

EDITORIAL

Drowning is a complex but preventable cause of child mortality

According to the World Health Organization (WHO), 372 000 fatal drownings were reported globally in 2014. It stated that 90% of these occurred in low-income and middle-income countries, where the drowning rate was more than three times higher than in high-income countries. Over half of the people who drowned were under 25 years of age. For children aged 1-14 years, drowning is one of the top five causes of death and it is the main cause of accidental deaths for children under five years of age.¹ As a comparison, the drowning death toll is almost two-thirds that of malnutrition.¹ A 2020 paper from China on social and environmental risk factors for accidental drowning among children exemplified the current situation. The authors reported that most of the children who drowned were boys and 70% lived within 100 metres of a body of water. Drowning primarily occurred in ponds, canals, rivers and wells, and over 90% of those bodies of waters had no safety measures. Almost 90% of primary caregivers did not provide full-time care for the children, and 80% had no knowledge of first aid skills for resuscitation.²

Deaths from drowning are preventable and this fact has been demonstrated by Swedish injury data. In the early part of the 1900s, about 100 children per year drowned compared to 10 per year in the most recent decades, corresponding to 0.55 per 100 000 child population. Child drowning has shown a much steeper decrease than drowning in adults. This is especially true for children under 10 years of age, who nowadays constitute only a few per cent of all drowning deaths in Sweden.^{3,4} Similar improvements are occurring throughout the world, particularly in high-income countries. An analysis of the WHO mortality database showed marked reductions, of between 13% and 80%, in unintentional drowning among children and adolescents during 2000-2013 in 20 of the 21 middle-income and high-income countries. Drowning in natural bodies of water was the primary cause in most countries, except for drowning in pools in the USA and in bathtubs in Japan.⁵

Encouraging results from universal preventive efforts are described in this issue of *Acta Paediatrica* in a paper by Peden et al They present a study about child drowning from three culturally similar high-income countries, Australia, New Zealand and Canada.⁶ The all-age crude fatal drowning rate in 2014 was lowest in Canada (0.92/100 000 child population) and highest in New Zealand (1.46/100 000). Over the 10-year period from 2005 to 2014, the study identified great reductions, of about 50%, in deaths among children below the age of five, who have been historically known to

be at greatest risk of drowning. This is probably a result of sustained investment in multifaceted approaches to prevention, which include research on causal trends, increased public awareness and education, legislation and enforcement of regulations. Strengthening pool-fencing legislation is an example of evidence-informed policy that has reduced the risk of drowning for the youngest children. Unfortunately, there were upward trends for some adolescent groups in Australia and New Zealand, which appeared to have been driven by significant increases in drowning fatalities among females. As about 75% of those who drown are male children, information and interventions may have been aimed too specifically at boys. We do not know what strategies may be effective in reducing drowning risks for adolescent girls, according to Peden et al⁶ There is an obvious need to investigate this problem further, especially if it is not specific to Australia and New Zealand, but is a more general phenomenon in high-income countries. Case analyses of random samples of girls could probably provide a deeper understanding of the increase in fatal drownings. One plausible explanation could be that adolescent girls have become more similar to boys in recent decades, with regard to their behaviour and range of activities. In the Swedish study mentioned above, adolescent female cases of drowning associated with swimming under the influence of alcohol and drugs were recorded. There were also hidden cases of suicides among females.³

The study by Peden et al also pointed out a higher risk of drowning among Maori children, who were significantly overrepresented in drowning fatalities in New Zealand. In earlier studies, there were strong indications that refugee and migrant children were at increased risk of drowning.^{3,7} Unfortunately, this could not be found in the coronial and drowning databases assembled by Peden et al⁶

Finally, the Peden study confirms that there was a higher risk of fatal drowning in children with pre-existing medical conditions³ and epilepsy, physical and mental disabilities and autism were the most common conditions.

Drowning in children and adolescents is rarely the result of a single cause. Therefore, national prevention strategies need to be multifaceted, age adapted and culturally acceptable. Some actions are universal and proven to be effective, mainly those based on practical interventions like legislation concerning pool fencing, well and water tank covers, and personal protection devices like life vests for children. The WHO¹ has suggested the following interventions for drowning prevention among children under five: wearing personal protection devices, fencing off bodies of water, using door barriers or playpens and supervising children in crèches. However, most of

Abbreviation: WHO World Health Organization

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2020 The Authors. *Acta Paediatrica* published by John Wiley & Sons Ltd on behalf of Foundation Acta Paediatrica

these interventions lack evidence of effectiveness in low- and middle-income settings, where most of the drowning deaths occur in natural waters and where fencing is rarely a practical solution, due to economic shortcomings. However, both playpens for children aged less than 18 months and crèches for pre-school children have proven to be effective in rural Bangladesh.⁸

Working with older children and adolescents is mainly a question of information, supervision and swimming education. Successful educational interventions should be content specific, age appropriate and tailored to the target group. Unfortunately, safety prevention messages often compete with other information, are often too content heavy and are delivered in a short space of time without opportunities for deeper discussions. In summary, there is an over reliance on education and information as an intervention strategy to prevent drowning, both with regard to parents and older children.⁹

Regions with cold winters have some specific problems, including drowning in ice-covered lakes. In Sweden, there is always a peak in drowning cases in March, when the ice becomes weak and insecure. On the other hand, there are great risks during extraordinary hot summers in the Nordic countries, when people swim much more than usual. This was the case in 2014 and 2018, when drowning in lakes and beaches doubled in Sweden compared to adjacent years.

Injury prevention has to be an ongoing process, and it is important to safeguard evidence-based successes gained over several decades. At the same time, there is a need to observe changes in behaviour, technical development and environmental conditions. Examples could include adolescents' eagerness to try new and potentially dangerous diving devices or crafts like water scooters. However, the greatest future problem globally is most likely to be climate change, with rising water levels and severe flooding in lowlands. Scientists with detailed knowledge of drowning prevention need to take part in the continued development of well-functioning safety measures, early warning systems and similar initiatives. We also have to be open to new approaches and use our knowledge to influence politicians and other important people in power, to protect children and adolescents from this preventable cause of death.

CONFLICTS OF INTEREST

None.

Staffan Janson^{1,2} 

¹Department of Public Health, Karlstad University, Karlstad, Sweden

²Department of Women's and Children's Health, Uppsala University, Uppsala, Sweden

Correspondence

Staffan Janson, Department of Public Health, Karlstad University, Karlstad, Sweden.
Email: Staffan.janson@kau.se

ORCID

Staffan Janson  <https://orcid.org/0000-0002-2542-6791>

REFERENCES

1. World Health Organization. *Global Report on Drowning: A Leading Killer*. Geneva: World Health Organization; 2014.
2. Wang M, Liu X, Kang L, et al. Social and environmental risk factors for accidental drowning of children under five in China. *BMC Publ Health*. 2020;20:1533. <https://doi.org/10.1186/s12889-020-09650-0>
3. Schyllander J, Janson S, Nyberg C, Eriksson U, Stark ED. Case analyses of all children's deaths occurring in Sweden 1998–2007. *Scand J Public Health*. 2013;41:174–179.
4. Swedish Life Saving Society. Death victims due to drowning. Swedish Life Saving Society: Yearly report 2019 (In Swedish only).
5. Wu Y, Huang Y, Schwebel D, Guoqing H. Unintentional child and adolescent drowning mortality from 2000 to 2013 in 21 countries: Analysis of the WHO mortality database. *Int J Environ Public Health*. 2017;14:875–887.
6. Peden A, Franklin R, Clemens T. Can child drowning be eradicated? A compelling case for continued investment in prevention. *Acta Paediatr*. 2020. <https://doi.org/10.1111/apa.15618>
7. Willcox-Pidgeon S, Franklin R, Leggat P, Devine S. Identifying a gap in drowning prevention: high-risk populations. *Inj Prev*. 2020;26:279–288.
8. Alonge A, Bishai D, Wadhwanja S, et al. Large-scale evaluation of interventions designed to reduce childhood drownings in rural Bangladesh: a before and after cohort study. *Injury Epidemiol*. 2020;7:1–12. <https://doi.org/10.1186/s40621-020-00245-2>
9. Leavy J, Crawford G, Leaversuch F, et al. A review of drowning prevention for children and young people in high, low and middle income countries. *J Community Health*. 2016;41:424–441.



Staffan Janson

How to cite this article: Janson S. Drowning is a complex but preventable cause of child mortality. *Acta Paediatr*. 2021;110:1981–1982. <https://doi.org/10.1111/apa.15674>