* (3.13) and *Partnership* (3.61). In-depth interviews provided further insights. This success was achieved thanks to the strong political commitment, great learning from implementation of other provinces, existence of technical package, effective inter-sectoral coordination, active community participation, in- kind contribution from private sector and social organizations. Challenges: frequent natural disasters, and economic difficulties, the incoming administration reform leads to the change of leadership, limited financial resources.
Lesson learnt: Sustainability was supported by strong leadership, active community participation, in-kind contributions from private and social organizations, and shared learning across provinces. Challenges included frequent natural disasters, economic hardship, leadership changes from administrative reform, limited financial resources.
Conclusions: The sustainability scorecard is a evidence-based framework to assess sustainability across multiple domains. It provides actionable insights to strengthen program performance and resource mobilization. The tool should be further refined for national application in Viet Nam and offers a practical reference for other low- and middle-income countries.

POLICY 18

Scaling up MERIT MAKER: A National Community-Based Program for Drowning Prevention in Thailand

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Background:
Prior to 2005, drowning was the leading cause of death among children under 15 in Thailand. In 2006, the government launched the "Child Drowning Prevention Vaccine" project, focusing on survival swimming. However, its impact was limited as it targeted only school-aged children. Recognizing the need for a more comprehensive and sustainable approach, the Ministry of Public Health developed MERIT MAKER, an evidence-based program addressing both individual and environmental risk factors.

Methods:
This study employed a mixed-methods approach to evaluate the national scaling of MERIT MAKER. The program was developed as a comprehensive, community-based intervention package based on 10 effective measures recommended by international guidelines and local research. These measures include installing barriers, providing safe places, raising public awareness, teaching survival swimming and water safety skills, and CPR training. The program uses a flexible, tiered system (Bronze, Silver, Gold, Diamond) allowing communities to select measures suited to their capacity and context. Following a successful pilot in four provinces, the program was expanded nationwide with support from a multi-level network and government-led initiatives to motivate and honor community teams.

Results:
From 2015 to 2024, MERIT MAKER was scaled up nationwide, establishing 6,594 community-based teams. Child drowning mortality decreased by 24.3% compared to 2014, and 94.7% of implementation areas reported reduced or stable drowning incidents. Key achievements included managing over 40,965 risky water bodies, training more than 1.5 million children in Survival Swimming, and over 500,000 people in CPR. Success was attributed to government leadership, a flexible design, focus on tangible results, and creating value and motivation for participants.

Conclusions:
MERIT MAKER is a highly effective, scalable, and sustainable model for national childhood drowning prevention. By empowering communities to implement comprehensive, evidence-based measures within a flexible, multi-level structure, the program overcame limitations of previous interventions. This government-led, community-based approach achieved substantial and lasting reductions in childhood drowning deaths and provides valuable lessons for public health initiatives in other countries facing similar challenges.

POLICY 19

Panel: Creating Sustainable National Drowning Prevention Programs

Vandana Shah, Lexi Bullick

Global Health Advocacy Incubator, Washington, DC, USA

Background: Drowning is the sixth leading cause of death worldwide for children aged 5-14 years, making it an urgent issue for many countries. However, over 90% of drowning deaths occur in low- and middle-income countries where resources are limited and there are competing policy priorities. National drowning prevention programs must be government-led and funded to be effective and sustainable.

Description: In the current international donor funding climate, the need for domestic public health financing is more important than ever to protect children and ensure the progress counties are making in health are not reversed. GHAI will host a panel with government officials and advocates from Vietnam, Bangladesh and Uganda to discuss the efforts each country has made towards sustainable drowning prevention programs.

Lessons Learned: Since 2017, GHAI has partnered with the Government of Vietnam to design and implement their national drowning prevention program, led by the Department of Child Affairs. Over the last five years, domestic financing for the program has increased annually at the national and provincial levels, while donor funding has slowly tapered off, allowing for a sustained increase in domestic resources. In Bangladesh, GHAI supported the allocation of a $30 million public private partnership which helped create a national drowning prevention program to support over 8000 childcare centers. In Uganda, the government is championing the Uganda National Drowning Prevention and Water Safety Strategy. The Strategy will need to have a long-term vision for domestic financing in order to sustain the efforts of government and civil society.

Conclusions: The cases of Vietnam and Bangladesh shows the potential for success in low- and middle-income countries when child drowning prevention is prioritized and a long-term plan for domestic financing is created early. As Uganda begins these efforts, the panelists will come together to discuss and share key learnings for sustainable financing for drowning prevention.

POLICY 20

Drowning epidemiology from a population-based nationwide survey in Bangladesh: an insight for policy action

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Centre for Injury Prevention and Research, Bangladesh, Dhaka, Bangladesh

Background: About 91% of the global drowning deaths occur in low- and middle- income countries including Bangladesh. Understanding epidemiological burden of drowning is prime to develop specific interventions in addressing the problem. Thus, we aimed at in-depth exploration of both fatal and non-fatal drowning in Bangladesh.
Methods: A nationwide cross-sectional house-to-house survey was conducted in 2023-2024. A total of 442,998 populations from over 110,000 households were selected based on probability proportionate to size with separate urban and rural samples from 64 districts in Bangladesh. Multistage cluster sampling method was applied to select desired number of households. Among these populations 304,112(72%) were from the rural areas and 138,886(32%) from the urban areas. The data was collected from respondents by face-to-face interview. Descriptive and logistic regression analysis were used to derive rates and test the association between variables.

Results: Fatal and non-fatal drowning rate were 11.06(95%CI8.27-14.5) and 53.70(95%CI:47.30-61.00) per/100000/populations/year respectively. The highest rates of fatal and non-fatal drowning were observed in children 1–4 years at 77.92(95%CI:51.99–211.25) and 221.82(95%CI:176.82–278.45) per/100,000/populations/year respectively. Both fatal and non-fatal drowning rates were significantly higher in rural areas (11.83, 95%CI:08.55-16.39 and 63.14 95%CI:54.82) compared to urban areas (09.36,95%CI:5.47-14.86 and 33.12,95%CI:24.84-44.18). Binary regression analysis showed that males were at higher risk of both fatal and non-fatal drowning than females. Children 1–4 years were 24.64 times (95%CI:3.65–178.75;p = 0.000) and 20.56 times (95%CI:0.66-129.12; p = 0.000) higher at risk of fatal and non-fatal drowning, respectively than 10-14 years. The poorest SES quintile had 7.08 times (95%CI:1.38-29.15;p=0.02) and 5.06 times(95%CI:0.88-19.81;p=0.06) higher risk of fatal and non-fatal drowning respectively than those compared to richest. Ponds are most common place 69.7% of

drowning in Bangladesh. About 56% of drowning took place in water within 20 m from victim's house. Almost all 97.0% drowning occurred during the daylight between 0600h and 1800h.
Conclusions: The study suggests that the magnitude of fatal and non-fatal drowning is very high in different part of Bangladesh. A national comprehensive effort for drowning prevention in Bangladesh is crucial in achieving several targets of the Sustainable Development Goals.

POLICY 21

The drowning prevention program in compulsory schools and collaboration with external expertise

Ann-Helen Odberg

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Background

Since 2015/2016, Norway's national focus on drowning prevention in compulsory schools has increased cooperation with external expertise like volunteer organizations and swimming clubs. This has raised discussions on balancing the school's responsibility and the use of external expertise, as outlined in the Education Act. Section 17-6 of The Education Act states that only teachers can be responsible for the education, though other staff may assist, with municipalities ensuring they receive necessary guidance from a teacher. (1)

A survey of 541 primary schools revealed that about half cooperated with external partners, mainly contributing with assistance and logistics. Reasons for cooperation include municipal decisions, quality concerns, and staff expertise gaps. However, schools using their own staff found it easier, provided better overall education, and leveraged students' familiarity with teachers. (2)

Description

The national drowning prevention action plan for compulsory schools is outlined in the Physical Education curriculum (2nd-10th grade) of the Knowledge Promotion 2020. (3,4) The competence aims are to equip students with knowledge, skills, and critical thinking in safe behavior, swimming, self-rescue, and life-saving to prevent and manage water-related dangers. The competence goals progress to equip students with the skills to assess risks and act safely in water-related situations.

Lessons learned

Cooperation with external expertise has highlighted the school's need for expertise and quality, while also exposing challenges in organizing and allocating responsibility to deliver a comprehensive and cohesive drowning prevention education that supports students to understand their abilities and limitations.

It is crucial for schools and municipalities to assess the best way to organize the education with external expertise, while ensuring that the school's responsibility is maintained. (5)

Conclusion

Cooperation with external expertise can positively impact both students' education and teachers' competence. Schools that partner with external actors must take greater responsibility for the education. This approach not only offers students a comprehensive and cohesive drowning prevention education but also strengthens internal expertise, fostering collaboration and ensuring that the curriculum aligns with established frameworks and regulations, as outlined in the Knowledge Promotion 2020.

POLICY 22

Enhancing Swimming Skills Among Disadvantaged Children: The Olympic Games' Influence in France

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Background: The 2024 Olympic Games (OG) in France were held in Seine-Saint-Denis, one of the most economically disadvantaged regions. As part of the Games' legacy program, policies aimed to improve children's water safety by the construction of new swimming pools and the increasement of learn-to-swim programs. Studying socio-economically disadvantaged children is crucial, as they face a higher risk of drowning[1]. This study evaluates the impact of these policies on children's swimming skills in the Seine-Saint-Denis region.

Methods: Between 2012 and 2024, the success rates of 12-year-olds children in a common national test were reported by 3,205 (France) and 135 (Seine-Saint-Denis) secondary schools. The national test is composed of a combination of aquatic skills as defined as important by Stallman et al. (2017)[2]. To assess the impact of the OG legacy program on swimming skills levels, two time periods were defined: the pre-application period (2012–2017) and the post-application period (2018–2024). For each period, a generalized linear model was used to assess the effects of year, sex, and socio-economic status of the school (calculated through families' socio-economic background) on the success rates. Deviations from the national average were analysed using the Wilcoxon test, while effect sizes were calculated using Cohen's *d*. Statistical significance was set at $p<0.05$

Results: The deviation from the national average remained statistically significant across the two periods ($p<0.05$), with disparities widening over time ($d=0.6$ for Period 1; $d=1.64$ for Period 2). In Seine-Saint-Denis, the success of children at the test remained stable between 2012 and 2017 at 70%, followed by a significant decline to 48% in 2019. However, from 2019 to 2024, success rates showed a significant recovery, reaching 60%. No sex effect was detected, whereas economic status of the schools impacted significantly the success rate ($p<0.01$).

Conclusion: Despite major political efforts in infrastructure and pedagogy, the impact of public policies to raise children's swimming skills levels takes time, particularly if health issues need to be addressed. The results confirm the significant weight of families' social background, and that these groups need to be targeted as a priority to reduce drowning accidents in French children.

POLICY 23

Exploring competencies for drowning prevention to enable positive change – Panel Session

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1JAMES COOK UNIVERSITY, Douglas, Australia. 2Johns Hopkins University, Baltimore, USA

Drowning prevention is gaining momentum, with increased engagement by the World Health Organization, government, not-for-profit, philanthropy and academia globally we are seeing an increase in activity across the globe. The latest Global Status Report highlighted the complexity of drowning, needing multisectoral buy-in to enact and enable effective drowning prevention interventions.

The Global Status Report reinforced that, the burden of drowning impacts low and middle income countries (LMIC) more than high income countries (HIC), noting that the burden is coming from differing risk factors. Legislation, behaviour change, standards, policy, drowning prevention plans, environmental modification, education, lifeguarding services, improved data collection, advocacy and partnering with other sections have all been proposed as solutions to help in the prevention of drowning. However, all of these require leadership, knowledge, skills, motivation and engagement to ensure successful outcomes.

In 2024 Bloomberg Philanthropies funded a global leadership program with 12 participants from predominately LMICs. The feedback from the participants was that the program was valuable and provided them with a range of skills to enhance their drowning prevention work. This work has now been built on by Johns Hopkins University, through the Global Drowning Prevention Leadership Institute, continuing leadership development through coursework and Alumni activities.

To effectively address drowning on the global stage, there is a need to ensure that there are adequately trained personnel with the range of skills required to effect change. This panel seeks to begin exploring (leading to the eventual development of) core competencies for drowning prevention to guide capacity strengthening for drowning prevention worldwide. This panel will think critically about the proposed solutions to explore what skills, knowledge, and attributes are required to enact the solutions.

The panel will also explore the personal journeys of the panel members, to think critically about how to attract talent and develop people to enhance drowning prevention. It will debate the value of different competencies in drowning prevention, explore leadership styles and skills, and think critically about what emerging skills (such as the use of AI and technology) will be necessary for future drowning prevention efforts.

Prevention

PREVENTION 01

Exploring factors related to drowning risk among Black and African American persons in the United States

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1CDC Foundation, Atlanta, USA. 2Norfolk State University, Norfolk, USA. 3American Red Cross Scientific Advisory Council, Washington, USA. 4USA Swimming, Colorado Springs, USA

Background: Each year, approximately 4,500 people in the United States die from unintentional drowning (1). Disparities in drowning exist by race and ethnicity in the United States (2), and non-Hispanic Black or African American (Black) individuals experience some of the highest rates of drowning (1,2). The aims of this qualitative study were to better understand factors that may influence drowning disparities among Black persons in the United States, and how to best tailor and implement evidence-based drowning prevention interventions to individuals at highest risk.
Methods: A qualitative, exploratory study was conducted using a community-engaged approach. Fifty individuals residing in seven states in the United States, participated in focus group discussions.
Results: Participants noted that for many Black individuals, historical and contemporary factors have reduced access to aquatic spaces thereby hindering opportunities to gain familiarity with aquatic activities and water competence. Past negative aquatic experiences were discussed as either barriers or motivators to participate in swim lessons. For many, facilitators to participate in aquatic activities could include assurances of safety and adequately addressing hair management needs. These facilitators may be supported when racial representation of bystanders and professionals is present in aquatic spaces. Participants strongly endorsed providing basic swimming and water safety skills training to children through public schools as a drowning prevention intervention.
Conclusion: The findings from this study emphasize the need for public health efforts to support tailored, community driven, trauma-informed drowning prevention initiatives so that more individuals and families can enjoy safe aquatic participation.

PREVENTION 02

Hidden benefits of international student drowning prevention programs: Fostering a sense of belonging in a new country

Amy Peden[1], Madhav Raman[2], Oliver Jackon[2], Belinda Lawton[1]

1School of Population Health, UNSW Sydney, Kensington, Australia. 2Health Promotion Unit, UNSW Sydney, Kensington, Australia

Background: Being unfamiliar with, and not having adequate skills and knowledge to safely engage with, aquatic environments are often identified as risk factors for drowning [1]. People who engage with water in a new country can be at higher drowning risk for these reasons. International students, who move to a new country to pursue higher education, are one of these at-risk groups [2]. Education and skill development programs can improve water safety for such populations while also potentially having other positive impacts. The aim of this study was to explore how learn to swim and beach and ocean safety programs delivered at a coastal university in Sydney, Australia impact international students' sense of belonging.
Methods: Semi-structured one-on-one interviews were conducted with 18 international students from a mix of countries, faculties, and programmes of study. Inclusion criteria was such that students had to have completed the University's 8-week learn to swim program and/or the University's three-day Beach Ocean Safe course. Interviews were audio recorded and transcribed. Thematic analysis of transcripts was performed comparing students' experiences against Allen et al's [3] four interrelated components from which belonging emerges: competencies for belonging (skills and abilities); opportunities to belong (enablers, removal/reduction of barriers); motivations to belong (inner drive); and perceptions of belonging (cognitions, attributions, and feedback mechanisms – positive or negative experiences when connecting).
Results: We found students' experiences were overwhelmingly positive, fostering increased skills and confidence around water. This facilitated social and broader community interaction, minimising previously held feelings of being an outsider when visiting aquatic locations due to a lack of ability or knowledge when compared to local residents. Additional benefits included forming friendships and improvements to both mental and physical health.
Conclusions: Australia has a reputation as a safe place for international students yet this population has been identified as facing increased drowning risk. This study has shown that the benefits of swimming and water safety programs go beyond that of drowning prevention, aiding students to feel more comfortable and connected in a new country, findings which could provide support for program sponsorship, initiation or expansion.

PREVENTION 03

Bridging the Policy Gap: Enhancing Migrant-Inclusive Drowning Prevention in Australia

Emma Derainne, Jagnoor Jagnoor

The George Institute of Global Health, Sydney, Australia

Migrant drowning prevention in Australia requires a coordinated policy approach that integrates culturally and linguistically tailored interventions into national and state-level water safety strategies. Despite ongoing efforts, migrants remain disproportionately vulnerable to drowning due to limited access to swimming lessons, unfamiliarity with local aquatic environments, and language barriers in safety messaging (Franklin et al., 2020; Willcox-Pidgeon et al., 2021). Existing policy frameworks often place responsibility on individuals rather than addressing systemic inequities that contribute to risk (Gupta & Jagnoor, 2019). This presentation explores the best policy investments to enhance migrant drowning prevention in Australia, emphasizing evidence-based government interventions, targeted funding, and cross-sectoral collaboration.

Using a policy analysis framework, this study evaluates existing national drowning prevention policies and assesses their effectiveness in meeting the needs of migrant communities. Key recommendations include: (1) embedding migrant-inclusive water safety programs within national drowning prevention policies, (2) allocating sustained government funding to co-designed swimming and water safety education for migrants, (3) enhancing policy coordination between health, education, and settlement services, and (4) leveraging community-led initiatives to ensure culturally appropriate interventions (Peden et al., 2020; Willcox-Pidgeon et al., 2021).

Government buy-in is critical to shifting the policy discourse from individual responsibility to structural intervention. A stronger regulatory approach, including mandatory water safety education for new arrivals, expansion of subsidized swimming lessons, and improved media representation of migrant drowning risks, would enhance existing strategies (Royal Life Saving Australia, 2024). By drawing on international best practices and policy innovations in high-migrant-risk settings, this presentation provides a roadmap for strengthening government leadership in drowning prevention. Ultimately, addressing migrant drowning as a structural issue rather than an individual failing will be key to achieving Australia's water safety and public health goals.

PREVENTION 04

“Prevention of water-related Injuries: Best practices in working with children and parents from vulnerable Romani communities in Bulgaria”

Jordan Ivanov, Anton Nalbantov

Red Cross, Sofia, Bulgaria

Water-related injuries, especially water drowning pose a critical public health challenge, particularly among vulnerable populations, with children of Romani origin disproportionately affected. Recent statistics from the Bulgarian Ministry of Interior indicate that 60–70% of fatal drowning cases involve these children, primarily attributed to inadequate water safety knowledge, low community awareness, and insufficient parental supervision. In response to this pressing issue, the Water Safety Service of the Bulgarian Red Cross has developed and implemented a targeted prevention model specifically designed for Romani communities.

Drowning among children from Romani groups in Bulgaria is a significant concern, as these communities often face heightened risks due to socio-economic factors and environmental conditions. For instance, Romani children in Bulgaria often live in conditions of poverty and social exclusion, which can increase their exposure to health risks, including those related to water safety.

This innovative model underscores the importance of collaboration with Romani health mediators, who are integral to fostering trust and bridging the gap between local institutions and the Romani population. Through culturally sensitive engagement, the Red Cross delivers educational programs such as “Friends with Water” for children and “Keep an Eye” for parents and caregivers. These interactive sessions address critical themes, including safe behaviors around water, basic first aid techniques, and recognizing potential risk situations.

The impact of these initiatives has been profound, resulting in increased awareness of water safety, a reduction in water-related incidents, and enhanced trust and cooperation between public institutions and the Romani community. The success of this targeted approach highlights the efficacy of utilizing culturally relevant strategies and community involvement in addressing public health issues. This model not only serves as a blueprint for reducing water-related injuries among Romani communities but also represents a replicable good practice that can be adapted for use in other vulnerable populations facing similar challenges. Ultimately, by empowering both children and parents through education and community engagement, this initiative contributes significantly to the prevention of water drowning and the promotion of overall public health.

PREVENTION 05

Water No Get Enemy

Prince Kofi Asante Sefa-Boakye

Black Star Polo, Accra, Ghana

US born Ghanaian Prince Kofi Asante Sefa-Boakye has committed himself to the advocacy of water safety, drowning prevention, and the introduction of Aquatic sports to marginalized African & African-American communities. In his career, Asante has competed internationally in Water Polo throughout Europe & South America following his collegiate career in the United States.

The Black Star Polo (BSP) movement operates in three symbiotic pillars, each initiative approaching water health and safety through a curated lens: free swim lessons with drowning prevention resources, open water activites to engage healing of generational trauma, & competitive water polo in Ghana.

In 2022, Prince Asante developed Ghana's first water polo league consisting of 7 teams, both male and female, spanning three regions. The BSP teams have been invited annually to participate in the Habawaba Tournament in Brazil, Italy, the Gauteng Invitational in South Africa, and to elite training sessions in Budapest, Hungary. Against all odds, young West African athletes proudly arrive in traditional kente at international pools inspiring young enthusiasts with validation through representation and catalyzing social change around water.

In 2024, a Pan-African campaign was launched to empower communities towards Water Safety. With Continent-wide allies, our team of young Ghanaians travelled to Durban, South Africa to meet a network of lifeguards and Water Safety enthusiasts.

Healing generational trauma from the transatlantic slave trade, institutionalized segregation, and selective cultural tropes is critical to the relationship with water within communities of color. BSP also curates floating sound baths with guided mediation & floatation devices to increase comfort in the water for novice and entry level swimmers.
Qualitative and quantitative data synthesized from BSP floaters suggests fast, beneficial, emotional and physical transformation in and around water.

Through protected exposure, accessibility, and inclusivity, BSP dreams new demographics thriving over a shared passion of aquatics with significantly reduced drowning rates in our communities.

PREVENTION 06

Peer-led training improves lifejacket wear among occupational boaters: Evidence from a cluster randomized controlled trial in Uganda

Frederick Oporia[1], Simon Peter Kibira[1], Jagnoor Jagnoor[2], Olive Kobusingye[1], Fredrick Edward Makumbi[1], John Bosco Isunju[1], Fred Nuwaha Ntoni[1]

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Background
The global burden of drowning is highest among occupational boaters in low and middle-income countries. Lakeside boat using communities are at greater risk. In Uganda, over 95% of people who drowned from boating-related activities were not wearing lifejackets at the time of the incident. We implemented and evaluated a peer-led training program to improve lifejacket wear among occupational boaters on Lake Albert, Western Uganda.
Methods
We conducted a two-arm cluster randomized controlled trial in which fourteen landing sites were randomized to the intervention and non-intervention arm using stratified permuted block randomization with a 1:1 allocation ratio. In the intervention arm, a six-month peer-to-peer training program on lifejacket wear was implemented while the non-intervention arm continued to receive the routine Marine Police sensitizations on drowning prevention through its community policing program. The effect of the intervention was assessed on self-reported and observed lifejacket wear using a test of differences in proportions of wear following the intention to treat principle. The effect of contamination was assessed using mixed effect modified Poisson regression following the As Treated analysis principle at 95% confidence interval. Results are reported according to the CONSORT statement–extension for cluster randomized trials.
Results
Self-reported lifejacket wear increased markedly from 30.8% to 65.1% in the intervention arm compared to the non-intervention arm which rose from 29.9% to 43.2%. Observed wear increased from 1.0% to 26.8% in the intervention arm and from 0.6% to 8.8% in the non-intervention arm. The test of differences in proportions of self-reported lifejacket wear (65.1%–43.2% = 21.9%, p-value <0.001) and observed wear (26.8%– 8.8% = 18%, p-value <0.001) showed statistically significant differences between the intervention and non-intervention arm. Self-reported lifejacket wear was higher among boaters who received peer training than those who did not (Adj. PR 1.78, 95% CI 1.38–2.30).
Conclusion
This study demonstrated that peer-led training significantly improves lifejacket wear among occupational boaters. The government of Uganda through the relevant ministries, and the Landing Site Management Committees should embrace and scale up peer-led training programs on lifejacket wear to reduce drowning deaths.

PREVENTION 07

Using Community Knowledge approach to determine the drowning burden in West Bengal, India.

Jagnoor Jagnoor[1], medhavi gupta[1], Sujoy Roy[2]

1The George Institute for Global health, Sydney, Australia. 2Child in Need Institute, Kolkata, India

Background: Drowning remains a significant public health concern, particularly in rural settings of low- and middle-income countries (LMICs). Routine data often underestimates the true burden. This cross-sectional study aimed to estimate the incidence of fatal drowning in West Bengal, India, using the community knowledge approach (CKA).
Methods: A cross-sectional study, adhering to STROBE guidelines, was conducted across West Bengal. The CKA methodology, validated for LMIC rural settings, was employed. Community leaders identified known drowning deaths, and household surveys were subsequently conducted only in those households where deaths were reported. This approach minimized data collection efforts. West Bengal, with its diverse topography including hills, riverine, delta, and coastal regions, and a predominantly rural population (68.13%), served as the study setting.
Results: Interim analysis of the data reveals a drowning mortality rate of 4.6 per 100,000 population. Further findings, including detailed demographic and regional variations, will be available in the coming months upon completion of the data analysis.
Conclusion: This preliminary data highlights that routinely collected data significantly underestimates the true burden of drowning mortality. Population-based studies, such as the one implemented in this study, are essential for accurately assessing drowning incidence and informing targeted prevention strategies in West Bengal and similar settings.

PREVENTION 08

lessons from implementation of a peer-led training program on lifejacket wear among occupational boaters on lake albert, uganda.

Frederick Oporia[1], Simon Peter Kibira[1], Fred Nuwaha[1], Tonny Muwonge[1], Lesley Rose Ninsiima[1], David Meddings[2], Aminur Rahman[3], Jagnoor Jagnoor[4], Aminur Rahman[3], Peter Simon Okello[1]

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Background
Drowning deaths are now acknowledged as major global phenomenon. For several years now, many interventions have proven effective in reducing these deaths. While the burden is reducing in high income countries, it is increasing in many low- and middle-income countries where over nine in every ten global drowning deaths occur. Africa remains the hardest hit, including Uganda, with lakeside communities most at risk. Lifejackets are among the proven effective interventions against drowning. To this effect, a peer-led training program was implemented, and its evaluation showed a dramatic increase in wear rates among occupational boaters involved in fishing and transportation activities on Lake Albert, Uganda. This study set out to explore the successes and failures of this program to inform modifications and possible scale-up.
Methods
We took a relativist ontological position to conduct a qualitative enquiry among occupational boaters on Lake Albert, Uganda. Using an emic epistemological approach, we conducted seven focus group discussions and seven in-depth interviews with peer trainers and recipients of the intervention to explore their perspectives on the program. Using an inductive approach, we employed thematic analysis techniques to generate the findings. We report these findings following the Consolidated Criteria for Reporting Qualitative Research.
Results
The peer-led approach was well received due to the trainers' familiarity with their communities, leading to increased demand for lifejackets. The timing of the training, manuals translated into local languages, and community engagement contributed to the program's success. On the other hand, limited access to quality lifejackets, and unrealistic expectations for free distribution, robberies on the lake and fishing seasons were perceived as some of the contributors to the failure of the program.
Conclusion
The peer-to-peer training approach on lifejacket wear was considered friendly due to the perceived collegiality between the trainers and the trainees. The Success of this approach depends on optimal session timing and providing trainers with culturally appropriate training materials for reference.

PREVENTION 09

Lifejacket Contribution Program: Addressing Drowning Risk Among Rural and Remote Communities in Ontario Canada

Lisa Hanson Ouellette, Emma Cox
Lifesaving Society Ontario, Toronto, Canada

Recreational boating-related injuries are a preventable cause of morbidity and mortality from outdoor aquatic recreation in Canada. Drowning and water-related injuries are a significant cause of mortality in Canada with almost 500 unintentional water related deaths occurring each year. Approximately one-quarter of these deaths are boating-related – most occurred in rural and remote locations and the majority individuals who died were not wearing a lifejacket at the time of the incident.

There are approximately 30 boating-related fatalities per year in the province of Ontario. Ontario fatal drowning data shows that 86% of boating-related fatalities where status of a lifejacket was known involved people who were not wearing a lifejacket. Most boating-related fatalities occur in rural and remote locations.

Lifesaving Society Ontario Branch created a Lifejacket Contribution Program to make lifejackets more readily available to Ontario residents. The goal of this program is to ensure that everyone who needs a lifejacket can access one, helping to keep them safe while in, on or around water while reducing drowning. A lifejacket lending program acts as a public distribution centre/location for lifejackets of various types and sizes that can be borrowed for free. The program focuses on rural and remote communities.

Ontario communities, municipalities, organizations and drowning prevention coalitions are eligible to apply. Applicants are required to match the Program's donation (a maximum of nine adult-size lifejackets) with as many (or more) youth and/or child-sized, Transport Canada approved, lifejackets. Proposals must outline/identify partners, location, structure type, hours of operation, storage/maintenance, tracking systems/reporting, and other details/documents communities wish to share.

Resources to support communities in their lifejacket lending programs were created including a Lifejacket Lending Station Start Up Guide and posters (e.g. How to Find Your Fit). Since its creation, the Lifejacket Contribution Program has reached communities across Ontario. The Program continues to grow.

PREVENTION 10

Cultural Barriers in Research of Drowning Prevention in the Middle East.

Afshin Kasir Moallem

Lifesaving, Tehran, Iran, Islamic Republic of

The main objective of this article is to identify and analyses the cultural and psychological barriers that causes challenges against collection of accurate details in drowning incidents. Collecting the information by interviewing with the people who directly witnessed the events as the primary sources is one of the best way and very crucial for each drowning research and investigation. I, as an individual who is interested in and is been working in drowning prevention programs, understood there are some challenges through collecting of the information from victims' relatives as the primary sources. Therefore first I tried to find out the reasons which cause people to avoid sharing their information about the detail of the drowning events. Thought this investigation I found some cultural and psychological barriers like: feeling guilty, being ashamed, avoid remembering, and also even repressing forgetting, which made many people avoid cooperation, and also make them not interested in participation in any drowning prevention projects.
This research first talks about the problems and reasons, and finally suggests some educational methods which are instrumental to inform those people who their informations are very helpful for the drowning prevention projects. This final goal of this article is to inform the importance of the victim's relatives' roles in the drowning prevention projects, and also aware them about how their cooperations and participations could saving lives through the future drowning prevention programs.
The research methodology included direct interviews and also structured questionnaires to gather some related information about each drowning cases from the victims' relatives.

This project worked on 10 people (relatives of drowning victims) which lost families in last 5 years in Iran.

PREVENTION 11

Investigating cause of death for drowning of submerged vehicles: a cross-cutting issue between drowning and road traffic injury prevention

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BACKGROUND

Although there is no available global figure on the estimated number of deaths due to drowning of submerged vehicles, several countries and regions reported the problem that require global attention. For example, every year about 400 people die in submersed vehicles in North America and this number increases to 2,000–5,000 in all industrialized nations. Drownings in submerged vehicles occur in Oman due to flash floods. The level of investigation on the causes of such deaths and crashes versus drowning contribution vary from country to another and there is no current global guidance at the current time. There are factors related to vehicle safety and road infrastructure that increase the risk of this issue such as Power Windows, laminated Glazing Versus Tempered Glass, lack of Vehicle Countermeasures, poor Highway Design, insufficient Dispatcher Training and lack of Warnings and Guidelines (1)

The World Health Organization (WHO) has provided clear guidance on preventing both road traffic injuries and drowning in a multi-disciplinary approach and hasn't issued specific recommendations for the drowning of individuals inside submerged vehicles. The World Conference on Drowning Prevention 2025 aims to bring together leading experts in drowning prevention to discuss effective strategies and technologies to reduce drowning incidents globally

OBJECTIVES

To present the different processes of reporting deaths due to drowning of submerged vehicles including verbal autopsies, registration systems and multi-disciplinary approach

To share the role of road safety authorities in managing crash-related factors related to such incidents.

To identify the needs to consider the issue in the global and regional agenda in terms of adequate reporting, preventive measures and multi-disciplinary investigation.

EXPECTED OUTCOMES

Preliminary recommendations for improving the reporting and practices on management of incidents of drowning of submerged vehicles

Participants: The panel discussion will convene representatives of concerned road safety stakeholders from selected EMR countries. WHO will take the technical lead, and the conference organizers will support the participation of the representatives including tickets and accommodation.

PREVENTION 12

Developing community-engaged interventions to prevent drowning of children under two: Insights from Rural Bangladesh

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Background: Child drowning is a major public health problem in Bangladesh claiming 14,500 lives annually. Several interventions, like community-based day-care centres, have been implemented to tackle drowning. However, engaging under-2s, most vulnerable to drowning is challenging due to age-specific needs. Human-centred design (HCD) is a well-known approach for developing and designing prototypes though not yet used in designing drowning prevention interventions for under-2's in low- and middle-income countries. This study is on identifying acceptable, feasible and sustainable interventions for under-2 children in Bangladesh engaging local communities from the beginning. The National Institute for Health and Care Research (NIHR), UK funded the project.
Objectives: To develop and test intervention prototypes that address the drowning risks of children under 2 in rural Bangladesh.
Methods: Qualitative methods were used. Focus Group Discussions, In-depth Interviews and Key Informant Interviews explored the child drowning context, current prevention practices, health-seeking behaviour, and challenges of existing drowning-prevention interventions. The research was conducted in five phases in two sub-districts of Bangladesh. Community risk mapping was accomplished to identify the most drowning-prone villages through transect work. The collaborative workshops with experts were conducted to identify and prioritise possible interventions. The data were collected from May 2023 to March 2024.
Results: It was found that mothers were the main caregivers followed by grandmothers, siblings and in-laws. Caregivers' time for preparing lunch was found most vulnerable time to drowning. Caregivers used toys, mobile phones, cartoons on TV, tricycles, and cardboard boxes to keep their children engaged. Participants in the community-level workshop ranked drowning as the main injury hazard. They suggested age-specific toys, fencing waterbodies and filling up unnecessary ditches, establishing community-based daycare, and awareness campaigns at the community level can prevent under-2 from drowning. The collaborative workshops with experts identified and prioritised possible interventions- adapting day-care centres, swings/slings, playpens or designated play areas, capacity building of communities on first aid, self-closing latches and locks, door barriers and community awareness.
Conclusions: Several of these interventions will be tested through build, resilience and learning processes with regular feedback from the community.

PREVENTION 13

From Neglect to Priority: Childhood Drowning Prevention journey in Bangladesh-a case study

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Background:
Two decades ago, childhood drowning was a neglected, unrecognized health problem in Bangladesh. This neglect phenomena were mainly due to lack of research on drowning, lack of data to convince policymakers for resource allocation and lack of human resources to address this issue properly. Centre for Injury Prevention and Research, Bangladesh (CIPRB) emerged as a research organization with a focus on injury prevention. The CIPRB provides a compelling example of how a dedicated research organization can successfully translate a neglected health issue into a priority. The objective of this paper is to explore and propagate the journey for replication of the strategy in other similar settings to address childhood drowning issue.
Methodology
Document review and consultative discussion with relevant stakeholders like CIPRB members, related government officials and members of the partner organization.
Findings
The journey unfolded in three stages: a preparatory phase, an engagement phase, and an implementation phase. The preparatory phase focused on generating evidence. The rigorous research conducted by the CIPRB, which included epidemiological studies, intervention trials, and implementation research, yielded strong evidence regarding the extent and effects of childhood drowning in Bangladesh. Moreover, CIPRB's research pinpointed suitable solutions for low-income environments like Bangladesh. During the engagement phase, CIPRB effectively shared its research findings with policymakers, media, researchers, and the general public through various publications, presentations, and advocacy initiatives. This raised awareness and fostered support for initiatives aimed at preventing childhood drowning. The CIPRB established robust partnerships with government entities, NGOs, development partners, and community organizations. These collaborations enabled the translation of research findings into actionable policies and practices. The CIPRB also actively advocated for the inclusion of injury prevention in national and international health policies and programs. Ultimately, drowning has been recognized as a priority health issue nationally and globally.
Conclusions
Rigorous research is essential for demonstrating the importance of neglected health issues and informing effective interventions. Engaging the policy makers, professionals, researchers and general community peoples are the key to translate research finding into policy actions.

PREVENTION 14

Understanding community Knowledge, Attitude, and Practices (KAP) related to childhood drowning prevention: Findings from a Baseline Survey in Rural Bangladesh

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Background:
Drowning is a leading cause of preventable child mortality in Bangladesh, particularly affecting children aged 1–5 years (1). The key risk factors for childhood drowning prevention include a lack of information on and awareness of prevention methods and the absence of dedicated drowning prevention programs (2). While drowning is widely acknowledged as preventable, knowledge gaps persist among caregivers and communities regarding effective prevention strategies. This study assesses the baseline knowledge, attitudes, and practices (KAP) of communities in rural Bangladesh on childhood drowning prevention, providing a foundation for the Integrated Community Based Center of Child Care, Protection and Swim-Safe Facilities (ICBC) project's interventions.
Methodology:
A cross-sectional mixed-methods study was conducted across 45 upazilas in 16 districts and collected data from 133,387 households. The KAP survey included 13,324 respondents, representing 10% of the total sampled households. The qualitative component included four KIIs, 28 IDIs, and 24 FGDs. The FGDs were conducted with parents of children aged 1–5 and 6–10 years (8 FGDs each) and community leaders (8 FGDs). Data collection occurred between February 10, 2024, and July 2, 2024, using tablet PCs equipped with Kobo software.
Results:
A significant proportion of respondents (61.0%; n=5,292) lacked satisfactory knowledge of drowning prevention for children aged 1–5 years, while 47.6% (n=3,663) lacked knowledge for children aged 6–10 years. However, 93.0% of respondents acknowledged that childhood drowning is preventable. Child supervision was the most cited prevention strategy (95.4%, n=8,274) and most practiced (94.1%, n=8,162), followed by. limiting water access (49.7%, n=) for children aged 1–5 years. Supervision (88.0%, n=7,633), and swimming lessons (79.0%, n=5,613) were emphasized for children aged 6–10 years.
For children aged 1-5, communities commonly known and practiced supervision and restricting water access as key safety measures. They also recommended teaching swimming. In contrast, communities prioritized swimming skill development for children aged 6-10.
Conclusion:
Despite a general awareness of drowning risks, significant knowledge gaps remain in prevention strategies. Strengthening community-based education programs, improving access to formal swimming lessons, and reinforcing household-level supervision are essential for reducing childhood drowning fatalities in Bangladesh.

PREVENTION 15

Fencing of ponds in a low-resource settings: A process evaluation of a one-year implementation trial

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Background: Children aged 1-2 years old face a high risk of drowning, especially in low-resource settings. The Sundarbans region in India is a water-logged, deltaic region experiencing some of the highest child drowning rates globally(1). Despite the elevated risk, children in this age group are least protected by the best-researched interventions like supervised creches(2). Fencing water bodies near households with children aged 1-2 years old may be an alternative solution, but there has been limited research to identify how this program can be best implemented and sustained(3). This study ran a small pilot of one hundred households to assess the feasibility of implementing a fencing program in this low-resource and remote setting.
Methods: One hundred households with children aged 1-2 years old were identified in collaboration with community members. Using a co-design approach, fences were erected using local materials to barricade the ponds nearest to these households. A mixed-methods approach was used to assess implementation of the program. Four monitoring visits were conducted over one year to measure the conditions of the fencing. Qualitative interviews were conducted with community members and program implementers to identify challenges and enablers to implementation. The results were analysed against the UK Medical Research Council's Process Evaluation Framework(4) to understand components of implementation such as fidelity, acceptability and contextual considerations.
Results: Our results showed good adherence to fencing repair and safety features over the one-year period. Additionally, community participants expressed satisfaction with the program. The majority of household members recruited took initiative to conduct repair activities after training. No drowning events were reported during the one-year period in any of the fenced ponds. One key challenge may be that male household members showed less buy-in than female members, but they were key to conducting fence maintenance activities. Consistent encouragement and monitoring may also be essential to adherence.
Conclusion: Fencing may be a sustainable and feasible program to prevent drowning in children aged 1-2 years old in low-resource settings with a high presence of open ponds. Further research should scale up this community-designed program and assess its effectiveness in preventing drowning.

PREVENTION 16

Media Monitoring to Strengthen Child Drowning Prevention in Vietnam

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Background:
Child drowning is a major public health concern in Vietnam. While the government collects official drowning data, the process is slow due to the need to compile reports from multiple provinces. To ensure timely insights and improve government responsiveness, media monitoring has become an essential tool for tracking drowning incidents and public discourse.
Project Description:
Since 2018, the Global Health Advocacy Incubator (GHAI) has systematically monitored media coverage on drowning to analyze sentiment, media outlets, article types, share of voice, and overall attention to drowning issues. This effort provides real-time insights into how drowning is portrayed in the media and how the issue evolves over time.
Regular media reports are shared with government partners, equipping them with up-to-date information to strengthen policy responses, enhance public awareness campaigns, and improve documentation of drowning incidents. These reports also help officials identify misinformation, enabling them to provide accurate guidance to the public. Over time, policymakers have increasingly relied on media monitoring to shape prevention strategies, allocate resources, and develop stronger communication efforts.
Lessons Learned:
Media monitoring is a powerful advocacy tool that accelerates information gathering, offering a faster alternative to official data collection. Providing real-time insights has improved government responsiveness and reinforced the importance of data-driven decision-making. Sustained tracking has also enhanced documentation, ensuring drowning prevention remains a national priority.
Conclusion:
By leveraging media data, this initiative has transformed how drowning prevention is understood and addressed in Vietnam. Integrating media insights into policy discussions has strengthened government action, improved responsiveness, and ensured child drowning prevention remains at the forefront of child safety efforts.

PREVENTION 17

Contextual Factors and Risk Determinants of Drowning Mortality in a Vulnerable Area of Bangladesh

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Background:
Drowning remains a major yet under-recognized public health concern in low- and middle-income countries, including Bangladesh. This study aims to examine the contextual and risk factors associated with drowning mortality in one of the country's most high-risk regions.
Methods:
A nationwide cross-sectional household survey was conducted in 2024, covering 133,387 households and a total population of 525,649 across 45 upazilas in 16 districts where a drowning prevention project was being implemented. A total of 1,260 enumeration areas (EAs) were randomly selected as primary sampling units, in consultation with the Bangladesh Bureau of Statistics (BBS) and key stakeholders. Data were collected using pretested semi-structured questionnaires by 105 trained data collectors, 16 field supervisors, and 4 research officers through a digital data collection system.
Results:
The annual fatal drowning rate was estimated at 20.0/ 100,000 population (95% CI: 16.50–24.18), with children aged 1–4 years experiencing the highest mortality rate at 126.44 per 100,000 (95% CI: 97.84–163.70). Males had a 1.6 times higher drowning rate (24.84/100,000) compared to females (15.30/100,000). Ponds accounted for 63% of drowning sites, and nearly half (46%) occurred within 20 meters of the victim's home. Common circumstances included working near water bodies (21.9%), playing (17.1%), bathing/swimming (15.2%), slipping along the bank (10.5%), and fishing (5.8%). The majority of incidents (91.4%) took place during daylight hours (0600h–1800h), and seasonality showed a peak during the monsoon (June–October, 50%) followed by pre-monsoon months (April–May, 19%). December–February had the lowest reported cases (12%). Search and rescue operations were attempted in 92.4% of cases; among those retrieved, 32.6% were found alive or unconscious. Of the deceased, 62.2% died during treatment, 20.4% at home, and 7.1% in the hospital.
Conclusions:
Drowning disproportionately affects young children—particularly males—due to limited supervision and close proximity to unprotected water bodies. For adults, lack of safety measures during occupational or recreational water-related activities contributes to risk. Context-specific, community-level interventions focusing on child supervision, water safety, and environmental modifications are urgently needed.

PREVENTION 18

Framing Migrant Drownings in Australia: A Critical Discourse Analysis of News Media Representations

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Media coverage of migrant drownings in Australia has gained prominence, yet the framing of these incidents may overlook key social determinants contributing to drowning risks for migrants. This study applies Critical Discourse Analysis (CDA) to examine the underlying ideological and power dynamics shaping the narratives used by Australian newspapers to frame migrant drowning between 2000-2024. The analysis compares the portrayal of migrant and non-migrant drowning incidents, revealing distinct differences in media narratives. Migrant drownings are often attributed to individual responsibility, while non-migrant drownings tend to receive greater systemic concern and sympathy. The study calls for a shift towards more inclusive and culturally sensitive media coverage that address the structural factors contributing to drowning risks for migrants in Australia.

PREVENTION 19

Evolution of migration routes from Africa to Europe

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Background
Every year, thousands of people try to reach Europe from North Africa through the different maritime routes in an attempt to find a better future, however, many of these people lose their lives or disappear during the crossing.
Knowing the real number of people who start the route is a complex task, although there are many entities that try to quantify the number, the published figures are an estimate.
According to UNHCR data in 2024, it is estimated that 199,400 people reached European shores via the four routes in the Mediterranean and North West Africa while 2,844 people died from drowning or disappeared at sea.
The aim of this work is to:
Identify the maritime routes most used by migrants to reach Europe.
To find out the evolution of migratory movements in recent years along the different routes.
Methods
In order to carry out this work, we have analysed the data published by the main sources that analyse migratory movements and mortality along the Mediterranean and North-West African migratory routes, including UNHCR, the International Organization for Migrants and the Euro-Mediterranean Human Rights Monitor over the last 10 years.
Results
The sources analysed show very disparate data, with differences of up to 43% in the number of deaths recorded depending on the entity publishing the data.
However, when analysing the evolution of the routes used, we observe that in recent years, the routes chosen by migrants for their crossing have changed substantially, observing that historically the most used routes were those of the central and eastern Mediterranean, while currently the North African route has become more important, being the most used in 2024 and the first months of 2025.
Conclusions
The lack of unified criteria together with the high number of disappearances on maritime routes makes it very difficult to know the real number of deaths.
Knowing the trends in the routes used is of vital importance in order to propose measures to help reduce the number of deaths and disappearances.

PREVENTION 20

Preventing drowning among migrants and refugees in Mediterranean: ILSE Guidelines for data-driven strategies and drowning prevention Interventions

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Background:
The Mediterranean migration crisis remains one of the most pressing humanitarian challenges of our time, with thousands of migrants and refugees perishing at sea each year. Despite efforts to document these tragedies, discrepancies in data from various monitoring organizations hinder effective response strategies. The International Lifesaving Federation of Europe (ILSE) aims to enhance data accuracy and promote evidence-based drowning prevention measures tailored to migrants and refugees.
Description:
This study analyzes data on migrant and refugee fatalities at sea from sources such as the International Organization for Migration (IOM), UN Refugee Agency (UNHCR), and NGOs, highlighting trends in arrivals, deaths, and missing persons across key Mediterranean routes. Findings underscore the urgent need for improved search and rescue efforts and proactive drowning prevention strategies in host countries. ILSE's European National Programmes for Migrants and Refugees Drowning Prevention provides key recommendations upon arrival in host countries, including:

- Strengthening communication with migrant and refugee communities.
- Developing multilingual water safety materials and digital awareness campaigns.
- Offering accessible swimming and survival skills training.
- Collaborating with local authorities to secure free or subsidized lessons.
- Establishing a database to assess and address drowning risks among migrants.

Lessons Learned:
Findings reveal that the lack of standardized data collection obscures the true scale of the crisis, delaying effective intervention. Additionally, migrants and refugees often arrive with limited water safety knowledge, increasing their vulnerability both in transit and host countries. Targeted, culturally sensitive interventions can significantly reduce drowning risks.
Conclusions:
Addressing drowning prevention among migrants and refugees requires coordinated global action, integrating data transparency, immediate response measures, and long-term education initiatives. The ILSE remains committed to advocating for comprehensive policies that prioritize both emergency rescue efforts and preventive education. Through collaboration and evidence-based interventions, we can save lives and uphold the dignity of those forced to undertake dangerous sea crossings in search of a better future.

PREVENTION 21

Assessing the Role of Self-Selection Bias in Basic Swimming Lessons Among Minorities in the United States.

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Background: In the United States, minorities experience higher rates of drowning than the general population. According to the CDC, the drowning rate of non-Hispanic Black persons is 1.5 times higher than non-Hispanic White persons (Clemens, Moreland & Lee, 2021). Several organizations seek to reduce this disparity. Voluntary enrollment swim lessons are likely to suffer from self-selection bias that diminishes efforts to improve minority safety. This research analyzes the extent of self-selection bias in swim classes on a large, open-enrollment, minority-majority college campus. In this environment, all students share the opportunity to learn to swim, improve their existing swimming ability or fitness, and to earn credit toward graduation. This is a stronger incentive structure than public swimming courses aimed to increase bather safety alone. It also provides the opportunity to assess swim program retention by race.
Methods: Using data from swim class enrollment at a minority-majority community college, the role of selection bias is investigated. Parametric tests are conducted to determine difference in initial enrollment by demographic groups in introduction to swimming and swimming level I, II and III courses. These rates are compared to the college, as well as physical education majors. Further analysis is conducted regarding minority completion rates as well as continuance in further swim classes.
Results: Difference in swim class enrollment and completion rates by race are investigated. Results are forthcoming.
Conclusions: The problem of self-selection in swim classes weakens efforts to reduce minority drowning rates in the United States. The distinction between self-selection bias for swim classes, completion rates, and program continuation is important in understanding the problem of high drowning rates among minorities. This analysis into that phenomenon will inform resource allocation in the effort to raise minority swimming ability and reduce minority drowning rates.

PREVENTION 22

Making waves: Youth voices on safe access to blue spaces

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Blue spaces are important resources for improving wellbeing. Given the global prioritisation of improving young people's mental health, this is of particular significance for today's youth. Despite well documented health benefits, their use is contested by controversies over safety, risk-taking, pollution, and exclusionary practices. In the UK, drowning is in the top 10 leading causes of death for young people[1]. 31% of drownings in children occur between ages 15-17 and the number of incidents has increased 85% since 2019[2].

This research responds to calls for further examination of the inequalities in power, access, and experience of blue spaces[3] by exploring the interplay between young people's wellbeing, inclusivity, and safety in their use of these environments to inform debates over young people's rights to safe access. This project seeks to centre young people's voices in the debates about safe access to blue spaces, utilising a participatory approach of concept mapping based upon a case study in the South of England. This presentation will demonstrate this innovative methodology, as well as emerging findings from the project including key concepts in young people's perceptions of risk, safety and inclusivity in blue spaces.

PREVENTION 23

Leaping into action: How further exploration of data on child drowning deaths drove the launch of a new water safety campaign by RLSS UK.

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In July 2023, the National Child Mortality Database (NCMD) published its report into child trauma deaths in England, which explored the prevalence of child deaths related to specific incidents of trauma, including drowning. The report highlighted evidence of the number of child drowning deaths increasing, from 20 in 2019-20 to 37 in 2021-22.
To understand more about this worrying trend, RLSS UK worked closely with the NCMD to publish a further update on child drowning deaths, covering the period 2022-23, and assess what, if anything, could be uncovered across the four-year period to help minimise future loss of life.
Using all the available data, RLSS UK was able to identify:
The total number of child drownings in the period
Data pertinent to each drowning incident e.g. location of drowning, demographics
Significant contributory factors e.g. lack of adult supervision
The full analysis period covered April 2019 to March 2023.
Analysis highlighted that the number of child drowning deaths in England doubled between 1 April 2019 and 31 March 2023. In total, there were 125 child drowning deaths across the period. In more than 4 in 5 drownings, the child was unsupervised by an adult.
Whilst accidental drowning in children is often associated with deaths in open water, findings showed that during the period, on average, at least 1 child a month drowned at home. In addition, 70% of infants that drowned in the bath were using a bath seat.
In response to findings from the analysis, and a first based on NCMD data, RLSS UK developed a brand-new water safety awareness campaign. Launched in October 2024, it aimed to drive a renewed focus on how to stay safe when in and around water at home, as well as promote the importance of competent adult supervision.
In a first for RLSS UK, campaign materials were extended to health professionals, calling on them to encourage families to always supervise children in, on and around water, particularly when at home. These materials were shared by the Institute of Health Visitors via a member blog and were cascaded by Health and Social Care Northern Ireland.

PREVENTION 24

Causes of dropout and retention strategies: a mixed method study to explore reasons of the caregivers' resignations from a community-based child drowning prevention programme in hard to reach areas of Bangladesh.

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Background: High turnover rates of caregivers in early care settings reduce the quality of education and child drowning prevention supervision services. From the findings of Bhasa-1, a comprehensive child drowning prevention project, it was evident that to operate 400 childcare and supervision centers, we needed to set up over 550 facilities, a center drop-off rate of 27%. Discontinuation of caregivers was found to be the leading cause of centre dropout, which increased the risk of child drowning. In the new project, we will explore the approaches to increase the efficiency of Anchal childcare interventions in Bangladesh. So, this study aimed to identify the reasons behind caregivers' resignations and dropout rates.

Methods: This study used a combination of quantitative and qualitative research approaches. We used project monitoring and exit interview data to understand the yearly dropout rates and socio-demographic information of the caregivers. For qualitative data, this study conducted 7 focus group discussions (FGDs) with intervention-focused staff, community leaders, and family members and 14 in-depth interviews (IDIs) with the dropout primary caregivers and project key staff.

Results: Between 2022 and 2024, 270 caregivers left their jobs, according to monitoring data. Qualitative data were analysed using thematic analysis including grouping similar codes into border patterns. The findings suggested several factors that resulted in high rates of caregivers' resignations. Parental support, extreme weather, and administrative tasks caused difficulties for caregivers. High dropout rates were due to pregnancy, low pay, and family conflicts. Caregivers managed both childcare and administrative duties but found it hard to balance these with family responsibilities. The lack of paid leave, including maternity leave, led to job dissatisfaction. Caregivers also struggled without help during health or personal problems. This shows the need for psychosocial support and stress management training.

Conclusions: Reducing administrative tasks, lowering the child-to-caregiver ratio, increasing salaries, and providing benefits such as covering expenses and showing appreciation may enhance retention and job satisfaction. Providing dedicated professional psychosocial support can help caregivers cope with stress and may contribute to a stable workforce. Implementing these strategies can result in improved caregiver efficiency and successful retention in the new project.

PREVENTION 25

Engaging community in idea ranking process to explore prioritizing solutions for prevent under two years child drowning in Bangladesh

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Background:
Annually, more than 96,000 young people drown globally[1]. Around 90% of drowning deaths occur in low- and middle-income countries (LMICs)[2]. Drowning is a leading cause of death among children in Bangladesh and each year, drowning accounts for 43% of deaths among children aged 1–4 years considering various contextual factors[2]. WHO-recommended child drowning prevention interventions face challenges to mitigate drowning rates for children under two years[3]. The Sonamoni project aimed to develop an acceptable and sustainable intervention for U-2 children. The objectives of the study were to explore community perceptions and their prioritization on the proposed drowning prevention solutions.

Methods:
Qualitative methods were conducted separately in two study areas: Kalapara and Sherpur Sadar in July 2024. In total 24 mothers and 8 fathers of children under 2 years and 8 influential local members were invited as participants in the two day-long workshops. Each participant was asked to prioritize the proposed 11 interventions, giving a detailed explanation based on their perceptions and experiences. All collected data, including participants' comments and fields notes, were analysed in detail to identify thematic areas.

Results:
Participants were asked to consider the local and cultural context including gender sensitivity, religious concerns for proposed idea intervention and willingness to pay. They also shared the potential advantages and challenges of those interventions that proposed. Considering child safety and ease of utilization in households' level by family members, the majority prioritize the following interventions i.e. community first response, adapting age-specific daycare Centre, dedicated play area with fence or playpens, drowning prevention awareness campaigns, modify water storage with locks, and swings. Perceiving ineffective or inappropriate or unfamiliar to use the proposed intervention, participants also ranked least preferred restraining children and baby slings ideas. The community showed willingness to contribute reasonably price for their child safety from drowning events.

Conclusions:
Caregivers of young children rated proposed interventions higher if they were more affordable, practical, and culturally acceptable. Community suggestions might be considered while developing intervention protype for drowning prevention of young children.

PREVENTION 26

Cost-effectiveness of child drowning prevention program in Viet Nam

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Background: Child drowning continues to be a significant public health challenge in Viet Nam, with geographic disparities in drowning burden. The National Program on Child Injury. Prevention for the period 2021 -2030 aims to reduce the rate of child drowning deaths by 20%. Since 2018, the Global Health Advocacy Incubator (GHAI) together with the Ministry of Labor- Invalids and Social Affairs launched the world-class intervention program, focused on survival swimming lessons for nearly 50,000 children aged 6-15 years in 12 high-burden provinces. This study evaluates the cost-effectiveness of the intervention –highlighted in its economic impact and analyzes regional variations in their effectiveness across different provinces.
Description: The cost of the survival swim program in intervention areas was calculated, including expenses for instructors, supervisors, organizing committees, and facility costs (pool rental, operation, equipment). The program's effectiveness in reducing child drowning deaths was measured. The incremental cost-effectiveness ratio was calculated by dividing the intervention's incremental cost by the incremental effect size (i.e., deaths averted with the intervention) for a hypothetical population of 100,000 children. Input data was gathered from regional health authorities, local government agencies, and program evaluations to assess the effectiveness of the interventions in reducing drowning rates.
Lessons Learned: The survival swim program is a cost-effective intervention for reducing child drowning deaths in Viet Nam. The findings of our study reveal the importance of designed interventions to localize economic conditions, infrastructure, and community needs. Enhancing public awareness and expanding the intervention program of GHAI could further improve cost-effectiveness, particularly in rural and vulnerable areas.
Conclusions: This study confirms the need for region-specific, cost-effective child drowning prevention programs in Viet Nam. Policymakers should prioritize high-risk areas and optimize resource allocation to maximize the impact of existing initiatives. Expanding successful urban interventions to rural areas, together with increased public awareness and community engagement, could greatly reduce drowning incidents. Ongoing monitoring and adaptation are essential for ensuring the long-term program effectiveness and sustainability.

PREVENTION 27

Bridging Knowledge and Practice: Understanding Parental Knowledge, Attitudes, and Practices on Childhood Drowning Prevention in Rural Bangladesh

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Background: Drowning is the leading cause of injury-related child mortality in Bangladesh, particularly among children under ten years old. While parental awareness of drowning risks is high, gaps persist between knowledge and actual preventive behaviors, exacerbating the burden of drowning fatalities. Effective supervision, structured safety interventions, and survival swimming training are crucial in mitigating risks. However, socioeconomic and cultural barriers often hinder the adoption of best practices. This study triangulates quantitative and qualitative findings from the ICBC Baseline Survey to explore parental knowledge, attitudes, and practices (KAP) related to drowning prevention in rural Bangladesh.
Methods: A cross-sectional mixed-methods study was conducted across 45 upazilas in 16 districts, covering 133,387 households, with a KAP survey involving 13,324 caregivers. Structured interviews and Likert-scale assessments were used to measure perceptions of drowning risks, supervision habits, water safety interventions, and behavioral responses. The study incorporated 24 Focus Group Discussions (FGDs) with caregivers, health workers, and community leaders to provide deeper insights into barriers and enablers of drowning prevention.
Results: 93% of caregivers acknowledged that drowning is preventable, yet only 49.7% identified limiting water access as a preventive measure. Supervision gaps were critical, with only 39% of caregivers consistently monitoring children near water bodies. 79% of caregivers supported survival swimming programs, yet access to such training was limited due to financial constraints and cultural perceptions. Infant drowning prevention knowledge was particularly low, with many parents unaware of early childhood water safety interventions. 85% of caregivers relied on traditional but ineffective rescue methods, such as spinning the victim (70.2%) or abdominal pressing (48.4%), rather than evidence-based first aid like CPR.
Conclusions: While awareness of drowning risks is widespread, significant behavioral gaps remain in supervision, access to safety interventions, and emergency response preparedness. Addressing these gaps through structured community-based education programs, parental training on first aid (CPR), and expanding survival swimming initiatives is essential. Additionally, integrating childcare services and community-led drowning prevention programs can enhance child safety in high-risk areas. A holistic approach combining behavior change communication, infrastructure modifications (e.g., fencing water bodies), and local policy support is crucial for sustainable drowning prevention.

PREVENTION 28

Ponds and Ditches: Hidden Environmental Hazards for Childhood Drowning in Rural Bangladesh

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Background:
Drowning remains the leading cause of preventable deaths among children in Bangladesh. According to the 2005 BHIS, it was identified as the primary cause of death among children aged 1–4 years (86.3/100,000/year), 5–9 years (26.2 per 100,000 per year), and 10–14 years (2.9/100,000 per year) (1). More than 75% of fatal drowning incidents occur within 100 meters of a child's home, primarily in ponds and ditches. Seasonal variations, particularly during the monsoon months, exacerbate drowning risks (2). Ponds and ditches, common in rural Bangladesh, are vital for daily life but pose significant drowning risks for children. This study explores these environmental hazards and their impact on childhood drowning, drawing insights from the ICBC project's baseline survey.
Methodology:
A cross-sectional study was conducted across 45 upazilas in 16 districts, assessing childhood drowning mortality and risk factors related to local water bodies. Data were collected between February and July 2024 through household surveys, interviews, and FGDs.
Result:
All 136 drowning deaths took place outdoors. The majority of drowning deaths 83.1% (n=113) of drowning incidents occurred in ponds (67.7%, n=92) and ditches (15.4%, n=21). More than three-fourths of the drowning deaths 82.4% (n=112) occurred within 100 meters and 46.3% (n=63) occurred within 20 meters of distance from victims' homes. The majority of water reservoirs (89.7%, n=122) did not have a fence around them. On the other hand, most water sources (83.8%, n=114) were not covered.
Conclusion:
Ponds and ditches, while integral to rural life, are major drowning hazards. Community-based interventions such as fencing water bodies, establishing safe play areas, and increasing caregiver supervision are crucial for reducing childhood drowning risks. The ICBC project should focus on modifying environmental risks alongside behavioral interventions to prevent child fatalities.

PREVENTION 29

A preventionist framework for reducing childhood drowning: A case for parenting interventions

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Background: Drowning is preventable, yet still claims the lives of over 300,000 people worldwide annually. The purposes of this theoretical review are threefold: 1) Discuss the theoretical framework for a multi-faceted system of prevention; 2) Discuss the importance of parenting, a crucial facet where drowning prevention research falls short; and 3) Discuss how evidence-based practices from psychosocial parenting research could be used to create drowning prevention interventions that support parents to implement water safety practices in their families.
Methods: This theoretical review paper synthesizes research from both the psychosocial parenting field and the drowning prevention field and makes the case for utilizing a transdisciplinary approach to preventing childhood drownings.
Results: One theoretical model that has been helpful for preventing an array of social problems [e.g., incarceration[1], child abuse[2,3], substance use disorder[4], and mental illness[5]] is Bronfenbrenner's[6] ecological model. According to this model, an individual's behavior is impacted by various levels within their environment – including their macrosystemic level (i.e., societal factors), their exosystemic level (i.e., local laws/policies), their mesosystemic level (i.e., relationships between microsystemic level institutions), and their microsystemic level (i.e., parents, peers, teachers). For drowning prevention, a multifaceted approach utilizing Bronfenbrenner's framework can aid understanding how interventions can successfully impact drowning prevention efforts at various levels of the ecological model. Though drowning prevention efforts have successfully targeted most levels of Bronfenbrenner's model[(e.g., 7, 8, 9)], the microsystemic level still lacks attention. Specifically, efforts to support parents in drowning prevention are insufficient. Psychosocial parenting interventions based in social learning theory could be particularly helpful for supporting parents in drowning prevention efforts. Social learning theory-based interventions focus on improving parent-child relationships, parental modeling and teaching of prosocial behavior, and parental confidence. They are often administered in forums such as peer support groups[(e.g., 10)], home visits[(e.g., 11)], and coached parent-child interactions[(e.g., 12)].
Conclusions: Developing interventions that integrate psychosocial parenting research with drowning prevention knowledge has the potential to support families, reduce drowning rates and save lives.

PREVENTION 30

Understanding communities' healthcare practices for drowning of young children in rural Bangladesh: A qualitative study

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Background:
In the past two decades drowning remained as one of the leading causes of child death in Bangladesh. Younger children aged between 0 and 4 years old are the most vulnerable to drowning [1,2]. Previous research suggests that rural communities may apply harmful traditional techniques during drowning events, however there have been limited recent studies [3,4]. Understanding communities' current healthcare practices during drowning events is critical to develop appropriate interventions to reduce child drowning mortality. The objective of the study was to explore healthcare practices in the event of a child drowning event in high-risk communities of Bangladesh.

Methods:
This study employed a qualitative inquiry design. In September 2023, we conducted six Key Informant Interviews (KIIs), four in-depth Interviews (IDIs), and six Focus Group discussions (FGDs) with healthcare workers, local leaders, traditional healers, and primary caregivers of Kalapara and Sherpur Sadar in Bangladesh. We used inductive and deductive methods to analyze themes and patterns in the data.

Results:
In recent years, the communities have changed how they respond to drowning incidents. Now people often seek medical help, including first aid services and hospital visits. Traditional practices for drowning, such as placing clay on a person's stomach and mothers being discouraged from touching their child's body are still prevalent, though less common now due to education, increased exposure to modern techniques through the media, and income improvements that enable access to private healthcare. However, healthcare provision is limited in rural areas, and there is limited information on the services provided. Government support helplines like 999 are acknowledged but response times are slow. Community people acknowledged the critical roles of community volunteers play as first responders. Conduction of awareness-raising activities such as one-to-one visits, group counselling, community gatherings, and training community members to improve healthcare practices in communities was suggested to improve the current practices.

Conclusions:
The study findings are valuable for understanding the different ways communities respond to child drowning events and their healthcare practices related to them. The evidence from this study will be used to influence policy and co-design appropriate community-based solutions as part of ongoing project work.

PREVENTION 31

Updating the three-delay framework for child drowning

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Background: Fast and appropriate post-event response to child drowning is crucial to decrease mortality and morbidity. However, these responses are often delayed, especially in low-income contexts(1). Challenges like poor knowledge of resuscitation, cultural beliefs, lack of supervision and poor safety infrastructure all delay the rescue and appropriate care of children post drowning(2). The Sundarbans region is a waterlogged, rural region in India facing a high burden of child drowning, facing these challenges(3).
Methods: We aimed to apply patient journey mapping to identify key delays to care occurring after incidents of child drowning. These delays were mapped against the Three-Delay Framework, analysing the delays of deciding to seek medical care, transporting the victim to medical care facilities, and delays in receiving appropriate care at the facility(4). Adults present during and after child drowning events in the Sundarbans were interviewed to identify which delays occurred and the factors influencing these delays.
Results: In addition to the three delays in the Three Delay Framework, we found that another significant delay occurred at the time of event identification and rescue. We dubbed this Delay Zero. This delay was caused by a lack of supervision preventing early identification of the event and unclear waterbodies. We also identified major delays occurred when deciding to attain medical care as bystanders first applied traditional resuscitation methods. Distance to formal medical facilities was also a barrier, leading to bystanders enlisting the help of untrained local quack doctors before attempting travel.
Conclusion: The Three-Delay model should be updated to a Four-delay model to better address drowning, as a major delay often occurred before rescue. In this low-resource context, appropriate care was rarely applied post-event. The results highlighted the need to improve child supervision and employ preventative programs in these remote communities as fast rescue was hindered by the prevailing environmental conditions. Post-drowning care could also be improved by training bystanders and local quack doctors in CPR, and by expanding the health system's geographic reach.

PREVENTION 32

Gender role in the community-based drowning prevention programme for young children in rural Bangladesh

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Background:
Drowning is a leading cause of death among children in Bangladesh[1]. The highest rate of drowning was observed in 1–to-4-year-old children[2,3]. Daycare has been shown to be an effective intervention to reduce drowning in this age-group, however implementation in Bangladesh has shown that low attendance for newly mobile children aged 2-year and below[4,5]. “Sonamoni” project aimed to develop an acceptable and sustainable intervention for U-2 child in Bangladesh, taking a Human Centered Design (HCD) approach. Understanding mothers’ caregiving routines is essential to develop appropriate intervention, however traditional local practice restrict opportunities for women to participate in the HCD process. The team explored to overcome these barriers, to ensure gender representation during developing and implementation of drowning prevention interventions in rural Bangladesh.
Description:
In Bangladesh, rural communities typically practice gender-based norms and roles for men and women. Women are primarily responsible for household-related chores, supervision of children, preparing food, whereas men engage in income-earning work. Culturally women are restricted in their mobility, participation in community assembly and leadership roles. As women are generally responsible for child-caring and have a comprehensive acquaintance with their children, their voices are essential during collecting qualitative data. In the community-workshops, women are invited to share their thoughts to identify their daily routine with under-2-year-old children, to explore potential stakeholders for child supervision, to know when children might be at drowning risk, to gather and preference drowning prevention solutions. In addition, female members of injury prevention committees are asked to raise their voices in decision- making with their male counterparts simultaneously.
Lessons learned:
Different studies claimed that community-based projects influenced gender norms, roles, and relationships within communities in LMICs. These contexts in turn impact on individual well-being. Women can share their own experiences and thoughts on their children’s daily routine preference from dawn to dusk, create stakeholder mapping for children supervision, identified solutions to prevent child drowning preference the proposed solutions. Ideas recommended by women might affect positive individual-outcomes and increase the acceptability, feasibility while pilot implementation.

Conclusions:
The findings of enrolling women in this study may be useful for other community-based drowning prevention programmes.

PREVENTION 33

You Can't Be What You Can't See: SLSA's Diversity, Equity, and Inclusion Framework

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Background:
Surf Life Saving Australia (SLSA) is an iconic organisation providing an essential community service and ranked as the second most recognisable charity in Australia. It should reflect the diversity of the Australian population within which it operates, in all roles, at all levels.
SLSA are committed to diversity, equity, and inclusion, and has supported activities to engage with many target audiences, but there was a lack of cohesive national direction. To enable SLSA to take a greater leadership role in setting priorities, scope and direction while continuing to enable and support stakeholders, they developed a Diversity, Equity, and Inclusion Framework.
Description:
There was a four-step process followed to deliver the Framework:
Gather insights – understand demographics, experiences and operational activities
Strategise – apply evidence to design Framework
Plan – inclusion actions into organisational, staff and stakeholder work plans
Deliver – deliver, monitor and evaluate ongoing
In conjunction with the Framework, they developed several policies and guidelines. These assist the federation in ensuring that the framework and action plan is actionable nationally.
Lessons Learned:
There is much being done in this space already within the organisation and Federation more broadly, and it is important to recognise that this Framework is another step in the journey. This was a large piece of work which was externally resourced, however still needed substantial support and time from internal staff. For ongoing success, it will need to be a key focus until bedded into everyday actions.
Conclusions:
The DEI Framework will give SLSA a strategic structure to build on those initiatives which are already being done well and will allow progress in other areas where more focus is required. By embracing diversity and fostering an inclusive environment, SLSA can enhance operational effectiveness, strengthen community ties, and improve water safety outcomes, benefiting both the organization and the broader Australian society. The ocean doesn't discriminate, and neither should Surf Life Saving.

PREVENTION 34

Expanding Understanding: Redefining Supervised Settings in Canada

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For decades, supervised water settings in Canada were defined as pools and waterfronts overseen by certified lifeguards. In 2018, a multi-sectoral sub-committee of the Canadian Drowning Prevention Coalition Committee (comprised of civil society organizations, academics, industry, non-governmental organizations, media/communications and civic government policymakers) examined fatal drowning data which took place in lifeguarded supervised settings. They noted that there were many water-related activities outside of lifeguarded areas in which supervision was expected. As such, they undertook the challenge of redefining supervised settings across Canada (1).

The first iteration of the definition shared in the 4th Edition of the Canadian Drowning Prevention Plan was simple, “settings where persons may reasonably expect to have an increased level of safety because of supervision.” One year later, this evolved to include “a designated area at, on or near water where a supervised activity takes place and a safety plan is available…”

Over the past six years, the sub-committee has refined, updated and communicated the importance of utilizing this definition. The definition has been shared in several editions of the Canadian Drowning Prevention Plan and within many aquatic environments. The 2025 definition of supervised settings yet again expands our understanding and expectations associated with supervision in various water locations during a variety of water-based activities. It prioritizes the development and availability of protocols and a safety plan specific to each location and activity. It discusses the inclusion and limitations of technology as supervisory tools. It articulates the importance of how to prevent, respond to, properly document, and debrief staff/supervisors about health and safety incidents that occur.

The sub-committee continues to refine the definition each year. They seek to extend their reach beyond Canada and encourage dialogue with others around the world. They seek to create recommendations for future research, standards and program development with the goal to bring the number of drowning deaths in supervised settings to zero.

This definition has implications for data collection and fatal drowning databases. It impacts schools, daycares and many organizations and businesses that include water-based activities, outings, field trips, camps, trips and more.

PREVENTION 35

Recognizing and valuing drowning prevention: the impact of the annual drowning prevention and aquatic safety award

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Background:
Drowning is one of the leading causes of accidental death worldwide, making the implementation of effective prevention and aquatic safety measures essential[1]. In Portugal, innovative projects have emerged to raise awareness and equip society with fundamental skills and knowledge. However, many of these initiatives remain largely unknown. To address this gap, Red Seagull Portugal created the Annual Drowning Prevention and Aquatic Safety Award (PAPASA) to recognize, promote, and reward these efforts, encouraging their expansion and impact[2].

Description:
PAPASA is a pioneering initiative that highlights projects, individuals, and organizations dedicated to drowning prevention and aquatic safety. The selection process consists of several stages: submission of applications, evaluation by the Recognition Committee, internal voting, and public voting. Award winners receive national recognition from the Association, enhancing the visibility of their initiatives.

Lessons Learned:
Since its inception, PAPASA has had a significant impact, driving the creation and improvement of educational and social programs focused on drowning prevention. Over the past three years, the competition has received applications from innovative initiatives, including standout projects such as *Safer in Water*, *Junior Lifeguard*, and *Safe Fun*, which have benefited countless children, young people, and communities. Additionally, public voting has strengthened societal engagement, fostering greater awareness of aquatic safety.

Conclusions:
PAPASA has proven to be an essential tool for drowning prevention in Portugal, highlighting and encouraging projects that promote aquatic safety. Recognizing these efforts contributes to the broader dissemination and implementation of best practices. The future of PAPASA lies in its expansion, reaching a greater number of participants and fostering inter-institutional collaborations to reduce drowning incidents.

PREVENTION 36

French lifesaving and first aid federation and Olympic games water safety: the perfect use of drowning prevention works

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FFSS, Paris, France

Context
The Paris 2024 Olympic and Paralympic Games represented a tremendous challenge in terms of organization and security, requiring the collaboration of many stakeholders, including the French Federation of Lifesaving and First Aid (FFSS). As a member of the G5, a group of major civil security associations, FFSS was particularly involved in securing aquatic events, including swimming, rowing, triathlons, and canoe-kayak. With 8,696 shifts covered by 1,700 volunteers from 60 French associations, it played a key role in the success of the event.

Description
Preparation was methodical, with an official mobilization in May 2023 and successive stages : signing of the G5 agreement October 2023, start of accreditations in December, volunteer training in March 2024, and finally, operational deployment during the Games from July to September 2024. Four major sites were secured, including the Seine for the opening ceremony, an unprecedented event requiring exceptional security measures.

Methodology
To anticipate challenges, the FFSS participated in several test events, such as the U19 World Rowing Championship and an Open Water Swimming World Cup. The methodology implemented was based on precise drafting of prevention and intervention processes, rigorous team management, and adapted logistics through collaborative tools and meticulous piloting.

Results
The success of the Olympics relied on flawless organization despite major constraints: logistical challenges, complex coordination between stakeholders, ongoing security issues, and the need for continuous adaptation. The event was nevertheless marked by strong institutional recognition, effective cooperation between associations, and unprecedented volunteer commitment, totaling 61,290 hours for the Olympics and 24,480 hours for the Paralympics. The unique expertise of our core federal activity, aquatic rescue, ensured the protection of spectators, athletes, and organizers, resulting in a perfect safety record!

Conclusions
However, some difficulties were noted, including restricted access to sites, heavy administrative requirements, challenging working conditions, and sometimes a lack of recognition for volunteers. This unique human and organizational adventure strengthened the cohesion of an entire people and demonstrated the effectiveness of project management in the face of a global challenge. We encourage all ILS federations to get involved in such event arrangements.

PREVENTION 37

Drowning burden in Brazil – are we doing the right actions to reduce it?30 years of generosity - YOUR LIFE COME FIRST

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Background: In 2023, the Brazilian population was 212 million inhabitants, with 5.883 drowning-related deaths(2.76/100.000 inhab.). Drowning was the second leading cause of death aged 1-to-4 yo, and fourth aged 5-to-24 yr[1]. The aim was to identify trends of drowning death over the past 30 years since the foundation of Brazilian Lifesaving Society-SOBRASA and identify if we are doing any difference on drowning burden?
Methods: Drowning rates were determined using death certificates(1994-2023) from the Public Health Mortality Information System(ICD-10). Additionally, all SOBRASA prevention programs and related actions, volunteer involvement, social media and press news were evaluated.
Results: Over the past 30 years(1994-2023), there were 197.784 deaths, averaging 6.592 deaths per year. There was an overall decrease in the incidence of drowning, from 4.9(1994) to 2.8(2023) death/100.000inhab.[1] In 30 years, our 13.456 volunteers have carried out: 33.349 face-to-face actions(3 actions/day), 1.223 asynchronous virtual actions and 4.2 million views of our drowning prevention messages(383/day). Our 15 prevention programs reached 1.3 million people directly, taking 55.304 hours voluntarily dedicated. SOBRASA produce 5.181 TV, Radio, newspapers and blogs news, covering 380 million people, 1.7 billion views with € 7,5 million Euros organic payback. On social media, 162.920 prevention post interacted with 231.000 followers producing 102 million prints. Our volunteers were able to involve 908.351 participants along 12.420 face-to-face and 17.000 on-line courses. Seventy institutional partnerships produce 146 opportunities and 5.872 professionals' involvement. Four regular yearly campaigns generated involvement with 242 million people including Latin American countries.[2]
Conclusion: Brazil has one of the largest aquatic recreations areas with 17.000 fulltime lifeguards. SOBRASA currently has 7.400 active volunteers across 27 states carrying out 17 prevention actions daily. Despite these efforts, an estimation of 70% of those areas remain unsupervised, increasing the risk of drowning-related deaths 60 times. Over 30 years, a 43% reduction in drowning deaths has been observed. However, the authors cannot support that education program was the only factor. In fact, the lifeguards service across the country has benefited from SOBRASA's expertise, protocols and knowledge, fostering a stronger water safety culture that has contributed to this achievement.

PREVENTION 38

‘Stop. Look. Stay Alive’: Evaluation of a new Australian beach and water safety message campaign

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Background: Drowning continues to be a significant problem at Australian waterways. National and regional water safety campaigns and messages can be vital in drowning prevention and in the Australian summer of 2024/205, Surf Life Saving Australia (SLSA) launched a new collaborative water safety campaign with the primary purpose of embedding a new, collaborative water safety message to the Australian public called ‘Stop. Look. Stay Alive’ (‘S.L.S.A’). The objective of the campaign was to reduce the number of fatal drownings with the primary target being males who represent 80% of drowning deaths nationally. The S.L.S.A campaign also encouraged the community to engage with a new mobile education site called the Beach Passport. Funded by the New South Wales State Government, the S.L.S.A campaign involved significant marketing and promotion across a wide range of communication platforms. However, water safety campaigns are rarely evaluated in terms of their recognition, recall, and behaviour change impact among the general public. This presentation will describe an evaluation of the Stop. Look. Stay Alive campaign using both quantitative and qualitative methods.
Methods: An online survey was developed and distributed to the general NSW public and first year university students to capture a representative range of demographic groups, including young males. The surveys gathered information about participants’ demographics as well as their exposure, awareness, understanding and opinions of the ‘Stop.Look.Stay Alive campaign. An additional face-to-face survey was administered at popular Sydney beaches. Following analysis of survey data, a series of focus group sessions were conducted with participants recruited from the surveys – both those who had seen, and not seen, the campaign. The focus groups sessions allowed capture of more in-depth data from participants on their understanding and perceptions of the SLSA message as well as how communication of the message may be improved.
Conclusions: This research is ongoing and results of the surveys and preliminary findings of the focus groups will be presented. The research is expected to generate greater understanidng of the uptake of the 'Stop.Look.Stay Alive' message, if it changed behaviours related to water safety and how it can be better and more effectively promoted in the future.

PREVENTION 39

Advocacy Communication to Elevate Child Drowning Prevention in Policy Agendas

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Background

Child drowning is the leading cause of death among children globally. However, there are proven prevention measures that can reduce drowning and there is a need to bring awareness to this neglected issue.

Description

The Global Health Advocacy Incubator (GHAI) has worked in Bangladesh and Vietnam to raise awareness of child drowning. This work aims to enhance support among policymakers, communities and families for drowning prevention initiatives.

In each country GHAI deployed a multi-faceted communication strategy focusing on raising awareness of the problem and the need for preventative measures. Communication efforts included infographics; videos showcasing the impact of drowning; a network of national and local media outlets; journalism workshops to provide a deeper understanding of the issue. To broaden its impact, child drowning prevention was also integrated into wider campaigns including child rights, safety initiatives, climate change and disaster risk management efforts.

Locally, parents, children and communities were engaged to drive grassroots action and indirectly influence policymakers and reinforce calls for action. Communication strategies included text messages, household visits, local television broadcasts, communal loudspeaker announcements and social media engagement. Annual events were planned for World Drowning Prevention Day, such as TikTok contests, Family Day and art exhibitions.

Results

All of these efforts helped to raise awareness among policymakers. For instance, through sustained advocacy and comprehensive communication efforts, Vietnam has successfully advanced critical policies, such as the 10-Year Inter-Ministerial Action Plan on Child Drowning Prevention, the National Program on Strengthening Child Drowning Prevention in the Educational System (2025–2035); Bangladesh approved a 3-year national child drowning prevention project via childcare centers (2022- 2025).

Lessons Learned:

Communications efforts need to be developed to reach a wide variety of audiences.

Data visualization effectively helps policymakers grasp the urgency of the issue.

Building policy champions is essential to amplifying advocacy efforts and securing stronger drowning prevention policies.

Media partnerships help to sustain momentum and journalists play a vital role in keeping child drowning prevention on the policy agenda.

PREVENTION 40

Evaluating public awareness and understanding of Emergency Response Beacons (ERBs) on beaches in New South Wales, Australia

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Background: Almost all coastal drowning deaths in Australia occur at locations without lifeguards or lifesavers or outside of locations and times when these services are operational. In the Australian state of New South Wales (NSW), a recent response to this problem has been the installation of 53 Emergency Response Beacons (ERBs) by Surf Life Saving New South Wales (SLSNSW) at recognised drowning hotspots or high-risk coastal locations, generally beaches and rock platforms. ERBS are equipped with a telephone and camera and can be activated by the public to alert SLSNSW of an incident so that appropriate actions can be taken. This study investigates public knowledge and understanding of these safety devices through analysis of 301 beachgoer surveys.

Methods: A survey was administered in hardcopy to beachgoers at a variety of unpatrolled and patrolled beaches in NSW both with, and without, ERBs. The surveys gathered demographic information about participants as well as information regarding their beach safety awareness in general and specific information about their awareness and understanding of ERBs. Survey data collection took place in March-April 2024.

Results: Less than a third (28%) of surveyed beachgoers had heard of ERBs of which only half (54%) could correctly describe what an ERB was. Beachgoers who lived within 1-10 km of the coast were more aware of ERB presence, but only half (50%) of those aware of ERB presence in general knew if the beach they were visiting had an ERB installed. Most beachgoers (72%), including those briefed about ERBs during the survey, rated ERBs as being extremely useful. Of concern, 80% of surveyed beachgoers with lower self-reported swimming abilities indicated they would be more likely to enter the water if an ERB was present.

Lessons Learned: An urgent need exists to improve public awareness and understanding of ERBs in order to optimize their lifesaving potential. Given the diverse demographics of coastal users, this represents a significant challenge. Future research examining the nature and outcomes of existing ERB activations and actual response times is recommended as this will help guide future ERB investment and placement.

PREVENTION 41

Factors affecting child participation in drowning prevention supervision intervention in Bangladesh: An exploratory study

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Background: Drowning is a leading cause of child mortality in Bangladesh, often exacerbated by insufficient supervision during parents' busy hours. In response, Project Bhasa implemented child supervision services aimed at preventing drowning. However, attendance rates at these centers have remained alarmingly low, with a peak of only 74% and an average of 65% well below the target threshold of 90%. This study aims to explore the factors contributing to low child participation in these critical drowning prevention initiatives.
Methods: A mixed-methods approach was employed to investigate reasons for low attendance rates. Quantitative data were collected from attendance records and parent surveys, while qualitative insights were obtained through 6 focus group discussions (FGDs) with caregivers, parents, and community leaders, along with 12 in-depth interviews (IDIs) with parents of children exhibiting irregular attendance. This dual methodology provided a comprehensive understanding of the statistical trends alongside personal experiences.
Results: The thematic analysis revealed several key factors affecting child attendance: (a) parents' work commitments often led them to prioritize professional responsibilities over childcare; (b) health-related issues, particularly common and seasonal illnesses, significantly impeded attendance; (c) low population density resulted in limited community engagement and transportation challenges; and (d) inadequate communication and support from caregivers contributed to parental ambivalence regarding regular attendance.
Conclusions: The study highlights important gaps in child attendance at supervision centers, underscoring the need for targeted interventions. A baseline survey is essential to assess child availability and adjust enrollment targets. Strengthening connections between families and government healthcare centers can mitigate health-related challenges. Furthermore, developing strategies to maintain center operations during extreme weather and promoting flexible community awareness programs will encourage regular attendance. Implementing these recommendations can enhance attendance rates and improve developmental outcomes for children in early care settings in Bangladesh.

PREVENTION 42

Mapping the evolution of high-frequency locations for unintentional and intentional drowning in the United Kingdom: a tool for evaluating intervention efficacy

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Background: Drowning is a significant cause of unintentional and intentional death in the United Kingdom (UK). In 2023 there were a total of 659 drowning deaths recorded in the United Kingdom's water incident database (WAID) including water-related fatalities (1) where 34% comprised accidents and 32% comprised suspected suicides. Available resources for prevention are limited with the rescue effort falling to publicly funded emergency services (e.g., police and fire service) and charitable organisations (e.g., lifeguards, lifeboats). Therefore, knowledge of the high-frequency (HF) locations where drownings tend to occur is valuable and will inform strategy and policy. We confirmed the existence of these HF locations for unintentional and intentional drownings spanning 2012-2019 (2). The present study repeated this analysis using more recent data (up to 2023) to establish if these HF locations had evolved in line with intervention.
Method: WAID data 2020-2023 were received and combined to create a 2012-2023 data set of 7,559 fatalities. Fatality geo-locations were extracted and mapped (R Studio, Posit PBC, USA). We then tested for the presence of HF locations using density-based spatial clustering algorithm of applications with the noise method (DBSCAN). Intentional and unintentional events were delineated for moderate, high and very high priority areas for intervention, within a 500-metre radius (i.e., 5–7-minute walk) of the water network.
Results: Between 2012 and 2019 there were 5,051 fatalities (3) which reduced by 1.82% to 4,959 between 2016 and 2023. Between 2012 and 2019, 35% and 44% of cases were suspected as unintentional (accidents) and intentional (includes suicide and crime). Between 2016 and 2023, 38% and 37% of cases were suspected as unintentional (accidents) and intentional respectively.
Unintentional drowning HF locations had reduced from 27 to 22 with the most severe priority category dropping by 2 HF locations; fatalities reduced. For intentional drowning the total number of HF locations increased by 1 (from 52 to 53) although the number of most severe locations did reduce. Fatalities were similar.
Conclusion: Our data support the efficacy of the UK drowning prevention strategy 2016-2026 for unintentional drownings. Further work is needed to reduce the number and frequency of intentional drownings.

PREVENTION 43

Preventing Suicide in public places: A best practice toolkit

Joanne Walsh

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Over 500 people die by suicide every year in Ireland. Indications are that about one third of people who die by suicide in Ireland, die at a public location (indoor or outdoor), and not in their own home. According to the Irish Probable Deaths Study (IPSDS) 2015-2018, those people who died in public locations were more likely to have died by drowning (37%) than those who died in a private location (1%).

Preventing suicide in public places: A best practice toolkit, gives particular attention to deaths by suicide that occur in public places – at bridges, cliffs, parks, railways, roads, waterways or historic sites. It is primarily for public bodies, agencies or stakeholders responsible for these public places in Ireland, and for those involved in related health, public health or suicide prevention/postvention responses, locally and nationally. Water Safety Ireland supported this project as part of the Project Advisory Group.

Suicide prevention is most effective when approached collaboratively and systematically, with strong consideration of evidence, careful implementation, and ongoing monitoring of outcomes. The toolkit provides clear and sequential steps to prevent deaths by suicide in public places. They are:

- Stage 1: Forming the correct partnerships from the outset
- Stage 2: Gather and analyse data
- Stage 3: Decide actions and interventions
- Stage 4: Implement actions and interventions
- Stage 5: Monitor and evaluate the impact.

According to Water Safety Ireland, from 2018-22 there have been an average of 116 drownings per year, and a total of 578 people, reducing from 132 average per year from 2013 to 2017 [39]. From 2018-22, males represented 69% of all drownings in Irish waters. Individuals aged between the ages of 40 and 69 years accounted for approximately 60% of all drownings in 2018-22. 207 were drownings by suicide, accounting for 36% of all drownings. 61% were male, with 39% being classified as female.

Conclusion:
The toolkit ultimately aims to support the implementation of preventative actions wherever possible and contains a variety of case studies on interventions that have been implemented in public places, nationally and internationally. These examples highlight innovative ideas and learning across unique settings.

PREVENTION 44

Water-related suicide - Can traditional drowning prevention strategies be effective, or is a different approach needed? Reflections from the UK National Water Safety Forum and Royal National Lifeboat Institution

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Background: The United Kingdom has witnessed statistics concerning suicide, with at least 7,000 cases recorded in 2023—a rate of 13.0 per 100,000. While male suicide rates remain disproportionately high, water-related suicides account for a significant portion, comprising 3-5% of all suicides.
Data from the UK Water Incident Database (WAID) (1) reveals that 35% of water-related fatalities over an eight-year span were suspected suicides, with clusters observed in high-frequency locations. In one recent audit, 279 such cases were documented in a single year, underscoring the urgency of targeted intervention, as for the first time on record in the UK, 2019 saw more people lose their lives in water-related suicides than died in accidental drownings. Furthermore, RNLI volunteer lifeboat crews respond to over 800 non-fatal incidents annually involving vulnerable people in crisis who threaten or attempt suicide.
Description: The WHO's LIVE LIFE Implementation Guide for Suicide Prevention (2) highlights the critical need for multisectoral collaboration and situational analysis in crafting effective prevention strategies. The UK's updated Suicide Prevention Strategy for England: 2023–2028 (3) incorporates these recommendations, including specific reference to water-related suicide and naming the UK National Water Safety Forum and Royal National Lifeboat Institution as lead organisations, signalling a decisive step toward addressing the issue.
Progress has been made in the areas including;
Responsible media practices
Data-driven situational analysis (4)
Data sharing to support real-time suicide surveillance systems
Advocacy and engagement with the suicide prevention sector
Lessons Learnt:
Suicide is a public health issue and collaboration with the drowning prevention community is vital
Suicide prevention is complex and enthusiasm to help may have unintended consequences.
Suicide is an emotive issue, so allow time and prioritise wellbeing
Search and rescue organisation's data can support suicide prevention activity
Conclusion: By integrating advanced data analytics, fostering collaboration, and engaging local communities, the UK sets a powerful example of how targeted intervention and strategic partnerships can reduce the burden of water-related suicide. The efforts underscore the necessity of coordinated action in tackling this complex public health issue, with a particular **focus on multisectoral working across suicide and accidental drowning prevention sectors**.

PREVENTION 45

Suicide: an overlooked factor in drowning prevention

Mats Melbye

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Background

In Norway, suicide is a leading cause of drowning.[1,2.] A significant barrier for education in swimming and lifesaving in compulsory schools is the negative impact of body image pressure, sexual harassment and bullying (harassments)[3] leading to reluctance for changing, showering, wearing swimsuits in front of others.[4]

The Norwegian government have adopted zero-visions for suicide[5] and drowning[6]. The government's action plan for suicide prevention highlights the role of the interdisciplinary subject *Health and Life Skills*[7] within the Knowledge Promotion 2020 framework[8], emphasizing its responsibility in preventing suicide.[5] The Education Act, mandates no toleration for harassment and plans for preventing harassments.[9]

Description

The school's interdisciplinary topic health and life skills shall give the pupils competence which promotes sound physical and mental health, and which provides opportunities for making responsible life choices.[7]There is a connection between harassments and suicide.[10] To facilitate for swimming and lifesaving in the Physical education subject by preventing harassment, is a contribution for preventing suicide. Additionally, in short terms the curriculum in physical education includes, “water competence”[11] and lifesaving in the outdoors.[12]

Lessons learned

The Knowledge Promotion 2020 provides a holistic approach to swimming and lifesaving incorporating interdisciplinary topics. Raising awareness about the contrast between nature and social constructs[13] such as gender, sexuality, fashion, and trends can be a tool for developing measures for preventing harassment. Understanding the distinctions between pool-based and open water education invites to utilizing both in drowning prevention. A change in applied pedagogy from instruction to discovery learning[14] gives opportunities for develop a positive self-esteem, (preventing suicide) and realistic progress in competence[14].

Conclusion

Education in swimming and lifesaving is a comprehensive, integrated program that prevent drowning and suicide. Shifting the pedagogical focus from instruction to experiential learning can give students the opportunity to develop a more positive self-esteem, which is crucial in suicide prevention. Preventing harassment will directly contributes to mental health support. Enhancing water competence, including the ability to assess risks and manage water-related dangers, provides opportunities to incorporate lessons from other subjects, giving lessons in classroom, pools an outdoor environments[15] and strengthening the broader goals of drowning and suicide prevention.

PREVENTION 46

Strategies and technical resources to support bystander rescue and resuscitation skills in low-resource settings: outcomes of an international workshop

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Background
Drowning disproportionately affects individuals in low-resource settings, with over 90% of drowning fatalities (1). Without professional rescue services, community members, including children, often conduct aquatic rescues and attempt resuscitations (2). However, without formal training, these rescues can be unsafe, and traditional resuscitation techniques may be harmful. Community-based training in rescue and resuscitation provides a valuable opportunity to enhance the safety of community responders, introduce modern resuscitation practices, and ensure timely responses to drowning incidents when professional responders are unavailable (3). The World Health Organization (WHO) has published guidance outlining the necessary processes, policies, and planning for this intervention (4,5). However, few organizations have experience implementing it in low-resource settings, leading to inconsistencies in how the guidance is applied in practice (6). In October 2023, the Royal National Lifeboat Institution (RNLI), Rashtriya Life Saving Society India (RLSSI), and the WHO held a five-day workshop in India to address this gap. Facilitated by various organizations, the workshop aimed to identify critical safety aspects and develop resources for effective implementation.

Methods
A gap analysis of the WHO publication identified areas needing additional guidance, including disease transmission during resuscitation, age-appropriate rescue training, refresher training requirements, and monitoring systems. Twenty-four participants from 18 countries with experience in implementing community-based rescue and resuscitation training were identified through a competitive expression of interest process. The workshop facilitated consensus on current practices and feasible adaptations of the WHO guidelines for low-resource settings. Draft resource materials (called toolboxes) were developed and presented for feedback to participants and external stakeholders.

Results
Participants noted that each topic area requires specific adjustments for low-resource settings, considering limited resources, literacy, training needs, and environmental factors. Developed resources included age-appropriate rescue training, disease transmission and resuscitation, monitoring and data collection framework and refresher training.

Conclusions
The collaborative workshop approach utilised provides a model for translating and interpretating policy and/or guidelines into a practical application for use in low resource settings. Pre-planning and engagement with the participants was a critical component to ensure that a clear focus was developed prior to the face-to-face workshop sessions, enabling a highly productive and committed process.

PREVENTION 47

Enhancing Lifesaving Practices: A Research Framework for Drowning Prevention in Surf Life Saving

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Background: Drowning remains a significant public health concern, particularly in coastal environments where surf lifesavers and lifeguards play a crucial role in prevention and response. This presentation applies a research framework to support evidence-based strategies that enhance the effectiveness of surf lifesaving initiatives in reducing drowning incidents.
Methods: The framework was applied across four key portfolios within Surf Life Saving: training and education, awareness, knowledge, and drowning prevention. Practical examples were mapped to each domain. For training and education, the framework was integrated into competency-based programs and leadership development pathways. Awareness strategies were examined through community campaigns and public messaging. Knowledge was applied through the translation of research into resources and operational guidelines. Drowning prevention efforts were explored through surveillance practices, patrol operations, and beach safety interventions.
Results: Applying the framework demonstrated its value in guiding targeted improvements across portfolios. In training and education, structured professional development enhanced lifesaver readiness and resilience. In awareness, tailored campaigns improved community engagement and safer beach behaviours. Within knowledge, evidence-based insights informed policy updates, equipment use, and decision-making at patrol and organisational levels. For drowning prevention, the framework supported proactive surveillance strategies, innovative rescue methods, and integration of mental health preparedness for lifesavers. Collectively, the framework provided a structured and adaptable tool that translated research into practice, strengthening the capacity of surf lifesaving to prevent drowning.
Conclusions: This presentation highlights the effectiveness of applying a structured research framework across multiple portfolios of Surf Lifesaving. By embedding evidence-based practices into training, awareness, knowledge translation, and drowning prevention strategies, the framework offers a pathway to sustained improvements in service delivery, volunteer capacity, and community safety. Future research should assess long-term outcomes of implementation, including reduced drowning incidents and improved volunteer well-being.

PREVENTION 48

The Power of Rotary; Local Solutions Through a Global Network.Using Rotary to design and implement local solutions to combat drowning in vulnerable communities worldwide.

Anna Roscoe

Global Water Safety and Drowning Prevention Rotary Club, Brisbane, Australia

The Global Water Safety and Drowning Prevention Rotary Club is a cause based Rotary club, with members from across the world. As one of only two international Rotary Clubs, it works with local Clubs in both developed and developing countries to implement local solutions to prevent drowning in vulnerable communities.
Our purpose is to ensure every child has a comprehensive water safety knowledge and some swimming ability before they finish primary school. Anyone can drown - No one should!.
We are involved in a variety of activities to achieve our aim; fundraising for projects, grant applications, running projects, engaging with stakeholders, sharing resources, raising awareness and volunteering.
Chartered in 2022, the club has got off to a strong start already supporting projects in Uganda, Vietnam, Thailand, Cambodia, Australia and Nepal with more projects coming up in The Bahama's, New York and The Gambia. Projects delivered include training Tutors, teachers and lifeguards, schools water safety workshops, situational awareness and The Rhythm of the Water programme and education. Delivering water safety education in alignment of the Rotary Foundations core themes.
Our approach to projects is different. Projects are tailored and varied dependent on a Community Needs Assessment carried out through the local Rotary partner club. The Rotary Foundation's work is strongly embedded in working with local communities to find local solutions to the problem. The club has adopted the same ethos to its work. It is not a top down approach and goes far beyond just teaching swimming.
We have learnt that a local approach and local partnerships are critical. From translating learning materials, practicalities around health and safety, connecting with local people, identifying the greatest needs and gaps in service provision, the partnerships with local clubs is vital throughout. Rotary clubs are made up of individuals full of local knowledge and a heart to serve their community. Together we can untap resources through the Rotary Foundation and delivery truly impactful solutions on a local basis.
We have created a solid foundation to grow from replicating projects globally though Rotary for decades to come.

PREVENTION 50

Helpcode's Drowning Prevention Program in Cambodia: A Sustained Effort to Save Lives

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Background:
Despite Cambodia's rapid post-reconstruction development, stark disparities persist in living conditions—particularly for rural communities. Disturbingly, drowning has become the leading cause of death among children aged 5–14 and continues to rise among adolescents, especially males.(1) The Helpcode Drowning Prevention Program (DPP) was initiated to empower children and their families, reducing vulnerabilities during seasonal floods and recurring natural disasters, while also galvanizing community and governmental support for a national response.
Description*:*
Since 2019, the DPP has been rolled out in rural and peri-urban areas, including the Koh Rong Archipelago in Sihanoukville Province, as well as Kampot, Kep, and Phnom Penh. The program's multi-pronged approach includes:
Training: Water safety, survival swimming, and CPR sessions targeted at schoolchildren.
Awareness: A comprehensive online and offline campaign designed to inform communities about drowning risks.
Mapping:A systematic drowning risk mapping initiative that engages residents for data validation.
In collaboration with the Khmer Swimming Federation—and bolstered by partnerships with WHO, UNICEF, and local authorities—the program has mobilized over 4,000 stakeholders, trained 700 children, distributed 1,500 informational materials, and involved 150 community members in risk assessments. These efforts not only enhance immediate water safety but also pave the way for drafting Cambodia's first National Strategy for Drowning Prevention, in which Helpcode was a key actor during the workshop phase.
Lessons Learned*:*
Community engagement has yielded significant improvements in water safety knowledge, basic CPR skills, and emergency response capabilities. Local dialogue has unearthed nuanced insights into the specific risks faced by these communities. Yet, challenges remain: the long-term retention of newly acquired skills and integrating safer behaviors into daily life call for continued, adaptive strategies.
Conclusions*:*
While early results are promising, the need for scale-up and sustained capacity building is clear. The DPP's successes and challenges provide valuable lessons for future drowning prevention initiatives—not only in Cambodia but globally. The next phase will focus on embedding these interventions into national policy frameworks to ensure lasting impact and support sustainable development.

Rescue

RESCUE 01

Understanding the extent, burden, epidemiology and risk factors of drowning at unpatrolled beaches in Australia

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Background: Beaches represent an integral part of Australia's cultural identity. While generally a safe space for recreating, injury and death at beach locations can occur. The provision of lifesaving services is recognised as the most effective strategy in ensuring beachgoer safety. However, with Australia's ~11,000 mainland beaches, it is not feasible for these services to operate across all beach locations throughout the year. Unpatrolled beaches are a key challenge for coastal drowning prevention in Australia.
Methods: Using longitudinal data on national fatal drowning and from a nationally representative survey, this mixed methods study describes the coastal drowning burden, identifies risk factors and explores beachgoer behaviour to better understand unpatrolled beach drowning. Operating hours of lifesaving services were also collated to provide an overview of service provision and how that varies around the country throughout the year.

Results: Between 2014/15 and 2023/24, a total of 630 drowning deaths were recorded at unpatrolled beaches. The overwhelming majority of these deaths occurred among males (85%), during the summer months (Dec-Feb; 49%) and while swimming or wading (59%). During the peak swimming season (summer [Dec-Feb]) lifesaving services in Australia are provided at 6% of the country's beaches, with only 1% of beaches patrolled year-round. Survey results showed one in five Australian's either exclusively or mostly visit unpatrolled beaches. The primary reasons given for visiting these locations include intentions to stay only in shallow waters, that the areas they swim is safe, and that they prefer quiet, secluded beaches.
Conclusions: Consistent beach safety advice is that the safest place to swim is between the beach safety flags - the designated supervised zone, yet this is not always achievable. As Australia's peak coastal safety body and largest provider of lifesaving personnel, developing a better holistic understanding of unpatrolled beach drowning and visitation is key if we are to reduce coastal drowning rates in Australia.

RESCUE 02

Analysis of Drowning Accidents at Beaches Considering Coastal Characteristics in Japan

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Background: In Japan, over 300 people drown each summer [1], and from 2,000 to 3,000 rescues occur annually on patrolled beaches. To prevent drowning, beach-goers must understand accident characteristics in advance. However, it is difficult to understand because the natural environment is constantly changing, and the characteristics of each beach are different. In this study, we clarified characteristics of drowning accidents at various beaches with different coastal and usage conditions.
Method: We analyzed data from beaches where drowning accidents occurred in 2023 and 2024, using lifeguard activity records and meteorological and wave data from the Japan Meteorological Agency. These beaches can be classified into three regions: A and B (facing inner bays with low wave energy), and C (facing the open ocean with high wave energy).
Result: In regions A and B, drowning accidents occurred primarily in the youth and children age group, whereas in Region C, it occurred in a wider age group. Region C, with severe wave conditions and beach-goers 4.5 times that of region A and 2.1 times that of region B, had 1.5 times more accidents per beach-goer than other regions. Rip currents were the main natural cause of accidents in A and C, while deep topography was the main cause in B. The accidents caused by deep topography in A and B mainly involved children under the age of 12, while there was only one accident involving a person in their 20s in region C. These differences highlight variations in beach-goer demographics between Low and High Energy Areas, influencing drowning accident characteristics. At the time of accidents, the number of beachgoers was more than twice the usual amount in A and B, and more than 3.5 times higher in C. In all regions, the accidents occurred under long-period wave conditions that increase wave energy and the probability of rip current generation.
Conclusion: In this study, characteristics of drowning accidents by regions were clarified using data analysis. The results show the special attention is required during high beach-goer numbers or elevated wave energy, irrespective of coastal characteristics, even though prevention measures should differ by region.

RESCUE 03

Understanding public rescue equipment in Australian coastal environments to develop a national guideline

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Background: Australia's coastline is a popular destination with an estimated 650 million individual visitations annually. However, coastal environments are dynamic with many risks that may not be obvious to visitors, with most coastal drowning deaths recorded at unpatrolled beaches and rock platforms. At these unpatrolled locations, rescues performed by bystanders often represent the only form of immediate response in the case of someone getting into difficulty in the water. Public rescue equipment (PRE) enables members of the public, aka bystander rescuers, to provide aid to a person in trouble or to perform a rescue themselves for those with the skills to use it.
Description: While PRE is seen as a positive drowning prevention measure, it is often installed on an ad-hoc basis with little evidence of the best type of PRE and those best suited for bystander rescue. Historically, there have been no standards and little guidance for PRE to help coastal managers and emergency services to determine and plan their PRE requirement.
Lessons learned: As the peak body of coastal safety in Australia, SLSA has a responsibility to develop a national guideline to support the installation of PRE at high-risk coastal and to evaluate PRE usage and relevance to confirm it is fit-for purpose along our coastline. Phase one of SLSA's National Public Rescue Equipment will explore existing PRE across Australia, with an intention to assess equipment type, condition, placement, usage, and current monitoring approaches. A longer term goal is to evaluate public awareness and knowledge of PRE, along with insights from SLS entities and emergency responders on existing gaps in practice and functionality.
Conclusions: Results from the Phase one audit will inform national PRE guidelines, incorporating best practice recommendations for signage, public education, and community engagement to ensure safe and effective use. This collaborative, multi-site approach will ensure the guidelines are nationally relevant, with long-term goals including collaboration with water safety stakeholders and community organisations to create a sustainable model for PRE management, reducing drowning along Australia's coast.

RESCUE 04

What environmental and human factors influence the decision of a beachgoer to enter the water at a high-energy beach? Application to South Western France.

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Background

Coastal areas are among the most attractive destinations worldwide, but engaging in water-based recreational activities is not without risk. The overall bathing *risk* ultimately results from the combination of natural physical *hazards* (e.g. rip currents, shore break waves) and the individuals who expose themselves to them. Among the growing body of beach safety studies, many have identified the lack of exposure data as a severe limitation (1). A first attempt to address this was made by considering the beachgoer population rather than the total population to assess incident rates (2). We believe our research takes a step further by estimating the proportion of beachgoers who enter the water on a given day.

Methods

We built a unique multidisciplinary database combining data collected by an on-site beachgoers survey, weather stations, marine buoys and tidal reconstruction. We employed a logistic regression analysis to predict beachgoer's decision to enter the water on any given day at a high-energy recreational beach.

Results

We demonstrated that both environmental and human factors influence a beachgoer's decision to enter the water. Daily mean wave height and daily mean insolation duration were significant predictors at the $p<0.001$ level, while age, place of residence and self-confidence in swimming out of a rip current were significant at the $p<0.05$ level or higher. Our model has an accuracy, F-Score, precision and recall of 71%, 73%, 86%, 79% respectively.

Conclusion

Beachgoer exposure on any given day can ultimately be predicted by coupling our model with beach attendance models (3). This would allow for the design of rescue and preventive operations on days with high expected exposure. While models based solely on environmental factors can be used to forecast beach risks, incorporating human factors into the model provides valuable insight for crafting prevention messages. To this end, forecasting tools must be based on behavioural analytical framework as much as possible.

RESCUE 05

Assessment of Lower Limb Strength and Its Impact on Kicking Efficiency in Lifesavers: A Case Study

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Background: Technical efficiency is a key determinant of performance in fin swimmers[1] and should therefore also be crucial for lifesavers, both in competitive settings and real-life rescue situations. However, the relationship between lower limb strength training and improvements in aquatic propulsion remains insufficiently explored.[2] Furthermore, enhancing technique may reduce muscle fatigue and optimize performance[3], benefiting both competition and rescue operations.

This study aims to evaluate the impact of a strength and stability training program on kicking technique and propulsive force generation.

Methods: A case study was conducted with an elite lifesaver over the course of a competitive season. A specific lower-limb training program was implemented, combining strength exercises with postural stability drills. Assessments included a maximum propulsive force test (T1)[4], a kicking power test (T2)[2], and a lower-limb maximal power test (T3), all performed at three different points during the season.

Results: The findings showed a 10.8% increase in maximum propulsive force (T1) and a 49.11% increase in mean propulsive power (T2). Additionally, a 38.53% improvement in kick amplitude and a 25% reduction in kick frequency were observed in T2. Regarding T3, there was a 15% increase in mean power output.

Conclusions: This study demonstrates that lower-limb strength training significantly contributes to improving kicking technique and propulsive force production in this lifesaver. The integration of specific strength programs could optimize performance in lifesaving competitions and rescue scenarios by reducing fatigue and enhancing water efficiency. It is recommended that these training principles be incorporated into lifesaver education and training programs. Further research with larger sample sizes is encouraged to validate these findings.

RESCUE 06

Identifying medical skills to inform a simulation-based training curriculum for pool lifeguards: A Danish Delphi consensus study

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Background: Pool lifeguards must be competent in providing first aid and resuscitation [1–3]. However, different training programs currently exist for pool lifeguards both nationally and internationally [4,5]. The initial step in developing a standardized training program is to identify the essential medical skills required for this role [6,7]. This study aimed to establish consensus on selecting and prioritizing medical skills to inform and standardize a simulation-based training (SBT) curriculum for pool lifeguards.
Methods: A 3-round modified Delphi method was used to achieve consensus on a list of prioritized medical skills [8,9]. Four groups participated in the study: 1) Healthcare professionals, 2) Danish stakeholder representatives, 3) Pool lifeguard instructors, and 4) Pool lifeguards. In round 1, participants identified an extensive list of medical skills relevant to pool lifeguards. In round 2, participants prioritized the medical skills according to four factors: 1) Estimated frequency of performing the skill, 2) Importance of training, 3) Impact of SBT, and 4) Feasibility for SBT based on suitability, availability, and cost. In round 3, the participants developed the final prioritized list of medical skills.
Results: In round 1, 74 participants identified 65 medical skills relevant for SBT of pool lifeguards after content analysis by the steering committee [10]. In rounds 2 and 3, the response rates were 86% and 98%, respectively. Using a ≥75% consensus threshold, 34 skills were excluded, resulting in a final list of 31 prioritized medical skills. The three highest prioritized medical skills were: 1) Perform chest compressions and ventilations on a person in cardiac arrest, 2) Put a person in the recovery position, and 3) Perform head-tilt-chin-lift.
Conclusions: This study established consensus on a list of 31 prioritized medical skills for Danish pool lifeguards. The findings highlight core basic life support competencies as top priorities. This is the first time guidance is available for an evidence-based, national, and international SBT curriculum for pool lifeguards.

RESCUE 07

Can lifeguard specific drowning detection be improved with training

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The study's primary aim was to examine the influence of two training protocols on lifeguard-specific drowning detection performance. To achieve these aims, we used a previously adopted animated drowning detection vigilance tool that allowed for the manipulation of bather number and drowning duration and a dual n-back WM training task. The main finding showed that lifeguard-specific training elicited a significant increase in drowning detection performance, whilst WM training provided no influence on performance post-training. These findings provide support for the value of exposing lifeguards to the challenges associated with drowning detection (e.g., various bather numbers, drowning durations, drowning locations), an aspect of lifeguard certification that is currently limited. As many lifeguards failed to detect all drowning scenarios at baseline, findings further highlight the need for all lifeguards to receive drowning detection training. Future researchers should endeavour to expand the limited understanding of the mechanisms that facilitate successful and sustained drowning detection performance.

RESCUE 08

Lifeguard training sharpens brain dynamics in novices during drowning detection

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Lifeguards play a key role in preventing drowning incidents by continually monitoring bathers and detecting hazards taking place in highly dynamic environments such as pools. Previous studies have observed that specialized drowning detection training is closely associated with enhanced detection of drowning events. However, the neural mechanisms underlying this greater drowning detection performance remain unclear. Here, we address this gap in the literature by comparing brain function between lifeguards and novices, and examining changes in brain dynamics associated with drowning detection training. Using a dynamic functional connectivity analysis method called Leading Eigenvector Dynamics Analysis (LEiDA), we analysed time-varying patterns of brain activity in 18 lifeguards and 16 novices during a drowning detection task and at rest. Our findings revealed significant differences within group and between groups in the probability of occurrence of attention-related brain networks, particularly the frontoparietal, ventral attention and Default Mode networks. These findings provide novel insights into the neural basis of lifeguard expertise and how specialized training shapes neural mechanisms and improves drowning detection performance in critical lifesaving scenarios.

RESCUE 09

Effectiveness of Lifeguards in Preventing and Responding to Incidents on the Paraná Coast (2019-2024)

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Introduction: Szpilman (2022) teaches that, despite the importance of rescue and treatment, drowning prevention remains the most powerful and lowest-cost intervention, capable of preventing more than 99% of drowning cases. This study aimed to analyze the trends, patterns, and characteristics of victims of incidents in liquid media on the coast of Paraná in the last five seasons, as well as to evaluate the performance of lifeguards and the effectiveness of active and passive preventive measures in reducing drownings.
Method: Data on incidents in liquid media from the 2019/2020 to 2023/2024 seasons were extracted from the Fire Department's Incident Registration and Statistics System (SYSBM), as well as internal databases of the Paraná Fire Department. Data were also collected from the Department of Information and Informatics of the Unified Health System (DATASUS).
Results: The results indicated that the presence of trained lifeguards is a determining factor in reducing fatal incidents. It was found that the closer swimmers are to lifeguard stations, the lower the risk (relative increase of 360% for drownings with a degree greater than one in locations where the distance exceeds 100m from the stations). Furthermore, although the vast majority of visitors to the resorts are received at times and in places where lifeguards are present, there were more hospitalizations due to drowning than serious cases attended by lifeguards, specifically 53 hospitalizations and 38 serious cases, confirming the importance of the presence of this professional. It was also observed that approximately 3% of victims come from the coast of Paraná, reinforcing the need for preventive measures in regions beyond the coast.
Conclusions: This study confirms the importance of lifeguards in preventing drowning, demonstrating that their presence significantly reduces the risk of fatal incidents. The proximity of swimmers to lifeguard stations proved to be a fundamental factor for safety, as well as the need for awareness of the dangers associated with sea bathing. The findings of this study have direct implications for the formulation of public policies aimed at aquatic safety, including planning the period in which lifeguards are deployed and improving preventive strategies aimed at the most relevant public.

RESCUE 10

Spot the Rip: investigating challenges in rip current identification and education

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Introduction

On many surf beaches, in Australia and globally, rip currents are the primary hazard to swimmers and bathers, resulting in drowning deaths and rescues. Studies have shown that beachgoers ability to identify rip currents remains poor and considerable efforts have been devoted to providing beachgoers with skills and knowledge on how to recognise rip currents. Typically, these efforts involved the use of photographs or videos of rip currents taken from varying angles or views. However, little work has investigated why beachgoers struggle with rip current identification or tested which types of mediums and approaches might be most effective at educating the public, particularly high-risk groups, to learn how to identify rip currents. This research describes the first dedicated attempt to evaluate the difficulties encountered with traditional rip current identification educational methods and the type of approaches that are most successful.

Methods and Results

Multiple surveys will be distributed in Australia in 2025 to collect both quantitative and qualitative data on people's ability to identify rip currents, their confidence in identifying rip currents, and the difficulties they perceive in identifying rip currents using a variety of photographs and videos. The surveys aim to collect a representative sample of those deemed at-risk e.g. young males and multicultural communities, along with those perceived to be highly skilled in rip current identification e.g. surf lifesavers, lifeguards and surfers. Data obtained from this mixed-methods approach will enable assessment of existing rip current identification strategies to guide future efforts. The research is presently being undertaken, and preliminary results will be presented.

Conclusion

The survey responses will allow for an assessment of existing rip current identification ability and compare the publics identification adeptness in both photographs and videos taken from different perspectives along with examining what factors make rip current identification difficult. It is intended for this research to support the design of improved communication strategies that reduce the instances of people getting caught in rip currents and prevent drowning globally.

RESCUE 11

Describing rip current awareness and attitudes to beach safety in South African beachgoers: A cross-sectional survey

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Background: Approximately 1500 people die from drowning in South Africa annually, (1, 2) and in coastal provinces, an estimated 28% of drowning fatalities occur in coastal waters (3). A recent analysis of media reports observed that rip currents were indicated in more than 23% of ocean drowning incidents in South Africa (de Beer, W.; MPhil dissertation; unpublished). Despite this burden, there is a paucity of research on rip currents and beach safety awareness in South Africa. The aim of this study was therefore to describe rip current awareness and attitudes to beach safety in South African beach goers.

Methods: This cross-sectional study utilised a survey methodology to address the primary aim and has modified existing survey tools developed for Australian, American and New Zealand beachgoers (4-7). Data collection occurred in four coastal cities of South Africa: Cape Town (Western Cape), Mossel Bay (Western Cape), Gqeberha (Eastern Cape), and eThekwini (KwaZulu-Natal).

Results: The survey, conducted in February and March 2025, included 476 participants from the four coastal regions. Key findings from the survey include: (i) a large proportion of respondents self-reported an ability to swim less than 25 metres; (ii) many were infrequent beachgoers; (iii) beach choice was primarily influenced by proximity to home, convenient transport, and the presence of lifeguards; (iv) baseline awareness of rip currents was low; and (v) respondents demonstrated poor ability to identify a rip current from standing level on a beach.

Conclusions: The study served as a baseline measure of public understanding of rip current risk and beach safety awareness in South African beach goers, at the start of a broader three-year, interdisciplinary project that will develop and implement a rip current forecasting service in partnership with the South African Weather Services. These findings underscore the need for targeted rip current education and a robust public awareness strategy to support the safe use of South African beaches. The data gathered in this survey will inform the ongoing development of the rip current forecasting model and guide the communication strategies necessary to improve beach safety across the region.

RESCUE 12

Forecasting rip current and shore-break wave hazards on the sandy beaches of southwest France using simple physics-informed models

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Background: Rip currents and shore-break waves are among the most significant surf-zone hazards, contributing to numerous drowning incidents and injuries worldwide. However, forecasting these hazards remains challenging due to their complex dependence on wave, tide, and beach morphology conditions. This study introduces two new physics-informed models to predict rip-current and shore-break wave hazards, with the aim of improving beach safety and drowning prevention.
Methods: The models estimate rip-current flow speed (V) and shore-break wave energy (Esb) based on wave height, period, tidal variations, and beach morphology proxies using a limited number of free parameters. These models were applied to La Lette Blanche beach, southwest France, a high-energy meso- to macro-tidal environment with strong rip currents and hazardous shore-break waves. Hourly lifeguard-perceived hazard levels, recorded from July 1 to August 31, 2022, were used to calibrate and validate the models. Hazard predictions were categorized into a 5-level scale (0 = no hazard to 4 = extreme hazard) for both rip currents and shore-break waves.
Results: The model effectively predicts rip current and shore-break wave hazards. For rip currents, the best Pearson correlation was r = 0.77, with an 83% accuracy in distinguishing low versus moderate-high hazard hours. Daily mean hazard correlation reached r = 0.82. Shore-break wave hazard modeling achieved r = 0.71 with 83% accuracy for moderate-high hazard hours and r = 0.74 for daily means. Rip hazards peak at low tide, while shore-break hazards increase at high tide. The model accurately captures hazard variations with wave energy and tidal modulation, aligning well with lifeguard observations.
Conclusions: These simple, physics-informed models provide an effective tool for predicting surf-zone hazards, offering a scalable approach to improve drowning and injury prevention strategies (1). By integrating wave forecasts and basic beach morphology metrics, these models can enhance public safety messaging and lifeguard decision-making. Future work should explore model validation at additional beach locations and should couple these hazard models with beach attendance forecast models.

RESCUE 13

Verification of Effectiveness of Rip Current Visualization Apps using Augmented Reality linked to AI Rip Current Detection System

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Background: In Japan, 48% of all drowning accidents at beaches are caused by rip currents [1]. Various efforts are being made to prevent rip current accidents. For example, lifesavers place flags and an alert signages in rip current areas to warn the beach-goers on patrolled beaches. However, rip current accidents have not decreased including accidents of unpatrolled beaches. One reason is that beach-goers cannot visually recognize rip currents and are unable to identify dangerous areas [2]. As a measure against these issues, the AI rip current detection system has been in operation on several beaches in Japan since 2019 [3]. In this system, AI automatically detects rip currents and send information about it to the existing mobile application and the digital signage. Actually, the number of rip current accidents at system operational beaches has been reduced significantly or is zero [4]. On the other hand, the notification to the existing mobile application limits information to within the shooting range of webcams, making it difficult to spatially recognize rip currents from the location of beach-goers. As a solution, we developed a mobile application that visualizes rip currents using Augmented Reality(AR) linked to the AI rip current detection system so that beach-goers can search and recognize rip currents from any angle. In this study, an effectiveness of this application for rip accident prevention was verified.

Methods: We conducted a hearing survey on 30 people to evaluate the ease of rip current recognition through this application, the usability of the application, and awareness of avoiding rip current areas by comparing the application with the alert signage.

Results: It was confirmed that the application using AR enhanced beach-goer's awareness of rip current areas, and increased their willingness to avoid rip current area. In addition, some subjects mentioned that it was easy to use because it could be viewed on smartphones.

Conclusion: The developed application using AR was found to be effective in helping beachgoers recognize and avoid rip currents. The application enhanced the AI rip current detection system, which was expected to be further useful system to prevent rip current accidents for beach-goers.

RESCUE 14

Developing a nationally relevant and practical data standard for lifesaving services in Australia

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Background:
Data underpins evidence-informed practice. This should be no different across the water safety sector. Across lifesaving organisations working in aquatic locations around Australia, there have historically been numerous inconsistencies and challenges in data collection and subsequent reporting and analysis. These challenges have arisen due to logistical, technological and cultural barriers, and while data collection methodologies have come a long way in recent years, there is much that can be done to improve data capture methods.
Description:
Lifesaving data (rescues, preventative actions, and first aids) is used in reporting, to guide coastal safety initiatives, community engagement and education, and advocacy. Surf Life Saving Australia, along with other water safety stakeholders, have recently undertaken the development of a data standard for consistent, accurate and practical collection of data by coastal lifesaving personnel across Australia. This program explored current data collection practices across a range of coastal safety organisations, with extensive stakeholder consultation with local and state government representatives, not-for-profit water safety organisations, research institutions, and other concerned parties, in the development of this initial version of this document. Concurrently, a core goal was to develop a document that considered and accounted for the real work of lifesaving personnel, encompassing a practical guideline that can be realistically implemented on that beach, but also being useful for researchers and risk managers across water safety organisations.
Lessons Learned:
The key challenges of this program spanned various aspects of data collection and data quality principles, technology tools and implementation, organisational culture and culture shift, change management, collaboration and trust-building across this sector and privacy issues surrounding the use of personally identifiable data. The greatest lesson was the importance of continued engagement with relevant stakeholder at all levels to both enhance the richness of information and perspectives included, but also to increase broader understanding of the project and build ownership within personnel.
Conclusions:
The current data standard is to be implemented in phases to encourage broader uptake by different stakeholders with the longer-term goal that supports consistence but acknowledges organisational and cultural challenges.

RESCUE 15

Integrating community engagement with lifeguard services in Bangladesh: A holistic approach to drowning prevention

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Background

Drowning is a leading cause of injury-related deaths in Bangladesh, with the 2016 Bangladesh Health and Injury Survey reporting over 19,000 annual fatalities, including 14,500 children. The increasing influx of local and international tourists in Cox's Bazar further elevates the drowning risk due to inadequate supervision, limited swimming ability, and the lack of rescue and first aid proficiency. In response, the Centre for Injury Prevention and Research, Bangladesh (CIPRB) launched the SeaSafe program to implement effective drowning prevention measures through beach lifeguard services, swimming education, and community engagement activities.

Description

The SeaSafe program implemented in Cox's Bazar, Bangladesh consists of two primary interventions: -Lifeguard Service: Deployed at popular tourist beaches to provide active surveillance, rescues, and emergency first aid.

-Community Engagement: Focused on inland and coastal high-risk communities, delivering water safety education to children and adults through beaches, schools, and community outreach programs.

Lessons Learned

Between 2015 and 2025, SeaSafe lifeguards conducted 404 rescues, saving 745 lives, demonstrating the critical impact of on-site rescue services. Additionally, 193,939 children received water safety education in schools, 29,137 on beaches, and 49,404 adults participated in community-based water safety training. The community engagement intervention, costing approximately USD 11,000 annually, proved significantly more cost-effective than the lifeguard service, which requires an annual budget of USD 100,000. While the lifeguard service provides immediate rescue benefits, its geographical coverage is limited. In contrast, community engagement activities have a broader reach but rely on active participation and local responsiveness for effectiveness. The combined efforts not only enhance drowning prevention but also have economic and governmental implications, potentially boosting tourism and gaining local government support.

Conclusion

SeaSafe's synergistic approach effectively addresses the high rate of drowning incidents in Cox's Bazar. Its's impact underscores the importance of integrated approaches, combining lifeguard services with community engagement, to combat drowning holistically and effectively. This model holds potential as a valuable blueprint for global drowning prevention efforts, especially in low- and middle-income countries, and contributing to coastal community safety.

RESCUE 16

Year-round Lifeguard Project at Nazaré Beach: Impact of Tourist Influx Generated by Giant Waves

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Impact of Tourist Influx Generated by Giant Waves Abstract This case study analyses the Annual Lifeguard Project of Nazaré Beach, implemented in 2017 by the Nazaré Lifeguard Association (Associação de Nadadores-Salvadores da Nazaré – ANSN) in cooperation with the Municipality of Nazaré. The initiative was created to ensure continuous surveillance and emergency response outside the official bathing season, following a high rate of drownings — an average of eight per year, reaching ten fatalities in 2017 — and a growing number of visitors attracted by the world-famous giant waves. The study combines quantitative and qualitative methodologies, drawing on operational reports from ANSN, data from the FEPONS Drowning Observatory, and historical statistics from the Portuguese Maritime Authority (AMN). Data from 2017 to 2025 were analysed, covering exclusively the non-bathing season, during which the annual safety device operates. During this period, 173 non-fatal drowning incidents and 1,072 first aid interventions were recorded, with no fatalities reported. The average response time ranged between 1 and 3 minutes, demonstrating a high level of operational efficiency. Qualitative analysis highlighted highly positive feedback from lifeguards and coordinators, who emphasized the importance of continuous presence, ongoing training, and effective cooperation with local emergency entities (Firefighters, EMS, Police, and Civil Protection). The results show that the device has eliminated drowning deaths outside the bathing season, becoming a national benchmark in water safety. Its success stems from the combination of year-round surveillance, adequate technical resources, and strong institutional collaboration. The study concludes that implementing permanent lifeguard projects is both feasible and effective, recommending the replication of this model in other high-risk beaches with significant year-round attendance. It further highlights the importance of institutional support, continuous professional training, and public funding to ensure the sustainability of these initiatives, which are essential for drowning prevention and the promotion of water safety in Portugal.

RESCUE 17

Safer Zones for Open Water Recreational Swimming: A Model for Middle-Income Countries

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Background

In Rosario, Argentina, the Paraná River is a primary recreational area for local citizens. The city, with a population of 1.4 million, has the highest number of registered vessels in the country (around 40,000), including powerboats, sailboats, and kayaks. This creates significant risks for open water swimmers. The Municipality of Rosario through Costanera Rosario Lifeguard Service oversees safety in these waters, yet designated safe swimming areas remain scarce in middle-income countries. In response, a structured safety initiative was implemented in 2012 to provide a secure environment for open water swimmers and bathers.

Description

The project established a 400-meter designated swimming zone demarcated with low cost buoys, with two restricted areas: one excluding motorized vessels and another preventing access to non-motorized watercraft with IALA buoyage system. The nearest section to the beach, is designated only for bathers.

Lifeguard surveillance is provided through four towers, staffed by one lifeguard per tower from 8:00 AM to 2:00 PM and two lifeguards from 2:00 PM to 8:00 PM, seven days a week in spring and summer. Over 12 years (2012-2024), approximately 92,000 individuals have been used the mentioned area.

Access to the swimming zone is regulated:

Swimmers must use a personal flotation device.

Minimum age requirement: 12 years old, underage swimmers must be accompanied by an adult.

Lessons learned

The initiative has significantly reduced drowning risks for recreational open water swimmers. Despite high user numbers, there has been no fatal drowning. The number of rescues remains low, with 42 recorded rescues. Over time, swimmer behavior has improved, with greater awareness of risks and adherence to safety rules. The initiative has also influenced local policies to ensure the creation of designated swimming areas in urban rivers.

The initiative serves as a model for other cities in middle-income countries, where designated open water swimming areas scarce. Moving forward, efforts will focus on expanding the initiative, increasing public awareness.

Conclusions

By implementing designated swimming zones, enforcing safety measures, and maintaining lifeguard supervision, open water recreational swimming can be significantly safer in middle-income settings. This model provides a replicable framework for other locations to enhance water safety.

RESCUE 18

When minutes matter, every second counts: the role of helicopters in lifesaving/rescue

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Background:
Rapid deployment and unique capabilities have seen helicopters increasingly used for search and rescue missions (SAR) and are a proven tool in saving people from drowning. They have the advantage to be able to get to locations quickly. The aerial aspect provides a unique view to quickly assess a situation, identify the person(s) at risk and undertake actions.
Description:
Rescue helicopters carry medical packs, resuscitation units and defibrillators, meaning that, following a rescue, the crew provide immediate care, increasing the chance of survival dramatically. The patient can be directly transported to further advanced care locations i.e. hospital.
Early interventions have been proven to improve the chance of survival in many instances. Since 2020, Sydney's LIFESAVER rescue helicopters have conducted over 1,600 missions, changing the lives of thousands of people. This includes rescuing swimmers, boaters, rock fishers, those who have been recreating in rivers, lakes and the ocean as well as those impacted by floods. The service responds to incidents in the bush, alpine and mountain regions, where survival in hostile conditions would have been minimal. In the past 50 years over 100,000 missions have been performed.
Lessons learned:
Rescue helicopters can assist often when other rescue services cannot, including rock fishers near rocks and surf zones, in flood waters and other hostile environments. It is in these time-critical situations, where having the ability to rescue someone and commence immediate first aid is the difference between life and death.
With time a priority for people in distress and in the water, helicopter rescue provides fast, effective means of accessing someone and removing them from these situations.
When compared with other aviation tools (planes), there are fewer operational restrictions and no landing facility is required.
Conclusion:
This presentation provides an overview and case studies of the challenges and limitations of such as service but also highlights the strengths and benefits. When minutes matter, every second counts and having a rescue helicopter service with rescue and emergency responder qualified persons on board means that those in difficulty have a greater chance of survival.

RESCUE 19

MyCoast App: delivering lifesaving information to create better, safer beach days

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Background:
The UK records over 400 accidental drowning deaths annually[1], with Cornwall having the highest in England, averaging 15 deaths per year[2]. Many incidents are predictable and preventable, yet critical safety information often fails to reach those at risk.
Coastal hazards such as rip currents, tidal cut-offs, and sudden weather changes are exacerbated by climate change, leading to more extreme conditions and increased danger. Limited access to real-time safety data and inadequate public awareness leaves many beachgoers, water users, and emergency responders unprepared for evolving risks, resulting in avoidable accidents and fatalities.
Description:
The MyCoast app, created in partnership with local government, industry water safety experts, academia, and end-users, serves as a user-friendly platform offering curated real-time, multi-source data for individuals enjoying beaches and water-related activities. It enables users to make informed decisions, enhancing both enjoyment and safety when visiting the coastline.
Feedback from over 500 MyCoast users surveyed in 2024, highlighted the platform's most valuable features:
Everything in one place – all essential safety data, alongside detailed information on facilities & amenities in a single, user-friendly interface;
Clear safety warnings & alerts – helping users make informed choices;
Accurate, easy-to-read tide times – reducing the risk of tidal cut-offs;
Uncomplicated sea & surf conditions – providing up-to-date insights for swimmers and water users;
Accessible, friendly information – ensuring inclusivity for all beachgoers.
Additionally, real-time user data enhances incident response and risk mitigation. These insights support policymakers in shaping future social, environmental, economic, and infrastructural strategies to improve coastal safety.
Lessons learned:
Through user feedback and pilot trials, we've learned that real-time, accessible safety data significantly influences user decision-making. By combining multiple data sources, we can improve situational awareness, support Search & Rescue organisations, and enhance public safety—but scalability depends on robust funding and partnerships.
Conclusions:
For the first time, multi-source data is seamlessly integrated into an easy-to-use platform, helping beachgoers and Search & Rescue organisations. MyCoast bridges critical safety gaps, setting a new standard for real-time coastal intelligence while laying the foundation for global scalability.

RESCUE 20

Global Maritime Search and Rescue Systems Review: Strengthening Resilience for the Future

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The Global Maritime Search and Rescue (SAR) Systems Review is a 20-month strategic initiative led by the International Maritime Rescue Federation (IMRF), with funding and support from Lloyd's Register Foundation. Commencing in June 2025, the project aims to assess the effectiveness of SAR systems across local, national, and international levels, identifying critical gaps and forecasting emerging challenges over the next 10–20 years.

SAR systems are vital to safeguarding lives, supporting maritime trade, and protecting coastal livelihoods. Yet, the sector faces mounting pressures: uneven regional capabilities, limited cross-border coordination, outdated legal frameworks, climate-driven risks, geopolitical instability, economic volatility, and insufficient data for evidence-based advocacy. These factors threaten the efficiency, equity, and sustainability of global SAR operations.

The Review will be delivered in three phases. Phase 1 focuses on situational analysis, mapping operational environments, regulatory structures, and external drivers such as climate change and technological shifts. Data will be gathered through literature reviews, stakeholder interviews, media scanning, and targeted surveys. Phase 2 centres on stakeholder engagement, using workshops and expert panels to validate findings and refine strategic priorities. Consensus-building techniques, including the Delphi method, will ensure alignment across diverse actors. Phase 3 will produce a comprehensive report and strategic outputs - advocacy tools, influencing strategies, and operational plans tailored to policymakers, SAR organisations, and maritime industries.

By integrating perspectives from national SAR bodies, governments, commercial shipping, artisanal fishers, academics, and suppliers, the Review will deliver actionable recommendations to enhance SAR resilience - particularly in under-resourced regions. The project's long-term vision is to foster global equity in SAR accessibility and ensure readiness for an increasingly complex maritime environment.

RESCUE 21

empowering communities through marine safety: sharjah's experience in public education and lifesaving awareness

Ahmed Al Hosani, Humaid Al Kindi, Heba Shalaby

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Following its designation as the lead authority for marine rescue in Sharjah under Executive Council Decree No. 7 (2024), the Sharjah International Marine Sports Club (SIMSC) launched a comprehensive training and community outreach strategy aimed at reducing drowning incidents and promoting water safety culture.

In collaboration with government partners, SIMSC implemented several impactful programs. These include the "Safe and Secure Tourism" campaign with Sharjah Police (July–December 2024), lifeguard refresher courses with Khorfakkan Municipality (November 2024), and official training in cooperation with the International Life Saving Federation (ILS).

A major achievement was the launch of the "Junior Lifesavers" program in partnership with the Sharjah Private Education Authority. Targeting 1,500 students (ages 12–14) over three years, the program teaches water safety and basic rescue skills within school swimming pools. In its first phase, 453 students were trained across 12 schools.

SIMSC also incorporated marine rescue training into summer camps for youth, training over 780 participants in basic lifesaving and safe swimming practices. Additionally, the Club trained 39 individuals in rescue protocols for international marine racing events.

A key success was the integration of rescue sports into the Club's official sporting program, laying the foundation for competitive rescue events in the future. SIMSC is currently developing specialized training for female lifeguards and expanding school-based rescue awareness programs across the Emirate.

This presentation highlights SIMSC's experience in building a sustainable culture of marine safety through education, training, and youth empowerment. Recommendations include integrating rescue skills into school curricula, creating inclusive training pathways, and leveraging sports and camps as effective platforms for public engagement.

RESCUE 22

building an integrated marine rescue system in sharjah: from executive decree to licensing and smart governance

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Sharjah International Marine Sports Club, Sharjah, UAE

In 2024, the Executive Council of the Government of Sharjah issued Decree No. 7, designating the Sharjah International Marine Sports Club (SIMSC) as the official authority responsible for regulating the marine rescue sector in the Emirate. This includes licensing rescue centers, accrediting lifeguards, and establishing technical standards for compliance and safety. The decree came in response to recurring drowning incidents, the absence of a unified regulatory body, and inconsistent lifeguard training standards.

Following the decree, SIMSC formed a specialized licensing and inspection team, developed an internal regulatory framework, and joined both the International Life Saving Federation (ILS) and the Arab Federation for Diving and Rescue. A centralized digital licensing platform was launched to streamline applications, approvals, and inspections, offering end-to-end digital services for rescue entities and individuals.

The Club adopted a phased licensing plan considering geographic and operational needs. It starts with a preparatory phase focused on awareness and training workshops to qualify lifeguards for licensing. Phase One targets 148 lifeguards in the Eastern Region (Dec 2025), followed by Sharjah City (Mar 2026) and Khorfakkan (Jun 2026). Each phase includes evaluation, registration, and certification aligned with international standards.

Comprehensive audits covered all swimming pools, beaches, and water facilities across the Emirate. These audits created a data-based foundation for a tailored marine rescue strategy. Challenges included outdated infrastructure, lack of qualified personnel, and low public awareness of new safety regulations.

This presentation outlines how Sharjah moved from fragmented efforts to a structured, government-led marine safety system. The model offers insights into building policy-based rescue frameworks for coastal cities. Recommendations include adopting smart technologies, improving agency coordination, and applying international benchmarks for effective marine safety governance.

RESCUE 23

Success stories of Marine Rescue Services Egypt

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This abstract highlight the remarkable success stories of **MRS - Marine Rescue Services**, one of the most prominent life-saving and rescue companies in the Egyptian market. Through a series of high-stakes, life-saving operations, the company has consistently demonstrated its expertise in aquatic safety and emergency response. By utilizing top-of-the-line equipment, highly trained personnel, and strategic coordination with local authorities, **MRS** has successfully rescued several individuals in perilous situations. These operations showcase the company's ability to respond swiftly and effectively, even under the most challenging conditions. This overview will delve into some of the most notable rescue missions undertaken by the company, highlighting the importance of specialized training, technological advancements, and collaborative efforts in ensuring the safety of lives at sea and also in the pools. Through these successful cases, **MRS** has solidified its position as a leader in Egypt's rescue and lifesaving industry, contributing to the ongoing improvement of aquatic safety protocols and practices.

Objectives

Here are some potential objectives of this abstract on the successful life-saving cases by **MRS**:

Showcase Successful Life-Saving Cases: To highlight key life-saving operations carried out by **MRS**, demonstrating their effectiveness and expertise in high-pressure maritime rescue scenario and situations.

Evaluate Rescue Techniques and Methodologies: To assess the advanced rescue techniques and methodologies employed by the company in handling various aquatic emergencies, including medical evacuations, boat accidents, and sea rescues.

Examine the Role of Technology and Equipment: To explore the role of the top-of-the-line equipment and technology in improving the efficiency and outcomes of rescue missions, emphasizing innovations in marine and aquatic safety tools.

Highlight Training and Preparedness: To emphasize the importance of continuous training and preparedness of **MRS** personnel in responding to aquatic emergencies swiftly and effectively.

Promote Public Awareness and Safety: To raise awareness about the significance of Aquatic safety and the role of professional rescue services in reducing the risks of drowning and maritime accidents.

Illustrate Impact on the Egyptian Market: To demonstrate the company’s positive influence on the broader Egyptian market, setting high standards for safety practices and life-saving protocols in the aquatic and marine industry.

RESCUE 24

Risks of aquatic incidents in the bathing areas of the state of Tocantins

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The present research addresses the risks of aquatic incidents in the bathing areas of Tocantins: drownings, incidents with boats, stingrays, and piranhas. Since the state has the largest chain of freshwater beaches in the country and the second largest river basin in Brazil, the Tocantins-Araguaia, with an extensive water network and potential for the establishment of numerous beaches and resorts (1). Furthermore, Tocantins holds the 5th most critical index concerning deaths by drowning, with an average of 71 deaths per year, which leads to an annual cost of about 14.9 million reais to Brazil (2). In this sense, the main objective of the research was to analyze the risks of aquatic incidents in the official bathing areas of Tocantins. Regarding methodology, this research is exploratory in nature, with both quantitative and qualitative approaches, developed in 2022 with an emphasis on July, the official beach season in the state. Data was collected from the Military Fire Department of Tocantins, the State Health Department of Tocantins, the Araguaia-Tocantins River Captaincy, and field research was conducted. Data from 76 bathing areas were analyzed regarding the existence of aquatic incident risks and the measures implemented to mitigate them. Field data was obtained in loco by on-duty Military Firefighters, including consultations with Civil Lifeguards, Municipal Drowning Prevention Agents, vendors, boatmen, and local authorities (3). The analysis shows the importance of mapping and studying aquatic incident risks, which can support actions, projects, and public policies to combat drownings and mitigate other risks in aquatic leisure areas, aiming to improve planning and reduce costs to preserve lives. It also encompasses the importance of rivers and their influence on the formation of population groups and the development of cities, as well as their use for aquatic leisure and tourism activities.

RESCUE 25

Over 5,000 Surf Instructors Trained in Drowning Prevention via the ISA/ILS Water Safety Course and Partnership and How this Impacts Drowning Prevention Efforts in the Surf Environment in Both Developed and Developing Nations

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In 2017, the International Surfing Association (ISA) and International Lifesaving Federation (ILS) began a key strategic partnership to establish a global standard water safety course and certification for Surfing coaches and instructors. This historic collaboration has been an excellent example of international federations with aligned goals working together collaboratively to make a safer environment for instruction worldwide.

This partnership has had a large impact on the surf instruction community and this presentation will highlight its benefits for water safety awareness and drowning prevention in both developed and low-middle income and developing countries.

Our 2023 research study showed that ISA Surf Coaches appeared to be an effective drowning prevention resource and that their rescue capacity and confidence was enhanced by the combination of their surfing experience, previous rescues, and their water safety training.

Since the ISA/ILS Water Safety Course was launched there have been 431 courses run for 5,382 instructors in over 50 countries. Over the past five years approximately 10% of the instructors mentioned above were trained in The Netherlands and 12% of the instructors were trained in developing or low-middle income countries with high drowning rates.

We will attempt to highlight the impact and implications of this training by comparing the surf instructors in developed countries using the target groups of surf instructors trained in the Netherlands to the surf instructors trained in low-middle income countries to show their value in both contexts.

Most of the target group in the Netherlands work in developed countries, typically with patrolled beaches. In contrast, most of the coaches in developing countries work on beaches where most or all conditions of the drowning chain are absent.

Surveys will be conducted to highlight why surf instructors trained in water safety courses are effective in drowning prevention. The objective is to show that water safety training for surf instructors is effective in drowning prevention and that this training works in both developed and developing nations.

RESCUE 26

Redesigning beach safety flags to improve comprehension and encourage compliance

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Background

The majority of countries have adopted an internationally standardized system of beach safety flags to inform the public about safety conditions at open water locations (1,2,3). These flags are crucial for preventing injuries and drownings. However, little is known about their effectiveness, which depends on public recognition, comprehension, and adherence. Findings of various studies show that this varies considerably between flags and countries (4,5,6,7). The current research examined how Dutch residents and international visitors in the Netherlands understand and respond to beach safety flags (8,9). Two subsequent studies (10) evaluated the impact of scientifically validated design modifications (11,12,13) to enhance clarity and effectiveness.

Methods

Two face-to-face interview studies on Dutch residents (N=174) and foreign nationals (N=245) assessed beach visitors' recognition, understanding, and behavioral compliance with existing beach safety flags. A subsequent online survey with 465 Dutch residents tested whether alternative flag designs incorporating pictograms improved comprehension and compliance. A fourth study surveyed 592 Dutch beach visitors on site, comparing the effectiveness of existing flags with modified versions featuring explanatory texts and pictograms in a real-world setting.

Results

Across all studies, comprehension of most existing flags was low, except for the red and double-red flags. Misinterpretation of the yellow warning flag was common, with many respondents perceiving it as a relative safety sign, leading to unsafe behavioral intentions. Conversely, the red-over-yellow flag indicating lifeguard supervision was frequently mistaken for a warning. Foreign visitors demonstrated similarly low comprehension levels. Studies on modified flag designs showed a substantial increase in comprehension and intention to comply. The online survey revealed that understanding of flags doubled when pictograms were added, while the beach study confirmed that modified flags encouraged safer behavioral intentions for warning flags while reducing unnecessary caution for the red-over-yellow flag.

Conclusions

The findings highlight significant gaps in public comprehension of beach safety flags, which can compromise the public's safety. Adding pictograms and explanatory texts substantially improves understanding and appropriate behavioral intentions. These results support the need for consideration of evidence-based modifications to flag designs to enhance beach safety communication and reduce drowning risks.

RESCUE 27

Developing Irish surfers as a vital link in the drowning chain of survival - an ongoing WaterSafety Ireland project.

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Background:
Surfing is a big participative sport in Ireland. During the 1990s surf school businesses formed to satisfy demand for access to the sport resulting in a massive growth of participants nationally. Surfers participate throughout the year and venture to secluded and non-lifeguarded places where
their presence, combined with a knowledge of the aquatic environment has the potential to become
a vital first response during incidents. Many recreational surfers are good board paddlers, can swim
and wear wet suits. Surf boards and SUPs can be vital buoyancy aids when required.
Description:
The Irish Surfing Association and Local Authorities licence surf schools to operate at venues subject
to outlined safety and quality criteria. As a result of a partnership with Water Safety Ireland, a Surf Lifesaver Award is now a pre requisite for all surfing instructors. Holders can support
lifeguards during incidents and offer assistance when emergency services are unavailable.
Other world initiatives have highlighted the effectiveness of involving recreational surfers as part of
local water incident response (1). Research indicates that surfers are more likely to intervene if they
have some qualification (2). The growing number of surfers and presence at many waterways is a major potential resource for drowning prevention.
Project Aims:
Ensure surfing lessons are safe.
Develop a Surfers Rescue Awareness Award for recreational surfers.
Emphasising prevention.
Develop a regional surfers response group.
Develop a surfer call out group for the Irish Police (Gardai) who are often the first to arrive at a scene.
Keep records.
Outcomes:
Surf School standards have improved. Safety is a priority
Surfing Instructors are now a potential support for lifeguards.
Co-operation between the local water safety and surfing communities.
Surfers are engaging to become rescue responders.
Recognition of Surf Instructors as Surfer Rescue Awareness Award providers.
Surfer Awareness award developed.

Ongoing issues:
Discipline in regard to training, record keeping, protocols and attendance.
Over rated personal ability and knowledge issues.
Poor recreational surfer uptake with courses.

Conclusions: Surfers are engaging with the potential role of lifesavers. Synergy is growing. Alternative methods such as online delivery of the Surfer Rescue Awareness Award are being considered.

RESCUE 28

A novel flume simulation does not replicate the physical demands of surf rescues

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Background: In New Zealand approximately 50% of beach rescues are carried out by lifeguards without powered equipment (i.e., IRB or Rescue Watercraft) [1]. Tube and Fins (T&F) or a Rescue Board (RB) are the most common non-powered equipment utilised. Due to its unpredictability, the open water environment influences performance in lifeguards [2], which is problematic for consistent assessment. The reproduction of rescue demands in a controlled environment may offer a reliable means of allowing for lifeguard assessment, training, and further research. The aim of this descriptive study was to test whether a rescue protocol conducted in a swimming flume can simulate a typical beach rescue scenario.
Methods: Five Surf Lifeguards performed simulation rescues of a manakin 100 m offshore utilising either T&F or RB in a randomized order at a local beach. A flume simulation was designed so the lifeguards had to perform actions that replicated the movement patterns they exhibited in the beach environment. Heart rate (HR) was measured throughout to determine the physiological stress and ratings of perceived exertion (RPE) were measured on a 6-20 scale upon reaching the manakin and upon returning to shore.
Results: Peak HR was lower in both the T&F simulation (mean difference (MD) = 17 bpm, standard deviation of difference (SDD) = 5 bpm) and BR (MD = 47 bpm, SDD = 5 bpm) simulation than the respective beach condition. RPE averaged across measurement points was also lower in both the T&F simulation (MD = 3, SDD = 2) and BR simulation (MD = 4, SDD = 2) than the respective beach condition.
Conclusions: The physiological and psychophysiological demands of the rescue appear to have been insufficiently replicated by the novel simulation. The reduced intensity and variability of environmental stimuli (e.g. wave, winds, current, water temperature) in the controlled environment is probably responsible for these differences. Due to the unique, challenging nature of the beach lifeguard's role, it seems that training and assessment needs to happen in realistic and representative environments.

Research

RESEARCH 01

Assessing Drowning Risk Among Children Under Two Years via Child Journey Mapping: Insights from Rural Bangladesh

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Background: In Bangladesh, about 19,000 people die annually due to drowning, and over three-quarters are children (76%, N=14,500) (1). There are WHO-recommended interventions in Bangladesh but specific interventions for under-2-year-old children don't exist. "Sonamoni" project aimed to identify an acceptable and sustainable intervention for under 2 in Bangladesh using the Human Centre Design (HCD) process.
Objective: The aimed to explore the daily activities of under-2-year-old children, identify when children are most at risk and unsupervised, explore the hazards around the household for children and gather suggestions from caregivers to prevent drowning.
Methods: Qualitative methods were used in two study settings in Bangladesh: Sherpur Sadar and Kalapara. Two-day workshops were organized with 13 caregivers of under-2 children from the most drowning-prone villages in each study area. The workshops were held in October 2023. Data were collected by visualising the activities, responsibilities, emotions, and locations of the children and caregivers from when they wake up to when they sleep at night. The various supervision techniques used in adverse situations were also explored, including situations such as illness (of the child or caregiver), disaster, or emergency.
Results: Detailed maps were created by human-centred design (HCD) experts visualising the daily journeys of under-2s and their caregivers throughout their day. In both locations, caregivers' time for preparing lunch was the most vulnerable time for children to drown, mothers were the main caregivers followed by grandmothers, siblings and in-laws. they used toys, mobile phones, cartoons on TV, tricycles, and cardboard boxes to keep their children engaged. All participants in both workshops ranked drowning as the main injury hazard for children followed by cuts, burns, falls, poisoning and electrocution. They suggested giving age-specific toys, fencing the water bodies and filling up the unnecessary ditches around households, establishing community-based day-care, and campaigning to be aware that mothers, family members and schoolteachers can prevent under-2 children from drowning in rural communities.
Conclusions: Child journey mapping is a useful tool of HCD that can explore drowning and other injury risks in detail by involving caregivers even in rural areas.

RESEARCH 02

Drowning Data Gaps: A Survey-Based Study on Non-Fatal Drownings in Switzerland

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Background
Drowning is a major public health concern worldwide, leading to significant morbidity and mortality. While fatal drowning cases are mostly well documented, non-fatal drownings remain underreported and less understood. The World Health Organization has recently refined the definition of non-fatal drowning, emphasizing its impact on long-term health. This study aims to investigate the prevalence and demographic characteristics of non-fatal drowning in Switzerland.
Methods
A cross-sectional telephone survey was conducted in spring 2024 among German- and French-speaking adults in Switzerland. A randomly selected group of 1’003 participants took part in computer-assisted telephone interviews, where they were asked whether they had experienced a non-fatal drowning event and its consequences. Logistic regression analysis examined associations between non-fatal drowning and demographic or socioeconomic factors.
Results
Of the 1’003 surveyed participants 172 individuals reported having experienced a non-fatal drowning. The explorative data analysis revealed some observable trends in the demographic characteristics of affected individuals. However, a logistic regression analysis did not find any of these differences to be statistically significant, meaning that none of the examined factors could reliably predict the likelihood of experiencing a non-fatal drowning.
Among the observed but non-significant trends, younger individuals were slightly more affected by non-fatal drowning than older participants. The gender distribution was nearly even. Regarding the education levels, individuals with higher education were slightly overrepresented among those who experienced a non-fatal drowning, while those with lower educational backgrounds were less frequently affected. The settlement type of affected individuals was also analysed, revealing that most people who experienced a non-fatal drowning reside in urban and suburban areas, while those living in rural areas were less frequently affected.
Conclusion
This study demonstrates how non-fatal drowning data can be collected through a survey and provides an initial overview of the situation in Switzerland. Of the 1’003 surveyed participants, 17.2% reported a non-fatal drowning, but no statistically significant predictors of non-fatal drowning emerged from the analysis. This highlights the need for further research using larger datasets and incorporating additional behavioural and environmental factors.

RESEARCH 03

Case Study: Accuracy Rate of the Portuguese Life Saving Federation Drowning Observatory, which collects data from press reports

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This case study analyzes the accuracy rate of the Drowning Observatory, an initiative of the Portuguese Life Saving Federation (FEPONS) that collects data on drownings in Portugal, based on press reports. Comparing the Observatory's data with the official data released by the Portuguese National Institute of Statistics (INE), which are published with a two-year delay, for the period from 2018 to 2022.

The main difficulty faced by the Observatory was to ensure the reliability of the data collected, given that press reports do not always present complete or accurate information. To mitigate this challenge, FEPONS implemented measures such as the use of Google Alerts clipping alerts, cooperation with the Portuguese National Maritime Authority, the creation of a Facebook page for the public to send information and the quarterly publication of monthly reports and status updates to the press.

The results reveal a high level of accuracy in the data collected, ranging from 94% to 100%, with an average of 97%. The analysis also identified false positives in 2022, representing 4% of reported incidents, while in other years no false positives were recorded. This variation may reflect the Observatory's inability to access the causes of deaths.

It is concluded that the Drowning Observatory is an effective and rapid tool for monitoring drownings in Portugal, complementing official data and contributing significantly to public awareness and the implementation of more effective preventive strategies.

RESEARCH 04

Economic burden and costs of drowning in Costa Rica and North America

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Surf-related drowning fatalities are recognized as a serious public health issue in Costa Rica. Using data obtained from the Costa Rican Judicial Investigation Department, this study estimates the long-term economic impact of surf-related drowning fatalities based on the Value of a Statistical Life Year (VSLY) and an estimate of the direct costs associated with search and rescue, emergency services, and postmortem care. Between 2001 and 2022, surf-related drowning fatalities in Costa Rica resulted in a direct cost (DC) of >$2.0 million per year (USD) for search and rescue, >$87k/yr in costs to the families for repatriation (R) of the deceased, and a long-term economic burden (VSL) of ~$100 million per year. On average, each drowning in Costa Rica results in a >$2 M cost (VSL+DC+R), which provides a benchmark to assess the net benefit of educational and legislated initiatives (e.g., lifeguards and warning systems) to reduce the number of surf-related drowning fatalities in the country. Additional data is presented from the Great Lakes Region of North America, where the average annual economic burden is estimated at ~$105 million per year (USD).

RESEARCH 05

Economic burden of child drowning in Viet Nam

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Background: Drowning is the leading cause of death among children aged under 16 in Viet Nam, claiming nearly 2,000 lives annually, and imposing significant social and economic impacts on families and society. Understanding the economic burden, including both direct and indirect costs, is essential for assessing its impact on the country. This study aims to estimate the economic burden of child drowning in Viet Nam and inform policy and resource investment.
Methods: The economic burden analysis of child drowning utilized a “cost of illness” framework, considering both direct and indirect expenses. Therefore, we use a mixed-methods approach to estimate various costs of child drowning. Direct costs include expenditures related to child raising before their drowning, covering both parental and public expenses. Indirect costs, assessed using the human capital approach, represent the long-term economic losses associated with premature death, including future earnings and the productivity loss of family members. We combined data from national household surveys, health and education statistics, and drowning incident records to conduct our analysis.
Results: The economic burden of child drowning in Viet Nam was estimated at 15.5 trillion VND (617 million USD), with the highest costs among the 0-4 age group, which experiences the most fatalities and the most significant potential loss in future income. Regional disparities were observed, with urban areas like Hanoi and the Red River Delta region facing higher costs due to their developed infrastructure and greater per capita income. In contrast, rural areas, particularly in the Northern mountainous regions, reported lower economic impacts, reflecting different economic conditions rather than a lower number of drowning cases.
Conclusions: This study emphasizes the substantial economic consequences of child drowning in Vietnam, especially among children under 4, and the need for targeted prevention interventions. It reveals the importance of accounting for both direct and indirect costs in shaping public health policy. Future research should consider broader societal impacts, such as long-term psychological effects, and assess how economic disruptions and drowning affect families and communities.

RESEARCH 06

Survival rate and characteristics of aquatic incidents in major Danish harbours a registry-based pilot cohort study: from 2016 to 2023

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Background:A recent study reported significantly increased mortality from drowning-related out-of-hospital cardiac arrest in Danish harbours compared to other public places. To improve our understanding of why drowning occurs, examining the events leading up to these incidents is essential. Whereas a drowning patient must experience some degree of respiratory impairment, an aquatic incident is defined as “any adverse water-related event that requires external support, such as assistance or a rescue” [1]. Crucially, an aquatic incident does not progress into a drowning event, and analysing aquatic incidents provides an opportunity to address the gaps in current data.

Methods:
This registry-based pilot cohort study analysed aquatic incidents in the three major Danish city harbours from 2016 to 2023 by searching electronic prehospital patient records utilising the Danish Drowning Formula on unrestricted terms to identify all water-related incidents registered in the electronic prehospital patient records from 2016 to 2023. The main objective was to identify the number of aquatic incidents, the 30-day survival rate, and the non-fatal-to-fatal ratio. The secondary objective was to describe associated risk factors (e.g., activities, precipitating factors, demographics, and temporal variables).

Results: In total, 326 aquatic incidents were identified (76% in Copenhagen, 21% in Aarhus, and 3% in Odense). Three patients died within 30 days, while 323 survived, resulting in a 30-day survival rate of 99% and a fatal to non-fatal rate of 108:1. Several factors were associated with aquatic incidents: Male vs female sex (58% vs 29%), Morning vs afternoon vs night (12% vs 26% vs 59%), non-witnessed vs witnessed (16% vs 38%). In total, 48% of patients were unintentionally in the water, 23% of patients were swimming, and 14% of patients attempted suicide.

Conclusion: Aquatic incidents in the three harbours had a high survival rate. Incidents occurred more often among males, at night, and patients were more often unintentionally in the water. Electronic prehospital patient records enable precise incident mapping and targeted prevention.

RESEARCH 07

Drowning deaths in Spain. A decade of the National Drowning Report

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Background
In Spain there are no official drowning registers that publish up-to-date data. The only official register publishes its data two years after the incident occurs, which makes it difficult to implement actions adapted to each moment.
For this reason, in 2015 the Royal Spanish Lifesaving Federation launched the National Drowning Report, which compiles information on fatal drownings in our country with the aim of:
Provide accurate, immediate and systematic information on drowning deaths that occur in Spain.
To know the existing differences in drowning deaths in Spain according to different parameters (age, sex, facility, existence of surveillance, place, date...).
To analyse the evolution of drowning deaths in Spanish aquatic areas between 2015 and 2024.

Method
Using Google alerts and other sources, information is collected from digital and written press on drowning incidents. The data are classified and analysed according to different parameters (age, date, time, sex, nationality, facility, place of the event, existence of a lifeguarding service, activity carried out, victim's factors and public or private space) after which a monthly report is published. At the same time, the data is updated daily in an application created for this purpose that can be consulted by anyone.

Results
In the last decade, at least 4,025 people have lost their lives by unintentional drowning in Spain, with the victim profile being that of a male (79.8%) of Spanish nationality (68.2%), over 45 years of age (60.1%) who died on unsupervised (66.5%) beaches (51.1%).

Conclusions
Despite having up-to-date and accurate data, public administrations have not implemented any initiative aimed at reducing the number of drowning deaths in Spain.
The dissemination and initiatives implemented by the Royal Spanish Lifesaving Federation have not had the desired impact on the data on drowning deaths in our country.
This facts highlights the need for the implementation of a State Aquatic Safety Strategy.

RESEARCH 08

Results of Drowning Prevention Programs in Inland Waters

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INTRODUCTION:
The *Firefighter in Schools Program* (FSP), which includes education on drowning prevention for children aged 10 to 15, is considered the most far-reaching program in the State of São Paulo. The objective was to evaluate the number of students reached by the PBE in correlation with the reduction of drowning incidents attended by the São Paulo Fire Department (CBPMESP).

METHOD:
This was a descriptive study using data from CBPMESP's Operational Data and Public Education System. Both descriptive and inferential analyses were conducted for the period from 2018 to 2024. Drowning incidents that occurred in locations such as rivers, lakes, dams, and pools—where no lifeguards were present and reactive rescue was required—were correlated with the number of students trained through the FSP during the same period. The FSP provides students with a 50-minute class on drowning prevention practices for both domestic and public settings. All data were analyzed using Jamovi®, with statistical significance set at $P<0.05$.

RESULTS:
Over the seven-year period (2018–2024), 3,919 drowning incidents were recorded, with 65% (2,549) resulting in on-site fatalities. During the same period, CBPMESP trained 354,564 students through the FSP. The program was implemented in all regions where drowning incidents were reported. There was an 18% decrease in drowning cases responded to over this time (from 633 in 2018 to 523 in 2024), showing a moderate inverse correlation of -0.31 ($P=0.032$) with the number of FSP graduates.

CONCLUSION:
Although education-based prevention is widely recommended as a key tool in combating drowning, there is a lack of global studies providing scientific evidence of its effectiveness. This study demonstrates that fewer drowning incidents occurred in areas where a greater number of students received drowning prevention education through the FSP. However, other factors may have contributed to these results. Further studies are needed to determine whether additional variables influenced the observed outcomes.

RESEARCH 09

3x more drownings during UK heatwaves - The impact of extreme weather – The UK National Water Safety Forum's collaborative and evidenced based approach

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Background:
The National Water Safety Forum (NWSF) released research on 30th July 2024 showing a concerning relationship between increases in accidental drowning deaths when warmer weather hits the UK – urging people to Respect the Water and stay safe.
The collaborative PR moment was an example of multisectoral partnership working between lifesaving charities and academia, underpinned by two independent pieces of research, one (1) by the Royal Life Saving Society UK (RLSS UK) and another (2) by Bournemouth University . Both concluded that significantly more people lose their lives to accidental drowning in the UK during periods of hot weather.
Key Findings:
• When UK average maximum air temperatures reach or exceed 25°C, there is a fivefold increase in accidental drowning risk when compared to days with an average of 10°C.
• Three times as many accidental drowning fatalities occur on days when air temperatures reach 25°C or more, when compared to the seasonal average."
• 57% of those who accidently drowned on days exceeding 25°C were swimming, almost three times higher than average . Teenagers and young adults are proportionately more likely to lose their lives.
• The PR moment coincide with hot weather, facilitated by NWSF spokespeople and families with lived experience.
Public Awareness & Impact:
The PR campaign, led by NWSF spokespeople and families with lived experience, coincided with hot weather to maximize impact. It achieved:
• 38 media interviews on major channels (e.g., Good Morning Britain, ITV News).
• Total reach of ~55.5 million people.
• 1,384 additional media items across 346 stations
• Sadly media coverage of the story was understandably muted due to the 29th July Southport tragedy – but there is clearly media appetite for this type of story in future
Conclusion: With clear evidence linking heatwaves to increased risk of drowning, proactive prevention efforts should be implemented to improve drowning related health outcomes ahead of UK heatwaves. 2025 was the warmest UK summer of record with four official heatwaves, but as forecasters predict extreme weather events such as heatwaves are likely to increase in frequency, we must ask ourselves the difficult question, are we doing enough?

RESEARCH 10

Risks associated with unintentional fatal drownings in limnic environments in the state of Santa Catarina: a case study on the Hydrographic Regions at Baixada Norte and Vale do Itajaí

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Given the cases of unintentional fatal drownings recorded in Santa Catarina (SC), this research raised the following problem: how to understand and identify the risks associated with them in the state? The objectives were to select the two Hydrographic Regions (RHs) where the majority of cases occurred during the period studied, analyze variables from the database of occurrences recorded by the Military Fire Department linked to cases of drowning in these RHs and relate the locations of occurrences with the river hierarchy (2) (5) and the classification of river beds (1) (3). The free geoprocessing software Quantum GIS (QGIS) was used to spatialize the occurrences and their main characteristics. The relationship between river hierarchy and classification of river beds was carried out using files in Shape File format from aerial photogrammetric surveys of SC. A total of 341 occurrences were found. RHs 6 (Baixada Norte) and 7 (Vale do Itajaí) presented the highest rates of occurrences in the study. Among RHs 6 and 7, the cases that occurred in the municipalities of Joinville, Jaraguá do Sul (RH 6), Itajaí and Navegantes (RH 7) stood out. Male individuals in the young age group are the most vulnerable to drowning. For the majority of cases, the association of the occurrence locations with the river hierarchy with a classification equal to or greater than 3 was identified. The beds of the well-rapids and undulating types with dunes and ripples were those most associated with the cases of the two aforementioned RHs. The greatest dangers regarding drowning in these cases are related to the depth of the mapped locations (4).

RESEARCH 11

Working towards improving safety at waterfalls

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Waterfalls are a unique geological formation that attract millions of visitors each year to view their beauty, climb them and swim around them. While many are familiar with the risk of other water locations, waterfalls are somewhat of an enigma with limited research despite a number of injuries and deaths over the years. This paper explores the risk, risk factors and prevention of deaths related to waterfalls.

Methods

This case series exploration of incidents at waterfalls uses a thematic approach[1] to provide information about risk, risk factors, severity and prevention. A search of online and social media were undertaken to find cases of people injured at waterfalls.

Results

Full results will be presented at the conference. Preliminary analysis shows that falls - while taking selfies, climbing and slipping on rocks are common, as is being caught in dangerous currents. Often these incidents occur away from emergency services and there is no lifesaving service present. Signage appears to have limited effect. Males appear to be more likely to be involved. In Australia, waterfalls also are often linked to First Nations culture, and there is a need to explore this in more detail. Some falls appear to have more incidents than others, for example, Wappa and Josephine falls in Australia.

Conclusions

Waterfalls are dangerous because of their unique geological features where the water cascades over hard rock into softer rock and carves out a plunge pool, that then flows down the river. Due to the high volume of water, rocks and other debris often move, changing the depth of the pools and creating currents that can push and hold people under water. There appears to be limited understanding of the risks around waterfalls and they are often promoted as destination locations for tourists. With waterfalls often in remote places, rescue and emergency services can take an extended time to reach people in trouble. Further work is required to understand the risk, people's attitudes, what people do at waterfalls, how long they spend there, what safety knowledge they have and what safety strategies work to prevent future incidents, including around people taking selfies.

RESEARCH 12

Development of a Drowning Research Agenda in the USA

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Background: Few current drowning prevention practices in the U.S. have received adequate evaluation. The U.S. National Water Safety Action Plan (USNWSAP) identified the need for a Research Agenda outlining priorities for drowning research that include evaluating current practices and produce evidence to guide best practices and support the development of minimum standards. Using the outputs of the six working groups that contributed to the USNWSAP and a national summit on child drowning prevention research held in 2022, agenda development began in 2024 and will launch in summer 2025.
Description: The development process involved: 1) formation of a multi-disciplinary/multi-sector working group whose objective was to synthesize the outputs and prioritize the list of applied research questions that will provide necessary evidence to move drowning prevention forward and 2) establishment of a drowning research interest group as part of the Society for the Advancement of Violence and Injury Research (SAVIR). The working group reviewed and discussed the proposed research questions, addressed major gaps, and prioritized the final list using a scoring rubric that assessed answerability, fundability, importance to advancing the field, and potential to impact inequities. Members of the drowning research interest group will discuss the final list at the SAVIR conference in April 2025 and feedback will be used to finalize the agenda which will be launched in summer 2025.
Lessons Learned: Observations to date highlight the lack of a common language across drowning prevention sectors, tension between public health and aquatics fields despite a common goal, the need to build consensus around the concept and facets of water competency, challenges in deciding “what is a chicken and what is an egg”, lack of drowning research funding, the need for further advocacy, the relative isolation of researchers who work on drowning research, and limited opportunities to present drowning research. Additional lessons learned during the second half of development will also be shared.
Conclusions: This activity will be useful in moving the U.S. toward its drowning prevention goals, advocating for increased funding, and engaging researchers across the country.

RESEARCH 13

Evaluating the Effectiveness of the Community Knowledge Approach in Capturing Fatal and Non-Fatal Drowning Events: Validation Study within the Sustain Drowning Prevention Project.

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Background: The Community Knowledge Approach (CKA) is a low-resource method for measuring death rates in low-and-middle-income countries (LMICs), relying on community leaders to identify deaths. However, its validity for capturing drowning, both fatal and non-fatal, remains unestablished. The Sustain Drowning Prevention Project (Sustain DP) utilizes CKA to measure drowning burden in West Bengal. This study aims to validate CKA for fatal and non-fatal drowning by comparing it to a household survey, the gold standard in low-resource settings.
Methods: A household survey will be conducted across Sustain DP study areas to identify fatal and non-fatal drowning cases. Results will be compared to CKA data from the same areas. A McNemar χ^2 test will assess statistical significance, determining CKA's sensitivity (proportion of drownings captured) and specificity (accuracy in identifying drownings). Rates will be stratified and compared in rural and urban contexts.
Results: Data collection underway and findings will be available by May 2025. Drowning mortality and non-fatal drowning rates obtained through the household survey will be compared to those from CKA. McNemar χ^2 analysis will determine statistical significance and quantify sensitivity and specificity. Stratified rural and urban comparisons will also be presented.
Conclusion: This study aims to validate CKA as a sensitive and specific method for identifying fatal and non-fatal drowning in LMICs. Validating CKA will provide a low-resource alternative to household surveys, enabling broader application for drowning surveillance and intervention planning in resource-limited settings. This method could significantly improve the availability of drowning data, informing public health strategies and resource allocation for drowning prevention.

RESEARCH 14

Establishing a Community-Based Routine Drowning Surveillance System Using Village Health Teams in Uganda: A project proposal

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Background: Four lives are lost every day due to drowning in Uganda. Many more individuals are affected by drowning disability and long-term trauma associated with drowning. There is limited awareness of the actual burden of drowning in Uganda, primarily due to inadequate record-keeping, resulting in many cases going unreported within communities. While the existing Health Management Information System (HMIS) of Uganda routinely reports some injuries such as those from road traffic crashes and violence, drowning is not reported. This national paucity of reliable data on drowning hinders targeted interventions. Evidence from a countrywide survey on burden and circumstances of drowning in Uganda showed that for every case reported to the police, about 14 remain unreported in the community, suggesting a gross underreporting. This project aims to establish a community-based drowning surveillance system to improve drowning data capture.
Approach: Community Health Workers, commonly known as Village Health Teams (VHTs) in Uganda, will use android-operated smartphones to report drowning incidents via the electronic Community Health Information System (eCHIS). The eCHIS was developed by the Uganda Ministry of Health (MoH) and partners.. We propose to add a module on drowning to this system that the VHTs will use to capture and report all drowning cases occurring in their communities The VHTs will be given a short questionnaire composed of a set of variables that form a minimum core dataset that can inform burden and prevention. This method will be piloted in three high-burden districts in Uganda.
Lessons Learned: This system is expected to improve drowning data quality and reporting, evidence of which can be used to inform scale up.
Conclusions: The eCHIS is an existing platform of the Uganda Ministry of Health. Integrating drowning surveillance into this system is potentially sustainable and at minimal additional costs. This will improve the understanding of the burden of drowning in Uganda.

RESEARCH 15

Scotland's Drowning and Incident Review Process

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Background
The Drowning and Incident Review (DIR) process is a data collection system that was created to help overcome limitations in data collection and data gaps in Scotland. The DIR process was created for Water Safety Scotland (WSS) by the Royal Society for the Prevention of Accidents (RoSPA) and the Scottish Fire and Rescue Service (SFRS) and has been extensively piloted and evaluated(1).
Description
The DIR process is supported by Search and Rescue organisations, public health and the Scottish Government and has been running successfully since its launch in May 2023. The process ensures that after each accidental water-related fatality, a comprehensive review takes place to 1) gather relevant data that can be used nationally and locally in prevention efforts and 2) provide specific contextual recommendations that can help reduce the likeliness of future fatalities in the location.
Lesson learned
This paper will provide an overview of the DIR process, but more specifically, the data captured and the new insights that have been analysed. This previously uncaptured data provides important insights for WSS's future campaigns, projects and national strategy. The paper will also provide examples of recommendations that have been put in place in local areas of Scotland following the DIR process.
Conclusions
DIR is a sustainable and innovative process which gathers relevant data and intelligence in relation to a drowning incident. The process has already improved the evidence base in Scotland and provides real time insights into fatality data. The process assists WSS in its national and local aims – as outlined in Scotland's Drowning Prevention Strategy. The DIR process has strong potential to be adapted to meet the data and insight needs of other countries.

RESEARCH 16

Evaluating Aquatic Incident Reporting Templates for Non-Fatal Drowning Classification in Ontario

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Introduction: Drowning is defined as the process of experiencing respiratory impairment from submersion or immersion in liquid.[1] Drowning outcomes are fatal or non-fatal; in non-fatal drowning, the process of respiratory impairment is stopped before death.[1,2] Current non-fatal estimates exclude incidents where the individual received treatment at scene and did not pursue further medical care, those who visited a family physician, and those who did not receive treatment. This underreporting limits surveillance accuracy and prevention. This study evaluates the alignment of aquatic incident reporting templates from Ontario lifeguarded facilities with the World Health Organization (WHO) Non-Fatal Drowning Categorization Framework (NDCF) and Utstein-Style Guidelines to inform the development of a standardized reporting tool.[2,3]

Methods: A structured document review of seven aquatic incident report templates was conducted. Each template was assessed against 27 variables derived from WHO and Utstein recommendations using a 3-point scale (0 = absent, 1 = partial, 2 = complete). Variables spanned six domains: facility/context, incident characteristics, victim information, rescue/resuscitation details, initial condition, and outcome/disposition. Mean scores were calculated to evaluate completeness and consistency across templates.

Results: Substantial variability existed among templates, with consistent omission of drowning-specific data needed for standardized classification. While age, sex, and incident date/time were well captured (mean = 2.00), key drowning indicators were often missing. Fields such as face submersion (0.00), rescue method (0.14), time to rescue (0.14), and respiratory-impairment severity (0.14) were absent. Documentation of consciousness (1.43) and breathing status (1.00) was inconsistent. In response, a draft standardized aquatic incident reporting tool, also used to evaluate existing forms, was developed to improve completeness and alignment by embedding submersion, respiratory, and functional-outcome fields structured to mirror WHO and Utstein variables.

Conclusion: Current aquatic incident templates in Ontario, Canada are not yet suitable for consistent non-fatal drowning classification. Incorporating drowning-specific documentation, providing lifeguard training, and adopting a standardized tool are essential to strengthen pre-EMS data collection. Future directions should assess the feasibility of this tool in real-world aquatic settings, ensuring standardized definitions respect operational constraints while complementing research needs. These steps will enhance international alignment and support equitable, evidence-based drowning prevention strategies.

RESEARCH 17

Viet Nam Government Investment in Child Drowning Data and Surveillance System.

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Background: Vietnam reports approximately 30,851 injury-related deaths annually, with drowning accounting for 4,237 cases (13.7%). The national drowning mortality rate (4.28 per 100,000) exceeds both the global (3.8) and Western Pacific regional averages. Children under 15 years bear the greatest burden, with 1,770 deaths (41.7%). Mortality is highest among those aged 0–4 years (8.16 per 100,000), followed by 5–14 years (6.96), both surpassing global rates. A marked gender disparity exists in the 5–14 age group, where boys have a rate 2.2 times higher than girls (9.72 vs. 4.23).
Description: Child drowning surveillance in Vietnam is based on two main systems. The health sector's A6 Death Registration and Recording System involves over 10,000 commune health stations and 34 provincial health departments reporting quarterly to the Ministry of Health, capturing demographic and incident data. Complementing this, the Child Database System of the former Ministry of Labor, Invalids and Social Affairs documents all child deaths under 16 years, providing contextual information on family conditions, social status, and supervision. Additional data are gathered through verbal autopsies and cross-sectional surveys from academic and local agencies.
Lessons learned: Key strengths include a comprehensive data collection network from central to grassroots levels, strong inter-ministerial collaboration, and the use of data to inform policy and interventions. Limitations: Challenges include incomplete or poor-quality data, particularly in rural areas, limited capacity of local data collectors, inconsistent age classifications between ministries, and disruptions from COVID-19.
Conclusions: Vietnam's proactive leadership has established a robust child drowning surveillance system. To strengthen impact, improved training and oversight at the community level are needed, alongside integration of existing databases into a unified National Database of Children, particularly following the merger of MOLISA into the Ministry of Health in 2025.

RESEARCH 18

Speed dating for researchers

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Research has been an essential instrument during the last 25 years that has allowed drowning reduction. Initially, many individual researchers, and those interested to crack drowning research nuts, have been able to contribute with significant projects and papers. The installation of the International Drowning Researcher's Alliance (IDRA) has been a milestone event to create a hub for these individual researchers. Their members have been, and still are, part of the backbone of the drowning researchers in the world. One of the consequences of all their efforts are that reducing drowning is inspired by evidence and has evidence-based grounds.
Within the domains of drowning epidemiology, prevention, rescue and treatment, research in the field of rescue lags, certainly when considering the very large number of people and financial investments involved in the practice of rescue. This also includes lifesaving in a broader sense.
With the installation of the International Life Saving – Lifesaving Academy, the opportunity is created to explore the opportunities to contribute to building a formal academic basis for academic research related to rescue and lifesaving.
This session is a try-out to understand if there is a need for more research related to rescue and lifesaving; and if so, if an organization-based hub can be developed.
The formal structure of the session includes a lecture by IDRA on the status of drowning research; several lectures where academic professors provide key data on them research; a summary of research questions by the ILS Commissions and Committees; and an interactive speed dating between universities and lifesavers with research ambition and universities: and a panel discussion to explore how academic institutions drown. related research assignment can collaborate
The intended outcomes of the session are:
• Understanding if the ILS-LA can start initiatives to start developing an academic hub for university departments involved in rescue and lifesaving research that may also benefit the international lifesaving community
• Link research-interested lifesavers to universities to become involved in rescue and lifesaving research
• Create a go-no go moment for the research-oriented branch of the ILS-Lifesaving Academy.

Swimming

SWIMMING 01

Integrating Water Safety into the National Curricula (Workshop 2)

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The World Health Organization (WHO) recommends incorporating swimming skills and water safety training into national curricula for children aged six and older. Drowning is a major cause of death, with WHO's Global Health Estimates (2021) ranking it as the fourth leading cause of death for children aged 1–4 years and the third for children aged 5–14 years. Among young adults aged 15–29, it is the 12th leading cause. Despite its significance, only 22% of countries include water safety in their curricula, and 36% offer such programs at a subnational level. Over a third of countries report no interventions at all (1).

At the WCDP 2023 in Perth, we held the first workshop on "Water Safety in the National Curricula," with 26 countries represented and over 70 participants. During this event, we launched the survey research project "Assessing the Role of Water Safety in the National Curriculum," which collected data from 28 countries. The survey examined how, when, and where water safety education is integrated, what subjects cover it, and who funds it. It also analyzed how curriculum content aligns with 15 core water competence areas.

Water safety education occurs during regular school terms (79%), as after-school activities (11%), and/ or in vacation programs (11%). It is delivered in various settings, including pools (39%), classrooms (32%), both (25%), and open water (21%). The subject is primarily integrated within physical education (57%), with smaller amounts in health science (7%), environmental science (7%), and other subjects (21%). Most education is aimed at students aged 7–12 years (75%), followed by those aged 13–15 years (36%). Funding comes from government contributions (44%), school budgets (26%), private sector support (15%), and other sources (37%).

The second workshop will build on previous efforts to integrate water safety education into national curricula. By presenting findings and fostering international collaboration, we aim to advance drowning prevention strategies and enhance access to water competence programs. We aim together to find various solutions to challenges in water safety education in schools, tailored to different needs worldwide.

SWIMMING 02

Perception of water competence and actual competence in 4 to 6-year-old children: a study using the ***Safer in Water*** teaching methodology.

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Background:
Drowning remains a leading cause of unintentional child deaths globally (1), with fundamental aquatic skills considered essential for prevention (2). The *Safer in Water (SIW)* methodology (3) integrates 15 essential aquatic competencies, as outlined by Stallman and colleagues (4), to promote skill development and drowning prevention. Given that children with a more accurate perception of their abilities make safer decisions in risky situations (5), this study investigated whether the *SIW* methodology enhances children's perception of their aquatic competence.

Methods:
Fifty-three children aged 4 to 6 years (MeanAge=5±0.81) who had been learning swimming with the *SIW* methodology for at least 12 months participated. They were first asked to predict their ability to perform nine aquatic skills: jump into deep water, rotate vertically 180° after the jump, swim 4m to a safe point, maintain a vertical position while counting to ten, jump into the water followed by 15sec dorsal flotation, swim "dog paddle" for 4m, swim underwater for 6m, collect objects from the surface while changing direction, rotate longitudinally between ventral and dorsal positions. A week later, their actual performance was assessed in a pool to evaluate the accuracy of their predictions.

Results:
Children's predictions of their aquatic abilities were mostly accurate, except for two skills. Only 52% accurately predicted their ability to swim underwater for 6m ($p < 0.001$, McNemar), and 74% correctly predicted their capability to change direction while swimming, though a significant difference between prediction and real ability remained ($p = 0.022$, McNemar). For the other seven skills, most of the children correctly predicted their actual performance, showing no significant discrepancies between predictions and actual abilities.

Conclusions:
The *SIW* methodology promotes children's ability to accurately perceive their aquatic competence, particularly in basic water safety tasks. However, skills requiring endurance and physical effort remain challenging for self-assessment. Compared to other teaching methodologies (5), children learning through *SIW* demonstrate a more accurate prediction of their capabilities. These findings highlight the importance of refining aquatic safety education programs.

SWIMMING 03

Swimming or Aquatic Competence: Are We Providing the Correct Concept to Our Swimming Students in Preventing Drowning?

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Introduction: One of the most publicized tools as a solution for drowning is “learning to swim.” Either a misunderstanding or a strong conflict of interest exists which in some cases has an opposite effect. Recent scientific evidence has revealed important facts to be considered such as adjusting for exposure because person-time estimates for drowning are 200 times higher than from traffic incidents[1]; no one has a drowning proof vest since the risk is present even in high level water competence individuals.[2] It is clear that swimming competency acquired in a pool does not directly relate to other scenarios[2] and may promote the “Peltzman effect”[3] increasing drowning events. The objective is to establish a better understanding of the role swimming plays related to drowning prevention.
Method: Professionals with experiences related to drowning have debated the question of whether scientific evidence was in line with the daily reality of those who teach swimming with the purpose of preventing drowning. This debate occurred over a period of 1 week at the international swimming meeting in São Paulo, Brazil(October-2024).
Results: Figure 1, a pictogram, shows the “Water competence components for swimming education, considering different water scenarios and their levels of risks”.
Conclusion: Swimming competency[4] may help to reduce the risk of drowning as long as personal competency is not overestimated. It is essential that children and parents recognize risks, establish behavioral limits, and respect their individual water competency. False confidence may be generated among parents whose children have acquired the fundamental competence to float, swim, and/or pick up submerged objects in a pool which may be extremely dangerous in the sea or rivers. Pool swimming classes may sometimes be too complex and ineffective to prevent drowning in natural bodies of water. It may have a negative impact on the child's psychomotor, socio-affective and/or cognitive development, and could lead to Post-Traumatic Stress Disorder or even death. A complete message to promote swimming learning is essential: Learn to swim, respect your limits, recognize the risks, learn how to avoid the risks, and learn how to rescue others without becoming a second drowning.

SWIMMING 04

Assessing Achievement of Independent Water Competency in Young Children

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Background: Evidence has suggested that participating in swimming lessons may reduce drowning among young children (ages 1-5 years)[1]. We examined both minimum and mean ages at which young children demonstrated components of unsupported water competency (without parent/instructor assistance or flotation). We assessed the degree of improvement associated with different numbers of formal group swim lessons using two different samples.
Methods: Study sites included agencies offering swimming lessons which enrolled young children in instructional programs offered by a nationally recognized organization. In study one, young children completing four-to-eight 30-minute formal group swimming lessons were included in the sample (n=45) while study two included children who completed between 12-18 lessons (n=27). We categorized pre- post-lesson performances on developmental levels for components of water competence[2,3].
Results: We observed significant improvements from pre-test to post-test across water competency components in both projects. In study one, we observed unsupported water entry and water exit behaviors at the youngest age category of 1-1.9 years. The youngest age category during which we observed unsupported breath control, back flotation/buoyancy, and changing body orientation behaviors was 2-2.9 years old. The greatest component improvement occurred in water exit followed by breath control. Importantly, most young children did not achieve unsupported water competence except in water entry and exit. Children did achieve more advanced unsupported behaviors as age increased. Children enrolled in more lessons (12-18) acquired more advanced levels of water competence than children in fewer lessons (4-8).
Conclusion: Although swimming skills improved in both studies, more research is needed to determine the optimal number of swimming lessons and the best instructional strategies for teaching lessons to young children to reach unsupported water competency levels[4,5].

SWIMMING 05

Evaluation of Protective Drowning Prevention Skills in a Decision-Making Scenario: Introduction to the ALFAC 'Parcours'

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Background: Assessing children's protective aquatic skills is a key objective of the Aquatic Literacy For All Children (ALFAC) project. The model of Stallman et al. (2017)[1] highlights fundamental aquatic skills (FAS) essential for protecting children from drowning. Additionally, information processing while moving in the aquatic environment is critical for water safety. Therefore, evaluating the ability to combine FAS with real-time information processing (i.e., visual and auditory information-taking as well as decision-making) is essential to determine children's ability to cope with various drowning scenarios[2]. This study aims to identify differences between boys and girls aged 6-7, 8-9 and 10-12 years across six European countries (i.e., Belgium, France, Germany, Norway, Poland and Portugal) in their ability to perform a combined aquatic skills task test while making real-time decisions.
Methods: A total of 617 school-aged children (46% girls) from six European countries participated in an aquatic combination task test: the 'Parcours'. The test combines six FAS (i.e., entry into the water, treading water, swimming on the belly, back, underwater, and exiting the water) with visual and auditory information processing and in-action decision-making. Performance in each task was assessed on a binary scale (i.e., succeed vs. failure) using predefined criteria validated by internal and external experts (ALFAC Manual[3]). A generalised linear model was used to analyse the effects of sex, age and country, along with their interactions on the children's 'Parcours' performance ($p<0.05$).
Results: The overall success rate across the various aquatic skills tasks within the 'Parcours' was high (90%). The most challenging tasks required a combination of motor, psychological and cognitive competencies, particularly treading water while processing visual information and making real-time decisions. While no sex effect was observed, children's performance differed significantly by age ($p<0.01$) and country ($p<0.001$) in these more complex tasks.
Conclusion: The ALFAC 'Parcours' test appears to be a highly informative tool for assessing children's ability to integrate FAS with real-time information processing and decision-making in an aquatic environment. Implementing a common assessment test across multiple countries could help to identify strengths and weaknesses in global water safety education, ultimately informing and improving swimming instruction worldwide.

SWIMMING 06

Environmental constraints: a comparative analysis of children's swimming competence in different aquatic environments

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Background and purpose: This study investigates how children's swimming competence transfer from calm and controlled indoor swimming pools to a dynamic open-water environment. With activities in, on and around aquatic environments being integral to recreation and sports worldwide, the risk of drowning underscores the need for effective preventative measures. This research, grounded in an ecological dynamics framework, explores how swimming competence in one setting correlates with performance in another. By assessing 9-10-year-olds' competencies across swimming pool and open-water conditions, the study investigates the relationship between these environments and improve aquatic education strategies. The purpose is to enhance understanding of water competence and inform practices for diverse aquatic scenarios.
Methods: This study employed a paired repeated measures design with 198 children conveniently sampled from three primary schools. Participants were assessed in both an indoor swimming pool and an open-water lake using the Swimming Competence Assessment Scale (SCAS). This scale, developed to align with the competence objectives outlined in the Norwegian physical education curriculum, evaluated six aquatic skills: water entry, front crawl, surface dive, floating/resting, backstroke, and water exit.
Findings: Significant differences were found between the two aquatic environments, with nearly half of the children competent in indoor swimming pool failing to demonstrate the same competence in the open-water lake. Key environmental factors such as water temperature and visibility impacted performance, particularly in tasks such as water entry, surface diving, and swimming on the back.
Conclusion: These findings suggest that, while indoor swimming competence is crucial, it does not necessarily transfer positively to open-water proficiency due to the dynamic and unpredictable nature of open-water environments. The study highlights the need for comprehensive aquatic education programs that incorporate environmental variability to enhance children's water safety skills and competence. By understanding how environmental constraints affect swimming performance, this research inform the development of more effective training interventions and safety guidelines prepare for real-world scenarios, ultimately contributing to drowning prevention efforts.

SWIMMING 07

Water Competency Integration into the Finnish Education System

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Finland, with a population of 5.6 million and an area of 338,000 square kilometres, is home to over 188,000 lakes. Swimming skills are a key public health concern, as studies show that 55% of sixth-grade students can swim at least 200 meters, including 50 meters on their back. Drowning remains a significant issue, with the World Health Organization (WHO) reporting a drowning death rate of 2.1 per 100,000 population in 2021 (1). The Finnish Swimming Teaching and Lifesaving Federation (FSL) is crucial in training swimming instructors and maintaining drowning statistics.

Finland has a long history of swimming instruction, adopting the Nordic swimming ability definition in 1996. A 2017 literature review (2) on water competency marked a shift in understanding aquatic skills, but the difficulty of measuring it slowed its implementation. A major advancement came in 2020 when FSL revised its instructor course materials to include water competency, covering 15 areas of competence. National training sessions were held between 2020 and 2024, and in 2023, discussions began to integrate water competency into the Finnish education system.

FSL has long collaborated with the Finnish National Agency for Education to develop curricula. The initiative to incorporate water competency began by creating a 10-level model to progressively develop skills, knowledge and attitudes. The next step was to review existing curricula, like those for early childhood and basic education, to identify where water competency concepts were implicitly present.

The 10-level model was then aligned with key learning objectives in the curriculum, particularly for early childhood education and various grade levels. A task force, including FSL representatives, university lecturers, swimming instructors, and a physical education teacher, led this work. The project was communicated through webinars, expos, and professional development events, with the goal of publishing new recommendations for school swimming education in 2025.

The ultimate aim is for water competency to be recognized in national educational guidelines. This initiative demonstrates significant progress even before official curriculum changes, inspiring hope and highlighting practical steps to improve water competency education within the current system.

SWIMMING 08

A creative, innovative, 'evolved' approach to teaching a critical life (saving)-skill in South African Primary schools – teaching drowning prevention

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21st century education has changed beyond recognition. Virtual teaching, flipped classrooms, ungrading, collective syllabi and the teacher as learner are concepts that, for many traditionalists, are foreign terrain. There are calls for more creative, critical and 'evolved' approaches and newer schools of thought, further pushing the boundaries of how we conceive knowledge and its application. Every discipline is seeing more inclusive pedagogy, inverted classrooms and an ever-increasing emphasis on student agency. In this context, we have no choice but to assess how we think about teaching and learning. Are the methods we use to communicate knowledge relevant today? Do they engage the modern student, visual learners and the social media generation? While communication is a celebrated core skill in the humanities, and representation is central to disciplinary practice in the arts and design, communication and representation methods in teaching – our modes of delivery – still often go unexamined. In this context, schools and higher education institutions have a unique position and role. We are responsible for reflecting on how we operate as educators especially with the challenges we face in the digital age; in how critical thinking impacts society; what should be considered as core competencies of contemporary learning; what does it mean for notions such as community and citizenship; what impact changes are needed at policy level for it to be effective in teaching contexts and, importantly, what are the experiences of educators and students in how it is taught and learned?
This paper presents an innovative, 'evolved' approach to teaching a critical life (saving)-skill in South African Primary schools, towards advancing the SDG goal of good health and wellbeing. By effectively using multimedia, we present a creative and innovative Swim Program on Land (SpoL) using multimedia, specifically Animation and music. This intervention could potentially have a global impact, as poor countries could be transformed into safe swimming nations, at minimal cost. We use technology to effectively reduce the high death rate globally and we promote the inclusion of this best practice to integrate water safety and swimming education into school curriculum.

SWIMMING 09

Water Safety - Lifesaving education for school children

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The Norwegian Lifesaving Society (NLS)has been contributing incorporating of water safety, lifesaving, first aid and outdoor swimming at school's syllabus.This has resulted that since 2015 the syllabus at school in Physical education for school in Norway.
The syllabus includes water safety and lifesaving from 7th grade until the 10th grade. This gives the students the basic knowledge in water safety, lifesaving and first aid. The important aspect is that the fora of education takes place also in outdoor water environment. This also entails that an all year round activity outdoor is being conducted. In a country where we have 4 seasons and cold water, the students learns water safety and lifesaving in a very challenging environment. These changes in the school syllabus has given the NGOs working on drowning prevention the opportunity to share their knowledge with the school system. In some level NLS has been contracted to hold school education for some students in Norway. This has given us the opprotunity to have lessons in cold water immersion, lifesaving and first aid. Most importantly to equip students with risk assessment and how to have safe activities near, by and in the water. We have in our experience seen that the early education promotes a more responsible approach in water environment activities. They learn the skill to identify risk and mitigate this, so that they can create activitivies that are fun and safe. Furthermore they learn a lifelong knowledge by learning lifesaving water rescue, water safety and first aid. They learn the chain of survival and get this automated in their everyday life. The other aspect is that these children becomes ambassadors in drowning prevention and water safety.

SWIMMING 10

Integrating swimming into Bahrain's National Curriculum: A partnership between Royal Life Saving Bahrain and the Ministry of Education

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Background:
Despite Bahrain's island geography, 95% of children in government schools do not learn to swim, and no government schools have access to swimming pools. Recognising this gap, Royal Life Saving Bahrain (RLSB) and the Ministry of Education (MoE) have partnered to introduce swimming into the national curriculum. This initiative aims to equip students with essential water safety and swimming skills, reducing drowning risks and fostering a lifelong relationship with water-based activities.
Description:
The implementation will utilise existing hotel swimming pools and introduce a 25m inflatable sea pool, which will rotate between public beaches near schools without local swimming access. Lessons will follow an age-appropriate, structured curriculum delivered by qualified instructors, integrating both swimming competency and water safety education. Initial implementation will focus on pilot schools and children in primary education aged between 8 and 10 years. each receiving a 12 lesson swim for safety program. Children will complete a pre-test and post-test to create an evidence base which demonstrates the effectiveness of the program, with plans for gradual expansion. Key stakeholders include The Ministry of Tourism, Ministry of Transportation, schools, parents, swimming instructors, and local businesses supporting the initiative by providing low cost access to swimming facilities as a CSR initiative.
Lessons Learned:
Initial assessments highlight the logistical challenges of transportation, scheduling, and ensuring adequate supervision. However, early pilot feedback suggests that using existing hotel pools and mobile sea pools is a viable solution to the lack of dedicated facilities. Engagement with parents and school administrators has been crucial in addressing concerns related to cultural norms, safety and feasibility. In addition, a shortage of female swimming instructors nationally presents an implementation issue for female students.
Conclusions:
Introducing swimming into Bahrain's national curriculum has the potential to significantly enhance water safety and reduce drowning incidents. This partnership demonstrates an innovative approach to overcoming infrastructure barriers and provides a scalable model for other regions facing similar challenges. Future efforts will focus on expanding accessibility, upskilling and training additional instructors, and securing long-term sustainability through policy integration and stakeholder collaboration.

SWIMMING 11

Increasing capability for the delivery of water safety and swimming programs in schools across Queensland – moving away from traditional learn to swim programs

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Queensland, the 'Sunshine State,' is home to many beaches and waterways, making water safety education essential. With 880,000 students across 1,797 schools, including 575,000 in state schools, there is a significant opportunity to teach vital water safety skills [(1)]. However, over 40% of children leave primary school without meeting the National Swimming and Water Safety Benchmarks for 12-year-olds [(2)]. Although 98.7% of primary state schools offer a swimming program, fewer than 50% of schools offer programs to all year levels to include all students, with many schools opting for a single year level to attend a water safety and swimming program [(3)].
To address these challenges, Royal Life Saving Society Queensland (RLSSQ) has developed flexible water safety programs to improve student participation and skills. These programs integrate in-water and classroom-based activities, aligning with the National Swimming and Water Safety Framework (NSWSF) [(4)], Education Queensland requirements, and Royal Life Saving's vision.
Programs include:
Prep-Year 1: Royal Rescuers
Year 1-2: Head Out of Water
Year 3-5: Wet and Wise
Year 5-6: Junior Lifesavers
Year 7-8: Save Your Mates
Years 9-12: School Pathway
These programs build progressively, allowing students to develop key skills. The School Pathway program offers the opportunity for students to complete competency-based courses in First Aid, CPR, and Bronze Medallion, providing employment and volunteering pathways in the aquatic industry.
Traditional learn-to-swim programs (5 x 30-minute or 10 x 45-minute sessions) are difficult for schools to coordinate and fund, with travel, venue, and contractor costs creating barriers. Additionally, 52.5% of schools report at least one parent or carer opting their child out of aquatic programs. Schools need flexible, cost-effective solutions [(3)].
RLSSQ's adaptable programs require minimal equipment and can be easily modified to suit various aquatic locations, making them more accessible. Since implementing these models, RLSSQ has seen increased participation, with schools favouring scalable options that integrate seamlessly into the curriculum.
Embedding structured water safety education into schools is critical to improving swimming competency. RLSSQ's programs offer accessible, scalable solutions to financial and logistical challenges, ensuring more students meet essential water safety benchmarks and gain life-saving skills.

SWIMMING 12

Application of Systems Thinking for Swimming Lessons: Enhancing Drowning Prevention in Indonesia

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Background
Drowning is a leading cause of preventable child mortality in Indonesia, yet access to swimming lessons remains limited due to the complex and interconnected socioeconomic, geographic, and cultural disparities. A systems-thinking approach is needed to identify how to improve access to and delivery of swimming skills in Indonesia. This study aimed to utilise a systems approach to map factors influencing access and engagement with swimming lessons in Indonesia to reduce child drowning risks.

Methods
We used a case study approach, using a causal loop diagram (CLD)-based systems modelling, to identify socio-ecological determinants and analyse interdependencies around swimming lesson participation. Data were obtained through a scoping review of peer-reviewed and grey literature, policy documents, and government reports, along with focus group discussions with parents and community leaders in West Nusa Tenggara, a high-drowning-risk province. Data were thematically analysed using qualitative coding to identify key system elements, such as barriers, policy constraints, and community perceptions of water safety and swimming training. Relationships between these elements were then iteratively mapped to refine the CLD, capturing reinforcing and balancing feedback loops and enabling the identification of leverage points for potential interventions.

Results
Using the CLD allowed for a broader and more in-depth exploration of the enablers and barriers to swimming lessons. Increased local swimming facilities and instructors drive participation and further investment (Local Resources Loop), while school-based lessons, supported by funding and technical assistance, improve access to swimming training (Education-Participation Loop). Furthermore, community engagement helps to shift sociocultural attitudes, sustaining local program support (Community Engagement Loop). However, progress is often stalled due to limited financing, especially in rural areas, and social acceptance is often influenced by sociocultural values, including gender norms and fatalistic beliefs.

Conclusion
A systems-thinking approach provides a wider lens for exploring swimming lesson access and engagement. To increase child swimming skills in Indonesia, a range of intersectoral strategies will be required for long-term implementation, sustainability, and scalability, including integrating swimming lessons into school curricula, providing technical support, expanding education and awareness initiatives, investing in equitable participation programs to ensure inclusive access, particularly in underserved communities, and policy advocacy.

SWIMMING 13

Developing Physical Literacy of Portuguese Adolescents from the Lisbon Metropolitan Region through Blue Physical Activities and Sports: Study Protocol of "AquaPhyLit" Pilot Intervention

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Background: Physical literacy (PL) is a foundational concept in quality physical education, physical activity (PA) promotion, and long-term development in sports [(1,2,3)]. It encompasses developing human capabilities through healthy learning processes and interactions with various environments through PA and movement, including aquatic environments ("blue spaces")[(4,5,6)]. Promoting meaningful, healthy, and quality human-blue spaces interactions, aiming to develop PL, is relevant for active citizenship (e.g., drowning prevention, pro-environmental behaviours), health, and quality of life enhancement. Schools play a vital role in developing PL by providing equal educational opportunities[(7,8)]. This presentation describes the protocol for a PL school-based aquatic education intervention (non-randomised cluster trial) aiming to impact PL perceptions, water safety behaviours, and sustainability consciousness of adolescents – "AquaPhyLit".
Methods: Regarding protocol development, an "integrated knowledge translation" approach informed the co-design of the final intervention protocol. A first phase considered an extended literature review for protocol definition - version 1. The second phase is characterized by an application of semi-structured interviews to teachers leading the school sport nautical activities (SSNA) in the intervention school cluster to assess knowledge and perspectives on PL and nautical sports didactics. A theoretical-practical workshop on the same theme will follow. A third phase comprises the assessment and discussion on intervention options, content, and implementation possibilities through a focus group. The final version of the "AquaPhyLit" pilot intervention protocol will target school adolescents (age 13-18 years) participating in the SSNA (Surf, Sailing, Canoeing) of a school cluster of the Lisbon Metropolitan Region. A controlled school cluster with similar geodemographic features will be selected. The development of PL perception, drowning risk, and sustainability consciousness will be assessed at baseline, end of intervention, and in a follow-up (after "6 months"). Outcomes assessment will consider mixed methods research techniques for a deeper understanding of teaching-learning experiences.
Discussion: This Portuguese school-based aquatic PL intervention and the subsequent studies have the potential to support the discussion around the unification of different research and professional fields related to aquatics, encouraging paradigm changes for policy making on aquatic education, safety, and blue PA, as well as for the development of aquatic education and professional training programs.

SWIMMING 14

Comparison of Aquatic Literacy levels in European children aged 6-to-12-year-olds for safe and sustainable engagement in aquatic physical activity

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Background: Grounded in the Water Competencies[1] model and the Physical Literacy concept[2], Aquatic Literacy (AL) encompasses both drowning prevention and the promotion of lifelong engagement in aquatic activities by fostering motor, psychosocial, and cognitive competencies in individuals. Recently, the Aquatic Literacy For All Children (ALFAC) test battery[3] was developed to assess children's AL levels across Europe. This study presents the first comparison of AL levels among children aged 6-to-12-year-olds across six European countries (i.e., Belgium, France, Germany, Norway, Poland, Portugal), providing valuable insights to inform and enhance aquatic education programs.

Method: A total of 1,441 pupils (50% girls) aged 6-to-12-year-olds from six European countries participated in the ALFAC test battery. The assessment included a child questionnaire assessing psycho-social and cognitive competencies (motivation, enjoyment, confidence, risk perception, engagement in water sport, and self-perception) and aquatic tests designed to assess motor protective competencies (9 isolated tasks and a combined task test). Generalised linear models were used to analyse the sex, age, and country effects ($p<0.05$) with post-hoc analyses and effect sizes calculations (Cohen's *d*).

Results: The questionnaire results indicated no significant effects of age, sex, or country. Overall, children exhibit a strong motivation and enjoyment to learn swimming. Age effect was shown in the isolated aquatic tasks ($p<0.001$) with younger children (aged 6-7) demonstrating lower proficiency in treading water, submersion, and propulsion tasks. Country effect was shown ($p<2.14^{-7}$) on isolated task with low level in propulsion task in France and treading water in Poland, whereas high performance in belly propulsion in Germany. Despite 6-to-7-year-olds' high scores on motivation, enjoyment and confidence, their low level on isolated tasks may increase their drowning risk in swimming pools and also in open water.

Conclusion:
Empirical data on the AL level of children aged 6-to-12-year-olds in Europe, and analysis of the age, sex and country effects provide an understanding on the motor, psychosocial and cognitive competencies to develop to engage safely and sustainably in the aquatic environment. Cross-country differences in motor skills suggest variations in curricula or teaching methods. Sharing

best practices across nations could enhance water safety education and better protect children across Europe.

SWIMMING 15

Influence of body density and morphology on the energetic, mechanical, and perceptual demands of supine stationary immersion: characterising passive and active floating

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Introduction: Remaining afloat whilst passively or actively maintaining the airway (mouth and nostrils) above the water surface in a back float position (supine, face–out) is an effective survival strategy during stationary immersion (1). In a treading water position (upright, head–out), the energetic cost is influenced by the net load, principally attributed to body density (2–4). However, it remains unclear if this relationship holds for the back float position, which requires compensating for rotational torque (5,6). We hypothesised that the demands of supine immersion similarly relate to body density and morphology.
Methods: Twenty–four participants [12 males, 12 females; mean ± SD: age 36.1 ± 8.2 years, height 1.73 ± 0.10 m, mass 75.4 ± 14.0 kg, body fat 20.9 ± 7.9%] completed two supine floating trials in a pool (T_w = 29.1 °C): a 3–minute untethered, unstructured trial, followed by a 5–minute tethered, instructed trial. Body density (via underwater weighing) and composition (via skinfolds) were regressed against energetic, mechanical, and perceptual demands, with comparisons made between trial types and biological sexes.
Results: Body density was strongly related to VO_2 (R^2 = 0.637, $p < 0.001$), HR (R^2 = 0.552, $p < 0.001$), and movement volume (R^2 = 0.681, $p < 0.001$), but no other variables. These relationships were primarily attributable to the proportion of fat to fat–free mass (all $p < 0.001$). Male participants had denser body types, inferior floatation, and greater energetic and mechanical demands than females. Perceptions were not related to these physical variables yet were intercorrelated, reflecting interindividual variability in perceived workload demands. The tethered test demonstrated construct validity (p = 0.871).
Conclusion: Demands were related to body density and morphology, supporting the hypothesis. Males and individuals with denser body types relied more on active movement to maintain their airway above water, resulting in a more dynamic approach to floating compared with females, who predominantly floated passively. These findings highlight how morphological variations constrain the physical demands of survival, underscoring the importance of effective strategies and techniques, which afford a means to reduce the physical risk of drowning.

SWIMMING 16

Body fat has a greater influence on buoyancy and floating than bone mineral density in people of African, Caribbean and Asian heritage

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Background: In the UK, there is a long-held belief amongst people of Black heritage that they cannot float due to their greater bone mineral density (BMD). The aim of this research was to establish if BMD influences buoyancy or floating competence in people of African, Caribbean and Asian heritage.
Methods: Participants (43 men, 53 women) of African, Caribbean and Asian heritage gave their consent to participate in the ethically approved study. Participants completed a body composition dual-energy x-ray absorptiometry (DXA) scan, anthropometric (arm chest, waist, hip and thigh girths) and buoyancy measurements and were given instruction and support (30-120 mins) to float. They were filmed in an indoor pool at 30 °C, out of their depth, from four angles during a two-minute float. The float outcome (did not float/floated with [no/little/some/lots] of effort) was subsequently assessed.
Results: Mean [range] were: age 37 [19-60] years; BMI 27.7 [16.7-51.3] $kg.m^2$, BMD 1.2 [1.0-1.5] $g.m^2$, body fat measured by DXA (BF_{DXA}) 33 [16.0-57.8] %) or calculated from relative body fat equations(1), (BF_R) 30.6 [9.4-48.7] %). BMD was weakly correlated with float outcome (r = -0.297, p =0.003) and buoyancy (r = -0.292, p =0.004). There was a moderate correlation between float outcome and BF_{DXA} (r = 0.628, p <0.001) and BF_R (r = 0.585, p <0.001) and strong correlations between buoyancy and either BF_{DXA}, (r = 0.755, p <0.001), BF_R (r = 0.643, p <0.001) and float outcome (r = 0.683, p <0.001).
Floating was achieved with a horizontal, vertical or angled trunk, some required no movement (passive, men = 14, women = 45) whilst others needed to be active to stay afloat (men = 29 women = 8).
Conclusions: BMD has little influence on floating whilst body fat percentage is associated with both buoyancy and float outcome. Those with greater body fat are more buoyant and can float passively. Leaner individuals can float but may need to be more active (“active floating”). In the future, it is recommended that individuals practice a variety of floating techniques to identify the method that best suits them

SWIMMING 17

Combined effects of body position and movement mode on the economy, efficiency, and viability of maintaining the airway above water during active stationary immersion

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Introduction: Effective strategies during active stationary immersion are critical for survival (1), yet the optimal approach is unclear. Leg activity reduces cooling (2), supports cerebral blood flow (3), and may improve torso angle (4), whilst arm activity may better maintain the airway, with minimal energetic differences between modes (5). Body position may exert a greater influence, as the level of immersion influences load and energetic cost (6). We thus hypothesised that back floating with combined arm–leg activity would be optimal.
Methods: Body position ([U]pright 'treading water' vs. [S]upine 'back floating') and movement mode ([A]rm–only vs. [C]ombined arm–leg) were compared in a randomised and counterbalanced 2x2 factorial design. Fifteen male participants [mean ± SD: age 36.3 ± 12.2 years, body height 1.80 ± 0.05 m, mass 78.5 ± 8.5 kg, fat 13.1 ± 2.6%] underwent four vertically–tethered, 5–minute active stationary immersions (experimental conditions: UA, UC, SA, SC; T_w = 29.0°C). Measures encompassed energetic, mechanical, cognitive, and ergonomic demands.
Results: Position and mode significantly influenced economy and efficiency (all $p \leq 0.001$), with both greater in the supine and arm–leg conditions. Supine immersion reduced energetic cost versus upright (oxygen uptake –14.4 ml·kg^{-1}·min^{-1}, heart rate –12.5 beats·min^{-1}; both $p \leq 0.001$), aligning with mechanical unloading of 35.5 ± 3.4 N from dorsal head immersion ($p < 0.001$). Differences emerged between movement modes: arm–only lowered oxygen uptake (–3.2 ml·kg^{-1}·min^{-1}, $p < 0.001$), whereas arm–leg reduced heart rate (–7.1 beats·min^{-1}, $p = 0.009$). Efficiency patterns matched economy trends, with psychomotor and perceptual efficiency highest in arm–leg conditions. Completion rates were 53% (UA), 87% (SA), 93% (UC), and 100% (SC).
Conclusion: Our hypothesis was supported: SC was the most economical, efficient, and viable survival strategy. SC not only improved economy and efficiency but, importantly, ensured the highest trial completion rates. Arm–only activity was not viable for all and may increase submersion risk in denser body types. Accordingly, back floating with combined arm–leg activity is recommended as the optimal strategy for survival during active stationary immersion to be inclusive of this population.

SWIMMING 18

Does anthropometry explain the individual variation in floating ability?

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Background: People of different size, shape and body composition have different buoyancy properties, and thus there is considerable variation in human floating capacity [1]. As floating is such an important, foundational skill [2] the absence of a detailed analysis of the different anthropometric factors that influence floating is perhaps surprising. Such information would help inform individualised coaching [3] and other survival strategies (e.g., clothing, equipment) for those most at risk. The aim was to identify which anthropometric measures best explain the energy cost required to stay afloat.

Methods: 187 adults (18-65 yrs old, mean: 36.9 years; 88 male, 99 female) who self-reported that they could float unsupported in deep water volunteered to participate. Several anthropometric variables were determined from a full-body dual energy x-ray absorptiometry scan (Lunar iDXA, GE Healthcare, Madison WI, USA). Passive submerged mass and the position of centre of buoyancy was also measured whilst participants were lying supine in an adjustable weighing frame during full expiration of their lungs. Finally, participants completed an unsupported float in deep water for up to 3 minutes whilst energetic cost was measured through a snorkel and breath-by-breath analyser (Cosmed Quark CPET, California, USA).

Results: Some people could float motionless (14%, n=27) but the majority (86%, n=160) needed to move in order to keep their airway above the water surface. A simple multiple linear regression model tested how well anthropometric characteristics (i.e., mass, height, position of centre of buoyancy, percentage body fat, bone density) explained the variance in energy cost while floating (volume of Oxygen inspired: VO_2). The energy cost of floating was heavily influenced by anthropometry ($P<.03$, $R^2=0.73$) with the most influential factors that predict more efficient floating patterns being less body mass, higher percentage body fat, and a relatively lower centre of buoyancy.

Conclusions: Much of the individual variation in floating capacity can be attributed to anthropometric factors. This information can help identify vulnerable individuals and also provide guidance for them to improve floating ability. Future research should consider what remaining factors account for how well (economically) an individual can float in water.

SWIMMING 19

Swim School in a Box. Supporting teachers and swim schools in emerging markets and hard to reach communities. Why delivering swimming teacher training in developing countries is not enough….

Anna Roscoe

Embers Aquatics CIC, BALLACHULISH, United Kingdom

The Swim School in a Box (SSiB) was created to help individuals set up swim schools in areas without a developed aquatics industry. In developed countries, swim school operators have various resources to tap into including support from awarding bodies, accredited training, software, franchises, and learning from the experience of others. However, in developing countries, many of these resources are unavailable or unaffordable and trainees are left flying solo with many potential swim schools failing to develop. Currently being piloted in Uganda and The Gambia, SSiB was designed to fill this gap.

Created by Embers Aquatics, a social enterprise, SSiB offers everything needed to establish and run a swim school in emerging markets. It includes qualifications, template documents, marketing materials, an online presence, training resources, local badge scheme and an online community. In regions without a swimming teachers' association or an awarding body, new NGOs have been established to fill this role and offer these resources.

Developed through 15 years of experience training swimming teachers in Africa, SSiB addresses local needs identified that international certificates often miss when delivered alone. It offers international-standard qualifications while providing localized resources and continuous support to compliment the initial training. For example, the program includes units for teaching safely in open water, a locally themed swimming award scheme based on familiar fish species, culturally relevant themed lessons, and weekly training for teachers to share ideas and further professional development. The online presence boosts teachers' credibility and offers affordable marketing materials for social media.

Recognizing the challenges of access to internet and computers, all resources are available through a mobile-accessible back office system plus translations to combat local language barriers. 15 swimming teachers and 12 Tutors trained so far, opening up to 100 more in coming months.

SSiB combines the benefits of a swimming teachers' association and a franchise model. Its goal is to raise industry standards and support teachers in areas where Aquatics infrastructure is lacking. The pilots working in partnership with IFSTA and the GWSDP Rotary Club, aim to develop strong national organizations and expand into other countries with limited Aquatics industries.

SWIMMING 20

Hungary: a small nation with a strong swimming legacy – the role of school-based swimming education in talent development and water safety

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Background
Hungary's competitive swimming success raises the question of how a small country built such a strong swimming culture. A long-standing commitment to school-based swimming has fostered both elite talent and water safety education. While Hungary has made significant progress in expanding access to swimming education, international trends suggest that a greater emphasis on survival skills and water safety education could further improve the effectiveness of these programmes.
This study examines the historical development of swimming education in Hungarian schools, focusing on curricular changes and their impact on competitive swimming and water safety. The Hungarian approach is compared with international models to identify areas for policy refinement.
Methods
A historical-comparative analysis was conducted on 45 curriculum documents and policy announcements (1777–2024), evaluating grade levels, instructional time, objectives, skill requirements, and water safety competencies. Given variations across curricula, a qualitative content analysis identified key structural changes (1,2). Stallman et al. 's framework for water competencies was used to assess the integration of water safety education (3). We also examined the integration of swimming education into daily physical education (since 2012) and the evolution of school-based swimming programs.
Results
Hungarian curricula have emphasized distance-based benchmarks, evolving from 25 meters to 50 meters, and now 100 meters. Earlier curricula placed greater focus on water safety, but the 1990s–2000s prioritized technical swimming strokes. Documents from 1926, 1927, 1941, 1943, 1946, 1952, and 1992 had the most detailed competency-based guidelines. The 2020 curriculum includes 7 of 10 key water competencies, and the Swimming Nation Program includes 8, indicating a positive shift toward competency-based swimming education.
Discussion
Globally, school swimming programs emphasize survival skills, including clothed swimming and extended distance requirements to better prepare students for real-life aquatic scenarios. Hungary has begun integrating basic water safety techniques, such as treading water, suggesting a gradual shift towards alignment with internationally recognized water safety skills and the broader concept of *aquatic literacy* (4). Future improvements should balance swimming proficiency with survival skills to further enhance water safety and competitive excellence.

SWIMMING 21

Waves of Change: Redefining Primary School Swimming and Water Safety with Temporary Pop-Up Pools.

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Aspire Active Education Group Limited, Birmingham, United Kingdom

Background

Drowning remains a leading cause of preventable death worldwide, with school-aged children particularly vulnerable. In England, nearly one in three leaves primary school unable to swim 25m, missing national curriculum requirements and lifesaving skills (1).

Traditional school swimming relies on leisure centres, yet closures and logistical barriers disproportionately affect children from low-income and ethnically diverse backgrounds (2). Since 2013, closures have outpaced openings, and 36% of state primary schools offer no swimming lessons or fewer than 10 annually (3).

Swim:ED eliminates these barriers by bringing temporary pop-up pools to school playgrounds, ensuring all children receive swimming and water safety education within the school day.

Description

Swim:ED is an innovative, school-based programme that provides high-quality, intensive water safety education, overcoming the barriers of traditional school swimming. Addressing logistical constraints and facility shortages through a people-centred, systemic design approach ensures greater access to water safety education.

Key features:

On-site heated temporary pools.

Intensive daily lessons aligned with national curriculum standards.

Real-time progress tracking in swimming proficiency, water safety, and self-rescue skills (4)(5).

Since 2023, Swim:ED has reached 22,500+ children across England (5).

Lessons Learned

Swim:ED demonstrates significant improvements since 2023:

154.2% increase in swimming 25m unaided (4)(5)

409.8% increase in achieving water safety (4)(5)

Schools report improvements in pupils' confidence and attendance, reduced fear of water, and increased enthusiasm for swimming. The convenience and cost-effectiveness of the pop-up pool model have reduced lost learning time and increased participation compared to traditional swimming programmes (5).

Conclusions & Future Implications

Swim:ED is a scalable, cost-effective solution for schools. Embedding lifesaving education into the school day ensures universal access to swimming and water safety.

Looking ahead, Swim:ED is:

Expanding to reach more schools and communities with limited swimming access.

Partnering with policymakers and researchers to embed pools in national drowning prevention efforts.

Advancing sustainability to lower costs and reduce its carbon footprint.

By 2027, Swim:ED aims to reach 70,000 children annually. As drowning prevention experts seek scalable, innovative solutions, Swim:ED provides a proven, replicable model to transform school swimming worldwide.

SWIMMING 22

Ice-Safety Training for Adults Aged 55+ in Finland

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Finnish Swimming Teaching and Lifesaving Federation, Helsinki, Finland

In Finland, winter activities on ice like skating, ice fishing, and snowmobiling are common but pose risks of falling through ice and immersion in freezing water. On average, 13% of unintentional drownings (W65-W74) result from falling through ice. Key factors include inadequate safety equipment (like ice spikes), limited ice safety knowledge, and reduced physical capacity due to age or excess weight. About 85% of victims are over 55 years old adults or elderly. (1,2)
The Finnish Swimming Teaching and Lifesaving Federation (FSL) has provided practical ice-safety training in aquatic facilities during 2024–2025 for approximately 500 participants, primarily adults aged 55+. Over 60% of participants were within this age group, and none had prior ice-rescue training. The training includes theoretical and practical components. Participants learn basic ice safety principles and self-rescue techniques before practicing climbing onto a fiberglass ice platform in a swimming pool using ice spikes. Different winter gear, such as insulated fishing overalls and snowmobile suits, is used to simulate real-life conditions safely.
While the training lacks cold shock exposure, feedback indicates increased ice safety awareness. Over half of participants reported a significant change in their perception of ice safety. About 90% acknowledged the importance of safety equipment, such as ice spikes, compared to 50% before training. Additionally, 97% stated they now understood how to respond if they fell through the ice. Some participants realized they could not climb onto the ice platform, leading them to reconsider engaging in ice-related activities.
Anyone spending time on or near ice should understand ice formation, risks, necessary safety equipment, and self-rescue skills. The artificial ice platform offers a safe and effective training method, especially for high-risk age groups. Though cold water effects cannot be simulated, feedback suggests that trained individuals would likely respond better in real emergencies than those without prior experience. Expanding training opportunities remains a key challenge.

SWIMMING 23

Adaptive Surf Sports at SLSA Australian Championships

Pamela Simon[1], Narelle Duggan[1], Michael Woods[2], Sharon Deans[1]

1Surf Life Saving Australia, Bondi Beach, Australia. 2Inclusive Sport Design, Sydney, Australia

Background:
Surf Life Saving Australia are committed to delivering a unique and inclusive environment where diversity is celebrated. SLSA supports initiatives and programs run by all SLS Entities that are designed to encourage participation by all Australians and to make everyone feel like they belong between the flags.
In 2022, the SLSA Board committed to deliver a national competition for people with disabilities at the Australian Surf Life Saving Titles in 2024 known as The Aussies.
Description:
There are over 120 clubs currently delivering inclusive participation programs. Adaptive Surf Sports was the next natural progression for those wishing to compete in surf sports.
35 competitors registered, and 32 competitors competed.
15 officials
6 events
All age groups
To compete in surf sports, there has been rules around entry eligibility. One of the key elements to delivering a successful event was to reduce the barriers to participation that have previously prevented people with disabilities from competing, while still maintaining the integrity of the competition.
Lessons Learned:
While the event was a great success for competitors and staff and we have come a long way, our post-event survey results show that we have progress to make. We will focus on the areas suggested for improvement for Aussies 2025.
Communication was an important element of the process and involved event officials being engaged early on the journey. The development of language and communication guides was an integral part of encouraging consistent and fair communication during the event.
There was a need for flexibility. Officials were encouraged to 'adapt' some of the rules of surf sports competitions.
Conclusions:
For a competitor to proudly wear their club-coloured caps, the Aussies vest and compete at this iconic event was an important milestone in the journey and demonstrated SLSA's mission to promote accessibility and strive for inclusivity.

SWIMMING 24

Increasing basic swimming and water safety skills training among underserved populations in the United States through school partnerships

Tessa Clemens, Greg Field, Briana Moreland

CDC Foundation, Atlanta, USA

Background: Teaching school-aged children basic swimming and water safety skills is a proven drowning prevention strategy. The CDC Foundation worked with school boards and community-based organizations (CBOs) to deliver basic swimming and water safety skills training to over 20,000 children in 10 states in the United States, with a focus on underserved communities that are disproportionately affected by drowning.
Methods: Community-based swim skills training providers partnered with local schools to enroll children in basic swimming and water safety skills training during the school day or after school programs. The frequency of lessons varied by CBO with a minimum of four, 50-minute lessons to a maximum of eight, 60-minute lessons**.** Swim skills (enter, exit, float or tread at least 30 seconds, orient towards safety, submerge and bob, submerge and exhale, submerge and retrieve and swim 25 yards) were tested on the first (pre-test) and last (post-test) swim lesson by aquatics staff from one of the participating CBOs. Narrative information on program impacts was reported by CBOs.
Results: Pre-/post-test data were analyzed for 19,351 participants. Average attendance was higher when lessons occurred during the school day (92.7%) compared to outside the school day (82.9%). All evaluated swim skills significantly improved from the pre- to post-test. On the post-test, 48.3% of children could float for at least 30 seconds and 13.8% could swim 25 yards indicating that, although participants significantly improved their skills, the frequency and/or duration of swim lessons may need to be increased to enable more children to achieve these benchmarks. Impacts beyond skills attainment included increased swim lesson participation among families of participating children, improved classroom environment on swim lesson days and increased evaluation capacity among participating CBOs. Several new school partnerships were developed in districts that were previously hesitant to allow swim skills training during the school day.
Conclusion: Swim lessons significantly increased school-aged children's basic swimming and water safety skills. Partnering with schools to deliver swim skills training during the school day is a promising model for increasing equitable access to swim lessons for school-aged children in the United States.

SWIMMING 25

2024 Survey Informs Newcomer Outreach Program to Address Drowning Risk Among Newcomers to Canada

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In 2024, the Lifesaving Society conducted another detailed survey of residents of Canada. The survey results lend insight into the differences in swimming ability, water smart knowledge and safety perspectives of both Canadian-born residents and newcomers (immigrants, refugees, international students). This survey used some of the questions from the 2010 and 2016 surveys. Results were compared with those from 2010 and 2016 to identify potential trends and key changes in skill and knowledge.

2,939 Canadian residents 18 years or older were surveyed online in English and French. In-language surveys were also conducted in Mandarin, Cantonese and Punjabi via phone call. Sampling quotas and weighting were used to ensure that the sample was representative for age, gender, region, language, and resident status (born in Canada vs abroad, international student, and recent vs non-recent immigrant). The weighting and sampling quotas were developed to match Statistics Canada Census figures.

Preliminary findings support the survey results from 2010 and 2016 that suggest newcomers to Canada (as compared to respondents born in Canada) are at a higher risk of drowning and water-related injury. Survey results will discuss swimming safety, water smart, exposure to water and boating safety.

Recognizing the differences between newcomers and Canadian-born residents in terms of swimming ability, water safety knowledge, and safety perceptions can assist in the development of resources, public education messages, and programs to support those most at risk. The Lifesaving Society is utilizing the results of the 2024 Survey of Canadian Residents to improve programs, public education, and outreach efforts.

The Lifesaving Society's Newcomer Outreach Program includes a tool kit of resources designed for newcomers to Canada which accompany in-water survival swimming training (Swim to Survive). Since its creation in 2023, the Newcomer Outreach Program has reached more than 80 affiliates across Ontario and has been distributed to eight of 13 provinces and territories in Canada. More than 200,000 Water Smart Tip Cards (available in 18 different languages) were distributed across Ontario with more disseminated across the country via provincial and territorial Lifesaving Branches. The Program continues to grow.

SWIMMING 26

A Safety Forward Novel Approach to Underwater Breath Hold Training Figure 1: The five layers of safety for the novel breath hold training program

Justin Sempsrott[1], Prime Hall[2]

1International Drowning Researchers' Alliance, Kuna, USA. 2Deep End Fitness, Carlsbad, USA

Background:
Underwater breath hold (BH) training is required by numerous industries. Military recruits in combat diving, underwater demolitions, combat control teams, and pararescue units have pre-requisite and intra-training BH exercises and drills. Civilian and military helicopter and flight crew teams train in “ditch” exercises where must self-extricate from simulated crashes [1]. Recreational and competition spearfishing, free-diving, and BH diving programs are gaining popularity. There are emerging anecdotes of BH training as an adjunct for increasing discipline, confronting fears, and reducing stress and anxiety.

Blackout from hypoxia, cardiac dysrhythmias, or other etiologies occurs in healthy participants and is always a risk of BH training[2]. Intentional hyperventilation prior to BH causes hypocapnemia and reduces the hypercapnemic urge to breathe, leading to hypoxic blackout. There are numerous drowning deaths every year in otherwise healthy athletes or military hopefuls while engaged in unsafe BH practices in unguarded areas or while intentionally hiding from lifeguards.[3]

There is a rise in the availability of BH training programs with little regulatory oversight. There is a need for safe BH training programs.

Description: We present a novel BH training program that employs 5 layers of safety (Figure 1) to facilitate civilian and military BH training for fitness, personal development, and water confidence. Trainings occur at lifeguarded facilities and hyperventilation is strictly prohibited. Typical exercises include carrying of weights underwater, brick tow, and treading with bobs.
Figure 1: Five layers of safety
Lessons Learned: The program was started in 2018 and has conducted countless 90-minute courses with over 12,000 athletes at 40 sites in the US, 1 in the UK, and 1 in Australia with no episodes of blackout, fatal or non-fatal drowning, or sudden cardiac arrest.

Conclusion:
We present a novel training program for underwater fitness that utilizes BH training. Multiple layers of safety and a culture of accountability are critical to preventing blackout and drowning while also allowing participants to push their limits and improve. Positive working relationships with lifeguards and aquatic facilities ensure seamless operation of emergency action plans. Future research is needed to better understand the training and safety methods and ensure reproducibility of results.

SWIMMING 27

Integrating age and stage appropriate messaging such as 'Float to Live' into water safety and swimming education in England.

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The National Water Safety Forum (NWSF) launched the UK Drowning Prevention Strategy in 2016[1] with a headline target that 'Every child should have the opportunity to learn to swim and receive water safety education at primary school and where required at Key Stage 3'.
Since the launch of this strategy, organisations from across the sector and at a range of levels have been working collaboratively, and alongside government, to provide a more cohesive, age and stage appropriate water safety education offer for those children of school age (5-18) in England, whether they are learning in the classroom, poolside, or taking part in an immersive outdoor programme.

Key Steps & Milestones

"We need to make sure our messaging is clear and accessible for the age group."
Research completed in 2017 to understand young people's perceptions of open water, the dangers and risks and how to stay in and around water.
"The Water Safety Code is the fundamental spine of all water safety education."
In 2018-19, the Water Safety Code, a consistent set of headline messages was drafted, detailed and agreed in collaboration between RNLI, Swim England, and RLSS UK.
"Given the large numbers who drown around the globe annually, a lesson on water safety should be part of every national curriculum."
Research published in 2022 by Tipton et al.[3] further demonstrated the efficacy of age-appropriate teaching of water safety education in the classroom, where benefits were retained for 6 months.

Outcomes

The Water Safety Code[3] has been embedded and mapped across a national learn to swim and school swimming programmes, teaching materials including SEND provision, immersive outdoor programmes, beach lifeguard school outreach activity, and campaigns such as the RLSS UK Drowning Prevention Week, which is support by the UK Government Department for Education.
In 2024, the number of children engaging with water safety education though the Water Safety code in England was <3 million (30%) aged 5-18.
Collaboration continues through the National Water Safety Forum, to influence policy, support those developing educational materials, and to improve access to water safety education to support a range of learning needs and audiences.

SWIMMING 28

“I thought I was going to die because I don't know how to swim” – needs for first aid and aquatic safety among fishing communities in coastal Mozambique

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Background: The highest rates of drowning worldwide are observed in Africa. Evidence-based prevention strategies across the continent are contingent on research into risk factors for drowning. Coastal Mozambique is such a setting where drowning and aquatic risks in general are highly prevalent; however, anecdotal evidence suggests that community knowledge on aquatic safety and first aid techniques related to aquatic hazards is limited. To address the aquatic safety needs of fishing communities in coastal Mozambique, a needs assessment was conducted by the Mozambican Red Cross.
Methods: A mixed-methods assessment was conducted in November 2024 among four fishing communities in Inhassoro District, Mozambique: 343 participants were included in a quantitative survey and qualitative data was collected through 11 key informant interviews (KII) and 14 focus group discussions (FGD) among 129 participants.
Results: Both quantitative and qualitative findings indicated poor swimming skills among women (80% fully unable to swim), despite their frequent work in the shallows as assistants of returning fishermen and/or as oyster/crab collectors. Knowledge of the risks of e.g. rescue drowning appeared limited. The highest perceived risks included falling overboard while at open sea (59%), incurring animal bites/stings (including sharks, stingrays, sea snakes, and jellyfish; 40%), and getting lost at sea (31%). Individuals’ own experiences with hazardous incidents in the past appeared to be the strongest driver of risk perception. 69% of the respondents routinely working on the water reported not taking any safety equipment and 73% reported never consulting weather forecasting services. KII/FGD participants indicated that communities would have an active interest in formal trainings on aquatic safety measures and/or first aid techniques.
Conclusions: Knowledge on aquatic risks was relatively limited in the assessed communities and safety practices did not appear to be commensurate to the risks. Additionally, risk perceptions seemed to be primarily shaped by personal exposure to hazardous situations. As such, our findings suggest that communities may benefit from low-cost interventions such as community-level awareness raising and education on basic first aid and aquatic safety measures. A guideline to this effect is currently under development by the Belgian Red Cross.

SWIMMING 29

An evaluation of different types of swimming and water safety lessons in the UK

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This experimental study aims to determine the impact of swimming lessons provided by pop-up pools within school facilities, schools using local swimming pools, leisure centres (after school) and the RLSS UK's Rookie Lifeguard programme within lifesaving clubs on actual water competency and other objective benefits such as changes in water safety knowledge and awareness of associated hazards, changes in mood, changes in water-related behaviours and any other benefits. All key stage two participants will take part in a 6-week programme. Data will be collected from children, teachers and instructors using a pre, during, post and retention design. The full data set from each of the four groups will be presented and analysed using appropriate inferential statistics.

SWIMMING 30

Process evaluation of water safety and swimming programs engaging populations at highest risk of drowning

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Background: According to the United States Centers for Disease Control and Prevention (CDC) drowning death rates for indigenous American Indian/Alaska Native (AI/AN) people ages 29 and younger are 2 times higher than the fatal drowning rates for European Americans[1,2]. While in natural water, AI/AN people have 2.7 times higher drowning rates[2]. The American Red Cross, with CDC funding, conducted a process evaluation of two aquatic programs to identify best practices and lessons learned to be shared with other providers to increase engagement and participation of marginalized indigenous community members[3].
Methods: Two Red Cross Aquatics Centennial Campaign providers whose southwest U.S. catchment areas included AI/AN populations in close and convenient proximity were the focus of the process evaluations[3]. The Red Cross research team met virtually with aquatic leadership to orient them to the research project and site visits. Before visits, both sites provided documentation that was content analyzed. During site visits, the research team interviewed key organizational stakeholders and identified needs and opportunities, strategies for future engagement, and opportunities for cultural training.
Results: Ten recommendations resulted from community surveys, document reviews, in-depth interviews, and personal experiences of aquatic staff and facility users. The first and most fundamental recommendation was for aquatic programs to gain a true understanding of their community's needs through conducting an aquatic needs assessment. Subsequent recommendations included ensuring the staff reflects the community, minimizing barriers to access and participation, creating a welcoming environment, identifying community members not currently engaged, raising awareness of programming and employment opportunities, and making compensation and programming attractive. The final recommendations included integrating water safety education into all programming, identifying community funding opportunities, and a variety of additional local factors.
Conclusion: In addition to previous recommendations, the project provided self-reflection questions as part of a toolkit to empower aquatic facilities to conduct needs assessments as well as on-going internal patron satisfaction surveys. The project resulted in several widely distributed documents including *Process Evaluation: Engaging Populations at the Highest Risk of Drowning in Water Safety and Swim Lessons*.

SWIMMING 31

Child Drowning trends in Vietnam: Geographic Characteristics and Community Lessons

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Background: Drowning is the leading cause of child mortality, especially in rural areas where awareness and preventive measures are deficient. Vietnam's diverse geography, which includes rivers, lakes, and coastal areas, increased high drowning risks for children, particularly those aged under 16. Many incidents occur due to unsupervised access to water bodies, with a notable percentage of parents lacking essential knowledge on drowning prevention and preventive measures.
Methods: A mixed-methods approach combined quantitative data with qualitative assessments from the community. Data were collected from 15 provinces through household surveys targeting local families with 600 child drowning cases from 2019 to 2024, supplemented by GPS-recorded photographs of drowning locations. This information was analyzed alongside official drowning mortality statistics to map out high-risk areas. Additionally the study explored the relationship between geographical features, economic conditions, climate factors, child swimming abilities, and the prevention strategies on drowning prevention.
Results: The research findings indicate that a major factor of child drowning: 90% of the case cannot swim, with most incidents occurring without adult supervision, especially sunny days and during working hours (>80%). Significant regional differences exist: in the Northern Mountains and Central Highlands, 79% of cases involve children under five, mainly in ponds and lakes near homes. Meanwhile, the Central region and Northern Delta experience the highest drowning cases among children aged 6 to 15 (made for 73%). Almost of cases occurred in large river systems far from home (>3 km). The Southern region, with a dense network of rivers and canals, also reports numerous incidents of young children drowning close to their homes.
Conclusions: Geographical features greatly affect drowning risks. The high number of children who cannot swim and the rise in unsupervised incidents highlight the need for improved the children's water safety education and swimming lessons. Regions such as the Northern Delta and Central areas need targeted interventions, while younger children from the Northern Mountainous and Southern regions face significant risks due to inadequate supervision near water sources. It is crucial to develop tailored prevention strategies that effectively address these geographic unique challenges.

SWIMMING 32

Disparities in swimming ability and swimming lesson participation in Canada: Results from a nationally representative survey

Tessa Clemens, Emma Cox, Lisa Hansen Ouellette

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Background: Drowning increased in Canada during the COVID-19 pandemic. People spent more time participating in outdoor activities, and infrastructure disruptions impacted participation in swimming lessons. Increased implementation of proven drowning prevention strategies, including basic swimming and water safety skills training, is needed to curb increasing drowning rates. Studies from other countries have identified racial and ethnic disparities in access to swim skills training. This study described swimming ability, swimming lesson participation, and barriers to swimming lesson participation in Canada by race and immigration status.
Methods: A nationally representative sample of 2,000 Canadian residents aged 18 and older were surveyed online in spring 2024. Sample boosts were used to survey additional respondents from population groups who may be at increased risk of drowning including immigrants who have lived in Canada at least 5 years (n=300), recent immigrants (n=200), international students (n=100), and refugees (n=50). Nationally representative weights were calibrated to 2021 Statistics Canada Census figures. The survey was conducted in English, French, Mandarin, Cantonese, and Punjabi.
Results: 35% of Canadians described themselves as non- or weak-swimmers (uncomfortable in deep water). Non- or weak-swimmers were significantly more likely to be immigrants to Canada, and significantly more likely to be South Asian (57%) or Black (55%), compared to White. The majority of non-swimmers (92%) were not currently taking swimming lessons, and 55% did not know where to go to take swimming lessons. Persons who were not born in Canada were more likely to cite cost and lack of time as barriers to participation in swimming lessons compared to persons born in Canada. South Asian persons were more likely to report feeling uncomfortable wearing a bathing suit in public as a barrier than persons of other races.
Conclusions: Rising drowning death rates have increased the urgency for implementing effective drowning prevention programs among persons at highest risk of drowning. Basic swimming and water safety skills training can reduce the risk of drowning, but barriers to accessing this training persist. Communities and organizations should increase access to affordable and culturally competent swimming lessons that address the unique needs of their community members.

SWIMMING 33

Using a socio-ecological framework to evaluate the efficiency of swimming interventions and programs: wave of change in drowning prevention

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Although many interesting interventions and programs focusing on learn to swim and survive exist worldwide, a framework supporting a systematic approach of evaluating the efficiency of these efforts is seldom used. Popular socio-ecological frameworks in health studies (1) will be explained and translated to learn to swim/survive as one of drowning prevention emphasized by the WHO. Useful frameworks are (I) RE-AIM (Reach-Effectiveness, Adoption, Implementation and Maintenance) and (II) Intervention Mapping Protocol (IMP). IMP describes program development in six steps: (a) need assessment; (b) specifying change objectives, (c) selecting theory-based intervention methods and practical applications, (d) designing and organizing of the program, (e) specifying adoption and implementation plans, (f) generating an evaluation plan (2).
Starting from these models, the different steps addressing multiple levels of influence (intrapersonal, interpersonal, organizational, community, physical environment and political levels) will be described. Published studies on swimming interventions/programs for children and their parents will be taken as examples to analyze the different levels of variables and their impact at short and long term.
Using a socio-ecological framework facilitates collaboration between researchers, practitioners in the field of learning to swim/survive, target groups and communities, intermediates and stakeholders from different backgrounds. The wave of change in this contribution is proving a better understanding of how interventions/programs in swimming education can have an impact at different levels.

SWIMMING 34

Train-the-Trainer Approach to Developing Aquatic Literacy in Young Children

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In response to an alarming decrease in children's fundamental motor skills proficiency worldwide over three decades and negative sequelae of consequences for physical/mental health, researchers developed and tested interventions to improve motor competence. A novel intervention involves teaching caregivers to act as role models/teachers for their children. Research evidence shows that empowering parents leads to a range of significant improvements in children's fundamental motor skills.

In reality, the precedent for caregivers serving as teachers is one we already see (but have not formally documented) within aquatics. Ample data supports the premise. For example, American Red Cross datasets have consistently shown that nearly 60% of Americans learn to swim via family/friend, caregiver, or self, outside of formal swimming lesson structure.

A Fall 2024 case study from Indiana (USA) shows a convincing evidence basis for informal instruction. A nonverbal three-year old autistic boy went missing. The parents texted neighbors, eventually calling the police. Officers canvassed the neighborhood upon arrival. In footage captured by a responding officer who heard a cry, the boy was located in a neighbor's above-ground pool: In a back float.

The backstory: In babyhood, his pediatrician warned of drowning risk (elopement). As a result, the father started taking his son to the public pool at ~age 1 to practice back floating. Neither the child nor his father ever had a formal swimming lesson.

The question is: How can we bring this precedent to scale?

To answer this question, a 2025 research study put the Community Organizing Model & Social Cognitive Theory into practice. Via a play-based, gentle approach to early aquatic competency empowering caregivers as trainers, we gathered data on aquatic competency skill acquisition in infants / toddlers, seeking to determine whether the amount of water time required to achieve aquatic competency skills varies as a function of children's age. Secondary objectives included determining caregivers' compliance with the training program; perception of its strengths/weaknesses; perception of their competence as trainers; and their willingness to continue the intervention beyond the initial study period. Initial findings, data analysis, and qualitative observations will be presented.

SWIMMING 35

Promoting gender equity in ocean swimming and recreation: findings from multi-national research and the Ocean Women project

Flossy Barraud[1,2], Aminath Zoona[3]

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Background:
Vast gender inequalities restrict women and girls' access to ocean spaces. Globally, 68% women cannot swim, compared to 43% men[1]. Females make up 1/3 of drowning deaths worldwide[2]. Being able to swim is key not only for safety, but for enabling access to the dominant environment and a core educational and economic space. Experiencing the ocean recreationally can improve stewardship, confidence and wellbeing, enabling communities to address wider inequities[3,4].
Methods:
This transdisciplinary project utilises a feminist participatory action research approach. It focuses on tropical coastal communities, drawing on multi-regional case studies, interviews and a survey. It aims to further knowledge on:
Recreational ocean access inequalities, barriers and enablers.
Broad-scale impacts of women and girls learning to swim, snorkel, dive or surf.
Key success factors for community-based water safety and connection initiatives.
Results:
Door-to-door Swimming & snorkelling skills survey, 2 islands, Maldives (n=700):
36% females could not swim compared to 7% males.
50% of 11–20 year-old females cannot swim compared to 6% males.
Women use the sea more than males for relaxing, playing, socialising and exercise. Males use the sea more for recreation, fishing and tourism work.
In-depth interviews (n=44): Maldives, West Papua, São Tomé, St. Lucia, Mozambique, Madagascar, Aotearoa New Zealand:
Barriers:
Gender norms and social stigmas
Lack of resources, safe spaces
Lack of female swimming teachers/mothers that swim
Enablers:
Local female role models, Family oriented, culturally-relevant programmes, Economic opportunities, Impacts of females accessing sea recreationally, safety, improved mothers confidence, intergenerational impacts, improved mental and physical wellbeing, economic independence, environmental stewardship, female empowerment
Key success factors for developing community programmes:
Localised & sustained approaches
Female leaders
Holistic programme design
Conclusion:
Our findings reveal that training local female leaders can enable more people to safely access dominant blue spaces. Findings were used to trial a pilot programme. Maldivian women were trained as swim and snorkel instructors and supported to develop businesses that have positively impacted their islands. Wider knowledge will be shared via an *Ocean Connection Strategy*,

equipping communities with tools to develop local water safety and ocean connection programmes.

SWIMMING 36

Trialing a Collaborative Female-Focused Swimming Instructor Training Programme in the Maldives: Challenges, Learnings and Impacts.

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Background:
Two thirds of women globally cannot swim[1]. Females make up to 1/3 of drowning deaths worldwide[2]. The Maldives is 99% ocean. Our research reveals some Maldivian girls are five times more likely than boys to lack confidence in swimming[3]. Experiencing the sea can improve marine citizenship and enable communities to address wider inequalities[4,5].

Description:
In 2022 we conducted consultations with 204 Maldivian people. We used findings to co-develop an instructor training programme. In November 2023 we trained seven swimming and snorkelling instructors, five female participants from AA.Rasdhoo island and two males from AA.Ukulhas and Fuvamulah island. We aimed to equip the islands with the instructors needed to teach people, particularly women and girls, for years to come.

The 10-day programme included:
SSI Swim and Snorkelling Instructor training -8-days including 36-hours apprenticeships.
workshops -1-day:
- Empowering women and girls for greater participation.
- Programme development and mentoring with qualified swimming instructors: participants create localised plan of action to create sustained swim and snorkel lessons for their communities.
- Environmental awareness and responsibility.

Lessons learned:

Challenges:
Lack of female swim teachers/ instructors/ mothers that can swim.
Fear of drowning.
Gender norms and societal stigmas.
Lack of access to safe swimming spaces.

Learnings:
Treat gender equity as a core element at all stages of the project.
To achieve sustainability of the programme, community engagement, connection building, and respecting the norms and traditions of the community are essential.

Impacts:
The certified five female instructors established their own swim school: they charge a small fee from the participants; earning an income.
conducted 14 successful 1-month learn to swim programme for the community.
Taught >111 women and children to swim.
13 women and children participated in the National Swimming Festival for the first time in the history of the island community.
Enabled environmental experiential educational field trips for 64 women and children in the community.

Conclusion:
Training female swim instructors to teach the community especially women and girls enables access to dominant environment, a core, educational, and economic space.
Ocean experiences are transformative: they can improve health and well-being, help to mitigate drowning, and foster livelihood opportunities.

SWIMMING 37

Using menstrual cups for menstrual hygiene management for community swimming instructors during swimming training in rural Bangladesh.

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Background: Community Swimming Instructors (CSIs) provided survival swimming teaching, SwimSafe, to 6-10-year-old children under the PROJECT Bhasa in the Barishal Division, the most drowning vulnerable region of Bangladesh. Over 90% of the CSIs were female considering the cultural context so that they can teach both boys and girls in the rural community. Every season a CSI taught swimming to 100-120 children. The female CSIs used sanitary pads or cloth during menstruation that restrained them from accessing water for swimming teaching. A study was needed to explore an alternative menstrual hygiene that allows them to continue teaching during their menstrual cycle.
Methods: The study was pre- and post-type quasi-experimental. At the beginning of the swimming season in April 2023, seventy female CSIs of Patuakhali and Barguna districts received menstrual cups and training on using and sanitizing menstrual cups, menstrual hygiene management (MHM), sanitization kits and user manual to trial over the months of the swimming teaching.
Results: Menstrual cup usage was low in the first two months of that swimming season but in the ending month, it increased to 91%. The main reason for not using the cups was fear, which gradually dropped throughout the swimming season. About 94% of the participants used the menstrual cups while teaching swimming. The usage of menstrual cups increased from 76% to 91% during the swimming season. The general view of the menstrual cups was that they were easy to insert (98%), comfortable to wear (98%), easy to remove (96%) and empty (100%), also, to clean and store (100%). 35.9% of cases responded that the cup insertion is the most difficult part of using and 29.7% mentioned the removal process. After several months their perception of the menstrual cup changed and managing menstruation was hassle-free.
Conclusions: The CSIs accepted using the menstrual cups which also allowed them to continue teaching swimming during menstruation. The survival swimming guideline should include this intervention for female CSIs in Bangladesh and other countries with similar settings and policy influencing is needed for an adequate supply of cups or similar mechanisms for menstrual hygiene.

SWIMMING 38

Inclusion of children with disabilities in the survival swimming teaching program: experience from rural communities of Bangladesh

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Background: Children with disabilities are at the highest risk of drowning worldwide, including in Bangladesh. There is a scarcity of formal swimming learning facilities designed to teach swimming to disabled children in the rural context of Bangladesh. CIPRB is implementing the survival swimming teaching program, SwimSafe, for children aged 6-10 years. Under the program children learnt swimming in rural areas using a modified swimming structure built from local resources. Following specialized guidelines, CIPRB has adopted provisions to teach swimming to children with disabilities, aiming to test the feasibility and inclusiveness of this intervention in rural communities.

Description: In 2023, 10 children with disabilities graduated from SwimSafe program. Three case studies were analyzed to evaluate the instructional methods used. Tailored teaching techniques, support materials, a gradual learning progression, and personalized strategies facilitated successful swimming education. For instance, the child with hearing and speech disabilities learned by observing and replicating movements with specialized materials and sign language for communication. A girl with these impairments progressed from one-on-one sessions to regular classes with parental involvement, while another child, born with an incomplete hand, learned floating and hand movements using a kickboard. A Community Swimming Instructor (CSI) provided constant physical support, ensuring safety while enabling the child to meet graduation criteria.

Learnings: The initiative demonstrated that swimming instruction for children with disabilities, utilizing the same modified structure as for other children, is feasible and acceptable. While no constraints were encountered, obtaining physician approval is necessary before involving a child with a disability in the swimming program. The existing intervention can be leveraged to teach swimming to children with disabilities across rural and urban areas.

Conclusion: Involving children with disabilities in drowning prevention activities is vital. Collaborating with organizations dedicated to disability inclusion can enhance support systems like screening and swimming eligibility. These types of partnerships can ensure access to assistive devices and resources, raising awareness and improving safety for vulnerable populations in Bangladesh and similar country settings.

SWIMMING 39

"Risk Awareness Walk" with unaccompanied minor asylum seekers - a low-threshold Water Safety Education project at the Swiss Federal Asylum Center Zurich.

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Background
In 2023, over 30,000 unaccompanied minors applied for asylum in Switzerland (1). The mainly male adolescents from a wide variety of countries of origin are initially assigned to one of six federal asylum centers when they arrive in Switzerland. The federal asylum center in Zurich is located in the immediate vicinity of the River Limmat. In the summer months in particular, situations regularly arise in which unaccompanied minor asylum seekers (MNA) from the nearby federal asylum center get into difficulties in the water.

Descprition
To respond to the situation, in June 2024 the Asylum Organization Zurich, the City of Zurich and the Swiss Lifesaving Society tested a low-threshold prevention measure. In a 90-minute "risk awareness walk", 25 MNAs aged between 14 and 18 were given a practical introduction to dangers and danger spots along the Limmat, safe behavior (self-protection) and what to do in the event of emergencies involving third parties.
When planning and implementing the measure, it had to be taken into account that the existing water safety skills, attitudes or possible traumas of the MNA were unknown beforehand and could not be queried. It also had to be taken into account that the group was very linguistically diverse.

Lessons learned
The following insights were gained from the pilot project:
In view of the observed active participation and attention of the MNA, a high proportion of experience-oriented elements has proven successful. (e.g. throwing rescue equipment to a figurant in the water).
The use of pictorial material and pictograms has proven its worth for elements of classic knowledge transfer (e.g. thematization of prohibition and danger signals).
It has been confirmed that the childcare ratio and group size are key success factors due to the linguistic heterogeneity and the different attention spans.

Conclusions
The pilot implementation was rated as positive by the participating organizations. The established cooperation and the knowledge gained can be used as a starting point for the gradual, evidence-based further development of drowning prevention measures for this specific but particularly vulnerable target group.

SWIMMING 40

safety compliance and drowning prevention in marine sports rental facilities: a case study from sharjah, uae

Heba Shalaby

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This presentation explores the implementation of water safety protocols and drowning prevention measures in marine sports rental facilities across Sharjah, United Arab Emirates. It draws upon my academic expertise as a Doctorate researcher in Business Administration with a specialization in Sports Event Management, alongside my professional experience as the Licensing and Safety Supervisor at the Sharjah International Marine Sports Club. This dual perspective enables a comprehensive analysis that blends theoretical understanding with practical, field-based application of water safety governance.

The presentation provides an in-depth overview of the regulatory framework enforced in Sharjah to ensure the safe and responsible operation of marine sports rental businesses. It outlines the licensing criteria, inspection procedures, mandatory safety measures—including the availability and use of life jackets, first aid kits, and emergency communication tools—along with staff training requirements for rescue operations and emergency response protocols. Emphasis is placed on the role of trained personnel in implementing and maintaining safety standards during daily marine sports operations.

Additionally, the presentation identifies recurring violations observed during inspections, such as inadequate safety gear, poorly maintained equipment, unlicensed operators, or lack of trained rescue staff. It analyzes the key risk factors contributing to these issues, which include insufficient awareness, limited enforcement capacity, and rapid sector growth that outpaces regulatory oversight.

As Sharjah's marine tourism sector continues to expand—welcoming increasing numbers of residents and visitors engaging in water-based recreational activities—regulatory authorities are tasked with adapting their approach to a more complex and competitive environment. Through documented inspection case studies and data-driven insights, the presentation demonstrates how effective coordination between licensing authorities, continuous operator education, inter-agency collaboration, and public awareness campaigns are instrumental in minimizing the risk of drowning incidents.

By showcasing Sharjah's proactive and context-specific model of marine safety management, this study contributes to the global conversation on drowning prevention. It offers practical strategies that can be tailored and applied to similar coastal contexts worldwide. The presentation concludes with a set of actionable policy and operational recommendations aimed at strengthening compliance, enhancing water safety culture, and supporting sustainable growth within the marine tourism industry.

SWIMMING 41

Scalable School-Based Water Safety Education in Vietnam: A Community-Centred Approach to Drowning Prevention

Joanne Stewart

Swim Vietnam, Da Nang, Vietnam

Swim Vietnam is a UK-registered charity committed to reducing child drowning through survival swimming courses, water safety education, and community capacity building in Vietnam. Alongside the in-pool survival swimming programs, one of its most impactful and scalable initiatives has been the development and delivery of a classroom-based water safety education program designed for primary and secondary school students.

This interactive, presentation-based program teaches children how to stay safe in and around water, covering essential topics such as recognizing hazards, basic survival responses, and emergency action steps. Originally designed by Swim Vietnam, the program was subsequently enhanced through collaboration with a global team of experts and academics*1.

Following successful implementation by Swim Vietnam's teaching teams, the model expanded to include the training of local school teachers across multiple districts. These teachers are then supported in delivering the curriculum within their own schools, creating a powerful multiplier effect. Working in partnership with local Education Departments and charitable organisations across Vietnam, this approach has enabled over 265,000 students to receive water safety education nationwide.

By embedding drowning prevention education within schools and empowering teachers to deliver training, we ensure long-term sustainability and local ownership of the program. This model offers an adaptable, replicable approach to water safety education that can be implemented in resource-limited settings around the world.

Looking to the future

As global attention shifts toward other humanitarian crises, sustaining excellence in drowning prevention requires innovation and continued evidence of impact as well as ongoing financial support. Swim Vietnam holds an extensive dataset of community-based in-pool survival swimming lessons, collected from almost 40,000 children since 2008. This data offers an exceptional opportunity to analyse the long-term effectiveness of our swim programs — including studies now underway to evaluate how many children retain swimming and survival skills one and three years after course completion. This analysis can give the opportunity to learn lessons from and make improvements in our own programs (including the classroom-based training) as well as helping to provide a research data driven framework for other organisations around the world seeking to build safer, more resilient communities.

SWIMMING 42

Swim Free - Transforming Water Safety Education in the Cayman Islands with a Mobile Pool and Mandatory Swim Training.A Scalable Model for Drowning Prevention and Swim Education

Jeff Wiseman, Frank Flowers

Swim Free, Georgetown, Cayman Islands

SWIM FREE is a charitable initiative founded and funded by three families in the Cayman Islands, united by a shared mission. SWIM FREE has developed an innovative approach to drowning prevention and swim education, ensuring that every Caymanian child can learn to swim and develop essential water safety skills.
At the core of this program is the Caribbean's first mobile swimming pool, constructed from a standard 40-foot shipping container. This innovative, portable solution addresses infrastructure limitations by delivering swimming lessons directly to schools without aquatic facilities. To maximize impact, SWIM FREE has partnered with the Cayman Islands Department of Education to integrate swimming instruction into the national physical education curriculum. Swimming lessons are now mandatory for all Reception, Year 1, and Year 2 students in government primary schools.

The SWIM FREE curriculum was developed by a former USA Olympic coach based on best practices from learn to swim programs in America and Australia. **SWIM FREE** participants receive 10 swimming lessons over a two-week period, with each session lasting 25 minutes. The structured program ensures consistent exposure and practice, enabling children to progressively build their skills. To date, the program has reached 2200 children, with a 75% success rate in achieving the benchmark of swimming 10 feet independently

The SWIM FREE Program eliminates key barriers to access, including transportation challenges and socioeconomic disparities, ensuring equitable access to water safety education. Families have expressed high satisfaction, reporting significantly reduced fear of water and increased participation in water-based activities, which enhances their overall well-being. Schools have also benefited, with teachers noting improved student engagement and physical development.

Beyond immediate skill acquisition, **SWIM FREE** fosters a culture of water safety across the Cayman Islands. This initiative offers a scalable model for island nations, coastal communities, and any region facing similar challenges worldwide. By addressing drowning prevention through

early intervention, innovative infrastructure solutions, and strong partnerships, **SWIM FREE** is helping to build a safer, more resilient generation.

SWIMMING 43

Mass winter swimming events in Poland – how we ensure their safety.

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Context:
Reducing the risk of drowning, searching for people in the water and providing aid in an extremely challenging environment.
Description:
The growing trend of active leisure has increased interest in various forms of physical recreation in Polish society. Since the COVID-19 pandemic, individual and organized winter swimming events have become highly popular during the winter months (December–March).
Winter swimming offers numerous health benefits, such as strengthening the immune system, reducing inflammation and body fat and positively affecting mental health, it also presents significant risks. Researchers highlight dangers such as an increased risk of cardiovascular diseases, a neurogenic thermal shock response and drowning due to hypothermia (1).
Winter swimmers choose all available bodies of water for their activities: rivers (though less frequently), lakes, ponds and the sea. The water temperature is less than 3° Celsius. Most winter swims take place individually or in small groups, while organized events typically occur on weekends, mostly during the day but also after sunset.
Mass winter swimming events are growing in popularity, attracting anywhere from dozens to hundreds or even thousands of participants at once.
Conclusions:
Water rescue teams should provide safety measures during mass winter swimming events. Their primary responsibilities include:
Providing direct assistance in the water,
Conducting underwater searches for missing individuals,
Assisting in cases of arrhythmias, cardiovascular incidents, and hypothermia,
Treating minor wounds and injuries caused by ice cover or sharp objects at the bottom.
Key Takeaways:
Lifeguards must be thermally protected with dry suits, gloves, and boots to prevent hypothermia while performing water rescues and standing by on shore.
Lifeguards operations should include:
Emergency searches and evacuation of victims from the water,
Treating defibrillatory heart rhythms,
Preventing hypothermia (including afterdrop),
Transporting victims to hospitals,
Treating limb injuries and wounds,
Assisting with near-drowning incidents.
Securing a mass winter swimming event requires coordinated efforts between lifeguard teams managing participants from open water, medical teams, diving teams, boats and ATVs with trailers for evacuations.
Final Recommendations:
Water rescue teams will significantly reduce response time, allowing for faster intervention, victim location, and evacuation. This will facilitate quicker medical treatment and improve hypothermia management.

SWIMMING 44

Why Swimming Lessons Are Not Enough. Education is the Missing Link

Shawn Slevin

Swim Strong Foundation, New York, USA. Global Water Safety and Drowning Prevention Rotary Club, Brisbane, Australia. Water Safety Coalition, New York City, USA. Multi Agency Taskforce on Life Guards and Water Safety, New York City, USA

The U.S. seems to be falling behind developed countries in regard to prevention and reduction of injury and loss of life due to drowning (1). In the U.S. if water safety is thought of at all, it is done so in a recreational context, leading to a lack of aquatic relevance to so many families,
Since 2018, Swim Strong Foundation has been working to educate families more holistically about managing the risk of water in their daily lives from an environmental and climate action perspective.
Drowning is now the leading cause of death for children under the age of 5, with most dying in their own homes. Why? Because their parents don't have a context for water risk at home in the same way they do understand about other risks, (i.e. electrical safety)
Out-doors the nature, behavior, danger and risk profile of water differs widely from man-made to natural water environments. Understanding the differences enables us to appropriately assess each risk. Similarly, so for seasonal changes. Climate action brings significantly more water related events. The Eastern Coast is seeing an extended hurricane season (once mid-June to Mid-October, it is now May through November). Major floods have impacted us globally across Central Asia, Southeast Asia, Central Europe, East and West Africa.
Given the above it is imperative that we all, having swim ability or not, look at water safety from a much broader perspective. Swim Strong Foundation created an educational program called "Know Before You Go, (R)" which has 5 programs under its umbrella. We have reached more than 104,000 students in the New York City Department of Education grades 1-12. A pre-quiz shows us the general understanding of the topic and post training quiz results show an increase in correct answers by 28-36%.
Prevention (barriers, fences etc.) and skills (learn to swim programs) are meaningful to those having access to them. But environmental knowledge of water as it relates to climate action is essential to help everyone safely navigate the risks of increased and at times, extreme, water in our lives.

SWIMMING 45

pool + safe: building a water safety education program and impacting the burden of drowning in Brazil

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Background: Drowning claims the lives of sixteen Brazilians daily. Among children aged 1 to 9, swimming pools and home environments account for 55% of fatalities (2). In Brazil, 95% of swimming lessons are privately provided in clubs, gyms, and schools, totaling around 4,000 institutions. Parents enroll children mainly to prevent drowning. For over 40 years, swimming lessons were believed to prevent drowning, but until the Pool + Safe (P+S) program launched in 2012, they lacked risk assessment and prevention strategies (5). This study shows how swimming centers can become a powerful drowning prevention tool through structured education.

Description: The P+S program was created in 2021 and recommends five key actions to reduce drowning incidents by 95% (1, 5): 1-Maintain 100% supervision of children, staying within arm's reach, even when a lifeguard is on duty; 2-Restrict unauthorized access with fences and self-locking gates; 3-Learn how to act in drowning emergencies; 4-Ensure a lifeguard is on duty in public pools; 5-Use anti-entrapment drains to prevent suction accidents. The classes include recently life jacket and risk assessment in other aquatic environments (5). Over time, the program expanded to include: P+S Lecture (45 min); Drowning risk assessment for pools (6); Basic Life Support (BLS) course for pools (4-5h)(7); Instructor training on safe swimming lessons (5h asynchronous+2h online); P+S certification for swimming facilities (7); Pool lifeguard training (8); Advocacy for national legislation and safety technical standards (like ISO certification) (6, 7).
Lesson learned: Since 2012, P+S has reached 19 Brazilian states, 487 swimming institutions, and 972,000 children, instructors, and parents. In 2024 alone, 3,465 initiatives impacted 173,250 students and educators from schools, gyms, and clubs (1, 9).
Conclusion: P+S goes beyond pool safety, educating about drowning risks in beaches, rivers, waterfalls, boats, and fishing areas (3, 4). By promoting "Education not to drown," the program contributes to reducing fatalities in Brazil.

SWIMMING 46

Universal Causes of Drowning as the Foundation for an Innovative Swim Program on Land (SPoL) to Teach “The ABC of Safe Swimming” at Schools without Pools, using “Save-Yourself-from-Drowning: The Bubble Song"

Camille Honiball

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Background
Although WHO highlights drowning as preventable disease of epidemic proportions, globally there is no consensus on essential skills required for humankind to survive when submerged in water on planet earth, unaided— alone. Effective pedagogies for teaching the most vulnerable, the children, are also lacking. Current approaches are constrained by either elementary water safety theory, or competitive swimming content overload, unsustainable methods reliant on resources, inadequate instructors, and high costs, excluding low-income households most in need.

Description
Integrating limited academic drowning physiology with a lifetime in education and aquatic activities since 1965, experiencing multiple drownings in resource constrained rural KwaZulu-Natal— provided practical insight to identify 15 essential ‘self-saving’ skills, ‘the ABC of Safe Swimming’, to counteract universal causes of drowning due to submersion. Although these remain constant to all ages, methods of teaching are age-appropriately diverse. Considering teaching programs globally, SPoL provides a **‘ground’-**breaking intervention, targeting age 10 as the youngest for fastest success at schools. For the pilot application, schoolteachers taught the self-saving skills during Life Skills lessons. The addition of the purpose-written Bubble Song to a current Special Needs Group, enhanced skill retention through melody, rhythm-&-rhyme. Both applications required less than expected water time, after cognitive and kinesthetic memory were established on land first.

Lessons Learned
By eliminating complicated academic and irrelevant content, ‘the ABC of Safe Swimming’ could clarify existing swim programs, expediting safer outcomes— as swimmers who develop aquatic competencies for their unique physiques first, are better skilled to survive. SPoL’s multi-modal pedagogical approach transcends literacy and language barriers, improving access and outcomes. SPoL is a low-cost intervention, skillfully bridging the gap between basic water safety and advanced swimming instruction — particularly in schools lacking pools, providing a safe, scalable and sustainable solution.

Conclusion
Scaling the mandatory application of SPoL for ages 10-11 throughout schools, may empower future generations, globally transforming poor countries into safe swimming nations, at minimal cost. Animation-in-progress of the song, visually demonstrating the universal self-saving skills, is expected to have significant drowning prevention impact on digital audiences of all ages, worldwide.

Keywords: drowning prevention, SPoL, swimming education, water safety, SYfD, Bubble So

SWIMMING 47

Increasing the interest and engagement of Youth in Life Saving skills – alternatives to traditional programs

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Queensland's many beaches and waterways make water safety education essential. With the second-highest number of drownings in Australia and an 8% increase on the 10-year average, urgent action is needed [3]. Alarmingly, over 40% of children leave primary school unable to swim 50m or float/tread water for two minutes [2]. Research shows that 75% of children stop swimming lessons by age eight, yet many swim schools delay teaching survival skills, with 29% not incorporating them at all [1].

This gap in education leaves young people vulnerable, particularly as a recent study found that 38% of Year 10 students (15-16 years old) cannot meet primary school benchmarks for swimming and floating [4]. This increases their risk of drowning tenfold by age 20.

To address these challenges, Royal Life Saving Society Queensland (RLSSQ) developed NextGen Life Savers, a flexible program for youth aged 8-17. Designed to build water safety and lifesaving skills, it provides pathways to lifesaving sport, volunteering, and employment. Aligned with the National Swimming and Water Safety Framework (NSWSF), NextGen integrates seamlessly into swim schools, clubs, and aquatic venues, with options for regular, intensive, or holiday sessions [2].

The program includes:

- Safe Entries and exits
- Rescue and Personal survival techniques
- Resuscitation
- Water safety skills
- Challenges such as paddleboard relays, manikin tows, and water retrievals

NextGen is designed for diverse aquatic environments, requires minimal equipment, and uses available resources, making it ideal for rural and remote locations. The program progressively builds skills through fun and engaging activities, encouraging participants to share knowledge with friends and family.

NextGen's adaptable approach has increased youth participation in water safety education. Schools and communities value its flexibility, affordability, and alignment with existing curricula. Running sessions around students' availability has improved engagement, allowing families to fit lessons around other commitments.

NextGen Life Savers bridges the gap in youth water safety education, particularly in underserved areas. Its adaptable design and low resource requirements make it a practical solution for improving water safety skills across Queensland, ultimately reducing drowning incidents and fostering a culture of aquatic safety.

SWIMMING 48

RESGATE Junior Lifeguard Educational Program – "Creating a water safety culture": 15-year perspective of program implementation in Portugal

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Background: The Junior Lifeguard Program (JLP) was established in 2005 by the board of directors of RESGATE-A.N.S.L.A., the Portuguese lifeguarding association. This program targets children and adolescents from 8 to 17 years of age and aims to convey a culture of safety, prevention, and ocean rescue based on eight pillars: teamwork, strength, endurance, experience, courage, discipline, resilience, and loyalty.

Description: The program's strategy involves establishing local and regional community partnerships with health, safety, and environmental institutions. These partnerships help achieve planned goals, efficiently use resources, and increase program visibility. Institutions collaborate by conducting lectures and workshops, enriching the JLP curriculum, and increasing partners' visibility and recognition.

The first JLP involved 87 young participants aged 8 to 17, divided into Dolphins (8-13 years) and Sharks (14-17 years). The program ran for four years, with two-week sessions, four hours daily, featuring various activities such as health and physical conditioning, the history of ISN and RESGATE, first aid (e.g., BLS), rescue techniques, environmental assessment, adaptation to the environment, and contact with rescue equipment.

The program has been growing gradually. In 2008, there were 149 participants. Due to high demand, 2009 the program was restructured into five groups and new intervention levels, allowing all young people aged 7 to 17 to participate in age-appropriate activities. Parents were also gradually involved with the Association. On the last day of the program, called "RESGATE" Family, parents participate with their children in activities related to drowning prevention. Over 100 parents participated actively. By 2009, the program had two certified instructors. To support growth, 10 young cadets were selected and trained as JLP instructors through a specific training program.

Lessons learned and Conclusions: In 2019, JLP celebrated 15 years, with 500 young people enrolled, almost five times more than in 2005. The high demand shows that the program message is effectively conveyed, and parents trust and recognize the importance of the message that RESGATE has passed over this decade. Over 15 JLP editions, 4000 young people participated. Currently, 25 instructors and lifeguards are living testimony of the program's effectiveness.

SWIMMING 49

Does wearing a buoyancy aid effect water safety knowledge acquisition, awareness or confidence in immersive water safety activities? A comparative view of open water safety programmes delivered to participants wearing or not wearing buoyancy aids in an effort to improve inclusion and accessibility.

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The World Health Organisation recommends delivering basic swim skills and water safety training programmes for children aged 6 years (1). Wearing a buoyancy aid (BA) is also often cited as critical competent in the prevention stage of the drowning chain of survival (2).
Swim Safe, established in the UK in 2013, has been delivered to >200,000 participants through partnership between Royal National Lifeboat Institute and Swim England. Practical sessions give learners an opportunity to experience outdoor conditions, crucial to develop outdoor water competence (3), not traditionally taught as part of UK learn to swim programmes. From inception there has been a pre-requisite ability to swim 25m unaided as sessions are completed in the open water environment without the use of a buoyancy aid. This excluded 30% of the early secondary school age (11-14) population (circa 565,000 pupils annually) who are unable to swim 25m (4). This increases to 65% in those from low affluence families or 57% from Black populations (5). These groups are over-represented in UK drowning statistics (6).
In 2024 we introduced Swim Safe content as a pilot to the Royal Yachting Association's Onboard Programme. This introductory programme to sailing for young people is a low cost, inclusive programme aimed at tackling inequalities, delivered in many localities including areas of deprivation. There is no pre-requisite swimming competency when joining the programme. As all Onboard programme participants wear BA as standard operating procedure, it opens participation to non-swimmers. We wanted to understand the impact of wearing BAs on participants water safety knowledge (WSK), awareness (WSA) and confidence (SWC).
8101 participants completed the course wearing a BA versus 12,289 without a BA.
The BA and non BA groups were compared using digitally administered pre and post intervention surveys. We sampled WSK, WSA, SWC and feelings about swimming outdoors.
There was no significant difference in WSK, WSA, SWC between the BA and non BA groups.
We recommended modification of practical water safety programmes, removing pre-requisite swimming ability, instead replacing with BA, to increase accessibility to water safety knowledge and experience of outdoors water.

SWIMMING 50

Gradual pool entries increase young children's drowning risk compared to pool edges

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Background: The 2024 WHO drowning report reveals that children under 4 remain the most represented group in global drowning statistics, highlighting the urgent need to understand their vulnerability (1). Previous research has shown that locomotor experience influences infants' responses to water-related falls (water cliffs) (2) , with more experience increasing their tendency to avoid falling (3). However, infants seem more likely to enter the water via gradual slopes than cliffs, regardless of their locomotor experience (4). A notable limitation of these previous studies is that infants tested on cliffs were Portuguese, while those tested on slopes were New Zealanders, raising the question: Are these less adaptive behaviors on slopes due to differing affordances or cultural influences?

Methods: The present study evaluated 107 Portuguese babies (ages between 6.93 and 35.75 months; mean age = 21.57 ± 7.52 months) on their adaptive behavior when placed closed to a body of water. Each baby was tested once on the water cliff (drop-off leading into the water) and once on the water slope (ramp leading into deep water) with the order of conditions randomized. Unlike previous studies conducted in laboratory settings, this research was carried out in public swimming pools to enhance ecological validity. At all times the baby's security was ensured using an adapted harness that limited water immersion to chin level.

Results: The results showed that infants were significantly more likely to enter the water via the slope, with 65% reaching the submersion point, compared to only 30% who fell from the pool edge ($p < 0.001$, McNemar test).

Conclusions: These findings confirm that sloped entrances into the water pose a higher drowning risk for young children. Beyond simply restricting access to sloped entrances, preventive strategies should also emphasize safely exposing young children to such environments. This exposure can help them develop the ability to recognize risks and adapt their behaviour appropriately, fostering both awareness and safer interactions with these settings from an early age.

SWIMMING 51

Performance data driving improved water survival competency

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Water Skills for Life™ is a vital programme developed by Water Safety New Zealand that equips tamariki (children) with critical water survival skills. Every year, 90,000 young children (one in four) engage in Water Skills for Life™ through schoolteachers with pool access or swimming instructors in local facilities. Unlike traditional swimming lessons, Water Skills for Life™ focuses on water survival content, giving children aged 5-13 the knowledge to assess risk and make safer decisions in aquatic environments, such as beaches, rivers, and lakes.

The programme offers freely available resources to enhance the quality of aquatic education, emphasising age-appropriate skills for environments where drownings most commonly occur. While typically delivered in pool settings, Water Skills for Life™ can be adapted to local waterways to ensure all tamariki gain essential skills, even in communities without pool access. However, in recent years, Water Safety New Zealand found that student competency levels remained stubbornly low and were not improving. Key survival skills were not being prioritised by instructors and school teachers. Why? Because student achievement data was not being made visible to them, so they didn't know there was an issue that required attention. Just like your own health and wellbeing, you can't manage what you don't measure. Without clear insights into student progress, many instructors felt overwhelmed by the programme content and responded by making their own choices about where to focus. This contributed to poor student competence progression.

In response, Water Safety New Zealand developed a simplified competency framework with age-appropriate skill progressions. In some year levels, instructors and teachers now focus on just five core skills. Implemented a system to provide aggregated student achievement data to instructors and teachers, helping them understand performance, identify skill gaps, and refine their delivery. Encouraged instructors and teachers to set their own targets for improving student outcomes.

The result? Since implementing these changes, student competency levels have increased by 14% in the first year alone. This is the largest recorded lift in water survival competence in New Zealand. Evidence-based approach ensures water safety education remains relevant and effective, adapting to changing conditions and community needs.

SWIMMING 52

Bridging the gap in water safety education: assessing awareness, skills, and misconceptions among indonesian students

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Drowning is a critical yet overlooked public health issue in Indonesia, particularly among children under 15 years old. Despite the country's vast aquatic environment, the absence of a national water safety plan and formal education on drowning prevention exacerbates the risk. This study examines water safety awareness, swimming skills, and misconceptions among students in coastal areas of Gianyar Regency, Bali. A cross-sectional survey of 1,044 students aged 9–13 revealed significant gaps in water safety knowledge, with 73% reporting swimming ability but only one student had received formal instruction. Additionally, 75% were unable to float properly according to international standards, and 92% held dangerous misconceptions about rescue procedures. Alarmingly, 52% of drowning incidents involved students who considered themselves capable swimmers. These findings highlight the urgent need for structured water safety education and policy-driven interventions. Integrating water safety into school curricula and fostering community-based initiatives could mitigate risks and promote a culture of water safety. Collaborative efforts among researchers, policymakers, and international organizations are crucial to addressing this crisis.

SWIMMING 53

Impact of baby swim programs on infants' risk-taking in aquatic environments

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Background: Drowning is a leading cause of accidental death in children aged 1–4 years (1). While the World Health Organization recognizes swimming competency as a protective layer against drowning (1,2), there is no evidence that children below two years have the capacity to acquire aquatic survival skills (3). This raises questions about infant swim programs, as no evidence confirms they reduce drowning risk. However, emerging research suggests swim lessons may influence infants' aquatic risk perception (4).
Methods: Two controlled laboratory studies examined the relationship between swimming lesson frequency and infant behavior across distinct aquatic entry conditions. Study 1 (Water Cliff paradigm; N=101; mean age=13.01±2.39 months) assessed infants' responses to a sudden drop-off into water, while Study 2 (Water Slope paradigm; N=77; mean age=12.52±2.94 months) evaluated behavior toward a gradual sloped entry. Infants were placed on a platform adjacent to either a water tank (Water Cliff) or entry ramp (Water Slope). The number of swimming lessons they had attended was used to predict their behavior (avoiding vs. entering/falling into the water). Infant safety was ensured by climbing equipment controlled by the examiner, allowing a maximum fall of 5 centimeters in the Water Cliff and limiting submersion to chin level in the Water Slope setup.
Results: The analysis revealed a significant interaction between lesson frequency and entry type ($\chi^2(1) = 18.15$, $p<.001$). Infants with 10 or more swimming lessons were significantly more likely to avoid entering the water in the Water Cliff condition (66% avoided) while showing greater tendency to enter the water in the Water Slope condition (only 16% avoided) compared to infants with less than 10 lessons.
Conclusions: Infant swim programs reduce risk-taken with sudden drop-offs but may increase risk-taking on gradual slopes, revealing a water safety paradox. The Portugal (Water Cliff) and New Zealand (Water Slope) findings raise questions: Are behavioral differences caused by entry types or are cultural factors playing a role? Controlled studies must disentangle these influences to understand how swim experience shapes risk assessment across aquatic environments.

SWIMMING 54

Verification of effectiveness of floating in swimming for water safety

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Background: Approximately 300,000 people drown annually worldwide [1]. The floating skill in swimming which is an ability to maintain a stable position on the water surface without sinking is one of the most effective ways for drowning prevention [2]. Especially, the Back Float that is the most common and fundamental type of the floating, a drowning person can breathe because their face is above the water surface. In drowning accidents, it is believed that the chance of survival increases if swimmer floats by the Back Float and waits for rescue. However, there is no quantitative evidence that the Back Float is an effective survival method. Also, there are other floating besides the Back Float such as the Prone Float, the Elementary Back Stroke, and the Treading Water. They may be more advantageous for survival than the Back Float, because the swimmer can float for a longer period. In this study, an effectiveness of the floating for survival was verified based on exercise intensity.
Method: An experiment was conducted in a still water pool with 10 subjects floating for 6 minutes in a random order using the floating as follows: the Back Float, the Prone Float, the Elementary Back Stroke, and the Treading Water. A heart rate was continuously measured during the experiment. It was used as an indicator of exercise intensity because it reflects the physiological demand of each floating technique [3]. The ANOVA was applied to analyze the data.
Result: It was showed that exercise intensity differed depending on the floating type. The increase of heart rate and heart rate at the end of 6 minutes were lowest in the order of Back Float, Elementary Back Stroke, Prone Float, and Treading Water.
Discussion: It was thought that the treading water has resulted in a higher exercise intensity, because it requires moving swimmer's body greatly to maintain the posture. In addition, the Prone Float is more strenuous than the Back Float and the Elementary Back Stroke because of the necessity of body movement breathe.
Conclusion: The most advantageous float for survival was the Back Float in still water condition.

SWIMMING 55

Can we agree on what constitutes harm in early childhood aquatic pedagogy, and what term best describes it?

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Theory and practice involving *trauma-free aquatic pedagogy* (common English term) and respectful aquatic education (Spanish term) are not new concepts. Across 4+ continents, the premises are similar even though terminology may vary. While some advocates have tried to tie these ideas to the U.N.'s Rights of the Child, no cohesive international effort existed.

In early 2025, momentum changed in reaction to an Oscar-shortlisted documentary. Based on the "method" of a swimming instructor to whom the director sent her son, "A Swim Lesson" chronicles terrified children being pushed/pulled underwater while crying, with mouths open, resulting in choking/swallowing/aspirating water. One hysterical girl repeatedly chokes/aspirates water, eventually vomiting in the pool.

A literature review reveals how Negative Prior Aquatic Experiences (NPAEs) adversely impact children's ability to acquire aquatic skills. Early negative experiences can also have negative long-term consequences across the lifespan, including by deterring lifelong water competency. Notably, 19% of reported NPAEs occur during formal swimming lessons. Research findings demonstrate the ineffective nature of pedagogy based in potential trauma, and the need for aquatics/larger society to adopt harm reduction strategies. Children with NPAEs consistently demonstrate lower aquatic skill levels across age groups. Differences between parent and child perceptions of NPAEs additionally highlight the need to consider both viewpoints in aquatic education.

An international movement coalesced in opposition to the film. Across 4 continents, 15 countries, & three languages, over 200 people worldwide convened electronically for months including in a live international meeting. A survey was conducted (English & Spanish). Responses reflect a wide array of reactions & motivations, including regarding what constitutes harm & the most appropriate "universal" term, with 69% of Romance language speakers but only 17% English speakers indicating "respect" as a key component. Respondents expressed a range of responses regarding the public health nature of drowning prevention & the extent to which they believe "water competency" & "swimming lessons" should be differentiated concepts (93% responded affirmatively: Likert score of 3 or higher out of 5).

Quantitative data & qualitative findings will be presented. Notably: Opposition to the film presents an ongoing unique opportunity to bridge divides between survival swimming and "traditional" pedagogies.

SWIMMING 56

Effect of staged entry on the initial responses to cold water immersion

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Background: Sudden immersion into cold water evokes an inspiratory gasp followed by uncontrollable hyperventilation and tachycardia, these responses may contribute to many of the open water drownings in cold water (1). Staged immersion (waist immersion for 30 seconds prior to immersion to the shoulders) elicits smaller respiratory responses compared to rapid head-out immersion in 15 °C water (2). This study investigated whether a further reduction in both respiratory and cardiac responses would be observed with a longer staged immersion.
Methods: The protocol was given ethical approval (SHFEC 2020-70) and all participants provided informed written consent. Thirty-seven participants (15 women) undertook two immersions into 15.7±0.1 °C water: a staged immersion (2 minutes to waist [stagedW] then 3 minutes to shoulder [stagedS]) and a rapid immersion (5 minutes to shoulder [rapidS]) . The order of immersions was counterbalanced and conducted at the same time of day on consecutive days. Minute ventilation (V_I), respiratory frequency (f_R), tidal volume (V_T) and heart rate (HR) were measured continuously. Inspiratory gasp (IG) was recorded as the largest breath in the first 10 seconds of immersion.
Results: In the first 30 seconds of immersion, V_I was lower in stagedW (29.5±10.9 L.min^{-1}) compared to both rapidS (50.7±18.7 L.min^{-1}; P<0.001) and stagedS (47.2±19.5 L.min^{-1}; P<0.001) which were similar. f_R was 21.4±5.3 breaths.min^{-1} in stagedW which increased to 28.3±8.6 breaths.min^{-1} (P<0.001) in stagedS and 32.3±9.4 breaths.min^{-1} in rapidS (P<0.001). V_T was lower in stagedW (1.41±0.52 L) compared to rapidS (1.62±0.52 L; P=0.003) but not different from stagedS (1.69±0.56 L). IG was smaller in stagedW (1.98±0.63 L) compared to both rapidS (2.31±0.78 L; P=0.16) and stagedS (2.35±0.60 L; P=0.004) which were similar. HR was lower in stagedS (102±20 beats.min^{-1}) compared to stagedW (110±17 beats.min^{-1}; P=0.01) and rapidS (111±18 beats.min^{-1}; P=0.04).
Conclusion: Although waist immersion resulted in smaller initial respiratory responses compared to rapid immersion, subsequent immersion to the shoulder evoked a similar response. HR was not different between waist and rapid immersion indicating that cold water immersion, even when staged, can pose a drowning risk.

SWIMMING 57

The owl's eye: sharpening the educator's view for individualized learning in swimming education

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Background:
Learning to swim is fundamental for water safety and drowning prevention. National guidelines (e.g., from swimming and lifesaving federations) provide structured learning pathways, consecutive lesson plans, and progression awards with assessments. However, they often assume a linear learning process. In contrast, real-world swimming education is more complex: diverse learners with different motor skill levels and prerequisites require a non-linear approach to skill acquisition, resulting in different lesson design requirements [1]. Educators must bridge the gap between the guidelines and the dynamic realities of teaching.

Description:
The Owl's Eye – a diagnostic procedure for swimming skill analysis – has been developed to support educators in navigating this complexity. The procedure is linked to a didactic framework [2] that provides a structured approach while allowing individualized learning paths rather than imposing a rigid structure. By precisely analyzing each child's current learning phase, the procedure provides suitable affordances, enabling educators to select appropriate teaching strategies and ensure individualized progression within a group. The priority is to empower educators. Therefore, the accompanying studies focus on educators' evaluations rather than directly measuring learners' performance.

Experiences:
Initial paper-pencil studies with educators have led to refinements, demonstrating the procedures' potential and value in everyday practice. In addition, translating the concept into a digital tool led to the further development of the procedure (e.g., clarifying decision-making processes and adding intermediate steps). Educators are always involved in ensuring that the tool is easy to use. Early feedback highlights how the procedure enhances the educator's ability to analyze learning needs and design dynamic learning environments that promote active engagement and skill acquisition.

Conclusions:
The Owl's Eye links diagnostic analysis to a structured didactic framework and the realities of diverse learning environments. It can sharpen the educator's ability to recognize individual learning needs. This approach can potentially strengthen swimming educators' confidence and ultimately enhance the quality of foundational swimming education for all learners. Its long-term success depends on close collaboration with educators – only if they find it feasible and see its value it will become an integral part of practice. *The Owl's Eye is* being converted into a digital tool (national funding).

SWIMMING 58

Promoting the use of personal floating devices and buoyancy aids in open water: a national drowning prevention initiative in Switzerland

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Background: In Switzerland, 90% of fatal drowning accidents occur in open waters, primarily involving able swimmers who drown suddenly, making it an important issue from a public health perspective [1,2]. Research highlights that personal flotation devices (PFDs) and other buoyancy aids effectively reduce drowning incidents [3]. To promote their use, the BFU — having a national mandate for accident prevention in Switzerland — in collaboration with the Swiss Lifesaving Society (SLRG), launched the "Stay on Top " campaign [4].
Description: At the annual Water Safety Forum (WSF), a shared understanding of drowning prevention was established, fostering collaboration among numerous organizations, with outcomes documented in a report [2].
Through the “Stay on Top” initiative, the BFU and SLRG jointly advocate the use of buoyancy aids while swimming and bathing in open waters and while boating. Implemented in two phases, the campaign first focused on PFDs used for boating (2019) and later prioritized buoyancy aids for swimming (2022).
To maximize impact, various stakeholders — including water police, lake and river swimming areas, local authorities, and safety product retailers — were engaged. Public awareness efforts included free rental stations with floating buoys, media outreach, and strategic partnerships. Scientific monitoring includes national baseline surveys and follow-ups. PFD usage while boating increased from 13% (2018) to 17% (2022), though within the statistical margin of error. Additionally, in summer 2022, 50% of river swimmers used buoyancy aids [5,6]. A follow-up survey in 2025 will further evaluate trends.
Lessons Learned: Evaluation criteria include stakeholder involvement, retail visibility, and PFD usage. Key stakeholders were successfully engaged, and campaign visibility increased through floor adhesives in national sports retailers. A user survey provided insights into preferences, promoting wider PFD adoption. The initiative's effectiveness may be reflected in a slight increase in PFD usage.
Conclusions: Sustained, targeted drowning prevention efforts require policy support, stakeholder collaboration, and public engagement. The success of national campaigns depends on strong partnerships and coordinated communication. The importance of buoyancy aids in preventing drowning in open waters is firmly embedded in the BFU’s Multi-Year Program (MYP) for 2026–2030, ensuring long-term commitment.

SWIMMING 59

Universal Causes of Drowning as the Foundation for an Innovative Swim Program on Land (SPoL) to teach “The ABC of Safe Swimming” at Schools without Pools, using “Save-Yourself-from-Drowning: The Bubble Song”

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Background
Although WHO highlights drowning as preventable disease of epidemic proportions, globally there is no consensus on essential skills required for humankind to survive when submerged in water on planet earth, unaided— alone. Effective pedagogies for teaching the most vulnerable, the children, are also lacking. Current approaches are constrained by either elementary water safety theory, or competitive swimming content overload, unsustainable methods reliant on resources, inadequate instructors, and high costs, excluding low-income households most in need.

Description
Integrating limited academic drowning physiology with a lifetime in education and aquatic activities since 1965, experiencing multiple drownings in resource constrained rural KwaZulu-Natal— provided practical insight to identify 15 essential ‘self-saving’ skills, ‘the ABC of Safe Swimming’, to counteract universal causes of drowning due to submersion. Although these remain constant to all ages, methods of teaching are age-appropriately diverse. Considering teaching programs globally, SPoL provides a ‘ground’-breaking intervention, targeting age 10 as the youngest for fastest success at schools. For the pilot application, schoolteachers taught the self-saving skills during Life Skills lessons. The addition of the purpose-written Bubble Song to a later Special Needs Group, enhanced skill retention through melody, rhythm-&-rhyme. Both applications required less than expected water time, after cognitive and kinesthetic memory were established on land first.

Lessons Learned
By eliminating complicated academic and irrelevant content, ‘the ABC of Safe Swimming’ could clarify existing swim programs, expediting safer outcomes— as swimmers who develop aquatic competencies for their unique physiques first, are better skilled to survive. SPoL’s multi-modal pedagogical approach transcends literacy and language barriers, improving access and outcomes. SPoL is a low-cost intervention, skillfully bridging the gap between basic water safety and advanced swimming instruction — particularly in schools lacking pools, providing a safe, scalable and sustainable solution.

Conclusion
Scaling the mandatory application of SPoL for ages 10-11 throughout schools, may empower future generations, globally transforming poor countries into safe swimming nations, at minimal cost. Animation-in-progress of the song, visually demonstrating the universal self-saving skills, is

expected to have significant drowning prevention impact on digital audiences of all ages, worldwide.

Keywords: drowning prevention, SPoL, swimming education, water safety, SYfD, Bubble Song

SWIMMING 60

A Randomized Controlled Trial of a 4-Week Treading Water Training Programme for Children

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Background: Despite global calls to enhance swimming education, evidence-based interventions targeting specific survival skills like treading water remain scarce. This study addresses a critical gap as the *first randomized controlled trial (RCT)* evaluating a structured treading water training program (TWTP)—a novel, skill-specific intervention combining practical training with drowning prevention education.
Methods: Using a single-blinded RCT design, 15 children (boys, 53%; age range, 5–10 years) from a Hong Kong swimming club were allocated to a 4-week TWTP (n=8) or a control group (n=7). Swimming competence was assessed by coach via the validated Swimming Competence Questionnaire (SCI score: 0–100), and treading water duration (seconds) was measured using stopwatch. Mann–Whitney U test tested if the intervention group had better improvement in swimming competence and treading water skill than the control group.
Results: The TWTP group demonstrated exceptional gains: swimming competence improved by 15.13 points vs. 5.71 in controls (p=0.04, d=1.05), while treading duration surged by 15.63s vs. 1.43s (p<0.001, d=3.63). These effect sizes highlight the intervention's precision in targeting survival-critical water safety skills.
Conclusions: These findings support the effectiveness of treading water training in improving children's swimming competence and treading water skill, highlighting the benefits of incorporating TWTP into traditional swimming training to bolster children's safety.
Keywords: Drowning prevention, survival skill training, aquatic safety, RCT evidence

SWIMMING 61

Assessing the implementation of a survival swimming program for children aged 6-15 in Vietnam using the RE-AIM framework

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Background
Drowning is a significant public health issue in Vietnam. In early 2018 the survival swimming program for children aged 6-15 implemented in 12 provinces with high burden and various geographic features. This study aimed to evaluate the program's effectiveness by using the RE-AIM framework, which broadly assesses the impact of public health interventions across five dimensions: Reach, Effectiveness, Adoption, Implementation, Maintenance.
Methods
A mixed-methods study design was employed, incorporating secondary data analysis, household surveys, and key informant interviews. Secondary data analysis included drowning mortality rates from 2017 to 2022. Household surveys assessed parental awareness, drowing risk factors, and program satisfaction. Key informant interviews gathered perspectives from releavant stakeholders. The RE-AIM framework was used to organize and analyze the data.
Results:
Reach: The program reached approximately 373,000 children, representing 3.9% of the target population.
Effectiveness: Drowning mortality rates showed a decreasing trend in intervention areas, with an estimated about 5 deaths averted per 100,000 children per year. Children aged 6-15, who directly participated in the program, experienced a more significant reduction in drowning rates compared to children in other age groups.
Adoption: The program was adopted by 12 provinces, with varying levels of participation and implementation. Survival Swim curriculum ratified by the relevant ministries and consistently adapted in community level. Quality assurance is well established at all levels.
Implementation: Key program activities included survival swimming lessons, water safety training, and community awareness campaigns. Transfer of techniques is good. More than 1,000 swim trainers certified by local authority. Over 90% of 50,000 trained children passed the program requirements (swim 25 meters and stay afloat within 90 seconds). Community awareness increased, with over 60% of parents in intervention areas reporting awareness of and > 90% satisfied with the program
Maintenance: The program's long-term sustainability is potential, remarkbly in political commitment, policy win and human investment. Other challenges related to funding, community participation, and data quality.
Conclusions: The survival swimming program demonstrated positive impacts on reducing drowning mortality rates among children aged 6-15 in Vietnam. However, challenges remain in reaching a larger proportion of the target population and ensuring the program's long-term sustainability.

SWIMMING 62

Swim for Safety, Sri Lanka – Survival Swimming and Water Safety Education Among School Children

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Background:
Drowning is the leading cause of accidental injury-related death among children aged 1–14 years in Sri Lanka. To address this critical issue, *Swim for Safety (SfS)* was introduced as a structured survival swimming and water safety training program for school children aged 10–16 years. The program is implemented by *Sri Lanka Life Saving (SLLS)* in collaboration with *Life Saving Victoria (LSV)* and in exclusive partnership with the *Princess Charlene of Monaco Foundation*, with the goal of equipping children with essential survival skills and water safety awareness.
Methods:
SfS consists of 12 structured lessons, each lasting 1.5 hours, delivered over 6–8 weeks. The curriculum includes survival swimming skills, safe entry and exit techniques, floating, sculling, treading water, swimming in a controlled direction, hazard identification, victim rescue, and basic emergency response following the *DRSA* (Danger, Response, Send for help, Airway) protocol. The program is delivered by trained swim teachers, volunteer lifesavers, and assessors, ensuring quality through a structured teachers' and assessors' guide, as well as expert supervision from *SLLS* and *LSV*. Participants are selected via convenience sampling, with approvals from the *Ministry of Education* and respective school principals. Informed written consent is obtained from parents and teachers. Knowledge and skills are assessed using pre- and post-tests, with knowledge evaluated via a self-administered questionnaire and skills assessed based on set criteria.
Results:
Since its inception in January 2016, the *SfS* program has reached over 6,000 children across eight of the nine provinces in Sri Lanka. Findings indicate a significant improvement in both water safety knowledge and survival skills among participants. Detailed data and analysis will be presented at the conference.
Sustainability & Impact:
Since July 1, 2020, the *Princess Charlene of Monaco Foundation* has played a crucial role in sustaining the program. Additionally, during the economic and political crises of 2021/22, this partnership was instrumental in supporting *SLLS* community-based lifesaving clubs, ensuring the program's continuity.
Conclusion:
The *SfS* program exemplifies a sustainable drowning prevention model aligned with *WHO* recommendations. Through strong partnerships and community engagement, it demonstrates a scalable approach to reducing drowning risks among children in Sri Lanka.

SWIMMING 63

engaging with faith-based organizations to drowning prevention program through international pathfinder camporee water safety station combining the rlssa aquacode and rnli float to live messages in line with world drowning prevention day 2025

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Background: The Pathfinder Club program is the Seventh-Day Adventist Church's version of the scouting movement that has an international, interracial and interreligious membership. It is mainly composed of students enrolled in Adventist elementary and secondary schools worldwide. This camporee held on 23 February to 2 March is participated in by 9500+ Pathfinders, adult leaders and directors from the Southern Asia-Pacific Division that comprises 11 countries, a camporee is being conducted every two years. The Philippine Lifesaving Society took the opportunity to handle the Water Safety and Swimming Station with the aims of introducing the World Drowning Prevention Day, RLSSA Aquacode and RNLI Float to Live messages to the participants.
Description: The PLS used the Water Safety Symposium program. The station is divided into four substations namely: WDPD 2025 and Aquacode, Resuscitation, Non-contact Rescue and Float to Live. Each station is given 15 minutes to lecture and provide demonstration and return demonstrations to the participants. Instructors use raising of hands and headcounts to gather data for questions and skills. One pool is used for the non-contact rescue and another pool for the Float to Live. 8 resuscitation manikins were provided.
Lessons Learned: It was found out that more than 90% of the participants never heard about the World Drowning Prevention Day and that most clubs did not conduct water safety and swimming activities despite the requirements of the Achievement classes and honors. It was also noted that floating and CPR are common skills among Pathfinders and that they have a preconceived idea that only swimmers can effect a rescue. Another lesson learned is that training equipment such as resuscitation manikins provide better outcome in CPR skills transfer particularly in giving ventilations.
Conclusions: The Pathfinder Club of the SDA is a positive avenue for the World Drowning Prevention Day advocacy given its adherence. In addition, RLSSA Aquacode and RNLI Float to Live messages can be combined to be used in a drowning prevention symposium. Further, the conduct of refresher courses among the volunteer instructors will produce best results. Furthermore, improving and replicating this activity for the scouting jamborees is highly recommended.

Technology

TECHNOLOGY 01

Effectiveness of AI rip current detection system at six beaches

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Background: In Japan, rip currents are the main cause of drowning accidents at beaches, it accounts for 48 % of accidents. As a measure against the rip current accidents, the AI-based rip current detection system was developed in 2018[1][2]. In this system, when the AI detects the rip current generation, the system automatically informs it beachgoer's smart phone using the mobile app. Furthermore, if swimmers enter the rip current area, the system informs it to lifesaver's wearable device. The system has been actually operating at six beaches that have different characteristics such as waves, rip currents and topography. In this study, an effectiveness of the system was verified using data analysis, image analysis and a hearing survey.
Methods: AI detection logs of rip currents and rescue data of six beaches were analyzed. The accuracy of the AI detection of rip currents was verified through image analysis and the hearing survey for local governments and lifesavers.
Results: The AI models of each beach were able to detect almost all types of rip currents, but it also includes cases that were not rip current generations. The results of the image analysis showed that the accuracy of rip current detection by AI was 70 to 80%. In the 4th system operational beach as an example, the number of accidents reduced to 43 in 2022, 30 in 2023, 19 in 2024, and 66 in 2025 after the system operation, even though a maximum of 374 rip accidents occurred before the system operation. As a result, the rip current accidents reduced to 32 % after the system operation in terms of the average total number of beachgoers. In the 1st system operational beach, the rip current accidents reduced to 6 %. On the other four beaches, there were no rip current accidents. In the hearing survey, the accuracy of rip current detections by AI and the usefulness of the system were evaluated as high.
Conclusions: It was confirmed that the AI rip current detection system can enhance rescue operations and was generally practical and useful which could contribute to prevent and reduce rip current accidents.

TECHNOLOGY 02

AI & Drowning Prevention: Using fixed Internet Protocol (IP) cameras for identification of rip & longshore currents

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Summary
Rip currents continue to be the number one hazard and are a known contributing factor in more than 35% of beach drowning deaths within Australia. (Royal Life Saving Society Australia, 2024) The majority (~70%) occurred more than 1km away from a lifesaving service, with all incidents occurring at unpatrolled locations, outside of patrol times, or outside the red and yellow flags. (Surf Life Saving Australia, 2024)
As part of tackling this issue, existing infrastructure – Internet Protocol (IP) cameras installed by councils & surf life saving clubs - can be used to track beach conditions in real time to not only provide tooling for lifeguards to monitor areas outside of their patrol but to also provide automated alerting to first responder networks, reducing time to rescue and stopping preventable deaths.

Description
ResQVision (Spectrum Rescue Technologies) have developed a risk management platform that integrates with existing infrastructure to mitigate preventable drownings - One of the key offerings is the ability to identify and detect rip currents in IP camera footage.

Realtime information can be extracted from any ocean facing camera - like ocean flow characteristics, wave data, shoreline changes - by using a mixture of classical computer vision techniques and deep neural networks, these features can be used to estimate near shore bathymetry and in turn detect & localise rip currents and longshore currents.

This information, coupled with swimmer detection models, powers automated alerting systems that integrate with first responders, allowing for coordinated rescues in unpatrolled locations.

This presentation aims to discuss some of the technical aspects involved in trying to understand the chaotic nature of the ocean, specifically around bathymetry & rip current prediction, as well as some of the limitations of AI in this space and what the future might bring.

TECHNOLOGY 03

XGBoost forecast modelling of beach attendance estimated using deep learning from video station images

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Background: Accurate prediction of beach attendance is crucial for coastal management and public safety, particularly in optimizing lifeguard deployment and improving beach safety programs. While environmental factors such as weather, waves, and tides influence beachgoer behavior, existing methods for estimating attendance often lack accuracy or require significant manual effort. Recent advances in deep learning and machine learning techniques provide new opportunities to more accurately measure and further predict beach attendance.
Methods: This study explores the use of an XGBoost machine learning model to predict beach attendance from video-derived data, integrating weather, oceanic, and temporal variables. This research was conducted on the southwest coast of France in summer. Beach attendance was estimated every 10 minutes during daylight hours at two beaches (La Lette Blanche and Biscarrosse) using a 180° video system, with the estimates further validated by lifeguard hourly observations at La Lette Blanche in summer 2022. Input data for the XGBoost model included daily environmental conditions (weather and wave conditions, tide), and temporal features (e.g., month, day, hour). An extensive hyperparameter tuning strategy optimized the model's performance through grid search, cross-validation, and early stopping to prevent overfitting.
Results: The XGBoost model demonstrated high predictive accuracy, successfully forecasting the time-evolution of beach attendance at Biscarrosse (R^2 = 0.97, RMSE = 70 individuals, with a maximum instantaneous count exceeding 2,000 individuals). Feature importance analysis revealed that the most influential predictor was the time of day (dayhour), followed by weather conditions in the order of temperature, insolation, and wind speed. Wave and tide conditions had minimal impact while incorporating daily mean values for weather variables further improved the model’s performance. The model successfully captured the complex nonlinear relationships between input variables, including the ability to differentiate between beach attendance patterns on cold, regular, and heatwave days.
Conclusions: The application of XGBoost for predicting beach attendance shows large potential for accurate real-time predictions (1). These findings can be integrated with surf zone hazard forecasts (rip currents, shore-break waves), to enhance public safety efforts. Future research should focus on further validating the model across different beach environments and during off-season periods.

TECHNOLOGY 04

Can AI improve Surf Lifesaving? - A Pilot Study with the Danish Lifesaving Organization

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Background: Artificial Intelligence (AI) has the potential to enhance both safety and efficiency in surf lifesaving. The Danish Lifesaving Organization (DLO) aims to assess AI's effectiveness in improving safety for the millions of beach visitors they protect each summer.
Aim: This study will evaluate whether AI can enhance beach safety through an evidence-based, comparative analysis.
Method: Data will be collected from two monitored areas:
Area A – Traditional surveillance by a single lifeguard using observation, listening, and situational awareness.
Area B – Identical to Area A but augmented with AI-driven cameras that monitor both the primary zone and an extended adjacent area.
The AI system will detect potential drowning incidents and notify lifeguards in real time. The study will compare the number of identified hazardous situations between Areas A and B, assessing both effectiveness and cost. Initial estimates suggest the AI system's cost is negligible relative to DLO's overall budget. Additionally, the study will evaluate whether AI alerts allow lifeguards to respond to adjacent-area incidents in time to make a meaningful impact. Data collection and analysis will follow the statistical value chain methodology(1).
Results & Conclusion: The study will be conducted during the Danish summer of 2025. If data volume is insufficient for statistical significance, further seasons may be required. The working hypothesis is that AI-enhanced Area B will outperform Area A in hazard detection with minimal additional cost.
Discussion. Findings will be analyzed in terms of safety impact, operational challenges, and user experiences from both lifeguards and beachgoers.

TECHNOLOGY 05

Creating AI model for help signal detection

Ryo Shimada, Toshinori Ishikawa, Naoya Fujita, Sarina Wada

Chuo University, Tokyo, Japan

Background: In order to prevent accidents on the beaches, lifesavers call out to beachgoers about heatstroke and dangerous areas or rescue beachgoers at risk of drowning. However, 2,000 to 3,000 rescues are performed annually in Japan and the number of rescues is not decreasing [1]. It is because of a situation in which one lifesaver needs to monitor more than 1000 beachgoers. Under these situations, beachgoers themselves also need to take measures to prevent accidents. The help signal is a universal sign to indicate that beachgoers need rescue. It is performed by waving one's arms out to the side. If this sign is found by a lifesaver, they can perform rescue operations quickly. However, it is difficult to constantly monitor all beachgoers under the situation in which one lifesaver needs to monitor more than 1000 beachgoers. Thus, we have created an AI model that can detect help signals to images taken by fixed-point cameras on the beach. For verification, we evaluated the accuracy of the AI model which detect help signals.
Methods: The study site is the Yuigahama-beach which has three fixed-point cameras and is used by a lot of beachgoers. First, we shot video of the subjects giving the help signal at the study site by the fixed-point cameras. Next, in order to train the AI model, we annotated the area of doing help signal in images. Then, the images were converted to a higher resolution and changed images' colors and size and rotated to increase the amount of training data. We created a mask image by calculating a difference of 3 consecutive images. As a CNN algorithm, we used the YOLOv5 [2]. The created AI model was verified by precision and recall.
Results: As a result of the verification, the AI model could detect help signals with an 88 % of precision, 86 % of recall.
Conclusion: The AI model that could detect help signals was created in a certain accuracy. It is thought that the crated AI model is useful to prevent beach accidents.

TECHNOLOGY 06

The future of sustainable rescue crafts

Alistair Glover-Main

E WaterCrafts, Sydney, Australia

E WaterCrafts – The Jet-Rescue Board

The Jet-Rescue Board by E WaterCrafts represents a new era in water-rescue operations—one where performance, safety, and sustainability come together in a single purpose-built craft. Powered by a high-efficiency 15 kW electric motor and a modular lithium battery system, the board delivers rapid acceleration, steady control, and reliable operation in dynamic surf and flood water environments. Reaching speeds of up to 55 km/h, it enables lifeguards and rescue personnel to respond quickly and safely in scenarios where every second counts.

Beyond performance, the Jet-Rescue Board supports a global shift toward cleaner, more sustainable lifesaving operations. With zero emissions, low noise pollution, and minimal maintenance, it provides agencies and communities with a viable pathway to reduce environmental impact while improving operational effectiveness. As ocean rescue organisations worldwide explore alternatives to fuel-driven Rescue Water Craft, the Jet-Rescue Board stands as a forward-thinking solution—one that aligns with evolving environmental responsibility, budget efficiency, and public expectation.

E WaterCrafts' mission: is to equip lifesaving professionals with innovative tools that protect both people and the marine environments they serve. The Jet-Rescue Board is a step towards that future.

TECHNOLOGY 07

Quantitative evaluation of recognition ability for rip currents with different characteristics using Virtual Reality and eye-tracking

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Background: Rip currents are the main factor of drowning accidents at beaches of Japan, it accounts for 48% of accidents [1]. It is difficult for beach-goers to recognize it [2] [3]. In order to reduce rip current accidents, it is necessary to clarify the actual level of beach-goer's knowledge and ability to identify rip currents [4]. However, there is a challenge in that the differences in recognition ability for various beaches, rip current characteristics, and knowledge levels have not clarified. If these are clarified, it is expected to lead to effective drowning prevention measures and education. In this study, it was researched to clarify the identification ability of rip currents with different beaches, locations, weather and wave conditions, rip current characteristics, and viewpoints using Virtual Reality (VR) and the eye-tracking. In addition, in order to quantitatively evaluate the rip current knowledge and clarify whether knowledge leads to differences in recognition, a knowledge survey was conducted for participants.
Methods: The 34 participants watched VR videos which were shot rip currents that differed in eight cases of target beaches, occurrence locations, weather and wave conditions, and characteristics such as flash, fixed and permanent rips. Three gazing data were used in the analysis as follows; total number of visits in the rip current area, total duration of visits, and time to first fixation. The participants' knowledge of rip currents was quantitatively evaluated using the knowledge test.
Results: Rip currents that generate under the calm wave conditions and fixed rips were not well known and were difficult to recognize. Almost all participants could identify the permanent rip from a bird's-eye view where the entire that could be seen. It was also found that even those participants with knowledge had difficulty in identifying rip currents more quickly.
Conclusions: This study quantitatively clarified the difference in rip current recognition ability due to differences in rip current characteristics and knowledge. It was thought that the results can be used to develop measures to prevent rip current accidents.

TECHNOLOGY 08

How can video assistance improve the intervention skills of lifeguards in teaching and practical evaluation?

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Background: Lifeguards play a crucial role in preventing and responding to such emergencies. Simulation-based learning (SBL) has emerged as a vital pedagogical tool for developing practical and theoretical competencies in emergency-related education. Video debriefing, a critical phase of simulation, enhances reflection and knowledge retention. The integration of video assistance in debriefing is revolutionizing how students learn and apply their skills.

Objective: This project aims to implement video assistance in lifeguard training to enhance practical intervention skills. The focus is on improving the teaching and practical evaluation of lifeguards through video-assisted debriefing. The study evaluates students' perceptions of video-assisted debriefing to identify successes and errors during clinical drowning scenarios.

Results: The use of video-assisted debriefing significantly enhanced the understanding and skills of a sample of 24 lifeguards trained at the University of Vigo (Spain) in resolving clinical cases. This improvement was particularly evident in their ability to recognize and address individual and group errors during simulations. Without video, 33.3% of participants rated their comprehension as "Acceptable," 58.8% as "High," and only 8.3% as "Excellent." With video assistance, only 4.2% remained at "Acceptable," while 67.7% reached "Excellent". The video assistance also enhanced individual and group error recognition, with 67.7% achieving "Excellent" in individual error appreciation compared to 4.2% without video. Group error recognition improved similarly, with 54.2% reaching "Excellent" with video assistance.

Conclusions: The project is perceived as an effective tool for improving the understanding of clinical cases in lifeguard training. Video assistance in debriefing provides precise, personalized feedback, freeing instructors from recording duties and enhancing the teaching process. The technology fosters a more dynamic and engaging learning environment, increasing student motivation and commitment. This approach not only facilitates knowledge acquisition but also enhances students' ability to apply their skills in practical situations, which is crucial in lifeguarding where quick recall and application of knowledge can be lifesaving.

TECHNOLOGY 09

A smartphone rip-detection tool to improve rip current awareness in Australia

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1Surf Life Saving Australia, Sydney, Australia. 2UNSW, Sydney, Australia

Background: Rip currents claim more Australian lives on average each year than floods, cyclones, bushfires and shark attacks combined. Despite numerous efforts to reduce rip current risk, recent statistics indicate that rip current-related deaths in Australia are still on the rise. Clearly, a new approach is needed to reach high-risk demographics, recognizing that not all of Australia's 11,200 beaches can be always patrolled by lifesaving personnel. This study presents a novel tool that harnesses deep learning algorithms to detect rip currents from smartphones.
Methods: Using existing community beach monitoring stations, smartphone cradles are used to stabilize video imagery in the field and enable the detection of rip features in the surfzone. A deep learning algorithm *RipDet+* was then tested and optimized using a new dataset of annotated rip currents from different perspectives developed specifically for Australian beaches. This database includes images taken by smartphone from the CoastSnap community beach monitoring project as well as new crowd-sourced data collection by volunteers from Surf Life Saving clubs. The new rip current database (comprising 15,000+ images annotated using *Roboflow*). This database was then used to test and develop the learning algorithm.
Results: A hybrid training framework of CNN-based parameter predictor, fully differentiable image processing module and RipDet+ with detection loss enabled the model to learn appropriate representations and to enhance video slices for better rip-current detection. Testing revealed rip detection performance at >85% on the new annotated dataset, although some challenges remain with ambiguous rips as well as at very low angle viewpoints.
Conclusions: The encouraging results demonstrate the potential of this tool for public application, with current progress working with stakeholder groups to test algorithm roll-out and design. Following extensive testing, this new is intended to be gamified and used to improve rip current identification skills and enhance rip current awareness with the Australian public, particularly among high-risk groups.

TECHNOLOGY 10

development of automatic drone operating system to prevent rip current accidents

Ryo Shimada, Toshinori Ishikawa, Naoya Fujita, Sarina Wada

Chuo University, Tokyo, Japan

Background: In Japan, 2000 to 3000 rescues occur yearly, and the main cause is rip currents [1]. In Australia, the United States, the United Kingdom, and other countries more than half of rescues are caused by the rip currents [2]. There are two issues to prevent rip current accidents. The first is that one lifesaver needs to monitor more than 1000 beachgoers. The other issue is that rip currents can occur even in calm wave conditions, so it is difficult for beachgoers to recognize them. As a measure against these issues, the AI rip current detection system was developed in 2018 [3]. This system is currently in operation at six locations in Japan, and it has been confirmed to either eliminate or significantly reduce the number of rescues at all the beaches where it is operated. On the other hand, lifesavers perform rescues and warnings, but it takes a lot of time on beaches with long coastlines. Therefore, it is thought that calling out to people using a drone would be a good idea, but there are technical issues, and the cost of hiring a drone pilot would be a burden for the beach administrator. To solve this issue, we developed a drone system that automatically flights and alerts to beachgoers in rip current areas linked to the AI rip current detection system.
Methods: At first, the homography matrix was calculated from the on-site survey, allowing the position coordinates on the image to be converted to the GPS coordinates. Then, using the coordinates of the rip current from the AI detection, the drone was programmed to fly automatically to a rip current area. To evaluate the drone system, the accuracy of drone position coordinates and the difference in the time taken to approach beachgoers with and without the drone were investigated.
Results: The accuracy of the drone system was 7-10 m comparing the GPS position of the drone with the subject, and the time taken to approach beachgoers was reduced by 49 %.
Conclusion: It was thought the drone system would be useful to prevent rip current accidents.

TECHNOLOGY 11

Verification of AI-based automatic drowning detection system in crowded swimming pool

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Background: An enhancement of “Keep Watch” is required to prevent drowning accidents in swimming pools. Therefore, we developed a system which could detect suspected drowning and dangerously behaving using AI in 2023. In this system, AI analyzes image data which is taken by web cameras at the poolside in real time. At the time of detection of swimmers suspected of drowning or behaving dangerously in a high-risk situation that could lead to a drowning accident, the system informs it to lifesaver’s smartwatch. This system has been actually operated at two pools. In the process of actual operation, a challenge arose as to whether AI could reliably detect suspected drowning and dangerous behavior in a crowded pool. In this study, an AI model was created for a situation in which more than 100 children were using at a 25-meter short-course swimming pool, and its detection accuracy was verified.
Methods: As determination of detection objects, we set five cases of the suspected drowning and drowning: beating the water surface, head bobbing up and down, climbing the ladder movement, and flow or submerged without moving limbs. In addition, five cases of the dangerous situations were set: diving under a platform on the bottom of the pool, nonfatal drowning while holding on to a course-rope or a kickboard, capsizing of a pool float, and submerge in play. In creating the AI model, a learning data for each object was used, when the swimming school was at its maximum usage. Also, YOLOv5 was used as an image detection algorithm [1].
Results: As a result of considering various learning conditions, we could create a highly accurate AI model with precision = 0.91 and recall = 0.92. This means that 91 % of the detection results were correct, and 92 % of the targets that needed to be detected were detected. Furthermore, it was confirmed that it could properly detect each subject under the actual operation.
Conclusions: It was found that the created AI model could detect the suspected drownings, drownings, and dangerous situations in the crowded swimming pool with a certain degree of accuracy.

TECHNOLOGY 12

Using Machine Learning to Predict Beach-Related Incidents in Ocean City, Maryland, USA

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Background: Ocean City, Maryland a 9-mile-long beach along the east coast of the United States, attracting one of the highest seasonal beach populations in the country. A significant portion of visitors engaged in ocean activities, increasing the risk of beach-related incidents such as lifeguard rescues, drownings, and surf-related injuries. These incidents are influenced by numerous factors, such as weather conditions, ocean currents, and peak tourism periods. Additionally, advancements in machine learning (ML) modeling have demonstrated significant potential in forecasting complex, environment-driven events, making it a promising approach for improving beach safety and emergency response planning.
Methods: The objective of this research is to develop a predictive forecasting model to assess water-rescue incident risks in the future, by geographical characteristics, based on forecast environmental conditions. The model predictors include precipitation, air and ocean temperature, holidays, wind speed and direction, and other ocean conditions. Weather and ocean conditions are collected from the NOAA database. Daily rescues by area are collected from the reports of lifeguard agency records. To examine spatial variations, Ocean City's coastline is divided into a grid, enabling geographically specific predictions. Each sector has unique characteristics. Machine learning (ML) models were trained on data between 2000-2022 and tested on 2023-2024 incident events to evaluate accuracy.
Results: Weather and ocean conditions are expected to be associated with incident rates. Model performance will be evaluated based on predictive accuracy, classification metrics, and spatial correlation analysis. By analyzing trends across different geographical coastline zones within Ocean City, regional variations are expected to be identifying, improving the ability to anticipate high-risk conditions and forecast likelihood of incidents before they occur.
Conclusion: By leveraging historical data on weather patterns, ocean conditions, and peak tourism periods, this model aims to provide a data-driven approach to forecasting high-risk days and geographical locations. The insights gained from this baseline model can serve as foundation for future enhancements, such as incorporating real-time data streams, refining spatial resolutions, and testing additional predictive features. Ultimately, this work contributes to improving emergency response planning, resource allocation, and to a proactive approach to drowning prevention.

Posters Day 1

POSTERS D1 01

Risks of Aquatic Incidents in the Bathing Areas of Tocantins

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The present research deals with the risks of aquatic incidents in the bathing areas of Tocantins: drownings, incidents involving boats, stingrays and piranhas. The state has the largest chain of freshwater beaches in the country and the second largest Brazilian hydrographic basin, the Tocantins-Araguaia, with a vast water network and possibilities for the establishment of numerous beaches and spas. In addition, Tocantins holds the 5th most critical index in relation to drowning deaths, with an average of 71 deaths per year, which generates an annual cost of around 14.9 million reais for Brazil. With that in mind, the main goal of the research was to analyze the risks of aquatic incidents at the official bathing areas in the state of Tocantins. As far as methodology is concerned, this is an exploratory study, with quantitative and qualitative approaches, carried out in 2022, with an emphasis in the month of July, when the state's official beach season takes place. To this end, data were collected from the Tocantins State Military Fire Department, the Tocantins State Health Department, the Araguaia-Tocantins River Captaincy and field research was carried out. Data were analyzed from 76 bathing areas on the existence of risks of aquatic incidents and the measures taken to mitigate them. The field data were obtained on site by Military Firefighters on duty, interviewing Civilian Lifeguards, municipal drowning prevention agents, beachgoers, boaters and local authorities. The data analysis shows us the importance of mapping and studying the risks of aquatic incidents, which can support actions, projects and public policies to combat drowning and mitigate other risks of incidents in aquatic leisure areas in order to improve planning and reduce costs for the preservation of lives. It also addresses the importance of rivers and their influence on the formation of population groups and the development of cities, as well as their use for water leisure and touristic activities.

POSTERS D1 02

Community Lifesaver and UITEMATE Survival Swimming Program

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Sri Lanka has experienced numerous natural disasters, including floods, landslides, tsunamis, droughts, and cyclones. The country is also highly vulnerable to climate change, with increasing monsoon intensity and unpredictable temperature and precipitation patterns leading to more frequent floods, droughts, and epidemics. Approximately 1,000 drowning deaths occur annually, with 80% in inland water bodies. Teaching survival swimming at the community level is crucial for protecting vulnerable populations during disasters and enhancing the safety of schoolchildren in daily activities.

During disaster response, personal and collective safety must be prioritized, which may involve evacuation or seeking secure shelter. Once safety is ensured, assessing the situation and determining the needs of those affected is essential. Effective disaster response, particularly during floods, requires calm decision-making and swift action by first responders, including medical assistance, food distribution, shelter provision, and other essential services. Clear communication among stakeholders at the village level is key to an effective response.

UITEMATE survival swimming is a life-saving skill that enhances disaster resilience, particularly in rural communities. Training and practicing this technique empower individuals to protect themselves, their families, and bystanders, fostering a network of community lifesavers who can respond effectively during flood-related emergencies.

Partnerships

Key organizations, including USAID, the US Embassy, Colombo Indo-Pacific PACOM Augmentation Team, Sri Lanka Life Saving (SLLS), UITEMATE Sri Lanka, and the Sarvodaya Shramadana Movement, have partnered to implement this training program. This collaboration has enabled the training of over 1,000 young individuals across eight districts, equipping them with essential first-responder skills.

Sustainability & Impact

Since July 2020, the Princess Charlene of Monaco Foundation has played a vital role in sustaining island-wide lifesaving programs. Through the Swim for Safety initiative, SLLS community clubs have recruited part-time volunteers to conduct survival swimming training. These trained lifesavers have extended their efforts to implement the Community Lifesaver and UITEMATE Survival Swimming Program nationwide.

During the economic and political crises of 2021–2022, this partnership was instrumental in sustaining SLLS's community-based lifesaving programs, ensuring their continuation despite significant challenges.

POSTERS D1 03

Outdoor Water Safety Weeks in Ireland - 80 years old and still going strong!

Brendan Mc Grath

Water Safety Ireland, Galway, Ireland

Background: Water safety weeks began in 1945 at venues around Ireland in response to many drownings and the lack of facilities within which to teach swimming and lifesaving.
Ireland is now a modern country with an unpredictable climate on the edges of the Atlantic Ocean. While swimming facilities have improved and access is more widely available than ever before, these annual Water Safety Weeks continue to thrive. Participant and venue numbers remain high. Tradition, challenge, access, local pride and low costs are factors. Risk Assessments dictate the suitability of a venue.
Description: These weeks consist of intense instruction in swimming and lifesaving skills. Locations include beaches, lakes, rivers and piers. Qualified voluntary water safety personnel attend, prepared with their plans. Today bookings are online with classes defined according to ability. A full swimming and lifesaving awards programme is delivered in open water.
Local personnel provide support but every effort is made to ensure full delivery by qualified local residents.
Advantages include:
Efficiency dealing with large numbers.
Low costs due to free water time.
No time limits.
Resuscitation and water safety awareness are taught in fields, on the beach and in local halls.
Delivered by volunteers.
Wet suits are very available and permitted.
Local involvement and identity.
Open to all socio-economic groups.
Fees charged to support other water safety projects.
Open water and Beach/ Surf Lifesaving Skills are introduced and developed.
Link is created between the advanced classes and Beach Lifeguard qualifications.
Swimming aids can be adapted.
Local schools engage.
Disadvantages include:
Weather
Water conditions - natural and manmade issues.
Range of responsibilities for organisers.
Dressing.
Traditional beliefs.
Clashes with other sporting summer initiatives.
Conclusions: While developed originally in response to local water based incidents and lack of facilities, water safety weeks continue to be popular throughout the country. Some venues have added extra weeks to cater for demand and participant levels are at an all-time high. The historic idea of these weeks is still a model that can be followed in both developing and developed countries.

POSTERS D1 04

Informing Community Drowning Prevention Coalition Action Through the Use of Existing Databases

Briar McCaw1,2, Stephen Beerman3, Jenn Carpenter1
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Background: Drowning is a leading cause of unintentional injury-related deaths, claiming approximately 300,000 lives annually.[1] Beyond the immediate loss of life, its impact extends to families, communities, and healthcare systems. Despite its significant global impact, drowning continues to be a neglected public health concern and an area that receives minimal research attention. This study aimed to explore how drowning mortality data collected from an 8-year period within a community located Southwestern Ontario, Canada informed the action of the corresponding community-based drowning prevention coalition.
Methods: A retrospective data analysis was conducted, on water-related fatalities that occurred between January 1, 2011, and December 31, 2019. The data was collected by the Drowning Prevention Research Centre (DPRC) Canada. Variables used to provide a comprehensive overview of the defining features of recent drowning incidents that occurred included: sex, age group, body of water, time of year, activity type, purpose of activity, accompaniment, and whether a rescue was attempted. Descriptive statistics were calculated to summarize drowning incidents.
Results: A total of 40 water-related fatalities in the region were identified during the study period. Regional rates were higher compared to provincial rates in bathing and pool fatalities, with an increase in ages 15-64. The study population had fewer boating fatalities and drownings in ages 65+ years of age compared to provincial rates. Based on the results of this study, we identified recommendations that this community should prioritize in their education, prevention and advocacy efforts. These include: 1) locations: bathtubs, and pools; 2) ages: 35& under, children; 3) risk factors: alone or no supervision. Emphasizing the importance of supervision and addressing risk factors associated with unsupervised activities are crucial aspects of community action and policy development.
Conclusion: The novel use of regional and community-specific data will help to provide evidence-based recommendations for action, policy, regulation, and future research for drowning prevention initiatives. Study results suggest there may be a need for drowning prevention data analysis and strategies tailored to specific communities.

POSTERS D1 05

Strengthening Drowning Prevention Amid Climate Change: The Role of Government in the provision of Targeted Training and Corporate Engagement

Frank Hughes

Water Safety Ireland, Galway, Ireland

Background:
Climate change has intensified weather patterns, leading to more frequent flooding, unpredictable currents, and dangerous aquatic conditions. Water Safety Ireland, with the support of the Irish Government has developed a programme to address the associated risks for many adults in the workforce who have never received formal water safety education. The two educational initiatives are: a **Corporate Water Safety Talk**, and a **Water Safety Awareness at Work course.**

Description:
Corporate Water Safety Talk – Bridging the Educational Gap:
This talk targets the general workforce across all industries, providing essential knowledge to those who may have missed water safety education earlier in life. Key topics include:
National drowning statistics and risk awareness
Beach and inland waterway safety (e.g., rip currents, tides, coastal hazards)
Cold shock, hypothermia, and safe swimming practices
Emergency response techniques
Pilot sessions were optional but fully booked, with enthusiastic participation and overwhelmingly positive feedback. One organisation noted "The talk empowered attendees with life-saving knowledge they could apply both at work and in their personal lives."
Water Safety Awareness at Work – For Those Working On or Near Water:
This targeted course is specifically designed for workers in sectors such as construction, environmental services, utilities, and others with regular exposure to aquatic environments. The curriculum includes:
Open water hazards specific to work environments
Legal obligations and occupational health and safety legislation
Personal risk assessment and safety protocols
Rescue techniques appropriate for work-related incidents
Use, selection, and maintenance of PFDs
By addressing occupational-specific risks, this course supports both employee well-being and employer compliance with safety standards, helping to prevent incidents before they occur.
Conclusion:
Together, these two educational pathways offer a comprehensive, scalable model for workplace-based drowning prevention. As climate change increases the prevalence and severity of water-related hazards, the need for widespread, accessible education becomes even more urgent. The success of the pilot sessions confirms a high demand for water safety awareness, and the dual approach allows for both general and role-specific training. These initiatives demonstrate how government-supported efforts can play a critical role in preventing drowning by fostering a culture of safety, supporting public and workplace education.

POSTERS D1 06

Salvacat: analisis of the current situation of the lifesaving sector in Catalonia (Spain) at an operational, governamental and prevention level

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The Salvacat project started in 2018 with the commitment and desire to analyze the current situation of the lifesaving sector in Catalonia (a region inside Spain, the capital city is Barcelona).

The Salvacat project studies 3 hypotheses, each of these with an objective and an applied methodology:
--> 1. There are enough lifeguards to cover the service
--> 2. There are many competencies distributed to manage the lifesaving sector
--> 3. Data processing and subsequent preventive actions have an impact on reducing fatal drowning

Each of the hypotheses has its own objective and a methodology to follow:
--> Objective 1. Determine if the supply of lifeguards is comparable to the demand
--> Methodology:
- study the supply and demand of professionals in the sector
- Risk analisis to identify the risk

--> Objective 2. Identify the shortcomings of the current management system
--> Methodology: to study and compare the Catalan lifeguard service with other countries

--> Objective 3: Zero avoidable fatal drownings in the Catalan aquatic environment
--> Methodology:
- study and analyze the assistances, rescues and drownings in the catalan aquatic environment
- study the current prevention methods and compare them with other countries

The results have been analyzed, and the conclusions identified the milestones to reach to get an improvement:
- of the most appropriate lifeguard service model for Catalonia
- of the figures of avoidable fatal drownings in the Catalan aquatic environment

The project has the following collaborators from the public administration:
- The Catalan police with its aquatic unit (Policia General - Mossos d'Esquedra)
- Catalan Sports Council (Consell Català de l'Esport): with the Catalan School of Sports (Escola Catalana de l'Esport) and the Catalan Census of Sports Facilities (Cens d'Equipaments Esportius de Catalunya)
- The Catalan Interior Deptartment: with the Civil Protection unit
- Medical Emergency Services (SEM) from Catalonia

POSTERS D1 07

Blue dragon emerging from the water, 3 short stories teaching water safety for children

Garry Seghers

Vietnam Swimming and Lifesaving Company, Da Nang, Vietnam

In the year of the Blue Dragon (2004/2005), it seems appropriate to use this image to teach water safety to children.

Introduction

There are three short stories about a family of dragons, at the swimming pool, on the river and at the beach and the problems they have in and on the water. Rescues are assisted by the Blue Dragon and performed by his friend the Lifeguard Dragon.

Following the three short stories there is a summary chapter with the important lessons we may have learnt.

Also included is the Water Safety Code from UK with the important message 'Float to Live',

What do we learn from these stories?

1. Obey swimming pool rules.
2. Never push anyone into the water.
3. Never jump in to save a friend.
4. If in difficulty in the water remember keep calm (don't panic), kick your legs and try to float on your back.
5. Weak swimmers should wear buoyancy jackets in open water (rivers and the sea).
6. Safe order of rescue is:
    - a. Talk
    - b. Reach with an aid (Lifeguard pole)
    - c. Throw an aid (Life-ring)
    - d. Throw a rope
    - e. Swim with a buoyant aid (Lifeguard Rescue-tube)
7. Know your own swimming ability, do not take risks, and put yourself in danger.
8. Know how to get help.
9. Always take safety advice from the Lifeguard.
10. Always go swimming with an adult to look after you.

Produced for the International Federation of Swimming Teachers' Association as an open source document for sharing knowledge to help with drowning prevention worldwide. The booklet is available from the website www.ifsta.co.uk

In Vietnam the booklet has been translated and is available through QR Codes that have been circulated to Government Sports Departments in several Provinces in the country.

POSTERS D1 08

Evidence based survival swim interventions for children aged 6-15 in Quang Tri Province, Viet Nam: Implementation research and policy reflections

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1. Background: In 2018, Viet Nam launched the world class intervention of survival swim and water safety education for children aged 6-15 since 2018 in 12 provinces with remarkable achievements in significant reducing child drowning rates. The implementation research continuously began in 4 poorest and disadvantaged districts in Quang Tri province. It is located in the central region of Viet Nam with highest burden of drowning, terribly impacted by natural disaster, flood season every year. This study aims to analyze external and internal contextual factors, evaluate the effectiveness of intervention during 2022- 2025. Convention Framework Implementation Research (CFIR) adapted to the study.
2. Methods: A mixed-methods study was conducted, Secondary data analysis, oriented in-depth interview, group discussion with the different level implementers. The CFIR was for contextual analysis.
3. Results: The external context was favorable thanks to the national drowning prevention program, lessons learned from 12 other provinces, and strong support from authorities and communities. Main challenges included limited facilities and funding, as well as impacts of natural disasters, epidemics, and administrative changes. The internal context showed a well-structured model, strong multi-sectoral collaboration, enhanced teacher capacity, and a student-centered approach. Barriers were addressed through resource mobilization, on-site training, and long-term planning. A total of 3,230 children participated in the intervention, with an average completion rate of 88.2%. Among them, 89.5% successfully acquired all three essential water safety skills (swimming, floating, and safe entry/exit), a significantly higher proportion compared to the average of 75.6% observed across 12 other provinces implementing similar model. Children aged 12–13 years demonstrated the highest achievement rates. The rate of children who could swim increased markedly from 11% in 2021 to 52.4% in 2025, surpassing the national average of 33%. Drowning mortality rate among children under 16 years of age in the province declined from 11.8 per 100,000 in 2021 to 6.9 per 100,000 in 2025.
4. Conclusion: The intervention model in Quang Tri has demonstrated feasibility and effectiveness in reducing child drowning. This model holds strong potential for nationwide scale-up. CFIR is great reference to adapt in other provinces and community health programs.

POSTERS D1 09

Nexus between drowning and climate change induced disasters such as floods and cyclones

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Bangladesh, a climate change-vulnerable country, faces significant risks from climate change. Climate change increases drowning risk due to frequent and intense weather-related disasters, particularly in coastal communities, and rising sea levels, exposing more people to dangerous water conditions and displacement. Drowning accounts for 75% of fatalities in flood-related disasters, being the fourth most common cause of death in children aged 1-4, and the third most common cause in children aged 5-14, underscoring the growing significance of extreme weather occurrences.[1]

Climate change is expected to exacerbate the impact of catastrophes on public health, with drowning being a major cause of fatalities during cyclones and floods.[2]These extreme events along with heatwaves and droughts lead drowning among fishers, ferry passengers, and migrants.[3] Drowning prevention is a critical climate change adaptation technique that requires more attention due to the involvement of health systems in climate change policy and the Loss and Damage Fund.[2] Implementing a public health strategy for drowning prevention can simultaneously reduce climate change risk and drowning. This paper aims to find out the connection between drowning risk and climate change in widely recognised policies globally and in Bangladesh and propose a policy framework that can eradicate drowning risk as part of mitigating the climate change impact. This will follow a content analysis and discussion with key stakeholders to discover the factors to build and validate the framework.

The UN and WHO have recognized the need to expedite actions to prevent drowning in the General Assembly Resolution and World Health Assembly in the past three years.[4] [5]The UN General Assembly Resolution prioritizes integrating drowning prevention into disaster risk reduction programs and linking global efforts to the Sendai Framework for Disaster Risk Reduction 2015-2030.[5] WHO advises to build resilience and manage flood risks for drowning prevention at national and local level, but there is still a gap between these two domains. [6] yet there remains a disconnect between two fields. Raising awareness, institutionalising swimming skills, supervising children, training caregivers—are some of the factors with governmental and non-governmental interventions that will create a framework for drought prevention

POSTERS D1 10

Performance of the Rio Grande do Sul Military Fire Department (CBMRS-BRAZIL) in the May 2024 Floods.

JEFERSON FRANCA

Military Fire Department of Rio Grande do Sul, Torres, Brazil

Context: Rio Grande do Sul faced, from April 29, 2024, a scenario of intense rainfall without historical precedent, culminating in severe flooding during the month of May. This catastrophe required an emergency and coordinated response from the security forces, with emphasis on the work of the Military Fire Brigade of the State of Rio Grande do Sul (CBMRS).
Description: The CBMRS mobilized a force of 3,145 military firefighters, 1,064 vehicles and 167 vessels for rescue operations and assistance to the population. The corporation also had the support of other Military Fire Departments throughout Brazil. The actions resulted in 42,133 people saved and 4,587 animal rescues. The actions of 59 pairs (search dogs and their handlers) were crucial in locating victims in difficult-to-access areas. The CBMRS aircraft carried out 28 aeromedical evacuations and the direct rescue of 335 people and 62 animals, demonstrating the importance of air resources in emergency situations.
Lessons Learned: The magnitude of the catastrophe required a massive mobilization of human and material resources, highlighting the response capacity of the CBMRS and the importance of cooperation between different military fire brigades. The success in rescues demonstrates the efficiency of training and the use of resources such as binomials and aircraft in rescue operations in natural disasters. The experience gained during the floods of May 2024 serves as a lesson for the continuous improvement of emergency response strategies and the strengthening of Civil Defense.
Conclusion: CBMRS's performance during the May 2024 floods demonstrates the corporation's high level of professionalism and commitment to the safety of the population of Rio Grande do Sul. The efficient mobilization of resources, interinstitutional cooperation and the dedication of military firefighters were determining factors for the success of rescue operations. The experience gained reinforces the need for continuous investment in training, equipment and strategies for preventing and responding to natural disasters, aiming to minimize the impacts of extreme weather events and ensure community protection

POSTERS D1 11

Elevating drowning prevention: Sport Singapore’s lifeguard academy's comprehensive capability development framework

Kenneth Seow

Sport Singapore, Singapore, Singapore

Since its inception in 2013, Sport Singapore's Lifeguard Academy has significantly enhanced the capabilities of its lean 200-pax strong lifeguarding workforce, managing over 3 million annual visits across our 23 public swimming complexes. This presentation offers a dual perspective on our comprehensive capability development framework, providing insights from both leadership and ground-level implementation viewpoints.
Our training framework for lifeguards includes a tiered approach and it begins with formal training which includes attainment of the Bronze Medallion national certification. Staff then progress through a structured development pathway with both formal and informal learning including on-the-job training sessions and sharing sessions, focusing on rescue techniques and emergency response protocols. Annual Emergency Drills establish and validate baseline competencies, while the annual Lifeguard Proficiency Assessment serves as both a rigorous evaluation tool and incentive for performance in fitness and proficiency.
We have enhanced our surveillance strategy by creating the role of Pool Guardian where staff are trained in first aid, basic lifesaving and pool surveillance. This multi-layered approach, combined with regular engagement, periodic review of processes and robust recognition programmes, has created a sustainable model for maintaining high safety standards with a 400-pax agile operational workforce.
This presentation will demonstrate how our holistic approach has elevated drowning prevention strategies, raised staff competencies, and enhanced overall safety in public swimming facilities. We will share key success factors, challenges, and future directions for enhancing our capability development framework.

POSTERS D1 12

From the first splash to safety and survival: building water competence. Traditional swim lessons focus on strokes and maybe safety but often neglect real-world water competence. We combine theory and practice, ensuring swimmers experience water's challenges firsthand—building confidence, survival skills, and true preparedness for unexpected situations.

Liselotte Christensen

Ribe, Ribe, Denmark

Many swim instructors focus on traditional swimming techniques and safety procedures. However, at YPISA A/S, we have found that this approach alone is insufficient for real-life water situations. Our method integrates theory and practice to ensure students not only understand swimming mechanics but also experience how their bodies react in various water conditions.

Explained vs. Experienced Water Competence

Explained competence involves theoretical knowledge—breath control, balance, propulsion, and risk assessment. However, without hands-on experience, students may struggle to react in emergencies.

Experienced water competence means physically feeling the water—falling in, swimming in currents, floating while clothed, and handling cold water. This creates an intuitive understanding of real-world scenarios.

Lessons for Swim Instructors

Realistic Training Matters

We use the Self-Rescue Ladder™ and its 15 steps, starting with basic skills before progressing to real-life scenarios, such as falling into water fully clothed.

Instructors should move beyond teaching strokes and incorporate survival techniques like floating, treading water, and self-rescue.

Training for Real-Life Reactions

Many instructors focus on avoiding danger but not on reacting to it. We expose students to controlled challenges that help them manage panic and make decisions in tough situations.

Swim lessons should include exercises that prepare students for unexpected falls, cold water, and currents.

Understanding Water's Forces

Water behaves differently depending on currents, temperature, and clothing. We teach students how to navigate these conditions firsthand.

Instructors should provide opportunities for students to experience water's physical properties.

Lifesaving and Self-Rescue

Traditional lessons focus on strokes, but self-rescue and lifesaving skills are equally vital.

Students should learn to float, tread water, use flotation devices, and assist others.
Instructors should incorporate lifesaving techniques into their curriculum.

Theory and Practice Must Go Hand in Hand

Our research with Danish public schools found that rigid stroke-based teaching left many children struggling with body awareness in water. While some could move mechanically, they lacked real confidence and self-rescue skills.

We aim to share our findings and introduce the Self-Rescue Ladder™ to help instructors adopt a more effective, experience-based approach—simplifying learning while improving safety and confidence in all beginner swimmers.

POSTERS D1 13

SCHOOL SWIMMING: A COMPARISON OF THE NORDIC COUNTRIES Swim teaching in the primary schools across the Nordic Countries (Denmark, The Faroe Islands, Finland, Island, Norway and Sweden). The study compares the criteria's in curriculums, age or class and competency goals of the countries.

Maria Jæger[1,2,3], Robert Keig Stallman[4,5,6,7,8]

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This study compares the teaching of swimming in the primary schools across the Nordic Countries. We include Denmark, The Faroe Islands, Finland, Island, Norway and Sweden. We are aware of the fact that swimming is approached as a school subject in different ways, not only in the different countries but in some countries, differently from community to community or even from school to school. The following general information is presented for each of the Nordic Countries. Collectively they might be thought of as that country's ''philosophy of school swimming''.

1. Is swimming described in the National School Curriculum?
2. Is it compulsory to offer swimming instruction in the primary schools?
3. Is swimming described as a school subject, like reading, writing or mathematics? OR is swimming ''part'' of another subject (usually Physical Education)?
4. Is there a competency goal described or defined in this curriculum?
5. At what age/class is this goal expected to be attained?

The great differences we encounter appear to be not only because of differing ideas about what swimming is, or what the goals of school swimming should be, but for administrative convenience. This is unacceptable. We propose that the information gathered here should lead to a common description of what the schools should offer regarding swimming, i.e. a Nordic standard.

POSTERS D1 14

An optimal proposed program for school swimming

Maria Jæger[1,2,3], Robert Kieg Stallman[4,5,6,7,8]

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From the time children are able to crawl, they are at risk of an aquatic accident. This is a time of rapid growth and the development of the brain and contact with all around them, including water! Even a bucket of water can present risk. Constant surveillance is absolutely necessary for this bundle of curiosity.
The schools, where we meet all children, have a huge responsibility in this regard. School swimming must be conducted at a high level of quality. We suggest that the following describes an optimal approach for swimming instruction in the schools.
Swimming competency is a major measure in the battle against drowning. The schools offer an excellent possibility to contribute. The approach of ‘’water competence’’ is more than simply teaching children to swim. We address a ‘’package’’ of motor skills, knowledge, and healthy attitudes towards safety in, on and around the water. The diagram below suggests the close relationships between skill, knowledge and attitudes. When integrated, they help one become ‘’water competent’’.

1. Start as early as possible, Grade 1. If parents and pre-school teachers have prepared the way, most children will be ‘’aquatically ready’’. At this point however, we must identify those who are not and provide some special attention.
2. Provide learning opportunities frequently. No one learns to play the piano by practicing once a week.
3. Provide a sufficient number of hours of instruction so that all learn.
4. Devise a criterion assessment tool which evaluates ‘’all-around aquatic development’’.
5. The optimal situation is that the qualified teacher (the classroom teacher or perhaps the PE teacher) is also certified to teach swimming, as recommended by the WHO.
6. Each school district must appoint a ‘’coordinator’’, a qualified teacher AND a specialist in the teaching of swimming.
7. The school swimming coordinator must have close contact with all teachers and the parents. Experience has shown that when the parents are deeply involved, learning is accelerated.
8. As Wilbur Longfellow said in the pre-WW I days, ‘’Teach them gently and entertain them mightily’’.

POSTERS D1 15

Barriers and Facilitators to Implementing Water Safety Curriculum in Public Schools: A Landscape Analysis of Districts across Washington State, United States (US)

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Background: Swimming lessons[1] and water safety instruction[2] are important drowning prevention tools, yet many children lack access to such programming.[3] Water safety professionals often advocate for public schools to implement water safety education,[4] yet the majority of public schools worldwide do not offer this programming. The current study seeks to understand barriers and facilitators to water safety programming in public schools.
Data was collected in the US state of Washington which is home to 74,000 miles of rivers and streams, over 4000 lakes, and nearly 3000 marine estuary square miles[5] and is ranked the ninth worst in the US in terms of drowning.[6] Washington has no statewide requirements for schools to teach water safety or swimming lessons allowing districts to decide, independently, whether to implement water safety instruction.
Methods: Administrators from all 321 Washington School Districts were invited to participate in an online survey that asked questions regarding whether the district currently implements water safety curriculum, details about programs being implemented, barriers to potential implementation, and interest levels in a state-supported water safety curriculum. Data was analyzed using descriptive statistics, Pearson correlations, linear regression, and manual coding of open-ended responses. Administrators from 90 districts participated.
Results: The majority of districts do not implement water safety nor do they have plans to. Participants cited barriers such as funding constraints, time constraints, lack of buy in from key stakeholders, and distance from pools. For the minority of schools that currently implement water safety curriculum, facilitators such as buy-in from school personnel and partnerships with community resources allowed participants to overcome barriers to implementation. There were no relationships between demographic characteristics of the districts and water safety implementation.
Conclusions: Significant barriers to water safety education prevent many districts from implementing curriculum. For broadscale implementation to occur, barriers such as funding and time must be systematically addressed. Future research should examine how to systematically address these barriers.

POSTERS D1 16

The Role of Legislation and Technical Standards in Promoting Water Safety and Preventing Drowning In Swimming Pools Arab Republic of Egypt

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Assiut University, Egypt

The research aimed to: identify the most important national and international legislation related to water safety; study the technical standards for design, maintenance, and supervision of swimming pools; evaluate the effectiveness of these legislation and standards in reducing drowning; and provide recommendations for developing the system of legislation and standards to enhance water safety. **Research Methodology**: The researcher used a descriptive survey approach, given the nature and procedures of the research and the research population and sample: employees of sports clubs with swimming pools (club manager, sports activity manager, swimming pool manager, lifeguard supervisor), lifeguard experts, and legal experts. The researchers reached the following conclusions: Integration between legislation and technical standards enhances water safety and prevents drowning in swimming pools. The researcher recommended that: Laws and legislation regulating swimming pools play a fundamental role in establishing the legal framework that must be adhered to to achieve safety. They stipulate standards such as appropriate pool depths according to age groups, mandatory presence of qualified lifeguards, licensing and operating conditions, water quality and sterilization standards, and the role of technical standards in reducing risks. Legal texts translate into practical, implementable measures, such as designing pools according to safe engineering standards, providing rescue equipment and clear warning signs, filtration and purification systems that prevent water pollution, first aid procedures at accident sites, and strengthening the legislative and technical role in addressing this problem. Legislation and technical standards must be viewed not only as written laws, but as dynamic tools that can be continuously developed, along with: activating oversight and inspection mechanisms, imposing deterrent penalties on violators, incorporating training and awareness programs for workers, and leveraging international expertise in the field of water safety.

POSTERS D1 17

I feel comfortable in the water

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Background
Children are often afraid of water. This assumption is not only shared by parents but is also reflected in many professional publications (Rheker, 2011). This perception is further solidified by an overly rapid process of learning to swim, commencing with acquiring a primary swimming technique (Staub & Fokken, 2020). In this approach, the development of fundamental water competence (Stallman et al., 2008) as well as the development of feelings of comfort in and underwater are neglected. This project aims to assess preschool children's emotions. Additionally, the study examines the extent to which their water competence develops over the course of the project.
Methodical process
A total of five kindergartens, including 36 girls and 28 boys aged six years old, participated in the study. The project commences in each kindergarten with four sessions, during which the trainers and children get to know each other, conduct water experiments, role-playing activities and motor exercises. This is followed by six water sessions. A pre- and post-test is used to assess the basic swimming skills (Assessment of Basic Aquatic Skills in Children; Vogt & Staub, 2020) and to evaluate the children's emotions by using emotion cards (Irmler & Boetius, 2016).
Results
The results indicate a significant improvement in the basic swimming skills, including submerging, floating, jumping, breathing and propulsion in water ($F(1,101)=29.88$; $p<.05$). Furthermore, pride and joy emerge as the most pronounced emotions, while insecurity, fear and anger occur less frequently. This effect was observed during the first water session (pre-test: $T=18.79$; $p<.05$) as well as after the last water session (post-test: $T=19.68$; $p<.05$). Anxiety and insecurity decreased over the course of the project, whereas joy developed into pride.
Conclusions
In summary, the results indicate that preschool children do not generally display a fear of water. Rather, they appear to approach the water with a sense of joy. Emotions play a pivotal role in the process of learning to swim. Therefore, it is essential to arrange the swimming lessons in a way that promotes self-determined learning and positive emotions such as pride and enjoyment (Ohlendorf et al., 2022).

POSTERS D1 18

Unifying programs to reach Water Safety and Swimming curriculum in Queensland.

Nikki Thornhill

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Water safety and swimming proficiency are critical for drowning prevention. In Queensland, numerous Learn-to-Swim (LTS) programs operate commercially and within schools. However, industry has observed a shift toward stroke development at the expense of essential water safety and survival skills. Research shows that 29% of program levels in Australia exclude water safety education, suggesting a disconnect between LTS programs, water safety curricula, and National Swimming and Water Safety Framework (NSWSF) benchmarks [(1)]. Additionally, many parents withdraw children from lessons once they perceive them as water-competent rather than when they meet safety benchmarks, limiting their ability to develop vital lifesaving skills.

To address these issues, RLSSQ, in collaboration with leading water safety and swimming industry bodies and the Queensland Department of Education, have developed the *Queensland Water Safety and Swimming Certificate* (QWSSC). This initiative will provide standardised objectives and milestones to align school-based swimming programs with NSWSF benchmarks [(2)]. The QWSSC will encourage all school water safety and swimming programs cover the essential water safety knowledge and skills with a focus on survival over stroke development.

Currently, over 20 different LTS programs operate in Queensland. The QWSSC aims to align the programs and bridge the gap, providing a structured pathway for students to meet national water safety benchmarks, ensuring that competency in survival skills is a core component of swimming education.

Many Learn-to-Swim programs emphasize stroke technique over essential survival skills, creating gaps in drowning prevention education. Enhancing education for swim teachers and swim schools on the importance of aligning programs with NSWSF benchmarks and the benefits of QWSSC will help ensure the consistent delivery of lifesaving skills across Queensland.

Additionally, addressing parental misconceptions about water competency—often leading to early lesson withdrawal—is crucial in shifting mindsets and ensuring students meet safety benchmarks

By integrating the QWSSC into school programs, Queensland can standardise water safety education, ensuring children achieve essential survival skills. Aligning programs with NSWSF, addressing parental misconceptions, and prioritizing water safety alongside stroke development will aim to significantly reduce drowning risks and enhance aquatic safety for all.

POSTERS D1 19

addressing the gaps in drowning data collection in bali

Pandit Wiguna, Indira Santi

Swimdo, Gianyar, Indonesia

Drowning is a leading cause of preventable mortality, with an estimated 370,000+ deaths occurring annually, predominantly in low- and middle-income countries (1). Indonesia, including Bali—a globally renowned tourist destination—faces significant drowning risks due to strong currents, unpredictable weather, and limited public awareness. However, the absence of a national drowning data collection system impedes targeted prevention efforts. Systematic data collection is crucial for understanding drowning risks and developing effective interventions (2). Swimdo, an NGO dedicated to child drowning prevention in Indonesia, has initiated Bali's first systematic drowning data collection effort to address this gap. This study compiles drowning incident data from key sources, including the Bali Search and Rescue Agency (BASARNAS), the Regional Disaster Management Agency (BPBD), local lifeguard associations, hospitals, and volunteer groups. Findings indicate that 68% of drowning victims are male, aligning with global patterns (3). Additionally, 90% of incidents occur in the ocean, with peaks between May and August and the highest-risk hours from 12:00 to 17:00. Tourists, particularly international visitors, comprise 45% of drowning cases, emphasizing the need for multilingual safety campaigns. This research provides evidence-based insights to inform policy recommendations, improve water safety strategies, and enhance emergency response systems in Indonesia. By highlighting both the challenges and opportunities in drowning data collection, this study advocates for multi-stakeholder collaboration to elevate drowning prevention as a public safety priority.

POSTERS D1 20

proposal to reduce the risk of drowning on sports and leisure vessels

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Introduction: In Brazil, deaths due to unintentional drowning occur: 90% in natural waters, 8.5% in unnatural waters and 1.5% during transport on boats. In this context, Brazil has approximately 7,400 km in length washed by the Atlantic Ocean. Rio de Janeiro is included within this context with approximately 1,042 km of coastline and approximately five-fold of fresh water perimeter(1). The exploitation of this area for leisure / recreation and sports practices with boats has increased significantly in the last years, also generating several occurrences, including risk of death from drowning. Objective: To analyze the occurrences with vessels from 2007 to 2018 in the state of Rio de Janeiro and propose preventative measures to the various accidents, including drowning(2).Methodology: The beaches considered from the state capital of Rio de Janeiro were those which have the highest frequencies of bathers and/or drownings, and topographic studies were carried out with the aid of the literature. Results: There were 344 vessel accidents in the last 11 years, resulting in 36 fatalities and 106 non-fatal victims. Of these, 85 shipwrecks (38 non-fatal victims and 26 fatal victims); 39 groundings (1 non-fatal victim); 57 collisions (28 non-fatal victims); 103 ship collisions (20 non-fatal victims and 3 fatal victims); 14 inflows of uncontrolled water "open waters" (no victims); 5 explosions (8 non-fatal victims and 3 fatal victims); 40 fires (10 non-fatal victims and 3 fatal victims); 1 pre-hospital care (1 fatal victim). There were 28.6 occurrences/year with 8.83 non-fatal victims and 3 deaths. However, approximately 83% of fatalities occurred due to drowning. Conclusion: Accident prevention actions by maritime authorities have been efficient, with a decrease of 18% (2018) in relation to the year 2017. These actions addressed the following situations: the documents of the vessels and drivers should be valid; no alcohol intake by drivers; periodic maintenance of electrical parts, hulls and engines; fire extinguishers and personal floatation devices should be in good condition and easily accessed by crew members/passengers, especially those of mass transport; check weather conditions and tide tables before drawing a route and the navigation rules to avoid collisions.

POSTERS D1 21

drowning prevention and water rescue program for a group of scouts

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Introduction: According to the WHO, in the last decade there were more than 2.5 million drowning deaths worldwide, with the highest incidences occurring among children aged 1 to 4 years, followed by children aged 5 to 9 years and more than half of deaths resulting from drowning is among those under 25 years of age. Therefore, the human, social and economic cost of these losses is high and therefore avoidable. In 2018, the Fire Department of Rio de Janeiro taught 48 young males and 14 females (aged 10 to 16) from the scout group, for 40 hours (month of January), aims at a vision of full development and citizen education, so, encouraging teamwork and the spirit of solidarity are part of its activities, thus fostering the preservation of the environment and encouraging the practice of physical activity and healthy living. Activities are held for approximately 20 summer days in January, from 08:00 to 11:30 a.m., from Monday through Friday. The approach to raise awareness and motivate children and youngsters to participate involve recreational activities, lectures on marine animals and oral health care and tours to museums, representing an important social tool to strengthen the links with the local community, contributing for the improvement of the quality of life and the exercise of citizenship and civility. As basic assumptions, advice on sea conditions, first aid, drowning prevention and basic notions of oceanography and meteorology are provided for children and youngsters. The idea is to stimulate new generations to adopt safe behavior in aquatic environments.

POSTERS D1 22

atmospheric electrical discharges: risks for professionals working in aquatic environments

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Introduction: It is estimated that from 2023 to 2024, approximately 280 million lightning discharges struck in Brazil, leading to 130 fatal victims each year and approximately 200 victims of burn injuries (direct contact, by other objects or by the ground) caused by the high thermal energy originating from electric discharges (average of 30,000 amperes), leading to treatment costs of US $ 263 million(1). In aquatic environment electric conductivity and as for the beaches and pools ions potentiate their conductance.
Objective: To assess the degree of knowledge among sea rescue lifeguards (SRLG), swimming teachers (ST) and physical education undergraduate students (PEUS) regarding potential risks of accidents involving lightning in the aquatic environment.
Methodology: A total of 162 questionnaires were applied to SRLG, ST and PEUS to determine the awareness of the risks related to lightning.
Results: the following results were considered correct based on the definitions proposed by the National Lightning Safety Institute(2): lightning flash (93% SRLG, 96% ST, 88% PEUS); thunder (98% SRLG, 98% ST, 91% PEUS), lightning (100% SRLG, 99% ST, 94% PEUS). Regarding the possible actions taken if they visualized a lightning flash and there were people in the water (leisure / sports): they would ask them to leave immediately 97% SRLG; 98% ST; 94% PEUS; warned them about the risks but would allow them to choose to leave: 3% SRLG; 2% ST; 4% PEUS; would take no action: 0% SRLG; 0% ST; 2% PEUS.
Conclusion: It was observed that the public studied mostly show good judgment as for the risks that may cause lightning in the aquatic environment, mainly to firefighters that according to the legislation are forced to intervene when there is imminent danger to life; however, more information must be shared so that all professionals can achieve the maximum possible safekeeping. As preventive measures, some actions are necessary: avoid the sea, don't seek shelter under trees, don't stay close to metallic objects such as umbrellas and beach chairs, wait in a safe place until a storm ends.

POSTERS D1 23

Development of aquatic skills and prevention of drowning through institutional programs of the Santa Catarina Military Fire Department

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Since 1998, the Santa Catarina Military Fire Department has developed an institutional program aimed at preventing drownings among children, called "Projeto Golfinho". Despite being highly renowned, the Golfinho Project is restricted to informing and guiding children aged between 7 and 11 years about the dangers associated with aquatic leisure environments (1). Given the gap associated with the other ages of childhood and youth, throughout the year 2024, the Santa Catarina Military Fire Department developed two other proposals for other age groups not previously served and now with the purpose of developing aquatic skills. One of them is the Junior Lifeguard, aimed at the age group between 11 and 14 years old (2). The other, called Young Lifeguard, is aimed at the age group between 15 and 17 years old (3). At the end of the work carried out in 2024, despite the great challenge of finding swimming pools to carry out the project, the high potential developed in the students was verified with a view to developing aquatic skills and reducing the risk of drowning.

POSTERS D1 24

Floods in India: Origins, Impacts, and Mitigation Measures. Author: Rajeshwari S KFacilitators: R.Adm. Purushottam Sharma, Tarun Murugesh, Koustav Bakshi, Jehan Driver.

Rajeshwari S.K.

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Background

Drowning risks escalate during floods, particularly in flood-prone regions. Flood hazards fall into four categories: coastal floods, tsunamis, river floods, and flash floods. While advancements in warning systems, evacuation plans, and community protection measures have improved, preventing drowning in remote urban and rural areas remains a challenge without dedicated disaster response units. In India, 51 districts fall under the "Very High" flood risk category (0.440–0.688), while 118 districts are classified as "High" flood risk (0.284–0.439).

Floods are triggered by various natural and anthropogenic factors, including urban concretization, inadequate land-use policies, outdated stormwater management, loss of water bodies, climate change, and poor waste management. These disasters lead to loss of life, injuries, public health crises, infrastructural damage, economic setbacks, and urban mobility paralysis. River floods primarily damage property and infrastructure, whereas urban flash floods result in a higher loss of lives.

Methods

The Rashtriya Life Saving Society (India) has implemented several training programs to mitigate drowning risks and improve disaster preparedness. These include:

- Aquatic Disaster Response Team Management & Rescue Diving Training
- Lifesaver and Lifeguard Certified Programs
- Swim and Survive Program First-Aid and Safety Workshops
- Village Lifesaving Bus Programme
- Household & Water Safety Training

Results

State and National Disaster Response Force personnel were trained through aquatic disaster response programs. Live training and certification assessments were conducted for lifeguards and lifesavers. Participants' swimming and survival skills were evaluated before and after training, with results documented in a white paper report. The **Himmat and Josh Awards** recognized top achievers. The **Village Lifesaving Training Bus Project** in Kirloskarvadi, Maharashtra, prepared rural communities for floods through hands-on training and mock drills.

Challenges

Despite qualitative success, national-level quantitative coverage remains insufficient. Given India's vast population and the annual loss of lives due to floods, current training efforts need significant expansion. The ultimate goal is to train a lifesaver in every household, requiring widespread implementation and collaboration.

Conclusions

These programs emphasize inclusive preparedness, focusing on youth participation and community engagement. A multi-stakeholder approach—integrating educational institutions,

corporations, NGOs, and government bodies—is essential to amplify impact and build a sustainable, flood-resilient future.

POSTERS D1 25

A Systems Thinking Approach for Mapping Policy, Research, Advocacy, and Partnership for Drowning Prevention in Indonesia

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Background: Child drowning remains a critical public health challenge in Indonesia, particularly in disaster-prone rural areas, due to weak policies, limited funding, and low community engagement. Traditional linear approaches fail to address the shortcomings of the drowning prevention system. This study employs systems thinking approach to map the dynamic interactions among policy, research, advocacy, and partnerships, identifying leverage points for sustainable, impactful drowning prevention strategies.
Methods: Using a case study method, we adopted a soft systems modeling method with a causal loop diagram (CLD) to analyze the interdependencies among key factors affecting drowning prevention in Indonesia. Data from a scoping review (research articles, government and policy documents) and focus group discussions with parents and community leaders in West Nusa Tenggara Province, a region with one of the highest child drowning rates, guided the iterative development process for the CLD. By mapping research-policy linkages, advocacy mechanisms, and partnerships, the CLD identified key variables, feedback loops, and leverage points to design targeted interventions.
Results: The CLD illustrated five interrelated domains: policy and financing, access and infrastructure, education and awareness, behavior and attitude, and community engagement, linked by reinforcing and balancing feedback loops. Reinforcing loops emphasized research-driven advocacy's role in shaping institutional frameworks and cross-sector partnerships. The "Community-Driven Research and Policy Feedback Loop" showed how local insights inform research, shape policies, and mobilize resources, while collaboration with global partners enhances knowledge exchange and integration of evidence-based practices. Key balancing loops revealed systemic barriers, including inconsistent funding, insufficient water safety curricula, and weak policy enforcement, which undermine prevention efforts. The analysis highlights three strategic leverage points: (1) data-informed policymaking to prioritize drowning prevention, (2) sustained advocacy to maintain political commitment, and (3) multisectoral partnerships to align resources and expertise.
Conclusion: Systems thinking provides a holistic framework for addressing Indonesia's drowning prevention challenges. Our analysis identified data-driven policy, sustained advocacy, and strategic partnerships as key leverage points, offering actionable insights for policymakers, practitioners, and researchers. These findings are generalizable to many other low-resource settings where, despite significant cross-sectoral investment in drowning prevention, fragmented efforts have failed to eliminate drowning as a leading cause of death.

POSTERS D1 26

When Waters Rise: Unraveling Socio-ecological Dimensions of Flood Disasters and Drowning Prevention Strategies

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This presentation explores the role of disasters in drowning deaths internationally. It begins with a review of the contemporary epidemiology of fatal drownings from monsoons and flash floods as two drowning etiologies often characterized as “natural disasters.” This discussion is followed by an exploration of how these environmental experiences fit into the scholarship on disasters (1), with particular emphasis on disaster anthropology (2-3) and the idea that no disaster is truly natural (4). The ways in which these drowning deaths represent proxies of climate change (5-6), human infrastructural change, and human patterns of intersection with the surrounding ecosystem — especially familiarity with survival swimming skills and bystander rescue options — will be discussed. Ultimately, these anthropological and public health perspectives, along with existing published recommendations in the literature (7-13) are used to share pragmatic mitigation strategies to reduce the public health burden of drowning from these large-scale water-related emergencies. Such public health interventions include an emphasis on individual-level preparation and water awareness. For example, in its first-ever report on drowning prevention, the World Health Organization noted that 73% of countries have SAR (search and rescue) programs built around water rescue and 73% also have community-based flood risk mitigation programs, but the percentage of countries offering training programs in rescue and resuscitation for bystanders is only 33%, and only 22% incorporate water safety and swimming in educational curricula (14). Evidence is rapidly accumulating that a basic level of water safety knowledge, coupled with a basic level of swimming skill (often called survival swimming) is sufficient to prevent most drowning episodes (15).

POSTERS D1 27

The Kimberley River Safety Program: Empowering First Nation Communities to Prevent Drowning in Outback Australia

Stephen Waterman

Waterman Training Solutions, Western Australia, Australia

The Kimberley region of Western Australia, renowned for its rugged beauty and expansive river systems, faces the highest rate of drowning incidents in the state and third highest in Australia, particularly among First Nation communities. These incidents are often attributed to strong currents, seasonal flooding, limited water safety knowledge, and restricted access to emergency services in remote areas.

The Kimberley River Safety Program was established with the aim of reducing drowning incidents through culturally informed, community-driven strategies. This program integrates traditional knowledge with evidence-based water safety practices, ensuring its relevance and effectiveness within local contexts. Key components include tailored education campaigns, practical safety education sessions that discuss the conditions, challenges and dangers of inland waterways, practices basic rescue skills and partnerships with local schools to foster ongoing community engagement.

Preliminary outcomes demonstrate increased awareness of river safety risks, improved supervision and rescue capacities, and strengthened community resilience. This presentation will share insights from the program's implementation, highlighting the importance of safety initiatives and seeking approval from traditional landowners within Indigenous communities, addressing logistical challenges in remote settings, and leveraging partnerships to sustain long-term impact. By addressing unique environmental and cultural factors, the Kimberley River Safety Program provides a scalable framework for drowning prevention in remote and underserved regions globally.

POSTERS D1 28

Drowning trends on the beaches of Cox's Bazar in Bangladesh: Insights from lifeguard incident reports

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Background
The Bangladesh Health and Injury Survey 2016 revealed that drowning results in 19,000 fatalities each year. equivalent of 53 drownings per day (1). Cox's Bazar faces escalating drowning risks due to the influx of tourists. Lifeguard services and educational programmes have demonstrated significant results in reducing risk of drownings and increases beach safety awareness.
Description
SeaSafe is a collaborative effort initiated in 2014 which aims to mitigate drowning risk in coastal areas of Cox's Bazar through the delivery of professional lifeguard services, beach education sessions and pre-arrival messaging in the Cox's Bazar area. Reviewing the Lifeguard incident reports from 2016 to 2023, across the three service beaches (Sugandha, Laboni and Kolatoli), we have identified key trends in drowning risks and rescues.
Lessons learned
80% of drowning incidents were male (14-29 age range). 90% of casualties were visitors. High risk activities were inflatable users (70% at Laboni, 50% across all beaches). Nearly half of incidents occurred at Sugondha Beach, 39% at Laboni, and 13% at Kolatoli. Rip currents were the primary environmental hazard, implicated in 65% of Laboni incidents, 60% at Kolatoti, and 41% at Sugondha. Inability to swim was the dominant behavioural risk, affecting 75% of incidents at Kolatoti and 65% at Sugondha and Laboni. Analysis also revealed that over a third of incidents occurred more than 100m from lifeguard towers. Lifeguards detected 94% of incidents before public alerts, demonstrating their critical role.
Conclusion
These findings highlight the essential role of lifeguard services in mitigating drowning risks. With significant proportion of incidents occurring outside lifeguard patrolled areas, with rip currents being the primary environmental hazard, and use of inflatables contributing significantly to these incidents- there is a need to enhance coverage and awareness among tourists. The integration of all three interventions - rescue services, improved safety regulations for inflatable users and enhanced prevention education can significantly lower drowning incidents in Cox's Bazar, Bangladesh.

POSTERS D1 29

Beyond the Pool: Making Every Lesson a Lifesaver

Esther Hone

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In New Zealand, most drownings occur in open water, yet swimming lessons focus primarily on pool-based skills. Research by the University of Otago in New Zealand highlighted that our traditional pool based 'learn to swim' programmes needed to change to play an effective part in lifting the water survival competence of New Zealanders. So, how do we ensure that pool delivered water safety education prepares people for the real-world risks they will encounter? Put simply, it requires a daily commitment to integrating open water challenges into regular swimming and water safety programmes.

Working with the incredible team from Ballarat Aquatic Centre, Australia we simulated open water activities to prepare students for the situations where most drownings occur. This equips them with the experience, skills and knowledge to navigate rivers, beaches, and lakes safely. By using students to adjust pool conditions—such as creating waves, practising in clothing, and simulating currents—children experience real-world challenges in a controlled setting. These activities build knowledge of what to expect and how essential survival skills (calling for help, floating in different conditions for an extended time, moving underwater to escape entrapment, guiding others in difficulty, etc) can help overcome challenges.

But changing the focus of the traditional programmes that we were all comfortable delivering hasn't been easy. Our competency framework has been rewritten, new lesson plans and resources developed, and we've invested significant time and energy working with frontline instructors and teachers to ensure that they understand what's now expected and feel comfortable to play they part in delivering fun, engaging and impactful water survival programmes.

What Have We Learnt?

It's more FUN for students

Student water survival competence has increased

Instructors and school teachers need the time to plan activities well.

A simplified programme framework is essential

Don't buy specialised gear, use everyday items.

Ensure everyone is actively involved in the session

POSTERS D1 30

The impact of swimming lessons on water safety knowledge and awareness

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This exploratory study aims to determine the impact of swimming lessons provided by various facilities and groups (pop-up pools within school facilities, schools using local swimming pools, leisure centres after school lessons and the RLSS UK's Rookie Lifeguard programme within lifesaving clubs) on perceived water competency and other perceived benefits such as changes in water safety knowledge and awareness of associated hazards, changes in mood, changes in water-related behaviours and any other benefits.
Eight focus groups were set up with teachers/instructors and children (separately) who have experience of pop-up pools / traditional school swimming lessons / after-school swimming lessons or the RLSS UK's Rookie Lifeguard programme.
The full data set from each focus group will be presented using thematic analysis.

POSTERS D1 31

Reaching Those At Risk, Drowning Prevention Outreach in Charleston, South Carolina, USA

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This project aimed to connect people in the Charleston, South Carolina, community with resources for water safety through community events and face-to-face interaction. Community collaboration has been a cornerstone of many public health objectives and has proven effective in influencing public perception. The project began in 2024 when Charleston County Lifesaving Association determined a gap in the community in drowning prevention education in collaboration with the local lifeguarding agencies. That summer, promotional materials for water safety were given out at local triathlons and other events to families both participating and spectating at the events. A variety of responses were observed, with most interactions resulting in positive feedback. To further this work in the Summer of 2025, the group plans to attend a more diverse lineup of events. Ultimately, the work serves as a case study for the implementation of a drowning prevention campaign in a city with staggering access to water. The project uses lifeguards at these events, enhancing its existing reputation in the Charleston area in the water safety arena. Having these youthful, energetic guards at events has increased positive interactions, a factor we look to quantify in the following years. Data will be completed and available following this summer surrounding the satisfaction and engagement at these events.. Communication between parents, children, and lifeguards has built trust as the source is recognizable and familiar. The materials handed out include information for a range of audiences from children to adults, and were developed by the United States Lifesaving Association's Public Education Committee. Following the second iteration of the campaign, the lessons learned aim to be examined for replication in other coastal communities to which it could be applied to improve drowning prevention outreach.

POSTERS D1 32

Effectiveness of Experience Drowning with Immersive Virtual Reality for Water Safety Education

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Background: There are approximately 800 water accidents at sea in Japan each year[1]. In 2023, 851 victims were involved in beach accidents[2]. To prevent drowning accidents, it is important to educate people to acquire knowledge and skills, and to take action to prepare for drownings. According to a survey of more than 10,000 people conducted in 2024[3], 17 % of respondents had a near-drowning experience. In addition, the experienced people were more likely to have learned safety education in swimming school, to know the help signal, and to have experience wearing or purchasing a life jacket. From these results, it was thought that the near-drowning experience may influence behaviors related to drowning prevention. However, the experience in the water safety education is dangerous and difficult. Therefore, we propose a virtual reality experience might be effective instead of the near-drowning experience. We also thought that to make the experience in VR more realistic, it is necessary to use method to enhance the immersive experience as well as the viewing virtual reality[4]. In this study, VR contents were created for two major causes of drowning accidents which were drowning due to falling water and rip currents. Also, two methods to enhance immersive experience were conducted to evaluate an immersive feeling and an educational effect.

Methods: More than 50 participants were divided into three groups as follows, Group A did not take any method to enhance the sense of immersion, Group B used a reclining seat to the drowning scene, and Group C used a VR simulator to the entire content. The immersive feeling and the educational effect of each case were evaluated by an analysis of a questionnaire survey.

Results: The immersive feeling and the educational effect were highest in Group C, followed by Group B and Group A. For example, Group C had an average of 7% more positive responses than Group B.

Conclusion: It was thought that VR would be useful as educational content for drowning prevention. Furthermore, it was confirmed that using the VR simulator increases the immersive feeling and the educational effect.

POSTERS D1 33

Lifesavng event for children: the Danish way

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Drowning prevention efforts require continuous innovation to engage and educate young generations in water safety and lifesaving skills.
In Denmark, a new event concept, the “Children's Lifesaving Event”, has been introduced to bridge the gap between swimming lessons and lifesaving sport, targeting children aged 8-14. This abstract presents the concept, its implementation, and its potential contribution to drowning prevention and lifesaving sport development.
The primary goal of the Children's Lifesaving Event is to provide a low-threshold introduction to lifesaving sport, fostering both water safety awareness and enjoyment.
It’s an indoor pool event and participation is open to all members of swimming clubs, aged 8-14, regardless of prior lifesaving experience, as long as they can swim a minimum of 25 meters unaided. Emphasis is placed on inclusivity, with no timing, formal competition rules, or individual winners. Instead, every participant receives a medal, underscoring the focus on participation and learning.
Each event consists of a social introduction and a pre-event workshop where children are introduced to essential lifesaving techniques, including the use of rescue equipment such as dummies, rescue tubes, and throw lines. Experienced lifesaving athletes demonstrate each discipline, providing visual learning support.
During the event, children participate in both individual and team disciplines, including obstacle swimming, dummy rescues, and rescue tube towing. The format allows for assistance during events, ensuring a positive and confidence-building experience.
The format also fosters interest in further lifesaving training and sport participation. Furthermore, the event serves as a platform to introduce parents and local swimming clubs to lifesaving sport, creating a broader awareness of drowning prevention and the importance of lifesaving skills.
This concept demonstrates the potential for combining sport and education to address drowning prevention from an early age. By lowering barriers to entry and emphasizing enjoyment and learning, the Children's Lifesaving Event offers a scalable and adaptable model that can be replicated internationally.
Future development will explore expanding the concept to open water environments and assessing long-term impacts on children's water safety competencies and their participation in lifesaving sport.

Posters Day 2

POSTERS D2 01

Sri Lanka Community Lifesaver Swim Teacher Program

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Drowning remains a significant public health concern in Sri Lanka, with over 1,000 fatalities reported annually. In response, the **Sri Lanka Community Lifesavers** initiative was established in 2021 as a volunteer-driven program dedicated to lifeguarding, swim training, and disaster preparedness. With over 1,000 active members, the initiative collaborates closely with **Sri Lanka Life Saving (SLLS), Sarvodaya Shramadhana Movement,** and **Village Disaster Management Committees (VDMCs)** to enhance community resilience through training, awareness programs, and emergency response efforts. Recognized by the **Disaster Management Center of Sri Lanka**, the program aims to equip individuals with essential lifesaving skills, first aid knowledge, and disaster management techniques to reduce drowning incidents and improve local response capabilities.

Building on this mission, **Angel Swim London, UK**, has been conducting the **STA Swim Teacher Program** in Sri Lanka for three consecutive years, empowering local teachers with the skills necessary to educate children in water safety. The initiative began in **2023 at Rahula College, Matara**, where 35 participants trained 100 children. In **2024, at Prince of Wales College, Moratuwa**, 30 participants trained 150 children. In **2025, the program continues at Piliyandala Central College**, where 40 participants are teaching 150 children, bringing the total number of schoolchildren trained to over **400**.

The **Community Lifesaver Swim Teacher Program** serves as a model for sustainable swim education, ensuring long-term impact by equipping children with essential water safety skills. Through strong partnerships and unwavering volunteerism, this initiative is transforming communities and saving lives, reinforcing the critical need for continued investment in drowning prevention programs worldwide.

POSTERS D2 02

Dry swimming lessons: Can a flipped learning model be used to improve the speed of skill acquisition of self-rescue skills in beginner swimmers? Assessing the effectiveness of the Swim England Pre Swimming Familiarisation, Activation and Water Safety Session (P-FAWSS)

Ashley Jones, Lorna Goldie, Beth Barratt

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Swimming and Water Safety has been included in the English National Curriculum (NC) for Physical Education at Key Stage 2 (age 7 to 11 years) since 1994. Schools must ensure pupils can perform safe self-rescue in different water-based situations [1]. Swim England (SE), the National Governing Body for swimming in England defines self-rescue in the curriculum as an ability to survive a fall in entry, resurface, float on the back for 60 seconds, tread water, signal for help, travel to a floating object, assume the heat escape lessening posture, travel to the side and exit unassisted [3]

England's 16,784 state funded primary schools, [4] (pupils 5-11 years), face significant challenges in meeting curriculum outcomes. These include access to swimming facilities [5], financial barriers [6] and time restrictions, 30% of schools now offer 10 or fewer swimming lessons throughout a pupil's education [7].

SE sought to create an intervention (P-FAWSS) that would speed up skill acquisition. Inspired by concepts of flipped learning [8], pedagogy that highlights the increased likelihood of skill acquisition when prerequisite knowledge is attained prior to attempting more complex tasks [9] [10]

The aim of this pilot was to test the efficacy of the P-FAWSS intervention.

450 pupils that had not previously met NC self-rescue outcomes took part in a 1 hour dry lesson prior to their first wet swimming lesson. This dry lesson introduced movements and language that they would experience in their first wet lesson.

Efficacy was measured using the school's publicly reported self-rescue attainment data. Data was examined pre and post-intervention and the values compared.

Attainment of self-rescue outcomes were compared between the intervention group and non-intervention group (127 schools) that reported data in the same time period. In the non-intervention group, attainment of self-rescue outcomes improved by 9%. In the intervention group, attainment of self-rescue outcomes improved by 36%.

P-FAWSS resulted in a significant improvement in the attainment of NC self-rescue outcomes. Where availability of water time is restricted, it is recommended that pupils receive pre swimming familiarisation activities in order to speed up skill acquisition.

POSTERS D2 03

eLearning in lifesaving Training - the German way

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Even before the Corona pandemic began, the DLRG had the idea of offering training online. In organized German sport, this can be done either synchronously or asynchronously. Synchronous means that instructors and participants are online at the same time and the content will be presented using applications such as MS Teams, Zoom or Go to Meeting. Participants have the opportunity to ask questions, which the instructor can answer directly. Group tasks can be worked on in breakout sessions and then presented. Asynchronous is teaching that is made available on a platform and that participants can learn whenever they want. Questions can be asked via the platform and answered by the instructor when they are online. The DLRG now has its own platform of this kind. This can be reached at lernen.dlrg.net. Shortly after the platform was published, the DLRG education department came up with the idea of offering lifeguard theory as asynchronous eLearning. This is to ensure that all lifeguards are trained with the same content. Furthermore, the trainers should be relieved of some of their time. By making the training more flexible, the training should be made more attractive, which should lead to an increase in the number of trainees.

POSTERS D2 04

The app Water Competence - from Idea to International Teaching tool

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For decades, the development of swimming skills and lifesaving abilities has received limited attention. As a result, many individuals lack sufficient swimming proficiency—something that may contribute to the high number of drowning incidents. According to the Norwegian Society for Sea Rescues, 95 people drowned in Norway in 2024. In comparison, 90 people lost their lives in traffic accidents the same year (1). Notably, most drowning incidents occur near safety opportunities such as the shore, boats, docks, or other rescue points.
To address this, the **Water Competence** app provides access to a range of aquatic learning exercises developed by the Norwegian Swimming Federation, the Norwegian Paddling Federation, and the Norwegian Lifesaving Society. These resources are grounded in evidence-based research on water competence. While swimming is often taught indoors, the majority of accidents happen in open water. This app therefore includes a wide variety of open water exercises—from beginner swimming and self-rescue skills to full lifesaving techniques. The goal is to help users, and those they teach, become confident and safe in, on, and around water (2)
Since its launch on October 1, 2022, the Water Competence app has reached users in more than 80 countries and surpassed 50,000 downloads. It is currently in use in regions such as Norway, Sweden, Denmark, Finland, the Faroe Islands, the Baltics, the UK, Germany, Portugal, the Netherlands, and Poland, as well as in the USA, Australia, South Africa, and across Asia, the Middle East, and parts of Africa and South America.

POSTERS D2 05

A descriptive study of drowning patients presenting to public emergency centres in the Western Cape province of South Africa

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Background: There are approximately 200 fatal drowning incidents in the Western Cape per annum (1), but there is little published data to describe the impact of this burden, and the associated non-fatal drowning cases, on emergency care facilities. The aim of this study was therefore to describe the epidemiology, clinical characteristics and outcome of patients presenting to Western Cape emergency centres (EC) following a drowning incident.
Method: This observational, cross-sectional study describes all adult and paediatric patients who presented to Western Cape public sector ECs using the electronic Hospital and Emergency Centre Tracking Information System (HECTIS) following a drowning incident between June 2017 and February 2024. HECTIS is a provincial application to track and manage patients' throughput in the EC.
Results: A total of 391 drowning presentations were captured on HECTIS during the study period, however not all public sector ECs were using HECTIS for the full study period. In 2023, the year in which the most facilities were utilising HECTIS, there were a total of 136 presentations. Preliminary analyses indicate that the mean age of patients was 16.8 (± 16.2) years, and 30.6% of patients were aged 5 years and under. The majority of patients were male (67.0%). The mean time from arrival to first consultation was 76.3 (± 84.7) minutes. Approximately half (50.5%) of all patients arrived direct from scene with EMS, and 36.0% were self-referrals. A quarter (25.8%) of patients were triaged red (emergent), 25.6% orange, 29.4% yellow and 16.6% green (non-urgent) on the South African Triage Scale. A total of 10 (2.6%) patients were dead on arrival, a further 8 (2.0%) died in the EC, 25.1% of patients were admitted and 28.4% of patients were discharged from the EC.
Conclusions: Public sector hospital admissions for drowning are low relative to the number of fatal drownings annually, this indicates that there are opportunities to improve survival rates following drowning incidents through safety promotion and prevention interventions. Further research is needed to quantify the burden of non-fatal drowning in South Africa.

POSTERS D2 06

How to digitize a Lifesaving Federation - a practical guide

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Many Lifesaving Federations have a high number of volunteers delivering the day-to-day work. With an increase in bureaucratic and formal needs, enhanced and intensified communication, collaboration has become a key component. Besides simplifying a lot of mainly manual activities, a proper level of digitalization may free up valuable time of the volunteers. This ranges from activities in public like education and information to pool activities like learning how to swim, (basic) water rescue education but also to rescue service. Overall, the change is required to allow any federation to focus on the very intrinsic topic of Drowning Prevention.
The presentation will introduce different aspects of digitalization:
connecting people by means of mobile apps and standard communication tools.
digital means of communication ranging from online meetings,
simplify day-to-day work like planning courses, application of the participants, managing any kind of event, etc.
collect data on incidents and rescue services to allow proper allocation of resources and planning of activities
raise awareness and training by means of e-learning, blended learning etc.
using existing standard software to foster one or more things to happen in compliant and efficient manner
finally, introducing AI to some selected opportunities
In a last part, a little future perspective is provided.

POSTERS D2 07

Analysis of Socio-Environmental Conditions of Incidents in Liquid Medium on The Paraná Coast

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Introduction: The World Health Organization (WHO) classifies drowning as one of the leading causes of unintentional death worldwide, emphasizing that most of these incidents are preventable through effective preventive measures. The objective of this research is to analyze the socio-environmental conditions of incidents in liquid medium recorded by the Fire Department on the coast of Paraná between the 2019/2020 and 2023/2024 seasons. Methodology: Data on the origin of the victims, lunar phases, location of the incident, distance from the lifeguard station, time of day, ocean conditions, relationship between warnings and guidance and the total number of incidents and time spent by the victim on the coast were analyzed. These data were collected from the Fire Department's Incident and Statistics Recording System (SYSBM), Paraná's Environmental Monitoring and Technology System (SIMEPAR) and other sources and statistically analyzed in order to identify correlations between the socio-environmental variables and the incidents. Results: The lunar phase did not have a major influence on the number of incidents, nor on the severity of the cases (p-value=0.97). Regarding the location of the incidents, the majority (81%) occurred between the first and second surf zone, where there is a strong influence of rip currents. The distance from the lifeguard station was also shown to be a relevant factor, with a significant increase in the severity of cases as the distance increased (p-value < 0.001). Furthermore, incidents occurred predominantly between 10 am and 12 pm and 4 pm and 6 pm (50%). The relationship between the number of warnings/guidance and incidents indicates that, with the increase in these preventive measures, the total number of occurrences tends to decrease (p-value=0.02). Regarding ocean conditions, aspects such as tide were analyzed, and it was observed that incidents were more frequent during ebb (32%) and flood (39%) tides. Conclusion: The results of this research outline the profile of the drowned person, as well as the environmental conditions of the incident at the time of the drowning on the coast of Paraná, highlighting the importance of raising awareness among bathers about the risks associated with sea conditions and the presence of strategically positioned lifeguards.

POSTERS D2 08

first international swimming teachers training in uganda to stop infant drowning in schools

George William Mukasa

Life saving Association Uganda, Kampala, Uganda. ILS Africa, Alexandria, Egypt

Every 25th July is World Drowning Prevention day since 25rh July 2021, Uganda has commemorated this day since inception 25th July 2021 with Life saving Association Uganda, we have echoed the drowning burden to our communities and the government to support the civil society to stop drowning through awareness and sensitization in line with the WHO Guidelines shared annually.
In 2024 "Seconds can save lives" "Anyone can drown, no one should" taglines were adhered to through initiatives such as capacity building in training swimming teachers for the first time in Uganda from a water safety perspective.
Twenty-seven (27) STA UK International Swimming Teachers were trained in Kampala by Adam Knight
from Angel swim London both in the Swimming pool based classes and open water on Lake Victoria and Lake Bunyonyi in July 10-25th 2024.
Over 2,000 children were taught in 45 hours by 27 Newly trained Teachers at Georgina Gardens swimming pool in Kampala and about 200 public beach revelers at Aero Beach in Entebbe along the shores of Lake Victoria..
Nine (9) Teachers including School Teachers, Tour operators and guides underwent the STA Swimming
Teachers Course based at Lake Bunyonyi in Western Uganda, at the deepest lake in Uganda and second in Africa, the teachers were equipped with Open Water Swimming skills later passed on the skills to over 500 school going children in 40 hours who use the canoe boats to attend School daily across the 29 islands on lake Bunyonyi.
After our successful private initiative, we desire to join the Government in launching the National Drowning prevention strategy this year 2025 where more affordable areas of intervention can be tackled and closed to stop drowning in Uganda by our organisation, Life saving Association Uganda and other civil society players.

POSTERS D2 09

High-Impact First-Aid: Superior Training at a Lower Cost- A Case Study with a European Lifesaving Organization (ELO)

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Background. In high-stress situations, first-aiders often struggle to recall proper procedures, leading to errors or inaction. Retention and training costs are key concerns. At WCDP 2019, we presented evidence showing that first-aiders trained through traditional methods forget over 50% of their knowledge within months(1). These findings, supported by both case study data and existing literature, highlighted the need for a more effective training approach. Since 2019, we have developed and tested a data-driven solution to improve first-aid performance. This study presents our latest results.

Aim: To compare the effectiveness of an alternative first-aid approach with traditional first-aid training methods.

Method: Through an evidence-based case study with the ELO, which employs over 100 lifeguards, we assess a novel training approach. This method leverages data-driven, gamified microtraining, enabling small groups to practice first aid in short, frequent sessions—such as 15-minute extensions of staff meetings. Data collection and analysis follow the statistical value chain methodology (2).

Results & Conclusion: Across multiple organizations, this alternative training model has resulted in sustained, and over time, first-aid performance rates of up to 90%. These findings will serve as a benchmark for evaluating ELO's first-aid performance, with data available by July 2025.

Discussion: We'll discuss the measurable impact of the training on first-aid performance and compare it to traditional methods. Additionally, we will discuss the lifeguards' feedback on the alternative approach, evaluating engagement, and practicality in real-world scenarios.

POSTERS D2 10

operational excellence in aquatic facilities: a systematic approach to safety management

Jaye Chua, Husnul Hamed

Sport Singapore, Singapore, Singapore

Sport Singapore has developed a multifaceted systems approach to drowning prevention across its 23 public swimming complexes. This presentation offers a unique dual perspective, combining insights from both headquarters and on-site management to provide a holistic view of our advanced framework.

Our strategy integrates modern technology with robust policies and standardised operating procedures. At its core is a safety management system built on ISO 45001 standards, featuring regular compliance audits and risk assessments. The integration of the Computer Vision Drowning Detection System has significantly enhanced our surveillance capabilities since 2019. We will explore our meticulously designed Emergency Action Plan, systematic incident management processes, and thorough safety protocols. Our commitment to safety excellence is demonstrated through active participation in international and national initiatives such as World Drowning Prevention Day, Lifeguard Appreciation Day, National Life Saving Day and more.

A key focus will be our approach to stakeholder management, ensuring effective communication and collaboration with staff, guests, and regulatory bodies. We maintain comprehensive safety communication through multiple channels, including digital platforms, townhall sessions, regular meetings and community engagement initiatives. We will also highlight our data analysis and benchmarking practices, which drive continuous improvement in safety standards and operational efficiency.

This presentation demonstrates how corporate safety policies, stakeholder engagement, and day-to-day pool operations integrate to create a robust drowning prevention framework, enhancing aquatic facility safety and elevating operational excellence in public swimming facility management.

POSTERS D2 11

Preliminary investigations into evidence-based sting treatments to improve patient outcomes

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Background: Coastal environments are intriguing with many hazards beyond drowning. Surf Life Saving Australia records over 40,000 marine stings annually, with a small but significant number suspected to be from potentially lethal cubozoans jellyfish. In Australia, two potentially life threatening cubozoan groups exist – cubozoans causing Irukandji syndrome and the Australian box jellyfish (*Chironex fleckeri*).
Sting management practices for *C. fleckeri* have been challenged as the most appropriate first aid, leading to misinformation and potentially harmful patient outcomes. An international research team were assembled to develop evidence-based guidance for Surf Life Saving operations and emergency response. Agency, lay discussions, and a thorough review of the historic and current literature, revealed an urgent need to answer two primary questions relating to the immediate first aid of *C. fleckeri* stings:
Is vinegar application as immediate first aid is harmful in any way?
Does vinegar or hot water application after a sting result in less tissue damage and systemic sequelae?
Methods: *C. fleckeri* specimens were sourced from the field (Darwin, Northern Territory, Australia) and venom activity and first aid treatments were tested using blood agar-based bioassays (a proxy for sting patient direct tissue damage by live tentacles). Following a 10 minute 'sting', seven immediate first aid treatments were applied along with two treatment controls. The zone of haemolysis was measured over a 6-hour time series to measure specific haemolytic activity.
Results: The 6-hour time points showed that ice and seawater treatments led to higher levels of haemolysis than the untreated control. Brief hot water rinsing and heat pack application lessened haemolysis, but the lowest levels of haemolysis were observed in replicates treated with vinegar and a patented treatment called StingNoMore.
Conclusions: Preliminary analyses revealed vinegar remains the best immediate first aid option, along with StingNoMore spray to mitigate further harm occurring to the patient. They also highlighted the negative impacts of ice and seawater as alternative first aid. Future research will explore first aid and subsequent envenomation treatment options, with larger specimens to robustly extend the research. This paper presents the first crucial step to clarifying tropical stinger management practices in Australia.

POSTERS D2 12

Impact of the Guarda-vida Mirim Project on the dissemination of safe practices in aquatic environments in Rio Grande do Sul.

JEFERSON FRANCA

Military Fire Department of Rio Grande do Sul, Torres, Brazil

Context: Drowning represents a serious public health problem, especially during the summer and in regions with a large concentration of bodies of water. Preventive education, aimed at children and adults, is a fundamental strategy for reducing these incidents. The Mirim Lifeguard Project, developed by the Rio Grande do Sul Military Fire Department (CBMRS), aims to disseminate good conduct and basic care for safe bathing. This study evaluates the initial reach of the project during Operation Summer.
Methods: This descriptive study evaluated the reach of the Guarda-vidas Mirim Project during the beginning of Operation Summer 2023/2024. Data relating to the first 26 editions of the project were considered, focusing on the number of participants. Data were collected directly from CBMRS records, counting the number of children (between 6 and 12 years old) and adults participating in the activities. The analysis focused on quantifying the participants and describing the activities carried out.
Results: Since the beginning of Operation Verão, the Junior Lifeguard Project has carried out 26 editions, reaching a total of 724 children and 526 adults. The activities covered topics such as identifying dangers at sea, rivers, lakes and swimming pools, the meaning of the colors of signal flags, basic rescue techniques and first aid in cases of drowning. The distribution of educational materials, such as booklets and leaflets, was also part of the actions.
Conclusions: The initial results demonstrate the significant reach of the Guarda-vida Mirim Project in disseminating information about water safety for children and adults in Rio Grande do Sul. The significant public participation suggests the community's receptivity to educational actions. Reaching a child audience is crucial, as children act as knowledge multipliers in their family and social groups, enhancing the preventive impact of the project. Future implications include the need to assess the long-term impact of the project, through studies that assess knowledge retention and behavior change among participants. It is also recommended to expand the project to other regions of the state and develop new educational strategies to reach an even larger audience.

POSTERS D2 13

Co-Producing Digital Tools with Scientists and Lifeguards for Rescues monitoring

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Background: Drowning prevention research projects require quality data on rescues characteristics. Such information is often collected by lifeguards but rarely in usable form for analytical purpose (1, 2). This study highlights the transformative potential of open-source and free software in enhancing lifeguard operations by enabling digitalized data collection and reporting.

Methods: In 2023, 5 experimental beaches on southwest France (Landes département) were equipped with tablets running Open Data Kit (ODK Collect), a free and open-source field data collection software. Lifeguards recorded rescues and contextualized data (e.g. date, time, causes) directly into these devices, which synced to a central database. An R-Shiny web application was developed to provide lifeguards and supervisors with real-time access to rescue statistics, customizable reporting, and analytics. Regular feedback sessions were organised with lifeguards during and after summer seasons.

Results: The digital data collection system was successfully deployed and utilized throughout 2023, 2024 and 2025 in the Landes department. Since 2025, all beaches of Landes (n=58) have been equipped with the device and 1,528 rescues were reported. Prior to our work, only 2% of these observations were recorded by the official healthcare systems. Lifeguards are now using our web application dashboard to build reports and as part of their training modules.

Conclusions:
This project demonstrates how open-source and free technologies can significantly improve lifeguard operations by digitizing data collection and enabling real-time analytics. This success has been made possible only through a long-standing partnership between researchers and lifeguards. Since 2025, permanent lifeguards continue to feed the database during off-season when many beaches are not supervised. The system's accessibility and cost-effectiveness make it highly scalable and adaptable for other regions and use cases. Indeed, our sytem has been expanded to two other administrative areas, including ocean beaches as well as estuaries and lakes beaches, across 90 sites. Preliminary analysis of the collected data has revealed recurring patterns in rescue activities, laying the foundation for predictive models (3).

POSTERS D2 14

Hypoxic Blackout in Competitive Freediving: Insights for Drowning Resuscitation

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Background: Drowning follows a sequence of last breath, forced apnea, progressive hypoxemia, loss of consciousness (LOC), weakened cardiac contraction, and finally asystolic cardiac arrest. Rescue ventilation alone can revive victims of acute hypoxemia if given promptly before cardiac contraction is lost. The critical time delay to starting ventilation that permits full recovery without chest compressions is unknown, as human data is rare. Organized freediving competitions provide a unique opportunity to witness hypoxic blackout after prolonged apnea that is physiologically similar to early drowning, and to record the timeline of intervention and recovery. We report a case a breath-hold diver who lost consciousness underwater during ascent from a 92-metre dive and was resuscitated by ventilation alone despite prolonged LOC.
Methods: A 29-year old experienced male freediver participated in a world competition at Dean's Blue Hole in the Bahamas. During ascent, the diver suddenly became motionless at 20 metres depth, which was captured by the event photographer. A safety diver immediately covered the mouth and nose to prevent water aspiration and brought the diver to the surface. The diver was apneic and unresponsive. He was transferred onto the adjacent barge deck to the medical team led by the author. There was no gasping or agonal breathing. Photographs showed that 52 seconds elapsed from underwater blackout to the first rescue ventilation, which was delivered using oxygen and jaw-thrust. After several ventilations, the diver opened his eyes and within two minutes appeared fully recovered.
Results: Apnea persisted for almost one minute after underwater LOC. Resuscitation was achieved by ventilation alone. We therefore define two major phases of drowning: (1) V-phase during which ventilation alone can resuscitate because the heart is beating enough to recover if given oxygen, and (2) a subsequent C-phase when chest compressions become essential due to hypoxemic loss of adequate cardiac contraction.
Conclusions: Rescue ventilation given within one minute of hypoxic blackout is a viable and reasonable first step in resuscitation, and has potential to restore consciousness. Chest compressions, which risk injury, may be deferred until after a ventilation sequence has been tried without response if started within the first minute.

POSTERS D2 15

‘Anyone Can Drown, No One Should’: A Community-Based, Youth-Centered Model for Drowning Prevention in Uganda

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Background: In the past decade, drowning has caused over 2.5 million preventable deaths. African nations, including Uganda, are disproportionately affected by drownings, with youth being one of the most at-risk groups. To reduce the burden of child drownings, the World Health Organization recommends teaching school-aged children swimming and water safety skills. In alignment with these recommendations, the non-governmental organization Energy In Action, in collaboration with local community partners, has designed and hosted annual youth water safety and learn-to-swim ‘Splash Safe Camps’ for youth in Kampala. This report describes and assesses the project plan, implementation, outcomes, scalability, and lessons learned for future interventions.

Description: Annually, approximately 150 youth aged 8-16 who attend school in communities around Lake Victoria are recruited to attend the water safety camps. All campers receive a workbook, t-shirt, a bathing suit, a towel, and a drawstring backpack. Youth rotate through 8 interactive workshop stations following a curriculum detailing topics including Water, Sanitation, and Hygiene (WASH), Drowning Prevention, First Aid/CPR, Mental Health, Teamwork/Gender Equity; Learn-to-Swim; and Water Polo. Pre-camp assessments are administered to the campers to gather baseline data on water safety knowledge, with the same survey administered post-camp to measure knowledge gains and shifts in attitudes.

Lessons Learned: Since the program’s inception in 2022, Splash Safe Camp has reached over 450 youth. Annual analyses of pre- and post-camp assessments have shown improved mastery in both knowledge and confidence regarding swimming, water safety, and sharing information with the community. Results indicated up to a 20% increase in quiz scores, reflecting greater water safety awareness. Youth also reported feeling significantly more comfortable with swimming and more empowered to support water safety within their communities.

Conclusions: The Splash Safe Camp youth water safety programming has proven to be an effective method of building drowning prevention capacity for youth among high-risk communities. Future program goals include conducting more long-term follow-up surveys and expanding the program to additional locations in Uganda and other low- and middle-income countries.

POSTERS D2 16

Bridging Talent, Water Safety and Global Opportunity

Laia Coma

UWC East, Singapore, Singapore

WaveWise is a global initiative transforming the lives of young athletes through recruitment, education, and social impact. Our mission is to bridge the gap between talent and opportunity by providing pathways that combine world-class training, academic placements, and water safety education.
WaveWise operates across three key areas:
Recruitment Agency – Supporting talented swimmers in securing international university scholarships, guiding them through eligibility, applications, and transitions.
SwimLab – Offering tailored training programs and expert mentorship to help athletes and anyone reach their full potential.
Global Impact Foundation – Creating Safer Waters for All
The Wave Wise Global Impact Foundation exists for one clear mission: to prevent drowning and expand water-safety education in those communities most at risk. The aim is to raise awareness and funds through endurance events, marathons, and global campaigns, while partnering with NGOs, Rotary Clubs, and local leaders to deliver real change where it's needed most.
Our hybrid model reinvests part of Wave Wise's revenue into the foundation, amplifying every wave we make.

By 2030, our vision is to:
✓ Reach 10,000 children through water-safety programs
✓ Train hundreds of local instructors
✓ Establish a sustainable swim-school model across Africa and Asia
Backed by a strong network of universities, coaches, athletes, governing bodies, and social partners, WaveWise merges sport, education, and purpose. Our vision is to shape the future of swimming, where opportunity and safety in the water are not privileges, but universal rights.
Wave Wise is more than an organization, it's a bridge.
A bridge between continents. Between privilege and opportunity. Between survival and potential.

POSTERS D2 17

Setting Global Standards: The International Federation ofSwimming Teachers' Associations (IFSTA) Partners with the Global Water Safety and Drowning Prevention Rotary Club(GWSDPRC) to Establish Teaching Standards and Member Associations Throughout the World: A Case Study in Uganda

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IFSTA partnered with the GWSDPRC to bring international standards to swimming instruction. IFSTA has long-established standards which all members meet and recently published its Guidelines for Creating Swimming Teacher Associations. GWSDPRC is committed to funding drowning prevention measures throughout the world via its network of local clubs and the leadership of GWSDPRC members.

The partnership focuses on areas where teaching swimming is rudimentary or non-existent. GWSDPRC desires to expand its impact by empowering local communities to provide their own quality water safety activities with the guidance of IFSTA and the GWSDPRC and the support of local Rotary Clubs. The economic, professional and health benefits from this program are advantages to be leveraged and measured as efforts progress.

The partnership's first joint effort is establishing a swimming teachers' association in Uganda. To date, the Ugandans have submitted the documentation to establish their own association. IFSTA members assisted the Ugandans in adapting their documents to meet national requirements as well as establish internal standards and curriculum. Once standards are introduced, enforcement mechanisms must be developed and maintained as essential to the success of a swimming teachers' association. Having recruited the initial cohort of swimming teachers, training them in organizational methodology and water safety techniques, these teachers are now becoming trainers, thus creating a sustainable and long-term pathway from swimmer to teacher to teacher trainer.

Participation of local Rotary Clubs to obtain buy-in and commitment to the projects of a new association. has been on-going. The partnership also is guiding them on marketing to elevate the availability of swim instruction throughout Uganda.

The impediments to swim instruction on a truly global scale are well known, and this effort is unique in bringing drowning prevention leaders from around the world together to establish long-term, locally administered, sustainable programs in underserved locations. Expanding well beyond teaching individuals to swim and even training instructors to teach swimming, this program is designed to provide capacity building and institutional development within countries. Policymakers will find this project instrumental in establishing relevant swim instruction and water safety programs on a sovereign basis.

POSTERS D2 18

the effect of a training program with a variety of resistance methods on the level of physical and physiological competence and the record level of lifeguards

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The study aims to suggestion a training program using different resistance methods, whether with body weight or with tools and devices (calisthenics - variable resistance), and to know its effect on the level of physical efficiency, physiological efficiency, and record level of lifeguards. The researcher also used the experimental method, and the study population included those enrolled in the lifeguard program (Beaches - Swimming pools) affiliated and accredited by the Egyptian and International Federation for Diving and Lifesaving in 2023 from the ages of 18 to 25 years, the study sample was chosen intentionally and numbered (12) qualified for lifeguard's as one experimental sample. The results of the study also showed a positive effect on physical variables (back muscle strength (66.56%) - abdominal muscle strength (95.37%) - front leg muscle strength (23.17%) %) - Strength characterized by speed in the arms (66.38%) - Strength characterized by speed in the legs (17.09%)- Flexibility of the torso (127.79%)- Agility (31.24%)- Compatibility (37.5%), and in physiological variables (pulse at rest (11.34%) - Pulse after exertion (3.98%) - Maximum oxygen consumption (Vo2 Max) (37.03%) - Vital capacity (30.38%) And in the record level variables (test (200) meters swimming, crawling on the stomach (43.94%) - Test (25) Underwater swimming meter (146.96%) - Tube rescue kit (62.92%) - Dummy rescue kit and pulling it (52.92%),The efficiency of those qualified to join the lifeguard's program under study was also raised, as they passed the lifeguard's tests approved by the Egyptian and international federation for diving and lifesaving with high efficiency.(1)

POSTERS D2 19

RescueLAB – An Effective Educational Space for Preventive Activities

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In the face of the growing demand for effective first aid and prevention training, we present an innovative educational solution – RescueLAB. It is a multi-station space equipped with technologically advanced equipment for measuring effectiveness and enabling learning through the "manikin per person" method. This approach guarantees high training efficiency in a short time, which is crucial in the context of time constraints in educational institutions.
The aim of RescueLAB is to create an optimal environment for learning first aid, including cardiopulmonary resuscitation (CPR), where repeated practice is key to developing motor habits. Our method addresses the environmental need related to the mandatory school first aid education, occupational health and safety (OHS) training for students, and preventive activities on beaches and other public places.
RescueLAB offers both stationary and modular solutions, tailored to various needs and locations. The use of technology allows for objective measurement of training effectiveness, and the use of competitive elements increases participant motivation. Additionally, joint training in RescueLAB helps to break the barrier of coming to the center of the room, which is significant in the context of the psychological aspects of learning.
RescueLAB is not only effective in teaching life-saving skills but also a versatile tool for preventive activities that can be used in various environments and situations.

POSTERS D2 20

Use of AI, Robotics and Dogs in Drowning Prevention on Beaches of Goa, India

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Background: Drishti has been providing lifeguarding services on Beaches of Goa since 2008 and 8000+ lives have been saved since then resulting in 99% reduction in drowning deaths.
Despite employing 600 lifeguards, we face a unique challenge where-in a majority of the visitors are fully clothed non-swimmers who are entering an ocean for the first time! This requires a significant amount of awareness and early warning necessitating tools and support to monitor randomly visited risk-prone zones to aid lifesavers in rescue and beach safety operations.
Description: Drishti has developed and deployed two AI platforms Aurus and Triton. Aurus is a self-driving robot that monitors the beaches and provides logistics. Triton monitors the area, assesses risk and shares real-time alerts with on-duty lifeguards. Both systems have autonomous capabilities to warn visitors, without human interference.
Aurus is currently deployed at 2 while Triton is on 5 beaches of Goa. Both the systems have undergone nearly 30,000 hours of deployment and many more are planned soon.
In a first-of-its-kind program in Asia, Drishti is training a team of 11 lifesaver "Paw Squad" dogs for deployment on high-density beaches in Goa to spot and rescue victims in distress and locate missing children. Their intensive outdoor training includes sessions on a jetski and sea swimming, and are already deployed on beaches of Goa.
Lessons learnt: AI and Robotics are cost effective, 24x7 available innovations and work even in no-internet areas. Tourists tend to listen to warnings from robots and Dogs more than fellow humans either out of fear of the unknown or love for the animal.
Conclusions: The initiatives will have significant impact in drowning prevention in risk prone areas especially in Coastal areas of Developing nations.

POSTERS D2 21

Promoting aquatic literacy in Portugal: a massive open online course on drowning prevention

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Context:
Drowning is recognized by the World Health Organization (WHO) as a global public health issue, accounting for approximately 300,000 deaths annually. Children under the age of five represent one of the most vulnerable groups. In Portugal, the Association for the Promotion of Child Safety (APSI) reports an average of nine child fatalities per year, making drowning the second leading cause of accidental death among children.
To address this global challenge, the Directorate-General for National Defence Resources (DGRDN), in collaboration with the Maritime Rescue Institute (ISN), is developing a **Massive Open Online Course (MOOC) on Drowning Prevention**. This course is open, accessible, and free to all individuals, and will be made available through an online learning management platform – the NAU Platform.
Description:
The primary objective of this course is to raise awareness within the community about drowning prevention by leveraging innovative technological and pedagogical strategies. Additionally, it seeks to disseminate theoretical and practical tools related to aquatic safety to a diverse audience, fostering aquatic literacy and a culture of safety among the Portuguese population.
The MOOC is structured into four modules:
Introduction to Drowning Prevention
Drowning Prevention at Beaches
Drowning Prevention in Swimming Pools
Basic Life Support Applied to Drowning Situations
The course will incorporate various asynchronous learning activities, such as videos, presentations, and assessment exercises. No prerequisites are required for enrollment. However, participants must achieve a minimum score of 75% in each module and in the overall course to complete it successfully.
The MOOC is scheduled for launch in **April 2025** and will remain available for six months, aligning with the period of increased public use of aquatic environments.
Lessons Learned:
During the development of this MOOC, technical meetings were held with the pedagogical team, the NAU Platform manager, the ISN, and other relevant entities to ensure the necessary methodological, technical, and scientific support.
Conclusions:
This pioneering and innovative initiative is expected to significantly reduce drowning incidents in Portugal and may serve as a model for similar initiatives at the international level.

POSTERS D2 22

Floating unconscious victim in swimming pool : which configurations ?

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Computer vision technology solutions enable earlier detection of aquatic distress as a complement to lifeguard supervision. The massive arrival of AI is shaking up the market of these technologies. It is creating a waiting effect and making current technologies look obsolete in a competitive context. Increasingly sophisticated solutions are expected. Tomorrow's challenge is no longer to detect a stationary solid mass at the bottom of the pool, but to detect distress before total immersion (*early detection*) : at the beginning of the accidental trajectory. A company that manufactures computer-aided systems for the detection of aquatic distress has reported a number of isolated cases of swimming accidents in public swimming pools (PSP) in Asian countries. The victims are found inanimate on the surface and remain in a stationary position. The pools are always shallow (less than 1.20 m deep) and the bathing water is not salty. However, literature and experience show that people suffering from aquatic distress sink quickly. Why do swimming accident victims float in certain configurations in Asian countries pools ? That's the question we're here to answer.
To try to answer this question, two methodologies were deployed. Firstly, multidisciplinary expert consultations (n=9) were carried out. The experts consulted come from 4 different disciplinary backgrounds. Secondly, in-situ pool tests were carried out with students (n=6) from sport science University.
The results provide an initial understanding of a phenomenon that is poorly documented in the literature.
The authors are well aware of the many limitations of this initial reflection. It does, however, open the way for future research. In particular, the tests in situ need to become more scientifically robust. However, these initial results may help the R&D sector to better detect accidents PSP. This work also demonstrates the interest and richness of interdisciplinary thinking, without which the possibilities of explanation are limited.

POSTERS D2 23

using approaches to drowning victims: techniques and procedures

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Introduction: There are several ways lifeguards proceed during approach, rescue/transport without equipment. These techniques are used in order to achieve the greatest efficiency at the first contact with the victim and not to be clung.
Objective: To analyze the methods of widely used approaches during aquatic rescues of drowning victims.
Methods: Questionnaires were applied to 96 lifeguards that work on the beaches of Rio de Janeiro, with an average of 10 to 21 years of experience. The questions regard the techniques of widely used approaches in different situations: jack knife dive, underneath the victim and emerging from behind (UVEFB); jack knife dive passing through the side of the victim and emerging from behind (SVEB); jack knife dive with knees rotation (KR) and by the arm, without diving (ARM).
Results: Conditions under which the victim is: Distressed (looking fearful, with poor front crawl, without synchronism of arms and legs): 7% would carry out the CBP approach, 3% would carry out the SVEB approach; 69% would use the KR; while 21% the ARM. Distressed (looking fearful, poor tread water, no synchronism of arms and legs, immersing and emerging, waves onto the victim): 67% would carry out the UVEFB approach, 8% would carry out the SVEB approach; 19% would use the KR; while 6% the ARM. Less distressed (disoriented and insecure, regular swimming), 2% would carry out the UVEFB approach, 3% would carry out the SVEB approach; 4% would use the KR; while 91% the ARM.
Discussion: Several ways of approaching during tow/transport should be taught in lifeguard training and retraining courses. However, depending on the behavior of the victim and sea conditions, some techniques should be reviewed and better trained, considering the protection and integrity of those involved, preventing the victim from clinging to the rescuer and not letting the victim escape.

POSTERS D2 24

different approaches to drowning victims: efficiency from the lifeguard's perspective

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Introduction: Different water rescue schools teach a range of approach techniques, aiming to have as little contact between the victim and the rescuer as possible. Subsequently, during the rescue/transport, several forms of holding the victim occur.
Objective: To analyze the efficiency of approach and holding methods during towing/transportation of a drowning victim.
Methods: 96 professional lifeguards who work on the beaches of Rio de Janeiro responded to the questionnaire.The questions were about **approach techniques:**"switchblade technique" emerging from behind the victim (CSP), "switchblade technique" with knee rotation - approach from the front–CRJ; **Towing/Transport:** Red Cross; armpits; wrist; arm; chin; hair and head.
Results:
Approach techniques: In the conditions in which the victim's behavior (agitated, fearful face, vertical swimming, diving and emerging, waves over the victim), 27% would perform the CSP approach, while 73% would perform the CRJ approach
Towing/transport: Considering the victim's good swimming technique, yet, disoriented and insecure about leaving the sea, 55% said they would accompany the victim from the side, without making a grip; 31% would take the arm; 14% would prefer to grip the victim's armpit. Considering the waves and/or agitated victim, 91% prefer to use the red cross grip, while 8% rather the arm grip. Considering children, in any situation (with or without waves) 96% prefer the red-cross grip, while 4% prefer the cross-chest grip. In view of two rescuers and one victim, 96% prefer to use the arm after the surf line. However, when they reach the surf line, 100% answered that one performs the red-cross grip, while another rescuer hugs the victim and the rescuer; There was no response regarding the grip techniques during transport by forearm, armpits, wrist, chin, hair.
Conclusion: Different forms of approaches and grip during transport should be taught in Lifeguard's graduation courses and the courses to update Lifeguard's skills. However, depending on the environment they may perform, some techniques should be emphasized and trained. Nonetheless, the safeguard and integrity of those involved should always be considered (avoid the victim's grab in the rescuer) and also not allow the rescuer to lose the victim.

POSTERS D2 25

use of jet ski by doctor to reduce response time in providing advanced life support to drowning victims

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Introduction: In 2024, the Fire Department of the State of Rio de Janeiro (FDRJ) conducted approximately 1,839,210 drowning prevention interventions and 23,655 sea rescues. Depending on the severity of the incident, a doctor may be required to provide initial medical care and accompany the victim to the hospital.
Objective: To analyse the use of a jet ski (1,630cc/170hp/52 mph) operated by a lifeguard and a doctor as pillion, to reduce response time in delivering Advanced Life Support (ALS) to drowning victims.
Methods: The study focused on a single Fire Department Unit (Barra Beach) in the period from 12/01/24 to 02/26/25, when the activity began.
Results: There were 144 incidents attended to, 65 of which were clinical cases, 54 other types of trauma and 25 drownings: Four victims were classified as grade 6, requiring Cardiopulmonary Ressucitation (CPR) performed by the doctor. Three of these patients successfully regained spontaneous circulation. Two victims were classified as grade 5. Two victims were classified as grade 2 and three victims were classified as grade 3, all of whom were transported by ambulance to the designated hospital. Fourteen cases were classified as grade 1 (rescues without complications). The average response time for the doctor-operated jet ski was eight minutes, compared to 22 minutes for land-based ambulance support, and in difficult-to-access areas, reach five times faster. **Conclusion:**The doctor operates as a crew member, carrying a waterproof backpack equipped with advanced cardiopulmonary resuscitation (CPR) equipment. Aimed at reducing response time and mortality rates in severe cases, the mobility of the jet ski allows for rapid access to locations with heavy traffic congestion, particularly during summer and festive periods (*Carnaval*, New Year's Eve, shows, parades, etc.). It has also been noted that ambulances often face challenges in reaching difficult-to-access areas such as rocky cliffs, islands, and waterways. This approach has demonstrated faster and more efficient care for victims who may require ventilatory support (adequate oxygenation), haemodynamic support and vasoactive drug infusions (epinephrine) to restore and stabilise vital functions(1,2), due to dysfunctions of the cardiac and Central Nervous System, in addition to hypoxemia and acidosis(3).

POSTERS D2 26

FASD: A Focused Ultrasound Approach for Drowning Victims – Rapid Assessment and Clinical Decision-Making

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The use of ultrasound, in addition to the primary evaluation, enables an immediate response to critical clinical questions. Since respiratory pathology is the predominant issue in drowning, a specific classification is absent in traditional ultrasound protocols. To address this gap, the

Focused Assessment with Sonography for Drowning (FASD) is proposed, utilizing a structured five-scan evaluation:
Subxiphoid view: Assessment of heart chambers, inferior vena cava, and gastric contents.
Right lung: Apex and base assessment. **Left lung**: Apex and base assessment.
Indications for FASD: FASD can be performed both in pre-hospital settings and at the bedside of a drowning victim who presents with: Dyspnea, Peri-cardiac arrest, severe hypothermia.
The need for **evolutionary control**. The exam should be completed in **less than one minute**.
FASD must provide answers to six key diagnostic questions:
Is there left ventricular motion?
Is the motion effective?
Is the inferior vena cava full?
Is there pleural line movement?
Are B-lines rare or confluent?
Is there gastric content due to ingestion?
Clinical Decision Pathway
Cardiac activity is first assessed:
If **cardiac arrest** is present:
Look for **intracardiac clots**.
If are present, death is confirmed.
If are absent, but the patient is hypothermic with a **non-frozen chest**, cardiopulmonary resuscitation is initiated.
If the chest is frozen, death is confirmed.
If **cardiac activity is present,** assess the **inferior vena cava**:
If **empty**, initiate **volume replacement**.
If **normal**, evaluate the **gliding sign**:
If **absent**:
Look for the **stratosphere sign** to diagnose **pneumothorax**.
If **present**, assess for **B-lines**:
If **rare**, evaluate the **subxiphoid bull's-eye sign** (indicating a full stomach):
If **full**, insert a **nasogastric tube** before oxygenation.
If **empty**, proceed directly to oxygenation.
If **B-lines are confluent**, check again for the **subxiphoid bull's-eye sign**:
If **full**, introduce a nasogastric tube before oxygenation.
If **empty**, proceed immediately to oxygenation.
Conclusions
The **FASD protocol** represents a significant advancement in the rapid assessment and clinical management of drowning victims. FASD is tailored to address the **unique respiratory and hemodynamic challenges** of drowning.

POSTERS D2 27

Improving access and equity to swimming and water safety programs to reduce drowning among migrant communities in Australia: a multiple case study

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Background
Drowning is a global public health issue, with minority populations, including migrants, experiencing significant disparities in drowning. The World Health Organization recommends learning to swim as a strategy to reduce drowning (1). In Australia, migrants are identified as a priority population for drowning prevention (2), accounting for approximately one-third of all drowning deaths (3). This study aimed to identify swimming and water safety programs specifically aimed at adult migrants in Australia and to explore how these programs are meeting the needs of the target audience.

Methods
Using qualitative multiple case study methodology, a desktop review was conducted of 30 publicly accessible swimming and water safety programs across Australia aimed at migrant adults. From this review, six programs were purposively selected for in-depth analysis. Interviews and focus groups with 63 participants (program, managers, swim teachers and program participants), were conducted, guided by the Health Belief Model (4) and Theory of Planned Behaviour (5). Data was thematically analysed using Clark and Braun's Framework (6).

Results
Four key themes with 14 sub-themes were identified: 1) Motivations for establishing programs, 2) Perceived barriers to participation for communities, 3) Addressing cultural determinants of health and 4) Factors and challenges to program success. Findings revealed that drowning incidents among migrant communities was the primary motivation for establishing programs, and that staff are consciously designing and tailoring these swim programs to ensure access and relevance to migrant communities. This included offering single-gender programs, providing culturally appropriate swimwear, having bilingual teachers, reduced participation fees and developing tailored training pathways to employment in the aquatic industry.

Conclusions
Swimming and water safety programs that acknowledge and respond to migrants' needs and characteristics offer multiple benefits beyond drowning prevention, including improved physical, social and mental health, and positive settlement experiences. These programs highlight the importance of acquiring water safety awareness, knowledge and skills, and how this can influence generational attitudes and behaviour towards drowning risk and water safety. Collaboration among multi-sectoral stakeholders is essential to create an impact and reduce inequities in drowning, especially for vulnerable populations.

POSTERS D2 28

Quantitative evaluation of recognition ability for drowning behavior and help signal using Virtual Reality and eye-tracking

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Background: There are from 2,000 to 3,000 rescues every year on patrolled beaches of Japan [1]. In addition, there has been a shortage of lifesavers, and the number of drowning accidents on unpatrolled beaches have been increasing [2]. Drowning behaviors can vary from beating the water surface, climbing the ladder movement and floating face down. On the other hand, one of the ways to call for rescue is to wave one hand in a large left-to-right motion as a help signal. In this study, we quantitatively investigated beachgoer's ability to recognize the drowning behavior, and the help signal using virtual reality (VR) and the eye-tracking [3] , and clarified issues.
Methods: The 360° video was shot on a bathing beach in summer. Drowning behaviors and actions in need of rescue were set three types such as the beating the water surface, the floating face down and the help signal at four locations. Also, these were set an area of interest (AOI) of eye-tracking in the VR video. Then, we measured the total time that the subjects' gaze entered the AOI while watching the VR video, and the time it took for the gaze to first enter the AOI. In addition, a questionnaire survey was conducted after the experiment.
Results: As a result of gaze analysis, it was showed that significantly fewer subjects were able to recognize the floating face down than the beating the water surface and the help signal, and the total time was significantly less. Although many subjects were able to notice the AOI in front of them, many subjects were unable to spot the AOI at the edge of their field of vision. It was found that many people felt that the help signal was the easiest to recognize and the most effective in preventing accidents by the questionnaire.
Conclusion: This study founded characteristics of beachgoer's ability to recognize the drowning behavior and the help signal. It was thought that it is effective for an accompanying person to be close to the front of the swimmer and for them to use the help signal to prevent drowning accidents.

POSTERS D2 29

Developing The WAVEMENT System to support greater customised aquatic engagement and education for our diverse community.

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RHM Management, Waalre, Netherlands

Background
The Netherlands is a water-rich country and has a strong culture when it comes to learning to swim. However, current drowning statistics (1) shows diverse and growing needs within our population related to age, class and culture that requires greater customised aquatic education efforts (2).
We have experienced these shifting needs at our local, private aquatic facility, and have felt the challenge to meet the diverse needs of our local community.
In response, we have developed The WAVEMENT system (3). This system supports greater customization and targeted practice for our clients, and to support our instructors in the delivery of quality aquatic education.

Description
The WAVEMENT System has been custom-designed for poolside use at aquatic facilities.
Hardware design: The 22-inch screen unit includes its own battery source (up to 6 hours of operation) and wifi capability. The large touchscreen allows easy navigation though the available tutorials.
Software: Software has been designed to work with the hardware unit. Wifi access allows the units to be updated and customised remotely. Tutorials include high-resolution videos created for The Wavement using a unique underwater video capture system. Videos feature real people and capture demonstration-quality movements from multiple angles. Tutorials offer both exercise routines and swim training resources.

Lessons learned
We have found significant benefits to using this system at our pool:
Clients have offered positive feedback, highlighting flexible and personalised training that fits their busy schedule.
Our instructors have found The Wavement a strong teaching tool, especially as a way to keep children engaged and provide underwater visuals of strokes poolside.
We can support a larger number of clients with existing staff numbers.

Conclusion
The Wavement has been a significant and positive addition to our facility and has allowed us to better serve our growing and diverse community. We are interested in potential research projects that could help independently assess the system, capturing its benefits as well as areas for improvement. We are also interested in partnering to bring this system to more facilities in Europe and around the world.

POSTERS D2 30

In work life the employer is held responsible for the work safety of employees. How is this handled in the self-induced work of volunteers? This presentation explains the approach of the German Life Saving Association (DLRG), the largest voluntary lifesaving organization in the world.(1)

Sabine Spinde, Werner Weber

German Life Saving Association (DLRG), Bad Nenndorf, Germany

A lifeguard cares about all others – but who cares for the lifeguard? In work life the employer is held responsible for the work safety of employees. But how is this handled in the self-induced work of volunteers? This presentation explains the approach of the German Life Saving Associalion (DLRG), the largest voluntary lifesaving organization in the world.(1)
In Germany there is plenty of legal regulation and guidelines.(2) In the aftermath of serious accidents, volunteer organisations and public health insurance authorities discussed safety aspects in volunteer work. As an outcome, DLRG brought forward this topic as main topic with outreach into all areas of volunteer life. (3)
In order to reach each and every volunteer within the organisation, a working group constantly monitors safety regulations and puts it into safe and simple tools availabe for all members. Risk assessment checklists for lifesaving clubs, their equipment, lifeguard stations and all sorts of training courses help to think through safety aspects. Deciders of local clubs as well as senior lifeguards and instructors are especially sensitized within their formation. Within volunteer lifeguard work the safety aspects of their activity and the usage of their equipment is put into daily routine supported by a „buddy-system“ in practice as well as memo-cards made part of personal safety equipment. Awareness and sensitivity for this topic is also been raised in all means of DLRGs (media) communication with each and every member through training contents, safety officers implemented within local clubs, newsletters, events and social media channels. With the help of media experts and a stunt coordinator as sensational ambassador work safety is now becomig a normal part in volunteer lifeguarding.
Lifeguards need to constantly be sensitized that safety for themselves and their colleagues must be in natural focus, even and especially if situations get tough. In support a „safety net“ of basic measures is actively in place.
This presentation wants to set important impulses and give some examples to other volunteer lifeguard organisations on how to approach.

POSTERS D2 31

Gallon-Buoy for Life-Saving

Chatchai Srivisorn, Tanakorn Srivisorn

Hook 31 Dhamma of Buddha nakhon ratchasima foundation, Nakhon ratchasina, Thailand

The initiative to prevent drowning among children in Nakhon Ratchasima Province is crucial, considering its alarming rates as the leading cause of death among children up to 15 years old since 2011. Promoting water survival skills and CPR education is vital, with a particular emphasis on children of all ages throughout the year.

One significant aspect of this effort is rescuing people who fall into the water, requiring specialized knowledge and equipment. Traditional life-saving equipment like lifebuoys can be expensive and scarce, especially in underdeveloped regions. The Hook31 Foundation recognized this issue and ingeniously repurposed the 5-liter water containers (Thai so-called gallon) attaching ropes to create a cost-effective, life-saving alternative. These makeshift life-saving gallons, priced at just 15 baht each, provide a practical solution that can be distributed in large numbers across various locations.

It has the power to save lives while also reducing plastic waste. The foundation's work expanded to educate schoolchildren, local communities, and park agencies, boosting awareness and skill development. Furthermore, they sparked interest in the Northeast, where water tourism places wanted to introduce these life-saving measures, offering a safer environment for everybody.

In summary, the Hook31 Foundation's attempt substantially addresses the severe issue of drowning by providing a realistic and economical way to avert tragedies. By reusing common materials, they have not only saved lives but also contributed to environmental sustainability by decreasing plastic waste.

POSTERS D2 32

Safer Waters, Safer Fishers: Strengthening Safety Culture in Norway's Fishing Industry

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Background
Commercial fishing remains one of the most hazardous occupations, with high rates of fatalities and injuries. In Norway, professional fishers account for a significant proportion of maritime accidents, often linked to harsh working conditions, lack of safety culture, and inadequate use of protective equipment. Despite regulatory efforts, voluntary safety measures are key to reducing risks.

Description
To address these challenges, the Norwegian Society for Sea Rescue (RS) launched *Trygg fisker* («Safe Fisher»)—a national initiative promoting a proactive safety culture. The initiative focuses on awareness campaigns, training, and incentives to encourage fishers to adopt life-saving practices, such as consistently wearing life jackets and improving emergency preparedness. A core component is the *Fisher of the Year* award, recognizing fishers who demonstrate outstanding safety practices, fostering peer-driven change.
Trygg fisker aligns with Norway's National Action Plan for Maritime Safety, which took effect in January 2025. This plan, developed in collaboration with key governmental agencies and industry stakeholders, aims to eliminate fatalities and severe injuries at sea. It outlines 70 concrete measures, including increasing the use of safety gear, prioritizing safety inspections, strengthening regulatory frameworks, and improving training opportunities. By advocating for these measures, *Trygg fisker* plays a vital role in supporting the plan's objectives and ensuring that safety becomes a shared responsibility across the fishing sector.

Lessons learned
Voluntary safety initiatives are more effective when they are industry-driven and culturally embedded rather than purely regulatory.
Recognizing and rewarding positive safety behaviors fosters a shift in attitudes toward risk.
Collaboration between authorities, industry leaders, and local fishing communities enhances impact and credibility.
Digital campaigns and tailored communication strategies ensure that safety messages reach even the most remote fishers.

Conclusion
This case study demonstrates the impact of targeted safety initiatives and the importance of collaboration between authorities, industry leaders, and the fishing community. By fostering a culture where safety is prioritized and rewarded, *Trygg fisker* offers a model for reducing maritime fatalities and improving working conditions in one of the world's most dangerous professions.

POSTERS D2 33

The Princess Charlene of Monaco Foundation Water Safety Days

Xavier ARCHIMBAULT

Princess Charlene of Monaco Foundation, Monaco, Monaco

The Princess Charlene of Monaco Foundation was established in 2012 with a heartfelt mission: to save lives and bring hope through the power of water safety and sport. Around the world, the Foundation works tirelessly to teach children and communities essential swimming skills, raise awareness about the dangers of water, and promote the unifying values of sport — courage, teamwork, and respect.

Among its most impactful initiatives is Water Safety Day, launched in 2014. This global program gives children aged 8 to 12 the tools and confidence to stay safe in and around water. Through a blend of practical workshops and engaging activities, participants learn life-saving techniques, first aid, and emergency response, guided by experts and supported by national institutions and NGOs.

More than a day of learning, Water Safety Day is a celebration of life and solidarity. Whether held on a beach, by a pool, or on dry land, the program inspires young people to look out for one another and to embody the values of perseverance and self-belief. The presence of local sports heroes adds excitement and inspiration, turning every session into a memorable experience of empowerment and joy.

Since its beginnings in Monaco and France, Water Safety Day has reached thousands of children across continents, adapting to local contexts and contributing meaningfully to the global effort to prevent drowning.

Driven by compassion and commitment, the Princess Charlene of Monaco Foundation continues to build a world where every child has the knowledge, confidence, and courage to enjoy the water safely — and to thrive beyond it.

POSTERS D2 34

Swimming ability and drowning risk among children aged 6–10 in rural Bangladesh: Insights from the ICBC Baseline Survey

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Background:
Drowning, both fatal and non-fatal, remains a largely overlooked public health issue. In 2012, an estimated 372,000 people lost their lives to drowning, making it the third leading cause of unintentional injury-related deaths worldwide (1). Drowning remains a leading cause of preventable childhood deaths in Bangladesh. According to the 2005 Bangladesh Health and Injury Survey, it was identified as the primary cause of death among children aged 5–9 years (26.2 per 100,000 per year) (2). Limited water exposure is a primary risk factor for fatal drowning among children aged 5–14 years (3). Enrolling in formal swimming lessons can significantly reduce the risk of drowning among children and young adults (4), since swimming ability is a key protective factor for the age group 6-18-years children, particularly in rural areas of Bangladesh. This study assesses the swimming ability of children aged 6–10 years and its implications for drowning prevention, using data from the Integrated Community-Based Center for Childcare, Protection, and SwimSafe Facilities (ICBC) project's Baseline Survey.
Methodology:
A cross-sectional study was conducted across 45 upazilas in 16 districts of Bangladesh, covering 133,387 households. The study assessed the swimming ability of children aged 6–10 years through household interviews. Data were collected between February 10, 2024, and July 2, 2024, using KOBO software.
Results:
Among children aged 6–10 years, 62.7% (n=33,273) were unable to swim, with a higher proportion among females. Only 36.8% (n=19,555) had swimming proficiency, with males (56.4%) showing higher ability than females (43.6%). Swimming ability increased with age, peaking at 31.6% among 10-year-olds and the lowest (7.5%) among 6-year-olds.
Conclusion:
Children in this age group are often away from parental supervision due to schooling, increasing their vulnerability to drowning. Expanding community-based survival swimming programs, such as the Survival Swimming initiative within the ICBC project, is essential to mitigate drowning risks and enhance water safety education in rural Bangladesh.

Posters Day 3

POSTERS D3 01

Mission, Vision, and Initial Impact of the "Drowning Research & Injury Prevention Policy Institute"

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The Drowning Research & Injury Prevention Policy Institute (DRIPPI) is an international umbrella network housing public health initiative which aim to revolutionize aquatic literacy through a comprehensive, evidence-based approach. DRIPPI addresses critical gaps in research, policy, and education.

Although drowning represents a leading cause of death worldwide, particularly for children ages 1-4, the aquatic safety field remains fragmented and lacks standardized, evidenced-based practices, including around pedagogy.

Our international, interdisciplinary team of experts in public health, pediatrics, motor development, developmental psychology, and aquatics are transforming this landscape through four interconnected impact areas:

Research: Conduct rigorous studies on topics related to water safety education/aquatic literacy, including innovative 2025 research on early aquatic skill acquisition using the Community Organizing Model via a Train-the-Trainer, scalable, sustainable approach for communities worldwide. Impact: Addressing knowledge gaps via better dissemination of research into practice; show evidence basis for scalable nature of “universal basic water competency.

Education & Awareness: Develop/implement evidence-based, trauma-free pedagogical standards/benchmarks prioritizing safety & developmental appropriateness. Impact: Confronting pervasive knowledge gaps across societies worldwide around risks and protective factors, including among parents, pediatricians, instructors, nonprofits, media outlets.

Policy & Advocacy: Capitalizing on state-level policy/legislative efforts including in the states of California and New York, create a global framework for aquatic literacy that addresses disparities in access and outcomes while promoting research-based teaching methodologies. Impact: Legislative action at state (CA)/national (potential for international) level.

Public Health/Research Initiative: Seed fund research/data analysis capacity for dozens of family nonprofit foundations via the DRIPPI consortium model. These nonprofits currently work in communities across the U.S. in water safety education/Learn-to-Swim, but they do not view themselves as public health educators/communicators. Their work is a vital part of public health interventions across the Spectrum of Prevention. Impact: Equipped 3 community-based organizations with tools to cull/collate/analyze existing data, publish findings, and further design discrete research projects for future interventions.

This initiative establishes one of the first multidisciplinary, evidence-based international approaches to aquatic literacy, with the goal of reducing drowning rates while ensuring equitable access to aquatic safety education worldwide. Initial deliverables/findings will be presented.

POSTERS D3 02

Assessment Criteria for Safe Swimmers – Evaluation and Further Development of the German Swimming Certificate BronzeSafe swimming in deep water is understood to fulfil the requirements of the bronze swimming certificate (German Code of Examination + Certification/DPO), which is socially recognized throughout the country.

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Introduction:
Students who have earned this badge are considered capable of moving safely in + around the water – the certificate may even be required as a “swimming license”. But there are indications that educators interpret the official examination requirements quite differently: A small pilot study with qualitative interviews revealed teachers do seem to test their students according to different criteria to some extent. This carries the risk that their performance levels are less comparable. In the present study, we therefore evaluate differences in the examination approaches of educators from different contexts (education + examination environment) with the aim of (re-)formulating well-founded criteria to further ensure their reliability.

Methods:
A questionnaire was developed by DLRG + the German Sports University + carefully derived from the existing DPO + the results of the pilot study. An extensive descriptive data analysis is conducted to compare the response behavior within + between different status groups.

Results:
The results of the survey with > 1,300 participants provide a revealing snapshot of the current practice in the administration of the German Swimming Badge Bronze. Particularly positive: Of the 7 requirements specified in the examination regulations, 6 are consistently tested in over 90% of cases.
However, an exception is found in the requirement to change position which is not checked by 12% of the respondents. 8% do not require the breaststroke at all. It is equally surprising that 20% of respondents allow swimmers to hold on to the edge of the pool during the 15-minute open water swim – circumstances that clearly contradict the requirements for the exam. These results therefore suggest to focus on different areas. First, a more in-depth analysis with experts how consistently the criteria set out in the regulations are actually tested in practice. This will allow a closer look at the relationship between standardization + individual exam performance + experience. A second focus is on the role of different examination environments in the swimming pools.

Outlook
A following Delphi study will consolidate expert knowledge to derive reformulated examination criteria, as well as a reliability analysis of these. Educators will benefit from further unified criteria, as they will simplify the examination procedures.

POSTERS D3 03

The effect of mixing dry land and water training within the training unit on improving the performance of lifeguards

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Introduction and problem:
This research addresses the critical need for effective lifeguard training, particularly for those lacking real-world experience. A survey of trainers revealed a gap in the understanding and application of modern training methods, including the integration of land and water training. This study aims to evaluate the effectiveness of innovative training approaches, such as those utilizing technology, in enhancing lifeguard performance and ultimately reducing drowning incidents.
The research aims to:
Implementing dry land workouts between sets in an aquatic training unit.
Apprehending The effect of mixing dry land and water training within the training unit on improving the performance of lifeguards.
Methods:
The researcher employed an experimental design utilizing a pre-test-post-test control group design, deemed appropriate for the study's nature. A sample of 40 novice lifeguards was divided into an experimental group (15 participants) and a control group (15 participants). Ten participants were excluded due to irregular attendance.
The training program was conducted from April 1, 2024, to October 1, 2024. Data was collected using the following tests: vertical jump, bent-arm hang, push-up, 1500m run, pull-up, sit-up, 200m freestyle swim, 25m underwater, and broad jump.
Statistical analyses, including mean, median, standard deviation, range, skewness, kurtosis, Shapiro-Wilk test, and t-test, were conducted. Results indicated that the integrated land and water training method within the training unit significantly improved both the quantitative and qualitative performance of the experimental group.
Results:
Rate of improvement for each test:
vertical jump 23% bent arm hang 35% push-up 45% 1500m run 37% pull-up 15% sit-up 28% 200m free 43% 25m under water 29% broad jump 19%
Conclusions:
The integrated training method had a direct and significant impact on enhancing lifeguards' performance.
There was a clear distinction between the post-test results of the experimental and control groups, favoring the experimental group that underwent the new training method.
The innovative training design, characterized by a mix of activities, disrupted the conventional training approach and its psychological limitations, resulting in enhanced lifeguard performance.

POSTERS D3 04

Rip & River Aware: Providing authentic, immersive and interactive simulated real-world education and training.

Karl Ross[1], Adam Wooler[2]

1Rip & River Aware, Auckland, New Zealand. 2Beach Safety Consultants, Auckland, New Zealand

Summary:
Drowning remains a leading cause of preventable death worldwide1, with rip currents and river hazards posing significant risks to water users. Rip currents are responsible for the majority of surf-related drowning incidents, with studies estimating that rip currents account for 80% of beach rescues and a substantial proportion of beach drownings globally[2]. In New Zealand, rivers are the second deadliest aquatic environment, contributing to approximately 31% of all preventable drowning fatalities[3]. In response, the Rip & River Aware initiative has been developed to educate individuals on these hazards, culminating in the creation of the Rip & River Simulator—a fully mobile, interactive educational tool designed for use in schools and public pools.

Description:
The Rip & River Simulator is an innovative, transportable unit that provides realistic, hands-on drowning prevention education by replicating key aquatic hazards. Using controlled water flow dynamics, the simulator allows participants to experience the behaviour of rip currents and river hydrodynamics in a safe and interactive setting. This experiential learning approach has been shown to significantly improve hazard recognition and response strategies, addressing gaps in traditional classroom-based water safety education.

By bringing the simulator directly to schools, community centres, and public pools, the initiative enhances accessibility and engagement, ensuring at-risk communities receive essential water safety training. Early evaluations indicate that participants develop improved survival skills and a greater understanding of key drowning risks compared to passive learning methods. This presentation discusses the development, implementation, and impact assessment of the Rip & River Simulator, with recommendations for integrating mobile simulation-based learning into global drowning prevention strategies.

POSTERS D3 05

One-year follow-up on water safety knowledge and perceived swimming skills among school children completing the 'Swim for Safety' programme, Sri Lanka.

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Background: Drowning is a significant public health concern in Sri Lanka, requiring effective water safety interventions. The 'Swim for Safety' (SfS) programme, developed by Sri Lanka Life Saving in collaboration with Life Saving Victoria, Australia, to equip school children with essential survival swimming skills and water safety knowledge. The current study was conducted with aim of assessing water safaety knowledge and perceived swimming skills among school children who completed the SfS programme one year prior.
Methods: A descriptive cross-sectional study was conducted among 162 participants from selected geographic areas in Sri Lanka. Water safety knowledge and their experiences were assessed using a self-administered questionnaire. The descriptive analysis was done using SPSS software.
Results: A majority of participants (81.5%, n=132) were aware that swimming alone is unsafe, while 98.8% (n=160) recognized the importance of checking for dangerous conditions before diving. Additionally, 96.9% (n=157) acknowledged the presence of hidden dangers in water, and 93.8% (n=152) understood the importance of remaining calm in water-related difficulties. However, only 11.1% (n=18) correctly identified the order of emergency response, highlighting a critical gap in knowledge.
Regarding skill perception, 87.0% (n=141) reported improved swimming skills, with 63.8% (n=90) perceiving significant improvement. However, only 52.4% (n=85) expressed confidence in swimming across different aquatic environments, while 67.9% (n=110) could identify hazardous swimming locations. A minority (15.4%, n=25) reported experiencing a water-related incident post-programme.
Conclusion: The findings suggest that the SfS programme effectively enhances water safety knowledge and swimming skills, with retention observed for up to one year. While most participants show a high level of water safety knowledge and perceived swimming skills, gaps remain in emergency response knowledge and confidence to swim in diverse aquatic environments. Future training programmes should emphasize emergency response and provide practical exposure to varied water conditions. Regular follow-ups are recommended to determine the long-term retention of acquired knowledge and skills.
Keywords: Swim for Safety, drowning prevention, water safety education, survival swimming, Sri Lanka

POSTERS D3 06

A future without drowning - The UK Drowning Prevention Strategy

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Background
Each year, in the UK, around 600 people lose their life to a water-related fatality. The National Water Safety Forum (NWSF), which is a collaborative association of organisations, released the very first UK Drowning Prevention Strategy in 2016 (1) with a recent review of the strategy being completed and released in 2025 (2).

Description
The NWSF is a voluntary association of organisations that was set up following a UK government review into water safety. The Forum leads the UK Drowning Prevention Strategy, which has the main aim of reducing accidental drowning fatalities in the UK by 50 per cent by 2026 and reducing risk amongst the highest risk populations, groups and communities. This presentation will provide an overview of the most recent data analysis as well as the workstreams which have contributed to a decrease in accidental fatalities across the UK.

Lessons learned
The recent review of the strategy shows that accidental water-related fatalities have reduced, on average (over 2019 – 2023), by 29 per cent compared to the baseline average. Every nation within the UK, some of which have complimentary strategies, have seen an average reduction. The NWSF's focus on education, communication, campaigns and recreational activity, along with significant activity from our individual members, has contributed to this reduction. From curriculum aligned education materials, to the establishment and promotion of a UK umbrella campaign, known as Respect the Water, the NWSF has delivered key projects to help reduce water-related fatalities. This presentation will cover the data insights but also some of these key projects in detail.

Conclusions
The UK released its first drowning prevention strategy in 2016 and the recent review has shown that the strategy is contributing to change and a reduction in accidental water-related fatalities. The learnings of this review will be used in the creation of the next strategy for the UK which may also have applicability and insights for other countries across the world.

POSTERS D3 07

floating face-up - the keystone to aquatic survival, a skill largely ignored in both curriculum and teaching programs, developed to an intuitive and totally effortless long duration level by a project that has taught over 8,000 women and teenage girls who had never ever before entered water deeper than their knees.

Christina Fonfe' BEM

Sri Lanka Women's Swimming Project, Knaresborough, United Kingdom

Facts: People don't drown because they cannot swim; they drown because they cannot breathe.
Findings: Floating on the back is the topmost survival necessity; it guarantees breathing, uses little energy and allows rest to overcome physical exhaustion, the point at which most people drown. Free swimming lessons in state schools to national curriculums, typically 25 meters and three stokes, have largely been replaced by industrial scale commercial lessons. A proliferation of floatation "aids" permits mass teaching and multiple strokes are not being properly mastered, while rising costs force most parents to bail out paying beyond the 25 meter goal. The overvaluation of "Can swim 25m" results in a high proportion of "swimmers" who then drown, doing so less than 5 meters from safety. Large organization cultural inertia continues to under-represent floating as a key strategy to not drowning. Paradoxically, lifesaving, rather than swimming organizations, have been the principal advocates of floating for survival.
Floating on the back does, however, require a complete mastery of buoyancy and balance; lifting just more than the face out of the water can completely destroy both. Initial instruction requires skilled hands-on one-to-one guided physical support. For complete non-swimmers, mastery can be achieved in a few short lessons, However, acquired float-aid dependency and fear of facial immersion can take many additional hours of lessons to overcome, all to commercial benefit.
A two decade-long, post-tsunami project, www.icanswimcanyou.com, in Sri Lanka, which taught over 8,000 women and teenage girls who were absolute non-swimmers for free, demonstrated to a very high level of aquatic survivability, that **learning to float face-up first** also led to better, quicker stoke learning.
The Project definitive "Pool-Safe Passport" has an individual fall into water, float for 10 minutes, cover 100m and climb out over a 30cm ledge to stand up. The addition of an Endless PoolsTM swim current generator to the Project's portable fabric 12m pool enabled full efficacy of this float-survivability to be demonstrated to all in swirling currents and even fast-moving white water.
Conclusion: "Conventional wisdom" in teaching swimming does not sufficiently address the fundamental cause of drowning, i.e. aquatic suffocation.

POSTERS D3 08

Risk exposure for drowning accidents of the Swiss Population in Water Activities: A Survey-Based Analysis

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Swiss Lifesaving Society, Lucerne, Switzerland

Background
Water activities are a central part of Swiss leisure culture, but they also pose risks, particularly in terms of drowning incidents. While attention is given to data collection of fatal drownings, the broader risk exposure of the population engaging in water activities remains less understood. This study examines trends in planned water activities and self-reported competence to assess drowning risk and changes over time.
Methods
A cross-sectional telephone survey was conducted in spring 2016, 2020, and 2024, commissioned by the Swiss Lifesaving Society. The survey targeted German- and French-speaking adults in Switzerland, with a sample of approximately 1’000 participants per wave. Respondents were asked about their intended water activities for the upcoming summer and their self-assessed water competence. Trends in risk exposure were analysed by comparing results across the three survey years.
Results
Over the three survey waves, the most significant shifts were observed in planned water activities. Pool swimming declined from 68% in 2016 to 56% in 2020 but rebounded to 67% in 2024, while planned swimming in lakes swimming showed fluctuations, rising from 60% in 2016 to 68% in 2020 before dropping to 59% in 2024. River swimming remained relatively stable, with minor variations (29% in 2016, 34% in 2020, and 32% in 2024). Swimming in the sea saw the most dramatic change, dropping sharply from 49% in 2016 to 28% in 2020, before partially recovering to 47% in 2024. The survey also examined water competence, revealing that the percentage of respondents who consider themselves to be 'good' or 'safe' swimmers showed an increase from 57% in 2016 to 69% in 2020, and 68% in 2024.
Conclusion
The study highlights that both self-reported water competence and planned water activities fluctuated over time, with the reported water competence increasing after 2016. Trends in water activities varied, influenced by external factors such as COVID-19 restrictions, with notable shifts in pool and sea swimming participation. These changes highlight the need for ongoing monitoring and targeted safety measures to address shifting risks across various aquatic environments.

POSTERS D3 09

Four editions evaluation of World Drowning Prevention Day – How important is in Brazil?

David Szpilman[1,2], Fabio Braga[1,2,3], Eduardo Santos[1], Danielli Mello[1,4]

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Background: Every 90 minutes a Brazilian die from drowning. Drowning is the second leading cause of death among children aged 1-to-4 yr, with 53% of incidents occurring at home). For over 30 years[1], SOBRASA has developed more than 15 prevention programs offering five customized safety tips tailored for each drowning risk activity/environment. An important investment in social and journalistic media has been made so those solutions can reach millions of homes. However, for these preventive measures to be effective, individuals must first recognize their own vulnerability to drowning. The aim was to present the impact of the World Drowning Prevention Day(WDPD) message “anyone can drown – no one should” in Brazil to break cultural/behavior barriers.
Description: Four editions of the WDPD(2021-24) were evaluated based on the number of actions, people involved, and costs, and overall impact. Each edition provided a tutorial guiding participants through three branches of option: Group or individual action, digital action and/or social media post interactions. A central nationwide event was planned to take place at an iconic monument in Rio de Janeiro, with both in-person and digital participation opportunities
Lessons learned: Over four editions, 5.050 volunteers and 604 institutions participated, covering 27 states and reaching 46 million people. Including 545 in-person actions and 1.410 monuments illuminated in blue along 12.402 hours. SOBRASA´s social platforms, with 231.000 followers, published 1.160 posts and 2.526 collaborations on social media, generating 226 million impressions. Those actions resulted in 729 media reports on TV, Radio, Newspapers, and digital platforms, generating €680.000 euros in spontaneous media with an investment of €33.259, reaching 38.4 million views.[2]
Conclusions: The WDPD event created by the WHO has generated a great impact on Brazilian society and conventional media, opening important opportunities for raising awareness about drowning prevention messages and fostering partnerships with key stakeholders. We still lack scientifically methods to measure the direct impact of this movement in the number of lives saved but an apparently engagement in our motto “I want to be part of the solution, not the problem” may represent a meaningful and expected behavior change.

POSTERS D3 10

RescueHex, Designing public rescue equipment for the untrained rescuer

Erik Bech

Danish Water Safety Council, Lynge, Denmark

RescueHex is a new perspective on rescue flotation devices enabling bystanders to safely perform time critical stabilization of a drowning accident.
RescueHex has the following objectives:
Intuitive to use without instructions for bystander and victim
Safe to use for bystander and victim
Designed for throwing and swimming rescues
High flotation device with 300N buoyancy
Can reduce hypothermia for the victim
RescueHex has been designed to meet these objectives and further tested with a user centered design approach focusing on data derived from extensive user tests. In pools, harbors and beaches by untrained bystanders who have never seen RescueHex before, as well as trained lifeguards has tested RescueHex. The poster shows the results of these tests (n=150), and the presentation also includes a tablet on the poster wall to show videos of the tests. In the videos, it is visualized how the untrained bystander uses the RescueHex without any prior training, and also how the victim responds after receiving RescueHex from the bystander. It is also visualized how trained lifeguards use RescueHex, both in pool competitions and in beach training exercises.
The initial stage of RescueHex was presented at the CIPREA conference in Spain in October 2024 and is now in the design phase and is therefore seeking valuable input from the lifesaving and aquatic safety community (1). The most optimal dialogue with the community is believed to be in a poster presentation.

POSTERS D3 11

helicopter ocean rescue techniques

Fabio Martins[1,2,3], Tarciso Salles[2], Rodrigo Medina[1,2,3], Alan Tavares[1,2,3], Igor Libório[1,2], Rodolfo Augusto[1,2], David Szpilman[1,2], Danielli Mello[1,4], Alexander Delgado[1,2]

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Introduction : Over the past 10 years, the helicopters of Military Fire Department of Rio de Janeiro(CBMERJ) have rescued 1,125 persons from Rio de Janeiro beaches by employing numerous resources and techniques for these rescues[2]. Understanding these methods is key to improving the efficiency of rescue operations for drowning[1,3].This study aims to identify the helicopter-based ocean rescue techniques used in the surf zone.
Method: This exploratory study collected data through a Google Forms questionnaire, consisting of 24 questions, which was distributed to participants via WhatsApp and email. The sample included managers from 16 public safety aviation units(UAP) from coastal states across Brazil .Two techniques were compared rescue net(puçá) and the winch. Descriptive statistics were applied for data analysis, including both quantitative and qualitative information, as well as content and pattern analysis of participants' responses.
Results: Among the 16 UPA, 93.7%(15) conduct helicopter ocean rescues. From those 80.0%(12) use the rescue net, 6.7%(1) use the winch and 13,3(2) use others. The annual average number of ocean rescues using the net is 215, while the winch is used for only 1 rescue annually. The downtime for the rescue net is typically 2 days, while the winch can experience longer downtime, sometimes lasting years. Among units using the net, 33.3%(4) reported incidents, while there were no one with the winch. According to experts, from the moment the crew member jumps out of the helicopter until the victim is transported to a safe area, 60.0%(9) reports a faster rescue by using the net , 26.7%(4) favor the winch, and 13.3%(2) support others. Regarding safety, 40.0%(6) consider the net safer, 53.3%(8) prefer the winch, and 6.7%(1) view others.
Conclusion: Different ocean rescue techniques using helicopters were identified across the UAP along Brazil's coastline. The rescue net is the most used and has a longer track record, with fewer downtimes, despite some incidents. It is considered the fastest technique. The winch, however, is regarded as the safest method. Further studies are needed to explore these techniques in more depth with the aim of preventing accidents and saving more lives in the ocean.

POSTERS D3 12

fly+safe: a new proposal to reduce drowning

Fábio Martins[1,2,3], David Szpilman[1,2], Eduardo Beni[4,1], Thiago Silva[1,3], Vinicius Oliveira[1,5], Rodrigo Medina[1,3,2], Danielle Mello[6,1]

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Introduction: A 45-year-old paramotor pilot drowned after falling into the sea during a flight along the Brazilian coast[2]. Unfortunately, incidents like this are frequently reported. With proper preventive measures, this tragedy could have been avoided. According to SOBRASA12 distinct aquatic scenarios were identified, each with specific prevention recommendations to promote a safer aquatic environment[3]. However, the lack of guidelines for aero-sport operations over water increases the risk of drowning in these situations[1].To enhance safety, defining the five most relevant preventive measures is crucial.
Method: Fifteen drowning experts and aircraft pilots participated in a study to identify key water safety messages for aero-sport operations .Using the Delphi method over three rounds, experts voluntarily selected and rated safety messages on a scale from 1 to 5.Messages with a final average score of 4 or higher were deemed most relevant through the FLY+SAFE campaign.
Result: As part of the prevention strategy addressed in this study, the development of five essential water safety measures was proposed:
1-**Wear safety gear**–Always wear a life jacket when flying over water and carry a smoke signal and whistle.
2-**Ensure rescue accessibility**–Conduct flight activities in areas where rescue services are on-duty. Identify in advance who to contact and how (e.g., via radio).
3-**Prepare for emergencies**–Keep a sharp object within easy reach and practice removing equipment in case of a water emergency
.4- **Respond effectively in case of a fall**–Stay calm, free yourself from non-floating equipment, activate your smoke signal, and waive for help immediately.
5-**Follow safe rescue procedures**–If you witness a fall into the water, do not attempt a rescue yourself. Instead, call emergency services or notify the nearest lifeguard.
Conclusion: Since 1995, SOBRASA has been dedicated to reduce drowning through prevention programs and campaigns. One of its most impactful initiatives is **POOL+SAFE**, a program with five key preventive measures that have significantly contributed to reducing child drowning in pools[4].We incentive that **FLY+SAFE** will be adopted as a new program, enhancing safety in aero-sport operations over water. By implementing these measures, we aim to make flying over aquatic environments safer and reduce the risk of drowning in this scenario.

POSTERS D3 13

Integrated Binomial System by Red Seagull Portugal: An Innovative Approach to Aquatic Safety

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Background: According to the 2024 Global Report on Drowning Prevention, drowning remains one of the leading causes of unintentional death worldwide. For Red Seagull Portugal, drowning prevention is a priority, especially during aquatic events that attract a large number of participants. Red Seagull is an organization dedicated to aquatic safety that has developed the Integrated Binomial System (IBS) to enhance emergency response in aquatic environments.
Description: The Integrated Binomial System (IBS) combines the coordinated action of a Lifeguard and a First Responder trained in pre-hospital emergency care, maximizing the effectiveness of incident response in aquatic settings. While the Lifeguard focuses on surveillance and water rescue, the First Responder ensures assistance and stabilization on land. Since approximately 80% of emergencies in bathing areas occur on land, this integrated model reinforces safety by guaranteeing a swift and coordinated response in critical situations.
Lessons Learned: The implementation of IBS has demonstrated that coordination between Lifeguards and First Responders is essential for an effective aquatic emergency response. In Portugal, many organizations face financial constraints that force them to choose between these teams, compromising safety. Additionally, the lack of uniformity in techniques hinders communication between professionals. The IBS addresses these gaps by integrating experts in both water rescue and medical emergencies, ensuring a synchronized, efficient, and needs-based approach for aquatic events.
Conclusions: The success of IBS in Portugal suggests that integrated and coordinated approaches can be effective in preventing drownings during aquatic events. The replication of this model in other regions could contribute to a reduction in incidents and promote a culture of aquatic safety.

POSTERS D3 14

Empowering Communities Through Swimming and Water Safety in West BengalAuthor : George Makasare

George Makasare

Rashtriya Life Saving society (India), Pune, India

Drowning is a major public health issue in India, causing approximately 38,000 deaths annually, particularly among children aged 5–14. It is the second leading cause of injury-related deaths, yet swimming education is largely absent from school curriculums, and prevention policies remain inadequate. (WHO) highlights that drowning is preventable through targeted interventions. Community-based programs, such as pond-based pools, teach children essential water safety skills. [RLSS(I)] have worked to promote awareness and training, but challenges such as cultural practices, resource limitations, and lack of community engagement persist.

West Bengal faces a high risk of drowning due to its vast water bodies, including rivers, ponds, and flood-prone areas. Sundarbans region experiences frequent flooding, further increasing the danger. Activities such as fishing, bathing, and boat travel expose individuals to water-related hazards. Low awareness, inadequate supervision, and insufficient safety infrastructure contribute to high drowning rates, particularly among children and marginalized communities.

Cultural and Occupational Factors: Water-based livelihoods, such as fishing and transport, elevate drowning risks.

Limited Resources: Financial and infrastructural constraints hinder the implementation of preventive measures, such as safety barriers and designated play zones.

Community Engagement: Sustainable efforts are required to raise awareness and encourage behavioral changes regarding water safety.

Swimming/Water Safety

To tackle these issues, drowning prevention and resuscitation workshops were organized across RLSS(I) and local organizations. These sessions educated students, teachers, parents, swimmers, and vulnerable groups, including orphans and individuals with disabilities. Training covered drowning risk identification, first aid, resuscitation, and safe rescue techniques without direct water entry. Practical demonstrations ensured hands-on learning.

Workshops at Burdwan, Howrah, Kolkata, and North 24 Parganas, engaging both small community groups and large school gatherings. The initiative emphasized community-driven education to foster proactive water safety measures.

Drowning remains a significant concern in WB, particularly for children and those reliant on water-based occupations. The swimming and water safety initiative enhanced awareness and equipped individuals with life-saving skills. However, broader efforts, including enhanced water safety education, improved infrastructure, and stricter regulations, are necessary. Strengthening community involvement and fostering a culture of water safety are essential to reducing drowning incidents and ensuring a safer future.

POSTERS D3 15

collaboration in drowning prevention strategies on lake victoria in uganda among volunteer organisations

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Life saving association Uganda, Kampala, Uganda

Uganda has over 20 percent of its land covered by water bodies including Africa's largest fresh water lake, Lake Victoria bordered by four countries including Uganda, Lake Victoria has the highest drowning rate in Africa and most of them occur to people from Uganda carrying out occupational activities including fishing, transportation and recreational activities, among the volunteer bodies in charge of beach safety is life saving association Uganda, Greater Entebbe Beach guards Association, Great Lakes lifesaving society Uganda among others.
We have spearheaded to bring together all volunteers and non governmental organizations that drive efforts towards water safety to work together even without resources and funding to sensitize and train bystanders and schools around Lake Victoria to know about water safety and how to remain vigilant to follow the water safety procedures at the beaches, while on the lake and other activities on the shores of Lake Victoria.

POSTERS D3 16

Swimdo: Reducing Geographic and Economic Barriers to Water Safety Education in Rural Bali

Indira Santi

Swimdo, Gianyar, Indonesia

Drowning is a significant public health concern in Indonesia, particularly among children in rural and economically disadvantaged areas. As the world's largest archipelagic nation, Indonesia faces heightened drowning risks due to its vast coastline and widespread water exposure. Despite this, the country lacks a national water safety plan, formalized education on drowning prevention, and a coordinated tracking system for drowning incidents (1). Swimdo, a community-driven initiative in Bali, addresses these challenges by providing free survival swimming instruction and water safety education to children in underserved regions. The program combines practical survival techniques, school-based awareness campaigns, and mobile teaching teams to overcome geographic and economic barriers. Since its inception, Swimdo has trained over 10,000 children across 75 villages, equipping them with essential skills to prevent drowning incidents. Research shows that structured water safety education and survival swimming skills significantly reduce the risk of drowning (2). The program's scalable, community-focused model demonstrates an effective approach to mitigating drowning risks in resource-limited settings. Insights from Swimdo's implementation can inform similar efforts globally, promoting water safety education in vulnerable populations (3).

POSTERS D3 17

National and Sub-National Burden of Unintentional Drowning in India: A Systematic Analysis of the Global Burden of Disease, 2021

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Background: Unintentional drowning poses a substantial public health threat globally, with a disproportionate burden in low- and middle-income countries (LMICs). India, a densely populated LMIC with diverse aquatic environments, accounts for a significant portion of global drowning deaths. This study aimed to comprehensively analyze the national and sub-national burden of unintentional drowning in India from 2000 to 2021, utilizing data from the Global Burden of Disease (GBD) 2021 study.
Methods: We extracted data on mortality rates, incidence rates, years of life lost (YLLs), years lived with disability (YLDs), and disability-adjusted life years (DALYs) from the GBD 2021 dataset. Linear regression was employed to assess temporal trends in drowning rates, while Poisson regression with robust standard errors was used to determine relative risks (RR) associated with demographic factors (sex, age) and sub-national regions.
Results: During the study period, India recorded 5,314,917 fatal and non-fatal drowning events. The average annual mortality rate was 5.3 per 100,000 population, demonstrating a 49.3% decline from 2000 to 2021. Males exhibited a significantly higher mortality rate (10.75 per 100,000) compared to females (9.45 per 100,000), with a relative risk of 1.88 (95% CI: 1.67-2.12). Children under five years (RR=2.64, 95% CI: 2.30-3.04) and adults aged 70 years and above (RR=3.01, 95% CI: 2.80-3.24) were identified as high-risk groups. Sub-national analysis revealed that Assam (RR=5.62, 95% CI: 4.83-6.55), Chhattisgarh (RR=5.11, 95% CI: 4.48-5.83), Madhya Pradesh (RR=5.01, 95% CI: 4.42-5.68), and Jharkhand (RR=4.90, 95% CI: 4.09-5.88) had the highest risks of drowning mortality compared to Delhi. DALYs decreased from 488.67 per 100,000 in 2000 to 194.99 per 100,000 in 2021.
Conclusion: While drowning mortality rates in India have shown a notable decline, substantial disparities persist across demographic groups and sub-national regions. Targeted interventions focusing on high-risk populations and geographical areas are crucial to further reduce the burden of drowning. Future research should prioritize addressing the challenges of under-reporting and developing context-specific prevention strategies tailored to the diverse aquatic environments and socio-cultural contexts within India.

POSTERS D3 18

Along the Shore: A Photovoice Exploration of Drowning Risks and Water Safety Behaviors Within Lakeside Communities in Uganda

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Background: Drowning-related injury and mortality remain a major public health concern, with more than 90% of cases occurring in low- and middle-income countries. The WHO African region, including Uganda, which borders Lake Victoria, the largest lake in Africa, has the highest estimated drowning death rates in the world, at 5.6 per 100,000 population. Despite this burden, drowning prevention research and interventions are limited. To address this gap, this study used a community-based photovoice approach to examine key environmental risk factors and water safety behaviors within lakeside communities in Uganda.
Methods: Using photovoice methods, this study assessed community knowledge, perspectives, beliefs, and risk factors related to water safety and drowning prevention in the Mayuge and Jinja districts of Uganda. 20 community-based photographers were recruited and trained in camera use, photography ethics, and different photography techniques through a 3-day training workshop. After a one month data collection period, photographs were discussed in groups, and transcripts were analyzed using the SHOWeD and SMART models through content analysis in NVivo.
Results: Community photographers identified several key risk factors for drowning, including unsafe vessels, boat overloading, lack of child supervision near water, unpredictable weather patterns, and low-quality or absent life jacket use. Drowning incidents and injury were frequently observed, particularly among individuals in fishing and transportation occupations. Photographers also documented a lack of water safety and drowning prevention messaging around the lakes. Participant reflections highlighted a strong community desire for increased access to safety equipment, learn to swim education, and infrastructure improvements to promote water safety.
Conclusion: This study underscores the need for context-specific drowning prevention strategies tailored to lakeside communities in Uganda. Findings emphasize the effectiveness of photovoice as a powerful tool for capturing lived experiences and fostering a sustainable, community-driven approach to data collection and dissemination.

POSTERS D3 19

Scaling Up Swimming and Water Safety Education: Reducing Child Drowning in Cambodia

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Background

Drowning is the leading cause of death among children aged 5-14 in Cambodia, with rates nearly twice the ASEAN average for low-income countries.(1) Despite ongoing economic development, the country lacks a national drowning prevention strategy leaving communities, particularly in rural and coastal areas, highly vulnerable. Since 2019, Helpcode Cambodia has started to plan the Drowning Prevention Program (DPP) to equip schoolchildren, teachers, and community members with essential water safety, CPR, and survival swimming skills.

Description

The program is based on the RNLI Aquatic Survival Manual's ten water safety messages, divided into three thematic areas: Spot the Danger, Keep Yourself Safe, and Keep Others Safe. Water Safety and CPR training has been provided to 4,284 children in 32 schools across Sihanoukville, Kep, Kampot, and Phnom Penh. The learnig experience is gamified and interactive to entice children's participation and knowledge retainment. Survival swimming instruction is delivered by personnel from the Khmer Swimming Federation, ensuring a favorable trainer-to-trainee ratio of five to one. Groups of 20 to 25 children participate in intensive three-morning sessions focusing on breathing techniques, floating, and effective kicking.

Lessons Learned

One of the first issues addressed during implementation was aligning Helpcode's operations with the school schedule in a way that wouldn't hinder the trainees' academic performance. This challenge was quickly overcome by establishing a strong bond of trust with the school directors, which served as the first stepping stone toward raising community awareness about drowning. Consequently, we observed increased interaction with children's caregivers, who requested additional training days.

Conclusion

Water Safety, CPR, and Survival Swimming training has demonstrated measurable success in reducing drowning risks by imparting lifesaving skills and knowledge. Future efforts will focus on scaling up implementation, securing sustainable funding, and advocating for the incorporation of water safety education into national curricula, thereby ensuring an enduring impact across Cambodia. Additionally, Helpcode is exploring ways to train local actors as Community Swimming Instructors to help retain and disseminate the acquired knowledge at the community level. A potential collaboration with private sector CSR, aimed at financing this development, is currently being assessed.

POSTERS D3 20

The Role of Survival Swimming Programs in Enhancing Water Safety Skills Among 6–10-Year-Old Children in Bangladesh

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Drowning remains the leading cause of injury-related deaths among children in Bangladesh. With over 60% of children aged 6–10 years unable to swim, the Integrated Community-Based Center for Childcare, Protection, and SwimSafe Facilities (ICBC) Project has integrated survival swimming training (SwimSafe) to enhance children's water competency and self-rescue skills. This study assessed the survival swimming program's roles and the community's perceptions of improving drowning prevention outcomes and reducing child mortality.

Methods: A cross-sectional study was conducted among 19,555 children aged 6–10 years across 45 upazilas in 16 districts, assessing pre- and post-training swimming ability. Data collection included direct skill assessments, caregiver surveys, and observational studies to evaluate floating, treading water, and controlled swimming techniques. Focus Group Discussions (FGDs) with caregivers and community leaders explored perceptions of drowning risks and barriers to swimming education.

Results: Pre-training swimming ability was only 36.8%, with a gender disparity (boys: 56.4%, girls: 43.6%). Post-training assessments showed significant improvement, with over 80% of trained children demonstrating proficiency in at least two survival swimming techniques, such as floating and controlled propulsion. Caregivers confidence in child water safety improved, with many supporting the integration of survival swimming into school curriculums. Challenges identified included limited access to safe training facilities, cultural barriers restricting female participation, and the need for trained instructors in rural communities.

Conclusions: Structured survival swimming training significantly enhances children’s ability to respond to drowning risks, making it a critical intervention in Bangladesh’s drowning prevention strategy. Scaling up these programs nationwide, integrating survival swimming into school curriculums, and addressing gender disparities in access to training are essential steps toward reducing preventable drowning deaths. A multi-sectoral approach, involving education, health, and community engagement, will be crucial in sustaining these efforts for long-term impact.

POSTERS D3 21

How to establish a National Umbrella Organization for Drowning Prevention: The Norwegian ***Flyte*** Approach

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Background:
Drowning remains a significant public health challenge in Norway, with mortality rates comparable to road traffic accidents. However, unlike traffic safety, drowning prevention has historically lacked a coordinated national approach. In response, the Norwegian Society for Sea Rescue collaborated with key stakeholders to establish Flyte in 2022—a national umbrella organization dedicated to reducing drowning fatalities and aligning with the UN Resolution on Global Drowning Prevention.
Flyte serves as a national hub for expertise and advocacy, promoting evidence-based policies, legislative reforms, and preventive measures.
Key achievements:
Political impact: Flyte played a crucial role in securing Norway's adoption of a zero-vision strategy for drowning prevention and a national action plan, consolidating governmental responsibility under a single ministry.
Coordination & networking: Now 20 member organizations (representing 1.2 million persons) engage in drowning prevention. Through Flyte´s efforts, stakeholders such as senior advocacy groups and the boating industry are now integrating layers of drowning prevention into existing initiatives.
Knowledge sharing & capacity building: Flyte hosts the annual Drowning Prevention Conference, uniting authorities, NGOs, researchers, and businesses, and organizes digital forums.
Local implementation: The Water-Safe Municipalities initiative raises awareness among local authorities about their role in drowning prevention.
Research & data collection: Flyte collaborates with universities and public agencies to enhance drowning data, including a new registry-based study on fatal and non-fatal drowning incidents. Flyte also served as the National Data Focal Point for WHO's Global Report on Drowning Prevention.
Public awareness & campaigns: Launched nationwide campaigns and established a coordinated national observance of World Drowning Prevention Day.
Lessons learned:
Defining the umbrella organization's role early fosters trust and prevents competition with member organizations.
Engaging stakeholders from the start strengthens coordination.
Shared platforms, such as conferences and awareness days, enhance visibility and collaboration.
The umbrella body should focus on coordination and advocacy, while member organizations retain operational roles.
Conclusion: Flyte demonstrates how a national umbrella organization can unify stakeholders, influence policy, and foster evidence-based drowning prevention strategies. Its rapid development and impact provide a model for other nations seeking to strengthen their drowning prevention efforts.

POSTERS D3 22

Innovating Lifesaving: Bridging Local Expertise with Global Technology for Safer Beaches

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Background:
As global connections in emergency services expand, the need for innovation and collaboration to ensure a safer, sustainable future is critical. The 2024 Surf Life Saving Australia (SLSA) Innovation Day emphasised the importance of blending local expertise with advanced technology to enhance safety, efficiency, and sustainability in lifesaving operations. The event showcased technologies that improve response capabilities and equip lifesaving teams for future operations across Australia.
Description:
The event highlighted several innovations, including the Adivo Life Saving Rashie, GPS trackers, Drone in a Box, Emergency Response Beacons, AI Camera technology, “The Chase” Search and Rescue device, and unmanned water response vehicles like Seabob, FReD, RoboDucky, and U-Safe systems. These technologies aim to improve response times, operational effectiveness, and support lifesavers in complex environments. Feedback revealed that while these technologies hold promise, thoughtful collaboration and refinement are required to scale them effectively across the country.
Lessons Learned:
Key insights from the 2024 Innovation Day pointed to areas needing improvement. For example, the FReD device, useful for water rescues, requires better battery life and performance under challenging surf conditions. The Adivo Rashie needs improvements in weight and portability for surf sports. RoboDucky’s capabilities for mass rescues are promising, but durability and control must be enhanced. Additionally, the event highlighted the potential of electric vehicles like E-bikes and outboard motors in providing sustainable, high-performance technology for rescue operations.
Conclusions:
The 2024 Innovation Day demonstrated the importance of collaboration in advancing lifesaving technologies. The lessons learned emphasise the need for continuous testing, refinement, and cross-border partnerships to ensure these technologies meet the evolving demands of emergency response. By fostering such collaborations, we can create a more connected, capable, and resilient lifesaving system, working towards reducing coastal drowning.

POSTERS D3 23

Analysis of 5500+ incidents between 2008 and 2024 involving Drownings, Rescues and Injuries on the Beaches of Goa, India

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Background Prior 2008 despite Goa Government managing beach safety 200+ deaths were reported annually.
Objective: To reduce drowning deaths so that Tourism in Goa is not adversely affected.

Programme Description: Government in 2008 outsourced beach safety to Drishti. Over 8300 lives were saved between 2008 - till date, reducing drowning deaths by 99%. Rescue data from Drishti's Incident Management System is analysed over 5000 incidents and effective drowning prevention measures put in place.

Outcomes and Learnings: Data is analysed on nationalities, gender, age, injury type, most risky beach, incident month etc. Total of 359 coastal deaths were recorded in Goa over 16 years, of which 104 were on beaches during lifeguard service hours and 255 were related to watersports/fishermen/medical emergencies etc and beyond service of Drishti Lifeguards.
Out of the 359 dead, 282 were Indians, 57 were foreigners and rest unknown. Predominantly, 305 (85%) were males, 36 (10%) were females and rest unknown. Majority (25%) were in the 26 - 35 age group. 16% of deaths were due to RIP current & in 22% alcohol was a factor.
Similarly, out of 7000+ water-based rescues between 2008-2024, 5513 (79%) were Indians and 1435 (21%) were foreigners. Predominantly, 78% were males and 22% females. Majority 25% was in the 26-35 age group.
Other than 7000+ water-based rescues, there were 652 (2008-2024) Child Lost & Found and 586 First Aid/Medical Emergency. 122 had limb fractures/dislocations. There were 45 spinal, 22 head/neck injury and 96 major breathing issue cases. Remaining had glass cuts/wounds and were minor first aid cases. Calangute Beach had the maximum 1461 rescues in 1040 incidents. October saw the maximum rescues at 1419.

Implications: Any incident on the beach- rescue, drowning or injury affects the victim's family and makes it a 'forever' unsavory memory. Drishti operations and data analysis has helped identify high-risk groups and effective preventive measures like AI enabled cameras, dogs for rescue etc are in place so that the community is safeguarded.

Conclusion: With nearly 38000 reported drownings (2021-22), there is a need for National Policy or central body to work towards Drowning prevention in India.

POSTERS D3 24

Waves of Change: Turning the Tide on Coastal Drowning

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Background:
Surf Life Saving Australia's embarked on a Strategic Planning process 12 months prior to the old Plan was due to expire. There were four 'squads' formed, consisting of senior managers, board members, club members and state CEO's. The squad work informed the formation of the Plan and involved working together to develop our shared perspectives and leverage our unique strengths to get behind a unified purpose.
Description:
The primary opportunity presented to SLSA was a fresh approach; we were encouraged to not be limited in our thinking. An opportunity to ask ourselves questions around our brand DNA and the part we see ourselves playing in and shaping our national community.
We completed an organisation-wide consultation involving exclusive sessions with the SLSA CEO and President. The feedback was shared with the Squads and assisted in their thinking and approach. A draft plan was presented to the SLSA Board for approval and has had some minor adjustments. Further work was then done on the measurements before implementation in July 2025.
Lessons Learned:
By having a mix of state representatives, roles and managerial levels in each Squad, it made for a breadth of conversation and perspective, shared clarity and alignment. When the Plan was rolled out, this also allowed for Champions to be across several different areas of the organisation.
Conclusions:
As Australia's peak coastal safety body, SLSA is committed to forging a dynamic and strategic pathway forward that supports the organisations, membership and community that it serves. This strategic planning process has resulted in an actionable plan that supports our vision of zero preventable deaths in Australian waters.

POSTERS D3 25

mechanisms of fatigue in drowning victims under physical effort: a mini-review

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Introduction: Drowning can occur rapidly and silently, where the victim may be unable to react, call for help, or even signal distress. **Objective:** To analyse the mechanisms of fatigue in drowning victims through a literature review. **Methods:** A literature review was conducted using PubMed database and specialised websites in drowning prevention, with the following keywords: drowning, freezing, central and peripheral fatigue. Four studies published between 1980 and 2024 were selected. **Results:** Most drowning victims exhibit characteristic involuntary behaviours, partly explained by the autonomic nervous system's response. These include a facial expression of fear, voluntary apnea, "vertical swimming" (alternating submersion and resurfacing), swimming against the current, arms extended sideways to push against the water surface in an attempt to lift the airways for breathing, head tilting backwards, and fluid aspiration(1). The freezing state (immobility and rigidity) is also observed as a defensive reaction to danger, fight, or flight. This process leads to central fatigue, characterised by neuromuscular junction failure(2)reduced ATP production and force generation, and increased levels of K^+, H^+, Pi, NH_3, bradykinin, and prostaglandins. Peripheral control mechanisms also fail, resulting in extracellular accumulation of K^+, H^+, ADP, Pi, Mg^+, La^-, and reactive oxygen species (ROS), among others(3). This response leads to partial or total loss of skeletal muscle movement, affecting invertebrates, fish, amphibians, birds, and mammals. It also reduces contractility in smooth (respiratory) and cardiac muscles(4), likely as an energy conservation strategy for vital organs. **Conclusion:** Cardiorespiratory fitness, neuromuscular capacity, and training adaptability are crucial for a swimmer to stay afloat in both calm and wavy waters. Additionally, lifeguards must quickly recognise potential drowning victims, identified by inappropriate clothing for the environment, reliance on flotation devices, a fearful facial expression, unusual behaviour, obesity, extreme age (young children or the elderly), tourist status, intoxication, or signs of panic. In this context, preventive drowning measures should be implemented to prevent victims from entering these pre-submersion behavioural states.

POSTERS D3 26

analysis of anthropometric and neuromotor conditions of lifeguards candidates in rio de janeiro

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Introduction: The Lifeguards of the Military Fire Brigade of the State of Rio de Janeiro (CBMERJ) are militaries who perform an average of six months of tough physical training to obtain the specialization course graduation to act upon prevention and rescue of bathers on beaches of the State of Rio de Janeiro. Such a course takes place yearly, starting in the winter (higher frequency of undertow, rainy and cold weather) is called Sea Rescue Course (CSMar).
Objective: To present the anthropometric profile and neuromotor performance of CSMar candidates. **Methods:** 116 male candidates between 23 and 34 years old participated in the study.
Results: Age average: 28.30±1.93 years old; Body Mass Index: 25.8±4.6 Kg/m^2; % Body Fat 14.5±5.8; Abdominal Circumference: 85.12±3.25 centimeters; Neuromotor tests: 2,400m run test (619 ± 127 seconds); 100m run test (13.53 ± 2.10 seconds), pull-ups on the fixed bar (12.88±2.14 repetitions); sit-ups (51.89±0.3 repetitions); 100m swim test (76±14 seconds); 800m swim test (935±63 seconds). **Conclusion:**Taking the American College of Sport Medicine (1) as a reference, candidates had satisfactory levels regarding the anthropometric analyzes and neuromotor tests (example: going in and out of the sea several times with an undertow) candidates must have a high level of physical fitness to be successful in rescuing drowning victims. However, the improvement of running, swimming and the teaching of rescue techniques will be learned throughout the specialization course, and when trained they will be able to perform dozens of daily rescues, mainly in the summer season, considered the period with the highest incidence of occurrences due to drowning (4,046 rescues in four months in the summer of 2017/2018)(2).

POSTERS D3 27

characteristics of the beaches of Rio de Janeiro and their potential risks of drowning

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Introduction: According to the World Health Organization, around 360,000 people die from drowning every year around the world. In this context, in 2022, the Military Fire Department of Rio de Janeiro carried out 16,027 drowning rescues at sea and 1,130,854 drowning preventions on the beaches of Rio de Janeiro.
Objective: To highlight the characteristics of each type of beach and associate them with the occurrences of drowning.
Methodology: The beaches considered from the state capital of Rio de Janeiro were those which have the highest frequencies of bathers and/or drownings, and topographic studies were carried out with the aid of literature.
Results: Intermediate beaches were responsible for 67.1% of drowning cases, followed by tomb beaches (23.5%), shallow beaches (6.0%) and protected beaches (3.4%). Beaches of tumbles: have coarse sand, clearer and "softer", steep slope, leading to the sudden rise in depth, resulting in intense precipitation of waves in the Berm crest region and high cliff formation, the intensity of the waves can lead to falls and drag people towards the sea. Intermediate beaches: have median and clear sand, combination of the characteristics of shallow and tumbling beaches, present median slopes and the surf zones are close to the beach, showing irregular shallow zones (sand banks) and return currents perpendicular and/or inclined, they feature tubular precipitation waves. Shallow beaches: dark, condensed sands, little slope where the surf zone is far from the beach, they present waves which can "crumble" and also tubular waves, can also present several lines of surf zones, return and lateral currents which are easier to notice in low-tide periods. Sheltered beaches: they have usually few waves and currents and the depth increase gradually. It is considered that all the beaches mentioned have different morphodynamical characteristics (return currents, lateral currents, slopes and tide amplitudes), which combined with meteorological conditions (winds, cold fronts) and gravitational conditions (the sun, the moon and the Earth) can increase the risks of drowning.
Conclusion: Preventive actions of signaling (banners and plaques) and interventions of the lifeguards guiding bathers, in the year 2023, there was an 11.7% drop in rescue actions.

POSTERS D3 28

Infrastructure Complexities and Drowning Prevention: A Systems Perspective in Indonesia

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Background:
Water safety infrastructure, such as public swimming pools, supervised swimming zones, barriers, and rescue stations, is crucial for drowning prevention. However, geographic disparities and inadequate facilities limit access to supervised water areas in Indonesia. A systems-thinking approach is needed to examine how infrastructure complexities intersect with socio-ecological determinants, such as risk perceptions, development planning, and funding, to identify leverage points for sustainable improvements. This study explores these interconnections to inform long-term water safety strategies. This study aimed to explore these interconnections to inform sustainable improvements in water safety infrastructure.

Methods:
Using a case study method, a soft systems modelling approach was utilised with a causal loop diagram (CLD) to analyse interdependencies shaping water safety infrastructure in Indonesia. Data were obtained through a scoping review of peer-reviewed articles and government reports, as well as focus group discussions with stakeholders in West Nusa Tenggara, a high-drowning-risk province. Data were thematically analysed using inductive qualitative coding to identify key system elements influencing water safety infrastructure. Relationships between these elements were iteratively mapped into a CLD to visualise reinforcing and balancing feedback loops affecting infrastructure, pinpointing leverage points for strengthening infrastructure and improving access to drowning prevention measures.

Results:
Reinforcing loops demonstrated how investments in local swimming facilities, barrier instalment, and supervised community childcare centres enhance safety outcomes. Community engagement and policy advocacy further drive infrastructure expansion and awareness, reinforcing a cycle of improved access and support for water safety initiatives. However, balancing loops revealed critical constraints, including financial barriers limiting infrastructure investment and accessibility challenges such as transportation costs and inequitable distribution of safety resources, particularly in rural areas.

Conclusion:
A systems-thinking approach highlights the importance of addressing infrastructure gaps for drowning prevention in Indonesia. Public-private partnerships and policy integration are required in overcoming these gaps, particularly in securing financial and technical support, ensuring equitable access to drowning prevention measures, particularly in underserved areas in Indonesia.

POSTERS D3 29

Surf-Save: Building a water safety education program for surfers in Brazil.

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Background: Every day, two Brazilians drown on beaches, often in front of unaware friends and family who could have helped. More than 80% of those who drown on beaches live outside the coast and are therefore not used to its dangers. Many drownings happen where and when the lifeguard is not present. In this scenario, the surfer is the most frequent beach visitor, often engaged in rescues, which can eventually end in tragedy to both patient and rescuer. The aim is to present the SURF-SAVE program and its training possibilities to surfers in basic skills in drowning prevention, rescues with surfboard, and first aid.
Description: Originally launched in 1982, the program run until 1986 and was reactivated by SOBRASA in 1999. Surf-Salva is offered in 4 different formats tailored to different audiences and skills levels: Lecture (15-60 min); Workshop (90-180min); Surfer course (4-5h); and SURF-SALVA PRO for instructors and professional athletes (10-12h). All versions have a similar grid with different depths: the drowning problem; risky environments and activities on beaches; identification of the drowned person; gestural communication signaling; help without getting into the water; how to rescue with a surfboard and basic life support for drowning patients. The program includes other surfboard sports such as SUP, kite surfing, canoeing, kayaking and others.
Lesson learned: Since 1999, the Surf-Save program has been implemented in 17 Brazilian states and seven countries (Portugal, Spain, France, Argentina, Uruguay, Chile, and El Salvador), totaling 1,912 events and 77,630 participants. The breakdown includes: 238 lectures (12,736 participants, 54/event), 567 workshops (24,769 participants, 44/event), 1,073 SurfSave courses (39,180 participants, 37/event), and 34 SURF-SAVE PRO sessions (945 professional surfers and instructors, 28/event). In 2024 alone, 94 events trained 1,153 surfers, professionals, and instructors.
Conclusion: we always receive news of surfers performing safe rescue. Beyond learning about rescue and first aid, our main objective is to educate surfers on beach risk analysis, assessment and prevention, helping them safeguard both themselves and other swimmers .To this end, we adapted the drowning survival chain for use by surfers, making water safety education more accessible and effective.

POSTERS D3 30

Conceptualization of a Strategic Water Safety and Drowning Prevention Action Plan for the Hawaiian Islands

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In February 2025, Hawaii became the second state in United States of America to publish a water safety and drowning prevention plan. The process began in August 2023 and took approximately 18 months to complete. By understanding the process, other governmental non-governmental organizations (NGOs) can develop their own plans, which will not only publicize the need for drowning prevention and water safety strategies worldwide, but also attract funding from a plethora of sources.

The process is presented from inception to final product publication and distribution in an easy to follow format. Major steps along the way include the formation of a core group of individuals personally invested in the process. The definition of a guiding principle and mission objectives or goals to accomplish. An extensive background investigation of existing water safety and drowning prevention plans from a variety of sources was conducted. From there, an outline and table of contents was established.

Identifying major contributors, working groups and a timeline of important milestones are imperative to ensure that all volunteer participants are included in the process. A key component for successful completion of this plan was the participation of a professional journalist who also had experience in graphic design and publishing.

POSTERS D3 31

Quantifying rip current-related drowning deaths and exposure on Australian beaches

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Background: Rip currents are the leading coastal hazard on Australian beaches and a significant contributor to coastal drowning. This comprehensive study explored the long-term epidemiology and exposure-based mortality rates of Australian rip current drowning deaths, with the purpose of informing rip-related education efforts to reduce coastal drowning risk.
Methods: A retrospective descriptive analysis of rip current drowning deaths between 1 July 2004 and 30 June 2023 was conducted and rip current involvement was determined using data triangulation methods (incident narrative, beach imagery, expert opinion). Temporal trends were examined using Joinpoint regression, while Australian population and coastal participation data were used to calculate mortality rates.
Results: 407 rip current drowning deaths were identified (21 deaths/year); an exposure-based mortality rate of 0.11/1 million coastal visits. Incidents predominantly involved males (85%), 20-34-year-olds (38%), occurred in regional/remote areas (59%), and in the presence of others (80%). For every rip current drowning death, an estimated 2,449 people were rescued by someone else and 8,171 individuals self-rescued.
Discussion: Despite small reductions in the rate of rip current drowning among males, little overall progress has been seen in attempts to decreases the mortality burden. Future efforts will require an expanded approach, beyond traditional means.
Conclusions: Rip currents remain a significant public health threat and the number one coastal hazard contributing to preventable mortality along Australia's coastline.
Implications for public health: Improved rip current education approaches, development and evaluation is needed to direct effective messaging to at-risk groups.

POSTERS D3 32

Making Swimming a Lifesaving Skill in India

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Background

Drowning is a major public health concern in India, particularly among children in rural areas with open water bodies. In response, the Ministry of Health and Family Welfare launched the Strategic Framework for Drowning Prevention in 2023, with survival swimming training as a key intervention. The goal is to equip children aged six and above with essential water safety skills to prevent drowning.

Programs like SwimSafe have successfully reduced drowning cases. These initiatives teach survival swimming, rescue skills, and basic first aid, tailored to natural water bodies (e.g., ponds, rivers) and controlled environments like swimming pools. Following WHO guidelines, the Indian government aims to integrate these programs into schools and community health initiatives, making water safety education a core part of learning.

Nationwide implementation presents challenges. Many rural areas lack training facilities and certified instructors, while financial constraints and low awareness hinder accessibility. Overcoming these barriers requires strong policies, infrastructure investments, and collaboration between government agencies, educational institutions, and local communities.

Despite these challenges, survival swimming training can save lives. By ensuring children acquire fundamental water safety skills, India can make substantial progress in reducing drowning incidents. With strategic support and coordinated efforts, these programs can create a lasting impact, ensuring every child knows how to stay safe in water.

Methods

To address these challenges, we developed the SwimProHub AquaGuardian app, offering:

- Standardized digital training modules to enhance basic swimming education.
- A structured curriculum aligned with recommended guidelines.
- Safeguarding, child protection, and gender inclusion policies for safety.
- A multi-lingual interface for grassroots accessibility.
- A targeted approach to significantly reduce drowning fatalities.
- Specialized training for differently abled individuals to ensure inclusivity.

Results

Comprehensive and standardized swimming training plans.

Simplified learning, making swimming an essential life skill.

Early intervention to nurture future swimming champions.

Long-term impact on livelihoods through professional training.

Conclusion

Leveraging technology to standardize training ensures consistency and quality in swimming education. By eliminating reliance on individual coaching styles, this initiative transforms swimming into a universal lifesaving skill, paving the way for a safer future for children across India.

POSTERS D3 33

Lake of Awareness (SafeLake) – An Innovative Model for Comprehensive Protection and Development of a Water Area

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The "Lake of Awareness (SafeLake)" project is a strategic partnership aimed at creating Poland's first comprehensive system for the protection and sustainable development of a water area, using Lake Morzycko as a model. This initiative addresses global challenges related to water safety and sustainable tourism, aligning with the goals of the UN resolution.
A key element of the project is the integration of activity zones around the lake (beaches, sports routes, quiet zones) into a cohesive rescue system, based on advanced technologies and education. Instead of traditional swimming areas, we propose point-based sports activity zones, equipped with educational boards, rescue equipment, and a notification system. A Mobile Intervention Group, supported by local services and partners, will ensure year-round safety.
The project emphasizes education and self-awareness among lake users through training, competitions, and information campaigns. A mobile application (KM) will enable e-interventions, monitoring of tourist traffic and water quality, as well as management of the quiet zone for registered vessels.
"Lake of Awareness" also involves the sustainable development of the local economy through the commercialization of the waterway, promotion of local products, and support for water sports. The project includes the municipalization of land, creation of walking trails, a parking system, and the development of recreational infrastructure and marinas.
This initiative aims to create a model solution that can be adapted to other water areas, promoting safety, sustainable development, and active recreation.
Keywords: Lake of Awareness, SafeLake, water safety, sustainable development, Lake Morzycko, water tourism, education, mobile application, strategic partnership, innovation.

POSTERS D3 34

"The effect of a resistance training program outside and inside the water on improving some of the physical and skill abilities of open water lifeguards"

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The research aims to identify “the effect of a training program for resistance training outside and inside the water on improving some of the physical and skill capabilities of open water lifeguards.” The research sample was chosen intentionally from beach lifeguards registered with the Egyptian Diving and Rescue Federation, where the number of members of the research sample reached 20 lifeguards representing a group Experimental research, The researcher used the experimental method due to its suitability and the nature of the research objectives and hypotheses. The researcher also relied on tools and means that work to achieve the research goal.
The most important results indicated that the training program using resistance inside and outside the water led to improving some of the physical and skill capabilities of open water lifeguards.
The researcher recommends taking advantage of the proposed resistance training program inside and outside the water to develop the physical and skill capabilities of the lifeguards under research to develop the performance of the lifeguards, and the need to pay attention to developing flexibility, muscle stretching, and physical and skill abilities within the training programs for preparing lifeguards because of their positive impact on raising the physical level and effectiveness Skilled performance.

POSTERS D3 35

Creating effective and sustainable child drowning prevention programs in two high-risk provinces of central Vietnam.

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Swim for life Vietnam, Quang Binh, Vietnam. 2Golden West Humanitarian Foundation, California, USA

Background:
Swim for Life Vietnam (SFL) was created in 2014 by US Golden West Humanitarian Foundation (GWHF) in response to unacceptable rates of child drownings in Vietnam. The objective was development of a local program in Quang Binh Province promoting awareness of drowning risks to children, parents, officials and providing effective and sustainable solutions. In 2020, with support from the Campaign for Tobacco-Free Kids – CTFK (Unit: Global Health Advocacy Incubator – GHAI), SFL programs expanded to neighboring Quang Tri Province.
Description:
SFL began in Quang Binh in 2014 as an effort to promote awareness of drowning risks, to build a sustainable capacity to promote water safety for children aged 6-15, parents and communities. SFL partners with schools, civic organizations, government agencies to raise awareness of drowning risks, build capacity to teach survival swimming, manage water safety education, safely operate swimming pools. Over the past ten years, SFL has trained 279 swimming instructors, taught 15,279 children, educated water safety to 70,000 children. Starting in 2020, with generous support from the CTFK, SFL expanded into four districts of Quang Tri Province, providing a comprehensive drowning prevention program that supported teaching survival swimming for 3,206 children and educated 8,799 children on water safety.
Lesson Learned:
On-going, community-based capacity building is the most economically viable model for effectively reducing rates of child drowning. Standardizing internationally approved survival swimming lessons, training local teachers as swim instructors, promoting local investment has proven to be an effective combination. Partnering with different organizations, active participation of parents and community members builds sustainable capacity. Engaging local people in a program enabling development of an enduring drowning prevention program will save lives.
Conclusions:
Making people aware of risks of child drowning, providing cost-effective tools to change the dynamic will engage leaders even in economically challenged communities. Our program teaches local people to operate time-limited drowning prevention interventions using available resources and facilities to provide the instruction. We provide the skills, the tools and the process needed to sustain a safe and effective program.

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WHO Global Status Report on Drowning Prevention 2024: insights and opportunities for action

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Background: Drowning remains a major and preventable cause of death worldwide, particularly among children and young people. The recently published *Global status report on drowning prevention 2024 (1)* provides the first comprehensive global benchmark for drowning prevention efforts, supporting strategic planning, multisectoral collaboration, and allowing for monitoring of efforts over time.
Methods: The report presents data gathered through a standardized questionnaire completed by teams of multisectoral national collaborators from 139 Member States and Territories, representing 85% of the global population. Evidence of national-level action for drowning prevention was investigated across five domains: (1) governance and coordination; (2) policy and legislation; (3) community-level interventions; (4) awareness-raising; and (5) data and research. The report includes a descriptive analysis of drowning burden, based on WHO Global Health Estimate data from 2021.
Results: In 2021, an estimated 300,000 people died from drowning globally. Over 40% of drowning deaths occurred among children aged less than 15 years of age, and over 90% occurred in low- and middle-income countries. The global drowning death rate has declined by 38% from 2000 to 2021. Many countries have made strong progress in implementing WHO-recommended drowning prevention measures, with widespread availability of weather alerts and community flood risk management efforts. However, interventions targeting children remain limited: fewer than one in four countries include swimming and water safety education in school curricula, and less than one third provide national childcare programmes offering safe spaces for preschool-aged children. Only 26% of countries report having a national drowning prevention strategy.
Conclusions: The report shows that although drowning deaths are declining globally, the issue remains widely overlooked and marked by deep inequities. The framework established through the *Global status report* offers a new foundation for tracking progress and guiding investment. To accelerate impact, countries must strengthen cross-sector coordination, expand proven, scalable interventions and integrate drowning prevention into broader development agendas.
Implications for policy & practice: This first *Global status report* offers decision makers actionable evidence to prioritize drowning prevention, align with United Nations and WHO resolutions, and catalyze action across health, education, transportation, disaster risk reduction and other related sectors.

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Melander, Linda Kristina Helena	SWIMMING 09
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Pino Espinosa, Jessica	DISASTER 07, PREVENTION 19, RESCUE 05, RESEARCH 07
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Reid, David	MEDICAL 06, MEDICAL 19, MEDICAL 26
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