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26 September 2023

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EMPLOYMENT, LABOUR AND SOCIAL AFFAIRS COMMITTEE**

Cancels & replaces the same document of 10 November 2022

Swimming skills around the world

Evidence on inequalities in life skills across and within countries

OECD SOCIAL, EMPLOYMENT AND MIGRATION WORKING PAPERS No.281

JEL classification: I10, I12, I14, I24, J16, Z20

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This working paper was prepared in the framework of the OECD Skills Outlook 2023, supported by the European Commission through the Erasmus+ programme.

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JT03527201

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Acknowledgements

This working paper was prepared within the framework of the OECD Skills Outlook 2023, supported by the European Commission through the Erasmus+ programme.

The authors would like to thank OECD colleagues from the Centre for Skills, the Directorate for Employment, Labour and Social Affairs, the Directorate for Education and Skills, the Environment Directorate and the Development Centre for their review of the paper. In particular, they would like to thank Willem Adema, Iván Bornacelly, Ottavia Brussino, Ricardo Espinoza, Ben Game, Bart Staats, Michael Ward, Sarah Wildi, El Iza Mohamedou, Mark Pearson and Emily Walker for their valuable comments and feedback; Jennifer Cannon and Duniya Dedeyn for their administrative and editorial work; and Diana Horvath for her work on the natural disasters data.

Abstract

Being able to swim empowers individuals to make choices, have agency, and be free to choose core aspects of their life, such as working safely on or near water. It is also associated with lifelong health benefits and reduces the risk of drowning. Using data from the Lloyd's Register Foundation World Risk Poll 2019, this paper provides the first global estimates of adults' ability to swim without assistance. Individuals in high-income countries are considerably more likely to report being able to swim without assistance than individuals in low-income countries. Disparities also exist within countries. In particular, women are less likely to be able to swim without assistance than men in virtually all countries, birth cohorts, and levels of education. Investing in reducing inequalities in life skills, such as swimming, can foster economic development and empowerment, especially in light of threats, such as climate change.

Résumé

Savoir nager permet de faire des choix, d'agir et d'être libre de décider de certains aspects essentiels de sa vie, comme travailler en toute sécurité sur l'eau ou à proximité de l'eau. Y sont également associés des bénéfices pour la santé tout au long de la vie, ainsi qu'un moindre risque de noyade. À partir des données de l'enquête *World Risk Poll 2019* de la *Lloyd's Register Foundation*, le présent document propose les premières estimations mondiales de la capacité des adultes à nager sans assistance. Les habitants des pays à revenu élevé sont beaucoup plus susceptibles de déclarer qu'ils savent nager que ceux des pays à faible revenu. Des disparités existent également au sein des pays. Les femmes sont notamment moins susceptibles de savoir nager que les hommes dans la quasi-totalité des pays, des cohortes de naissance et des niveaux de formation. Investir dans la réduction des inégalités en matière de compétences de la vie courante, comme la natation, peut favoriser le développement économique et l'autonomisation, en particulier à la lumière de menaces telles que le changement climatique.

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1 Introduction

1. According to Amartya Sen's capability framework (1999^[1]), social arrangements should be evaluated according to the substantive freedom people have to achieve the goals they value and be the people they want to be. Key life skills, such as the ability to swim, empower individuals to make choices, have agency, and be free to choose core aspects of their life – such as where to work, travel, and what physical exercise they participate in whether for fun or for health reasons. In the absence of such life skills, it would be impossible for individuals to carry out some of these activities and individuals' choices would be restricted. When people are not able to swim, they may adopt a wide range of self-limitations because they fear the consequences of falling in water or they may be prevented from engaging in certain activities (for example working on or near waterways) because of health and safety regulations. Such limitations, for example refraining from going near deep water, may lower the likelihood that individuals will suffer negative consequences, such as drowning. For example, if people do not know how to swim they may face the risk of drowning if they go fishing, they may fear crossing a river to sell food at a market, or may simply refrain from having a refreshing bath in a river or lake during very hot days. However, such limitations also lower individuals' welfare because they decrease the range of labour market opportunities that individuals have or simply the opportunities they have to socialise and enjoy leisure activities.

2. Following Sen's (1999^[1]) framework, the ability to swim is a capability: it represents the opportunity for individuals to engage in activities they find valuable. The ability to swim, like other life skills such as being able to drive and cycle, broadens the horizon of the possible and empowers individuals. Capabilities thus represent the substantive freedom people have to be and do the things that they value. According to Sen (1999^[1]), capabilities are determined by circumstances and resources and, in turn, determine what people can do and the type of people they can be ('beings and doings') (Robeyns, 2003^[2]). Life skills, such as swimming, enable individuals to convert the resources they have into achievement, given the circumstances they are surrounded with.

3. When policy makers and policy analysts consider disparities, they typically suggest that the goal of policy action should be to equalise outcomes or to equalise inputs. In education, this would typically entail equalising enrolment or graduation rates (outcomes) or the amount of financial or human resources (inputs). In contrast, by adopting Sen's capability framework (1999^[1]), this paper argues that interventions should be evaluated in terms of whether they promote capabilities and whether they afford individuals the substantive freedom to reach the life goals they set for themselves. Sen's approach has been criticised for the (intended) failure to specify such goals. However, the basic tenet of Sen's theory, namely that capabilities empower individuals and communities and that a lack of capabilities entails welfare losses at both the individual and community level helps to reconsider the role of skills in shaping inequalities both across and within countries.

4. In the context of this work, at the societal level, the loss of welfare experienced by the many individuals who engage in formal limitations or self-limitations because they do not know how to swim is likely to be high and may well be equal to or even surpass the suffering experienced by those who go near water and drown or suffer water-related injuries. For example, this paper shows that, globally, men are more likely than women to drown, but this reflects the fact that many women do not engage in near-water activities because they are less likely than men to know how to swim. Sen's (1999^[1]) capability framework accounts for the welfare loss experienced by women due to their lack of swimming skills, whereas

traditional welfare economics models simply consider disparities in drowning deaths as the key outcome of interest, failing to appreciate the full extent of welfare loss derived by women's lack of substantive freedom to pursue activities they might find valuable.

5. Besides the substantive freedom swimming ability can provide, engaging in physical activities such as swimming is associated with lifelong health benefits. Swimming is associated with lifelong benefits as a good source of physical activity (Chase, Sui and Blair, 2008^[3]), and exercise is good for physical and mental health as well as short- and long-term memory and cognitive performance (Alomari, Alzoubi and Khabour, 2021^[4]; Shoemaker et al., 2019^[5]). A sedentary lifestyle is associated with a higher risk of all-cause mortality and certain chronic diseases, including cardiovascular disease, diabetes, and osteoporosis (Haskell et al., 2007^[6]). Swimming may be an especially good way to engage in physical activity for individuals suffering from conditions that make engagement in aerobic activities - such as walking, jogging, and running - more difficult, painful, or dangerous (Lin, Davey and Cochrane, 2004^[7]). These include, for example, individuals who suffer from arthritis or have diabetes, disabilities, or excess weight (Chase, Sui and Blair, 2008^[3]) and individuals who suffer from asthma. The incidence of these chronic conditions is increasing, including in many developing countries, thus, increasing the relevance of exercise in general and swimming in particular (Chase, Sui and Blair, 2008^[3]).

6. Finally, the ability to swim allows people to be able to engage in an enjoyable and valuable leisure activity. Swimming is a popular leisure activity, especially during summer. For example, in the Australian state of Victoria, swimming is rated the most popular leisure activity among children and adults (Eime, Harvey and Charity, 2020^[8]). In Germany, 61% of adults reported engaging in swimming activities at least once a year, and 26% reported swimming at least once a month (Stiftung für Zukunftsfragen, 2020^[9]).

7. Swimming is essential to reduce the risk of drowning when individuals are in or near water (Asher et al., 1995^[10]; Brenner et al., 2009^[11]; Yang et al., 2007^[12]). In many developing countries, labour market opportunities are often geographically concentrated near lakes, rivers, and other sources of water. In 2020, 58.5 million people worked in the fisheries or aquaculture sectors, with 84% of fishers and fish farmers being in Asia (FAO, 2022^[13]). Being able to swim may be a precondition if individuals are to benefit from such opportunities. Furthermore, the sea, rivers, and other waterways constitute important trade routes, so individuals who know how to swim are more likely to be able to safely travel and engage in trade and commerce between different villages or areas. In many countries, waterways also interrupt roads either seasonally or permanently, and using boats or other vessels is the only way to travel across. The ability to swim is also necessary to enter the Navy, or to work in professions such as marine biology, naval engineering, and technician in offshore wind farms, and in conservation projects to remove plastics from the ocean. Many of the occupations involved in the development of sustainable exploitation of renewables for energy production and conservation of natural habitats require being able to swim.

8. Disparities in life skills, such as the ability to swim, can disproportionately reduce the welfare of certain groups in society, in part because these groups may be especially likely to face situations in which these skills are valuable and in part because these groups lack alternative skills which would provide alternative opportunities for personal realisation and economic empowerment. For example, socio-economically disadvantaged groups may be especially vulnerable to extreme weather events because they tend to live in areas that are susceptible to floods or extreme heat (Sam et al., 2017^[14]). They may also have less access to mitigation technologies. For instance, they may be less likely to be able to rely on air conditioning and may therefore be more likely to try to cool off in water in the presence of extreme temperatures. There is also evidence that the vulnerability of extreme weather events is gendered (Salvati et al., 2018^[15]). Similarly, in many context women's opportunities are determined by a range of explicit and implicit cultural and legal restrictions as well as lack of skills and capabilities to use their bodies and their talents to reach their own goals and objectives. Many life skills such as swimming are acquired during childhood, a period when children in most countries have the right and duty to devote their time to learn. When certain skills are not taught (and learnt) in formal educational settings, opportunities for skills development depends on the resources and willingness to impart instruction at the household and

community level. While it is reasonable to expect that, as adults, individuals may vary in their preferences for engaging in activities that require swimming, the acquisition of swimming skills among children is mostly a function of the provision of instruction at school or organised by families and the extent to which such instruction is prioritised. Therefore, large and pervasive differences in levels of swimming ability between socio-demographic groups can be taken to reflect disparities in opportunity rather than underlying differences in preferences between members of such groups.

9. The paper uses data from the Lloyd's Register Foundation World Risk Poll conducted in 2019 to examine in which countries adults report being able to swim without assistance and which socio-economic and demographic groups are more likely to lack basic swimming abilities. The goal is to shed light on the pervasiveness of disparities both across and within countries in one life skill and highlight the constraints such disparities pose to both to human flourishing but also economic development. This may be especially important in light the COVID-19 pandemic. During periods marked by lockdowns, curfews, and social distancing, severe restrictions were put in place to limit the spread of the virus, among which was the closure of swimming pools. As with lost academic skills during the 2020 and 2021 school years, it remains unclear what the long-term consequences of these closures will be. Unless action is taken, it is possible that children who missed on valuable swimming lessons during the pandemic may not gain this valuable life skill and see their capability set curtailed.

2 Where people know how to swim

10. Individuals typically learn to swim without assistance in childhood. The ability to swim without assistance is a key component of swimming skills, alongside water competencies about how to be safe in water, such as risk awareness or knowledge of hazards (Stallman et al., 2017^[16]) (see Box 2.1 on the definition of swimming competencies). In some countries, swimming programmes are offered even before children learn to walk or crawl. For example, the Royal Life Saving's *Swim and Survive program* is one of many swimming programs in Australia that offers classes for children aged six months and older to promote familiarity with water (Royal Life Saving Australia, 2022^[17]). It also teaches fundamental swimming skills to children aged 3 to 5 and advanced swimming skills to children aged 5 and older (Royal Life Saving Australia, 2022^[17]). In some countries, swimming lessons are a mandatory part of the elementary school curriculum, such as in Austria, France, and Germany (Bayrische Staatskanzlei, 1996^[18]; Ministère de l'Education Nationale et de la Jeunesse, 2022^[19]; Rechtsinformationssystem des Bundes, 2022^[20]).

11. This paper exploits data from the World Risk Poll in 2019 (Lloyd's Register Foundation, 2020^[21]), which covers information on the ability to swim to map the extent to which people around the world consider that they can swim without assistance (see Box 2.2). Descriptive analyses are complemented by previous empirical evidence (see Box 2.3).

Box 2.1. Defining swimming competence: Australia's National Swimming and Water Safety Framework

The ability to swim is part of what swimming competence entail. In addition to the ability to swim, swimming competence encompasses a set of attitudes and behaviours, knowledge and understanding that are necessary to minimise one's risk of drowning and actively and safely engage in activities in, on, and around water. Australia has a well-defined and comprehensive framework that defines swimming competence. The Australian National Swimming and Water Safety Framework (Royal Life Saving Australia, 2019^[22]) lists several interrelated elements which, taken together, define who is a competent swimmer. These comprise: the understanding and assessment of the dangers and hazards of aquatic activities and environments as well as the identification of safe water entry and exit points; the ability and willingness to develop, improve and maintain swimming skills and personal fitness; the development of survival skills and orientation strategies; as well as underwater techniques for swimming survival and rescue. In addition to maximising one's own survival skills, one should also acquire lifesaving and rescue skills and learn how to analyse and make quick decisions in aquatic emergencies. According to this framework, the ability to swim is an important but not the sole component of swimming competence. Given the data available, this working paper focusses on swimming ability.

Source: Royal Life Saving Australia (2019^[22]), National Swimming and Water Safety Framework, https://www.royallifesaving.com.au/data/assets/pdf_file/0018/32157/National-Swimming-and-Water-Safety-Framework_FINAL-2020.pdf.

Box 2.2. Gallup World Poll

The 2019 World Risk Poll is a module included in the Gallup World Poll, which seeks to increase knowledge of how people understand and experience risks. The study was conducted by Gallup and was implemented in 142 countries, with representative samples of the resident population of individuals aged 15 and older, covering a range of key themes, such as *Occupational risks*, *Technology risks*, or *Sources of safety information and trust in those sources*.

The World Risk Poll collected information from approximately 1 000 adults aged 15 and older interviewed per country. The questionnaire was translated into the major conversational languages of each country or territory. All samples were probability-based and nationally representative of the resident non-institutionalised population of 15+ individuals, covering the entire country, including rural areas. The survey was administered face-to-face in the majority of countries while telephone surveys were organised in countries and territories where telephone coverage represented at least 80% of the population or was the customary survey methodology.

This paper uses information from the World Risk Poll on swimming ability. The Poll required survey participants to specify whether they are able to swim without any assistance. Respondents could either respond with “yes” or “no.”

Source: Lloyd’s Register Foundation (2020^[21]), The Lloyd’s Register Foundation World Risk Poll: Full report and analysis of the 2019 poll, <https://wrp.lrfoundation.org.uk>; Lloyd’s Register Foundation (2019^[23]) The Lloyd’s Register Foundation World Risk Poll: 2019 Methodology, http://doc.ukdataservice.ac.uk/doc/8739/mrdoc/pdf/8739_lrf_worldriskreport_methodologyappendix.pdf.

Box 2.3. Limitations

This study relies on self-reported data on swimming ability. This is in line with many studies in the literature on swimming ability. Although the use of self-reported instruments has the important advantage that such instruments can be easily administered, it is associated with a number of shortcomings and biases, potentially giving inaccurate information on not just levels but also disparities across individuals living in different countries or social groups thus lowering the accuracy and validity of the information collected (Kankaraš, 2017^[24]). For example, respondents may be inclined to answer in a way their behaviour is perceived as favourable, introducing a social desirability bias (e.g. behaviour related to alcohol consumption (McCool et al., 2008^[25]; Moran, 2008^[26]; Willcox-Pidgeon, Kool and Moran, 2017^[27])). In the case of swimming ability, respondents may not be able to accurately assess and express their true competence (Dixon and Bixler, 2007^[28]; McCool et al., 2008^[25]). In addition, differences in the accuracy of self-evaluations of performances have also been reported between men and women, whereby men tend to rather overestimate and women rather underestimate their performance (Beyer, 1990^[29]). Few studies on swimming ability rely on direct measurements rather than self-reports. Berukoff and Hill (2010^[30]) for example, measure swimming performance using a Swimming Performance Checklist and find that boys have a higher swimming proficiency compared to girls.

Data presented in this work is also cross-sectional and therefore it is not possible to assess if differences across age groups, for example, arise because of differences in the level of swimming instruction received by different birth cohorts or changes in swimming ability over the life course as a result of swimming practice, ageing and physical fitness. Most studies in the literature that were reviewed suffer the same limitation (e.g. McCool et al. (2008^[25])). By contrast, contrary to the previous literature, this study is based on large-scale cross-country comparable and representative samples and therefore findings have high levels of external validity and generalisability. Most previous studies reflect narrowly defined samples and are therefore not generalizable. For example, Berukoff and Hill (2010^[30]) focus on

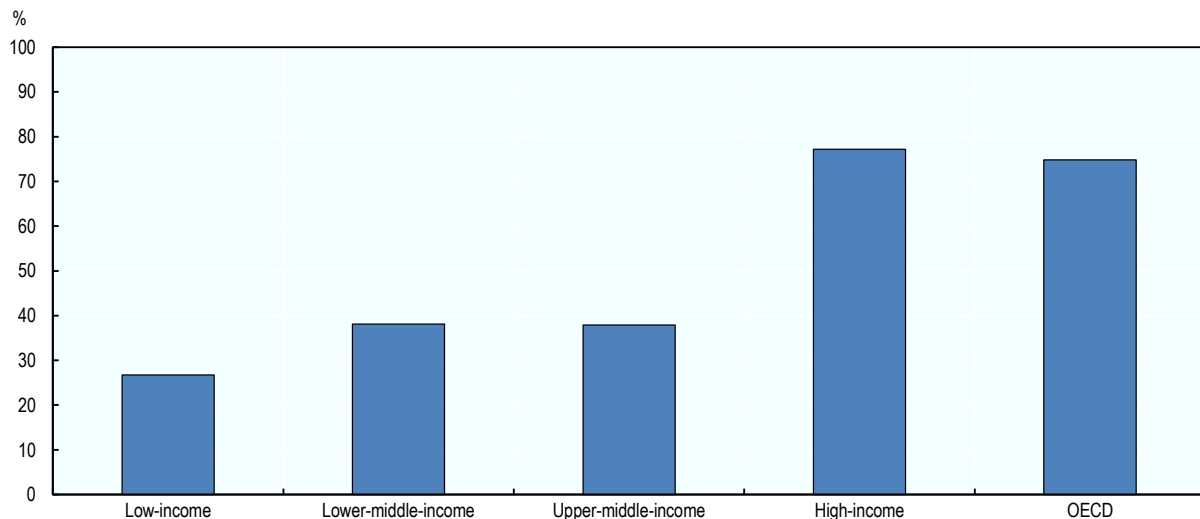
Hispanic and Latino students in the United States; Hunter et al. (2015^[31]) focus on the Northern and central Philippines; van Lenthe, Brug and Mackenbach (2005^[32]) restrict their study to a medium sized city in the Netherlands. In some studies, the sample population lacks representativeness of the overall target population (e.g. Moran (2008^[26]) interviewed beachgoers). Furthermore, many studies rely on relatively small samples (Berukoff and Hill (2010^[30]), for example, with 144 observations).

Source: Berukoff and Hill (2010^[30]), A Study of Factors That Influence the Swimming Performance of Hispanic High School Students, <https://doi.org/10.25035/ijare.04.04.07>; Beyer (1990^[29]), Gender differences in the accuracy of self-evaluations of performance, 10.1037/0022-3514.59.5.960; Dixon and Bixler (2007^[28]), Failure to Learn to (Really) Swim: Inflated Self-Efficacy?, <https://doi.org/10.1123/rsj.31.1.14>; Hunter et al. (2015^[31]), Swimming and Gendered Vulnerabilities: Evidence from the Northern and Central Philippines, <https://doi.org/10.1080/08941920.2015.1046097>; Kankaraš (2017^[24]), Personality matters: Relevance and assessment of personality characteristics, <https://dx.doi.org/10.1787/8a294376-en>; McCool et al. (2008^[25]), New Zealand beachgoers' swimming behaviours, swimming abilities, and perception of drowning risk, <https://doi.org/10.25035/ijare.02.01.02>; Moran (2008^[26]), Will They Sink or Swim? New Zealand Youth Water Safety Knowledge and Skills, <https://doi.org/10.25035/ijare.02.02.04>; van Lenthe, Brug and Mackenbach (2005^[32]), Neighbourhood inequalities in physical inactivity: the role of neighbourhood attractiveness, proximity to local facilities and safety in the Netherlands, <https://doi.org/10.1016/j.socscimed.2004.06.013>; Willcox-Pidgeon, Kool and Moran (2017^[27]), Knowledge, Attitudes, and Behaviours of New Zealand Youth in Surf Beach Environments, <https://doi.org/10.25035/ijare.10.02.06>.

12. Figure 2.1 suggests that the ability to swim without assistance is unevenly distributed among countries of different levels of economic development. On average, among low-income countries, 27% of the population aged 15 and older report being able to swim without assistance. Among lower-middle- and upper-middle-income countries, around 38% of respondents report being able to swim. By contrast, in high-income and among OECD countries, around 75% of adults report being able to swim. These results imply that around three quarters of individuals in low-income countries are not able to swim but also that in high-income countries around one quarter of the population, are not able to swim without assistance. Mandatory swimming lessons embedded in the school curriculum are likely to be associated with a high prevalence of people with swimming skills in high-income countries. However, despite the high proportion of swimmers, it is important to examine in depth the possible consequences of leaving to individual schools or local authorities the decision as to whether swimming lessons should be provided as part of the curriculum or not (see Box 2.4).

Figure 2.1. Swimming ability, by country income group (2019)

Percentage of the population aged 15 and older who report being able to swim without assistance



Note: Data for Belarus and the Russian Federation (hereafter 'Russia') are included when aggregates for swimming ability by country income group are presented in the figures in this paper.

Source: Adapted from World Bank (2022^[33]), World Bank Current Classification by Income (database), <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>; World Risk Poll (2019^[34]), The Lloyd's Register Foundation World Risk Poll Report 2019, <https://wrp.lrfoundation.org.uk/>.

13. Figure 2.2 provides a more fine-grained cross-country comparison of the distribution of individuals who report being able to swim without assistance. Among OECD countries, for example, in Finland, Germany, the Netherlands, Norway, and Sweden, over 9 in 10 adults report being able to swim without assistance. By contrast, in Mexico, less than one in two individuals reports the same. Among OECD countries, differences in swimming ability amount to up to almost 50 percentage points between Sweden with the highest share of swimmers and Mexico with the lowest share of swimmers. When considering the full set of 138 countries with available data, differences are even more pronounced: In Sweden, 95% of adults report being able to swim without assistance, whereas, in Rwanda, Pakistan, and Ethiopia, 15%, 17%, and 19%, respectively, do. The between-country variation in swimming ability maps closely between-country differences in levels of economic development.

Box 2.4. School-based swimming in the Netherlands

Embedding swimming classes in schools is one way in which countries ensure that young children have swimming skills and to reduce inequalities in who knows how to swim and who does not. In some countries, swimming lessons are a mandatory part of the elementary school curriculum, such as in Austria, France, and Germany (Bayrische Staatskanzlei, 1996^[18]; Ministère de l'Education Nationale et de la Jeunesse, 2022^[19]; Rechtsinformationssystem des Bundes, 2022^[20]). Figure 2.1 indicates that 77% of adults report being able to swim in high-income countries, while this share is around 50 percentage points lower in low-income countries. This reflects the fact that in many high-income countries swimming pools are more readily available and that many individuals learnt how to swim as part of their schooling. Should swimming lessons be removed from the curriculum in these countries, the prevalence of individuals who are able to swim without assistance could decline and inequalities increase.

The Netherlands is a country in which mandatory swimming lessons were removed from the school curriculum. The Netherlands introduced compulsory swimming lessons in the late 60s, early 70s, but this was changed in 1985 (Floor, 2016^[35]; isgeschiedenis, 2022^[36]). Over the years, the number of schools in the Netherlands that offered swimming as part of the curriculum dropped considerably, from about 90% of schools in the early 1990s to less than 50% of schools in the early 2010s. A reason for the decision of schools not to voluntarily continue to offer swimming classes was the fact that many children reported already being able to swim and some municipalities consequently felt swimming classes did not provide sufficient added value justifying the investment in school swimming programmes, particularly at a time of tight budgets for local authorities (van der Werff and Breedveld, 2013^[37]). The literature suggests that the removal of mandatory swimming lessons led to worse outcomes for children with an immigrant background who relied to a larger extent on school provision to acquire adequate swimming skills (Wisse, 2009^[38]).

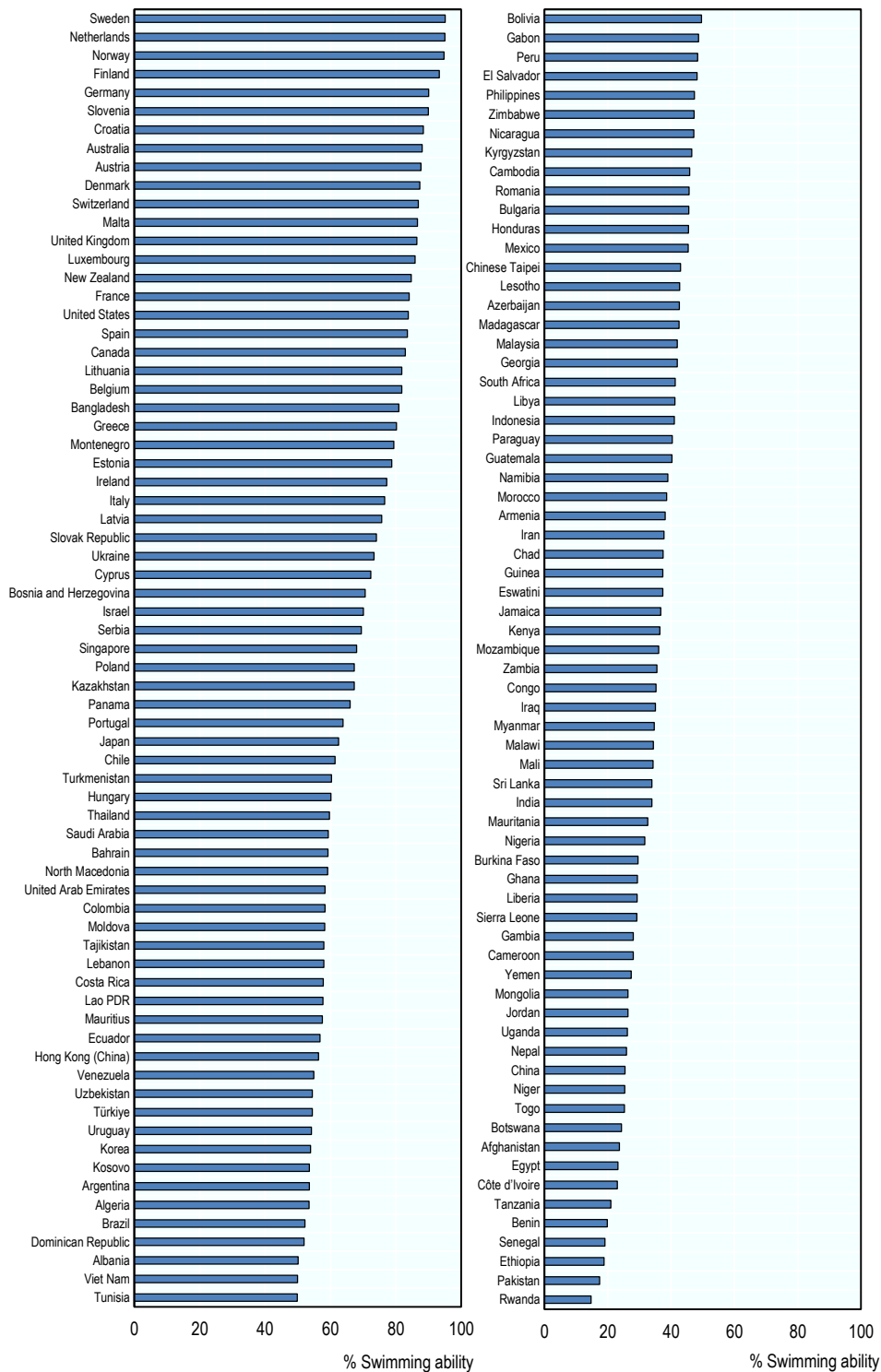
In order to reduce adverse effects arising from the discontinuation of compulsory swimming programmes in schools a series of safety net schemes were introduced at the local level to support young people with disadvantaged backgrounds. For instance, the National Swimming Safety Norm which was introduced in 2017 identified swimming grade C as the minimum level necessary to consider an individual as having sufficient swimming ability (grade A provides children with basic skills to move and recreate safely in a pool without any attractions; grade B provides swimming skills appropriate for pools with attractions, such as a slides; grade C provides additional swimming skills for swimming in open water, such as recreational lakes, but not the sea (Nationale Raad Zwemveiligheid, 2022^[39]). This norm provides a clear and more ambitious benchmark for the swimming skills that need to be developed, and creates an incentive to provide children with A, B and C grades.

In addition, in 2016, the project “NL Zwemveilig” was launched, with the aim of collecting and disseminating information about swimming lessons and safety. All kinds of research has been conducted into elements of swimming education and drowning with publications that can all be found on a centralised website (kenniscentrumsportenbewegen, 2022^[40]). This project was followed by the National Plan for Swimming Safety 2021-2024, which describes a concrete plan for the government and stakeholders to work together on improving swimming safety in the Netherlands. As a consequence, swimming skills improved considerable. For example, while in 2012 only 23% of 10 year olds had all three swimming grades (A, B, C), this figure had increased to 33% in 2018 (Corry and Tiessen-Raaphorst, 2018^[41]) However, as many countries experienced interruptions in school classes and activities during the COVID pandemic, there was a slight increase between 2018 and 2020 in the number of children aged 6-16 who had not acquired any of the three swimming grades (from 6% in 2018 to 9% in 2020) (Hollander and Hoekman, 2022^[42]).

Source: Bayrische Staatskanzlei (1996^[18]), Durchführung von Schwimmunterricht an Schulen [Implementation of swimming lessons at schools], https://www.gesetze-bayern.de/Content/Document/BayVV_2230_1_1_1_1_3_UK_205>true; Corry and Tiessen-Raaphorst (2018^[41]) Zwemvaardigheid 2018: Inzicht in het zwemdiplomabezit van kinderen en volwassenen [Swimming Proficiency 2018: Understanding children's and adults' possession of swimming], <https://www.kennisbanksportenbewegen.nl/?file=9763&m=1573727788&action=file.download>; Floor (2016^[35]), Schoolzwemmen 2016 Betrokkenheid van scholen en gemeenten en lokale vormgeving [School Swimming 2016 School and community involvement and local design], <https://www.kennisbanksportenbewegen.nl/?file=8081&m=1504521748&action=file.download>; Hollander and Hoekman, (2022^[42]), Zwemdiplomabezit van kinderen, <https://www.kennisbanksportenbewegen.nl/?file=10672&m=1644504062&action=file.download>; isgeschiedenis (2022^[36]), Invoering van het schoolzwemmen [Introduction of school swimming], <https://isgeschiedenis.nl/nieuws/invoering-van-het-schoolzwemmen>; kenniscentrumsportenbewegen (2022^[40]), <https://www.kenniscentrumsportenbewegen.nl/>; Ministère de l'Education Nationale et de la Jeunesse (2022^[19]), Le Bulletin Officiel de L'éducation Nationale, de la Jeunesse et des Sports, <https://www.education.gouv.fr/bo/22/Hebdo9/MENE2129643N.htm>; Nationale Raad Zwemveiligheid (2022^[39]), De Nationale Zwemdiploma's worden landelijk uitgegeven door de Nationale Raad Zwemveiligheid en bestaan uit het Zwem-ABC, de Zwemcertificaten, Nationale Snorkeldiploma's en de Zwemvaardigheidsdiploma's., <https://www.nrz-nl.nl/licentie-nationale-zwemdiplomas/zwem-abc-en-andere-nationale-zwemdiplomas/>; Rechtsinformationssystem des Bundes (2022^[20]), Gesamte Rechtsvorschrift für Lehrplan - Bewegung und Sport AHS (Oberstufe) u. a. [Entire legal regulation for curriculum – physical activity and sport AHS (upper secondary school) and others], <https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=10009684>; van der Werff and Breedveld (2013^[37]), Zwemmen in Nederland De zwemsport in al zijn facetten nader belicht [Swimming in the Netherlands: Swimming sport in all its facets in more detail], <https://www.kennisbanksportenbewegen.nl/?file=2668&m=1422883202&action=file.download>; Wisse, (2009^[38]), Schoolzwemmen ter discussie [School swimming under discussion], <https://www.kennisbanksportenbewegen.nl/?file=8053&m=1503581866&action=file.download>.

Figure 2.2. Swimming ability around the world (2019)

Percentage of the population aged 15 and older who report being able to swim without assistance

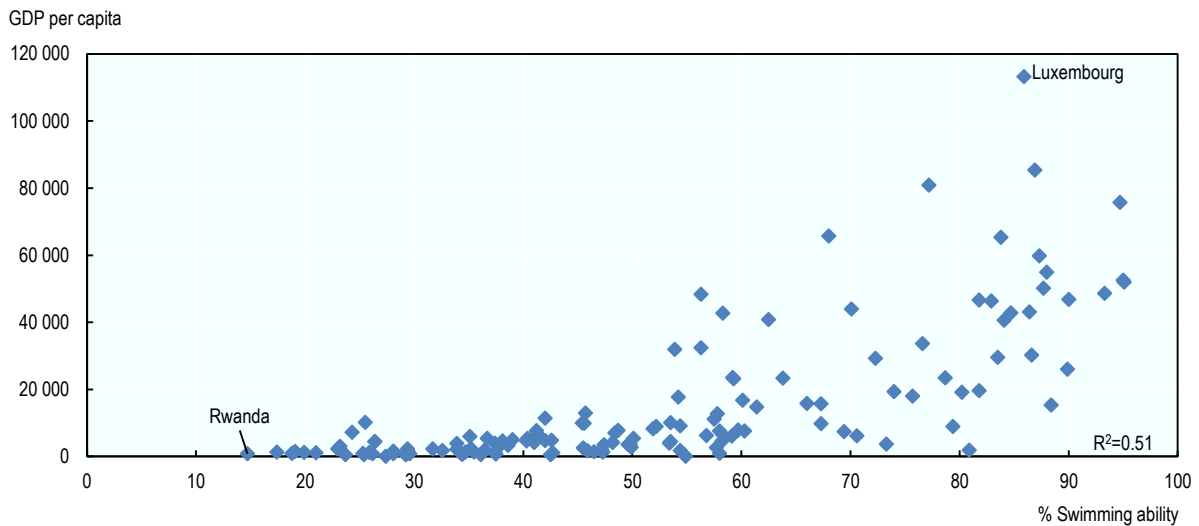


Note: Countries are sorted in descending order of individuals who are 15 or older who reported being able to swim without assistance.
 Source: Adapted from World Risk Poll (2019^[34]), The Lloyd’s Register Foundation World Risk Poll Report 2019, <https://wrp.lrfoundation.org.uk/>.

14. Figure 2.3 reveals that there is a strong positive association between a country's level of per capita gross domestic product (GDP) and the percentage of the population who reports being able to swim without assistance.

Figure 2.3. Association between swimming ability and level of economic development (2019)

Percentage of the population aged 15 and older who report being able to swim without assistance and level of GDP per capita



Note: The figure shows a scatterplot between countries' GDP per capita (current USD) and the percentage of the population (15+) who reported being able to swim without assistance. While Belarus and Russia are not among the data points shown in this figure, their data are included in the R^2 calculation.

Source: Adapted from OECD (2022^[43]), National accounts (database), <https://www.oecd.org/sdd/na/>; World Bank (2021^[44]), GDP per capita (current USD) (database), <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD>; World Risk Poll (2019^[34]), The Lloyd's Register Foundation World Risk Poll Report 2019, <https://wrp.lfoundation.org.uk/>.

3 Drowning: A global health burden

15. Drowning is one of the leading causes of death worldwide and is the third leading cause of unintentional fatal injury (WHO, 2017^[45]). The World Health Organization's (WHO) estimates that fatal drownings claim the lives of 230 000 people worldwide annually (WHO, 2022^[46]). While children aged 1 to 4 are the age group most affected, it is closely followed by the 30 to 49 age group, which suggests that prime working age populations may be especially exposed to the risk of drowning (WHO, 2020^[47]).

16. In the last two decades, there has been a continuous downward trend in the total number of drowning deaths (Franklin et al., 2020^[48]; National Center for Health Statistics (U.S.), 2021^[49]). Based on Global Health Estimates (GHE) provided by the World Health Organization (see Box 3.1), total drowning deaths amounted to around 360 000 in 2000, and decreased to 236 000 in 2019, a reduction of around 35% over a 20 year time span. However, this positive trend has not affected all economies to the same extent (Franklin et al., 2020^[48]). GHE data in fact reveal that virtually all progress (around 99% of reductions in total drownings) accrued in lower-middle- and upper-middle-income countries – countries that originally had very high drowning rates. Specifically, low- and middle-income countries accounted for more than 90% of drownings (WHO, 2014^[50]).

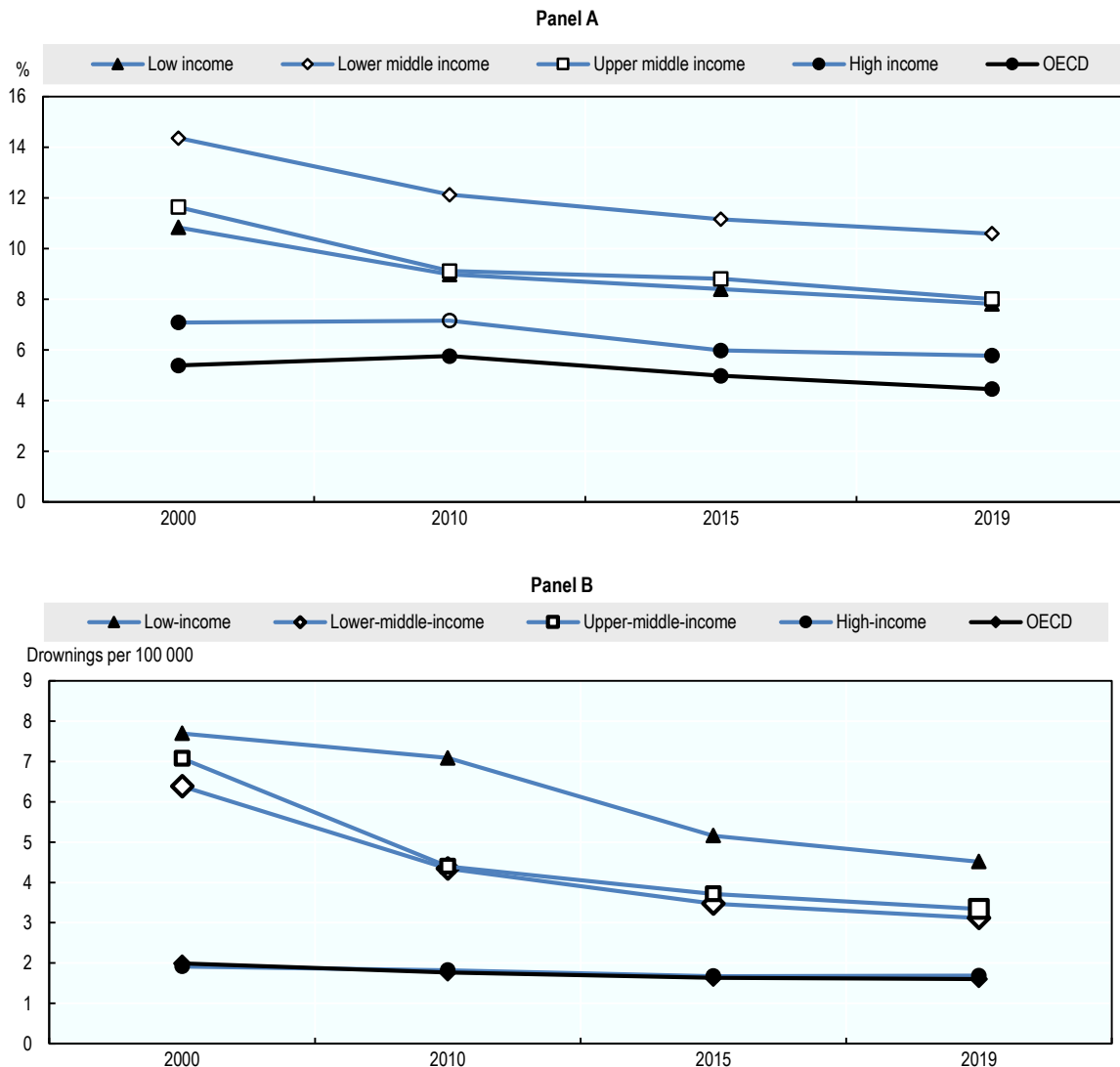
Box 3.1. WHO Global Health Estimates (GHE) and World Bank Income Classification

The World Health Organization's (WHO) Global Health Estimates (GHE) provide mortality estimates for the years 2000, 2010, 2015, and 2019. Deaths are categorised by cause of death, according to the International Classification of Diseases, by age and by sex for its member countries. Estimates provide information on the number of drownings for each member state for each given year.

To aggregate information for the numerous countries, for which data are available, countries are categorised into four income groups according to the World Bank. Countries are categorised into low-, lower-middle-, upper-middle-, and high-income countries based on their gross national income (GNI) per capita in current USD. Throughout this report, we use the World Bank Income Classification from 2019. When comparing trends over time, we assign countries to income groups based on the 2019 World Bank Income Classification, so that stable groups of countries can be evaluated over time.

Source: WHO (2020^[51]), WHO methods and data sources for country-level causes of death 2000-2019, Global Health Estimates Technical Paper, https://cdn.who.int/media/docs/default-source/gho-documents/global-health-estimates/ghe2019_cod_methods.pdf; World Bank (2022^[33]), World Bank Current Classification by Income (database), <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>.

Figure 3.1. Percentage of drownings as a percentage of total fatal unintended injuries of the whole population



Note: Panel A shows the share of drownings as a percentage of total fatal unintended injuries and Panel B shows the share of drownings per 100 000 people by country income level between 2000 and 2019. Countries are assigned to four different income groups based on the World Bank Income Classification. Data for Belarus and Russia are included when aggregates for drownings by country income group are presented. Source: Adapted from WHO (2020^[47]), Global Health Estimates 2019: Deaths by Cause, Age, Sex, by Country and by Region, 2000-2019 (database), <https://www.who.int/data/global-health-estimates>; World Bank (2022^[33]), World Bank Current Classification by Income (database), <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>.

17. Panel A in Figure 3.1 illustrates the evolution of drowning deaths between 2000 and 2019 for OECD countries and by country income, which are grouped into low-income, lower-middle-income, upper-middle-income, and high-income country groups (see Box 3.1). In low-income countries, the share of drownings as a percentage but of total fatal unintended injuries¹ was 11% in 2000 and 8% in 2019. For lower-middle-income and upper-middle-income countries, drownings were 14% and 11% in 2000 and 11% and 7%, respectively, in 2019. The lowest shares were observed among high-income countries with 7% in

¹ Fatal unintentional injuries include: road injuries; poisonings; falls; fire, heat and hot substances; drowning; exposure to mechanical forces; natural disasters.

2000 and 6% in 2019. Among OECD countries, drowning deaths as a percentage of total fatal unintended injuries were 5% in 2000 and 5% in 2019.

18. Panel B in Figure 3.1 shows the evolution of drowning deaths per 100 000 people. In 2019, 4,5 per 100 000 people drowned in low-income countries. In lower-middle and upper-middle income countries around 3 in 100 000 people drowned, while in high-income and OECD countries it was around 1,6 per 100 000 people. Panels A and B indicate that the strongest reductions in drowning deaths, both relative to other fatal unintended injuries and to population size, over the past two decades occurred in countries that had comparatively high levels of drownings, determining a global convergence in the global burden of drowning deaths. For example, in lower-middle- and upper-middle-income countries, reductions in drowning deaths as a percentage of total fatal unintended injuries were almost 4 percentage points. Reductions in drowning deaths rates in low-income countries were around 3 percentage points. The lowest absolute reductions were observed among high-income countries with 1.3 percentage points fewer drownings as a percentage of total fatal unintended injuries in 2019 compared to 2000 levels. While low-, lower-middle-, and upper-middle-income countries experienced a steady decline throughout the four time periods, this has not been the case for high-income countries in general and OECD countries more specifically. In fact, between 2000 and 2010, high-income and OECD countries experienced a slight increase in drowning death rates and experienced marginal decreases since then. Other data sources, such as a study conducted in France, using information on emergency vehicle and victim assistance sent to ‘drowning’ or ‘suspected drowning’ sites (Bessereau et al., 2015^[52]), have found the same pattern of a relatively stable number of drownings in high-income economies.

19. Even though the number of global drowning cases decreased steadily over the past two decades, the number of drowning deaths remains high. Differences in drowning deaths across countries with different levels of economic development remain large: for example, the difference in the share of drownings over overall fatal unintended injuries between lower-middle-income and OECD countries corresponded to six percentage points. One of the possible reasons as to why drowning rates are higher in low- and middle-income countries is a lack of swimming ability (Figure 2.1) and a higher exposure to risky situations (e.g. commercial fishing or fishing for subsistence, working on small boats, daily commutes on overcrowded, unsafe vessels that lack safety equipment or are operated by personnel untrained in dealing with transport incidents or navigation) (WHO, 2014^[50]).

20. Figure 3.2 shows total drowning deaths and the share of drowning deaths as a percentage of total fatal unintended injuries in all countries with available data. In absolute numbers, drowning deaths are highest in the People’s Republic of China (hereafter ‘China’) (52 806), followed by India (48 774) and Japan (8 408), and are lowest in Barbados (1), Iceland (1), and Luxembourg (2). In relative terms with respect to the total number of fatal unintended injuries, the percentage of drownings is highest in Micronesia (40%), Seychelles (33%), and Kiribati (28%), while it is lowest and equal to 1% in Barbados, Iceland, and Luxembourg.

21. While drowning deaths have declined steadily over the past two decades, ensuring that this positive trend continues will require sustained effort. Successful prevention strategies need to be adapted to the circumstances of different risk groups, comprising the provision of swimming competence, but also knowledge and competences related to water safety and controlling the access to water (see Box 3.2). Climate change is in fact contributing to an increase in both the likelihood that extreme weather events will occur and in the severity of such events, both factors which may increase the risk to drown. Moreover, recent global shocks such as the pandemic and Russia’s war against Ukraine, with its effect on energy costs, have highlighted how fragile education systems can be not only to maintain academic skills (Hanushek and Woessmann, 2020^[53]) but also important life skills such as swimming which may have contributed to the decreasing levels of drowning deaths observed in high-income countries (see Box 3.3).

Box 3.2. Drowning Prevention

Multiple factors determine whether people have the ability to swim without assistance and drowning prevention strategies need to be adapted to the circumstances of different risk groups. Equipping people with swimming skills is not enough to prevent drowning: the skills and knowledge required go far beyond physical ability. Effective drowning prevention strategies encompass various elements. These comprise the provision of swimming competence, including the physical ability to swim or even more advanced swimming skills but also knowledge and competences related to water safety and controlling the access to water (WHO, 2022^[46]; WHO, 2014^[50]).

One element of swimming competence as an effective drowning prevention is to teach people from an early age the ability to swim without assistance. Correlational studies suggest that even youngest people in society can be equipped with basic skills. For example, the literature provides evidence that teaching toddlers aquatic competences already during early ages improved their swimming ability through training (Asher et al., 1995^[10]) and was associated with positive benefits for drowning prevention (Taylor, Franklin and Peden, 2020^[54]). Studies elaborating the drowning death of toddlers found a low share of participation in swimming lessons among victims and conclude a protective association (Brenner et al., 2009^[11]; Yang et al., 2007^[12]). Similarly, a randomised trial offering swimming lessons of different length showed that more intense courses improve swimming ability significantly at the end of the study period and that, overall, swimming ability is moderately correlated with in-water safety skills, the latter attempting to reflect children's drownings risk (Asher et al., 1995^[10]).

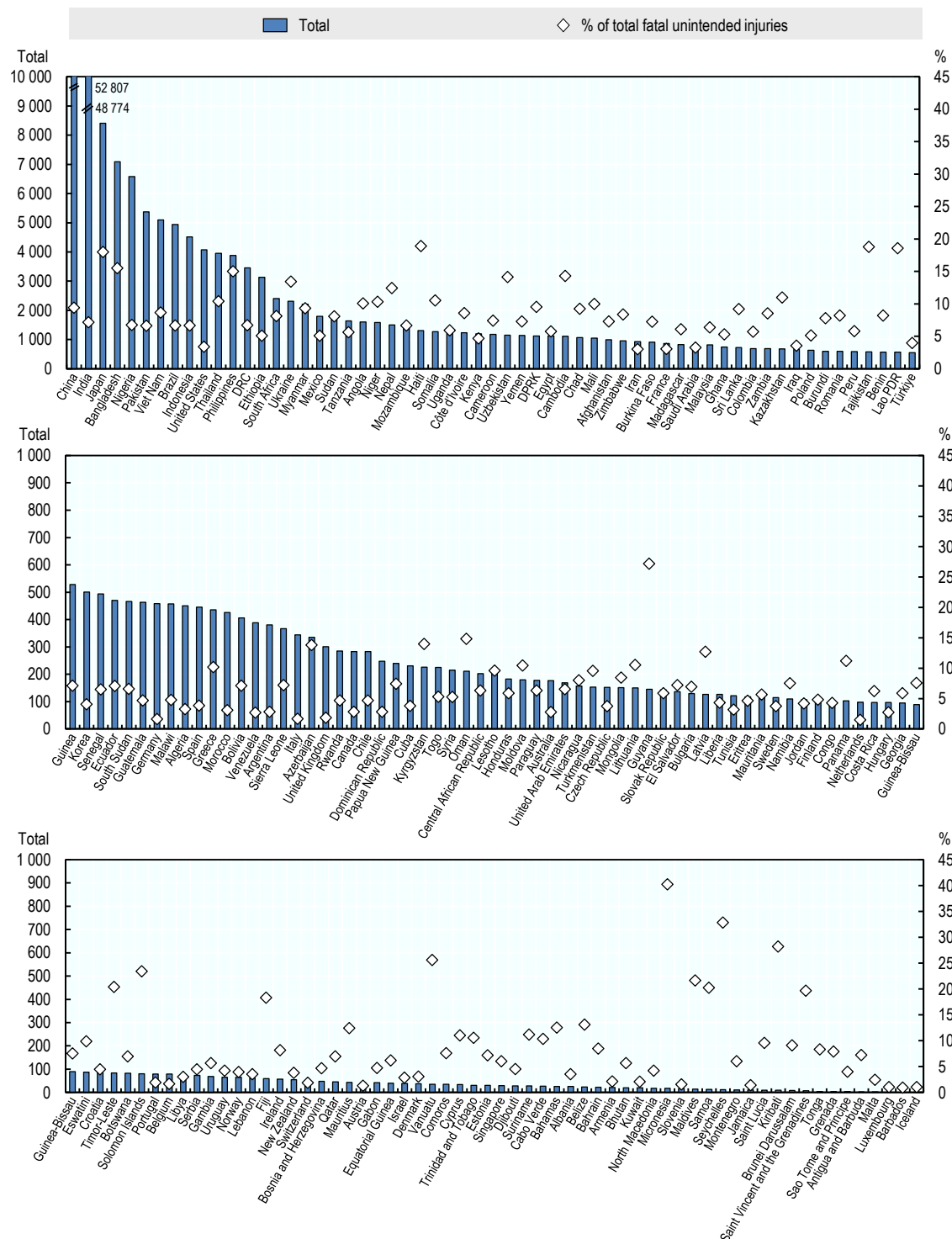
Another important element of swimming competence is knowledge around water safety (Stallman et al., 2017^[16]; WHO, 2022^[46]). Previous empirical evidence suggests that men are more likely than women to engage in risky swimming-related behaviour. For example, men are more likely to consume alcohol prior to swimming activities (Howland et al., 1996^[55]; McCool et al., 2008^[25]) and to swim outside of designated areas at patrolled beaches (McCool et al., 2008^[25]), although other studies do not identify gender differences in risky behaviours (Willcox-Pidgeon, Kool and Moran, 2017^[27]). To enhance individuals risk perception and risk behaviour, several studies provide evidence that offering water safety trainings is associated with an increase in water safety knowledge as, for example, among 10- to 12-year-olds using virtual reality, traditional video, and poster (Araiza-Alba et al., 2021^[56]) or 10- to 14-year-olds using the educational package by the American Red Cross (Turgut, Yaman and Turgut, 2015^[57]).

Providing people with the ability to swim and water safety knowledge gives people the agency to engage in water-related activities but also to reflect about their behaviour and actions. For children, however, the restriction of access to water and supervision through parents or caretakers is an essential part of drowning prevention. As discussed above, a large fraction of toddlers drown in pools, with fatal incidences frequently associated with insufficient fencing barriers (Browne, Lewis-Michl and Stark, 2003^[58]) or lack of supervision (Peden and Franklin, 2019^[59]; Peden, Franklin and Pearn, 2017^[60]; Tyler et al., 2017^[61]).

Source: Araiza-Alba et al., (2021^[56]), The potential of 360-degree virtual reality videos to teach water-safety skills to children, <https://doi.org/10.1016/j.compedu.2020.104096> ; Asher et al., (1995^[10]), Water safety training as a potential means of reducing risk of young children's drowning, <http://dx.doi.org/10.1136/ip.1.4.228>; Brenner et al., (2009^[11]), Association Between Swimming Lessons and Drowning in Childhood, [doi: 10.1001/archpediatrics.2008.563](https://doi.org/10.1001/archpediatrics.2008.563). PMID: 19255386 ; Browne, Lewis-Michl and Stark, (2003^[58]), Unintentional Drownings among New York State Residents, 1988–1994, <https://doi.org/10.1093/phr/118.5.448> ; Howland et al., (1996^[55]), Why are most drowning victims men? Sex differences in aquatic skills and behaviors, <https://doi.org/10.2105/AJPH.86.1.93> ; McCool et al. (2008^[25]), New Zealand beachgoers' swimming behaviours, swimming abilities, and perception of drowning risk, <https://doi.org/10.25035/ijare.02.01.02>; Peden and Franklin, (2019^[59]), Causes of distraction leading to supervision lapses in cases of fatal drowning of children 0–4 years in Australia: A 15-year review, <https://doi.org/10.1111/jpc.14668> ; Peden, Franklin and Pearn, (2017^[60]), Unintentional fatal child drowning in the bath: A 12-year Australian review (2002–2014), <https://doi.org/10.1111/jpc.13688>; Stallman et al., (2017^[16]), From Swimming Skill to Water Competence: Towards a More Inclusive Drowning Prevention Future, DOI: [10.25035/ijare.10.02.03](https://doi.org/10.25035/ijare.10.02.03) ; Taylor, Franklin and Peden (2020^[54]), Aquatic Competencies and Drowning Prevention in Children 2–4 Years: A Systematic Review, <https://doi.org/10.3390/safety6020031> ; Turgut, Yaman and Turgut (2015^[57]), Educating Children on Water Safety for Drowning Prevention, <https://doi.org/10.1007/s11205-015-1109-0>; Tyler et al., (2017^[61]), The epidemiology of drowning in low- and middle-income countries: a systematic review, <https://doi.org/10.1186/s12889-017-4239-2>; WHO (2014^[50]), Global report on drowning: preventing a leading killer, <https://apps.who.int/iris/handle/10665/143893>; WHO (2022^[46]), Preventing drowning: practical guidance for the provision of day-care, basic swimming and water safety skills, and safe rescue and resuscitation training, <https://www.who.int/publications/i/item/9789240046726>; Willcox-Pidgeon, Kool and Moran (2017^[27]), Knowledge, Attitudes, and Behaviours of New Zealand Youth in Surf Beach Environments, <https://doi.org/10.25035/ijare.10.02.06>; Yang et al. (2007^[12]), Risk factors for childhood drowning in rural regions of a developing country: a case-control study, <https://doi.org/10.1136/ip.2006.013409>.

Figure 3.2. Drowning deaths around the world (2019)

Total drownings and share of drownings as a percentage of total fatal unintended injuries of the whole population



Note: The figure shows total drownings for all OECD countries (left y-axis, bars) and the share of drownings as a percentage of total fatal unintended injuries (right y-axis, markers). Countries are sorted in descending order of total drowning deaths.

Source: Adapted from WHO (2020^[47]), Global Health Estimates 2019: Deaths by Cause, Age, Sex, by Country and by Region, 2000-2019 (database), <https://www.who.int/data/global-health-estimates>.

Box 3.3. Influence of global shocks on swimming and drowning

Containment measures following the COVID-19 pandemic

The outbreak of the COVID-19 pandemic in early 2020, which was followed by containment measures in most parts of the world, affected swimming skills or the lack thereof in multiple ways. The closure of schools and public swimming pools led to the cancellation of (mandatory) swimming lessons and restricted children's access to learning opportunities. This has put children who depend on swimming lessons taught at school at risk of not learning basic swimming skills properly, which is likely to not only affect drowning rates in the future but also the chances of these generations passing on swimming skills to their offspring. Secondly, studies conducted in Australia and the United States suggest that COVID-19 indirectly augmented the risk of drowning (Lawes et al., 2021^[62]; Moreland, Ortmann and Clemens, 2022^[63]; Royal Life Saving Australia, 2021^[64]).

In many countries, swimming is part of the mandatory school curriculum (e.g. Austria, France, and Germany) (Bayrische Staatskanzlei, 1996^[18]; Ministère de l'Education Nationale et de la Jeunesse, 2022^[19]; Rechtsinformationssystem des Bundes, 2022^[20]). During school closures to contain the pandemic outbreak, swimming lessons had to be cancelled, creating a new barrier to swimming education for an entire generation (Royal Life Saving Australia, 2021^[64]). In the United Kingdom, for example, nearly 1.2 million children are expected to leave primary school over the next five years unable to swim (Swim England, 2021^[65]). Moreover, during the pandemic outbreak, those children who would have wanted to acquire swimming skills outside of schools faced additional barriers, as public swimming schools were closed, and swimming courses did not take place. For instance, in the Netherlands, the share of 6- to 16-year-olds who did not obtain any swimming diploma increased from 6% in 2018 to 9% in 2020, while the share of children who reached the national standard for swim safety decreased from 36% to 32% during the same period (Hollander and Hoekman, 2022^[42]). Even as societies and schools re-opened, there have been multiple obstacles for children who want to catch up on the opportunities they missed during a critical age for skill development. Such challenges include long waiting lists, lack of swimming teachers, and increased prices to access swimming pools (BBC News, 2021^[66]). Those who would use public, community, and apartment pools, rather than private pools, were especially affected by pool closures. As research suggests that there is a link between a child's swimming skills and its socio-economic status, the COVID-19 pandemic might have, therefore, further exacerbated certain inequities (BBC News, 2021^[66]; Johnson et al., 2021^[67]).

Compared to previous years, the number of recorded drowning cases seemed to temporarily decrease with the outbreak of the COVID-19 pandemic, as was the case in North America's Great Lakes region or Guangdong in the People's Republic of China. Lockdowns, movement restrictions, closure of public pools, as well as people wanting to avoid outdoor activities were the main reasons for this decrease (Houser and Vlodych, 2021^[68]; Zheng et al., 2021^[69]). However, studies conducted in Australia and the United States suggest that once people were no longer confined at home, they increasingly spent time near natural water and engaged in swimming and boating activities (Lawes et al., 2021^[62]; Moreland, Ortmann and Clemens, 2022^[63]; Royal Life Saving Australia, 2021^[64]). In the United States, drowning deaths increased by almost 17% in 2020, whereby males and young people aged 20 to 29 seemed to be especially affected (Moreland, Ortmann and Clemens, 2022^[63]). The data on the 2020 drowning profiles points towards an amplification of the persistent racial disparities in the United States' drowning rates, as the largest increase in drowning rates concerned Black people. The observed increase of drowning death rates in the United States may have resulted from reduced access to safety measures, including reductions in lifeguard resources, increased visits to unsupervised water locations, or the closure of lifejacket loaner programmes, as well as altered behaviour due to self-isolation fatigue (Houser and Vlodych, 2021^[68]; Lawes et al., 2021^[62]; Moreland, Ortmann and Clemens, 2022^[63]).

Energy crisis following Russia's invasion of Ukraine

The rising energy costs following Russia's invasion of Ukraine presents a challenge that affects not only households and production enterprises but also leisure providers, such as swimming pools. For example, in the United Kingdom, energy bills for public leisure facilities increased by 150% since 2021 and are projected to increase by 185% for 2023 (ukactive, 2022_[70]). The UK non-profit active lifestyle sector association *ukactive* conducted a survey amongst its members, which include 30% of all public leisure facilities in the United Kingdom, on how the increasing energy costs impact them. Up to 79% of the questioned operators stated that it was "likely" or "extremely likely" that, due to the raising energy costs, they would no longer be able to operate within the next six months (June 2022 to November 2022) if they did not receive government support (ukactive, 2022_[70]). Moreover, operators reported to be "likely" or "extremely likely" to increase customer prices (78%) and reduce services (85%) or staffing (63%) within the next six months (June 2022 to November 2022) if they did not receive more government support (ukactive, 2022_[70]).

When being asked about the long-term (next twelve months June 2022 to May 2023), the questioned operators were more likely to report the above-mentioned outcomes. 85% of the participating operators said that it was "likely" or "extremely likely" that, without additional government support, they will no longer be able to operate. 100% of the questioned operators indicated that they were "likely" or "extremely likely" to increase customer prices, while 85% stated that they were "likely" or "extremely likely" to reduce services, and 85% said that they were "likely" or "extremely likely" to reduce staffing unless they would receive more government support (ukactive, 2022_[70]). Thus, without financial support from the government, many swimming pools in the United Kingdom will need to increase their entry fees, lower the water temperature, and reduce working hours if they do not want to close within the next few months. Given that 72% of primary schools rely on public swimming pools, the reduced accessibility and affordability of swimming facilities pose a serious threat to the development of children's swimming skills (The Guardian, 2022_[71]; ukactive, 2022_[70]).

Source: Bayrische Staatskanzlei (1996_[18]), Durchführung von Schwimmunterricht an Schulen [Implementation of swimming lessons at schools], https://www.gesetze-bayern.de/Content/Document/BayVV_2230_1_1_1_3_UK_205>true; BBC News (2021_[66]), Covid: Parents urged to prioritise swimming lessons, <https://www.bbc.com/news/uk-56992594>; Hollander and Hoekman (2022_[42]), Zwemvaardigheid 2020: Zwemdiplomabezit van kinderen [Swimming skills 2020: Children's swimming certification], <https://www.mulierinstituut.nl/publicaties/26568/zwemvaardigheid-2020/>; Houser and Vlodarchyk (2021_[68]), Impact of COVID-19 on drowning patterns in the Great Lakes region of North America, <https://doi.org/10.1016/j.ocecoaman.2021.105570>; Johnson et al. (2021_[72]), Impact of COVID-19 Pandemic on Toddler Swimming Routines, <https://doi.org/10.12691/jpar-6-2-7>; Lawes et al. (2021_[62]), When Natural Hazards Intersect with Public Health: A Preliminary Exploration of the Impact of Bushfires and the COVID-19 Pandemic on Australian Coastal Drowning, <https://doi.org/10.3390/ijerph18105314>; Ministère de l'Éducation Nationale et de la Jeunesse (2022_[19]), Le Bulletin Officiel de L'éducation Nationale, de la Jeunesse et des Sports, <https://www.education.gouv.fr/bo/22/Hebdo9/MENE2129643N.htm>; Moreland, Ortmann and Clemens (2022_[63]), Increased unintentional drowning deaths in 2020 by age, race/ethnicity, sex, and location, United States, <https://doi.org/10.1016/j.jsr.2022.06.012>; Rechtsinformationssystem des Bundes (2022_[20]), Bundesrecht konsolidiert: Gesamte Rechtsvorschrift für Lehrplan - Bewegung und Sport AHS (Oberstufe) u. a., Fassung vom 20.07.2022 [Federal law consolidated: Entire legal regulation for curriculum - physical activity and sport AHS (upper secondary school) and others, version of 20.07.2022], <https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=10009684>; Royal Life Saving Australia (2021_[64]), National Drowning Report 2021, https://www.royallifesaving.com.au/_data/assets/pdf_file/0007/50110/RLS_NationalDrowningReport2021_LR.pdf; Swim England (2021_[65]), Impact of Coronavirus on school swimming and water safety, <https://www.swimming.org/swimengland/impact-coronavirus-school-swimming-report/>; The Guardian (2022_[71]), Going under: energy price rises leave UK pools in deep trouble, <https://www.theguardian.com/lifeandstyle/2022/apr/26/swimming-pools-in-uk-will-close-without-energy-bailout-ministers-told>; ukactive (2022_[70]), Sector leaders call for urgent action from Government as energy costs put leisure facilities and pools at risk of closure within six months, <https://www.ukactive.com/news/sector-leaders-call-for-urgent-action-from-government-as-energy-costs-put-leisure-facilities-and-pools-at-risk-of-closure-within-six-months/>; Zheng et al. (2021_[69]), Trends of injury mortality during the COVID-19 period in Guangdong, China: a population-based retrospective analysis, <https://doi.org/10.1136/bmjopen-2020-045317>.

4 Disparities in swimming ability and drowning risk

22. This section considers disparities in swimming ability and drowning risk perceptions across population groups within countries. Key dimensions of inequality are: age, educational attainment, and gender. In the broader literature on engagement in physical activity, these socio-economic and demographic characteristics are among the most prevalent factors correlated with engagement in physical activity (Bauman et al., 2012^[73]). The literature also suggests that differences across countries in how wide disparities in engagement in physical activity are reflect broader societal level factors. For example, gender differences in engagement in physical activity are wider in societies where women are under-represented in the labour market and where they are less present in politics, i.e. where societal level gender inequality is higher (de Looze et al., 2019^[74]). While not individuals may equally invest in their ability to swim without assistance, large differences across socio-demographic groups are most likely to reflect differences in the opportunities afforded to such groups to acquire and build their swimming ability given economic and social constraints and, as such, be an indicator of unequal distribution of capabilities in the population.

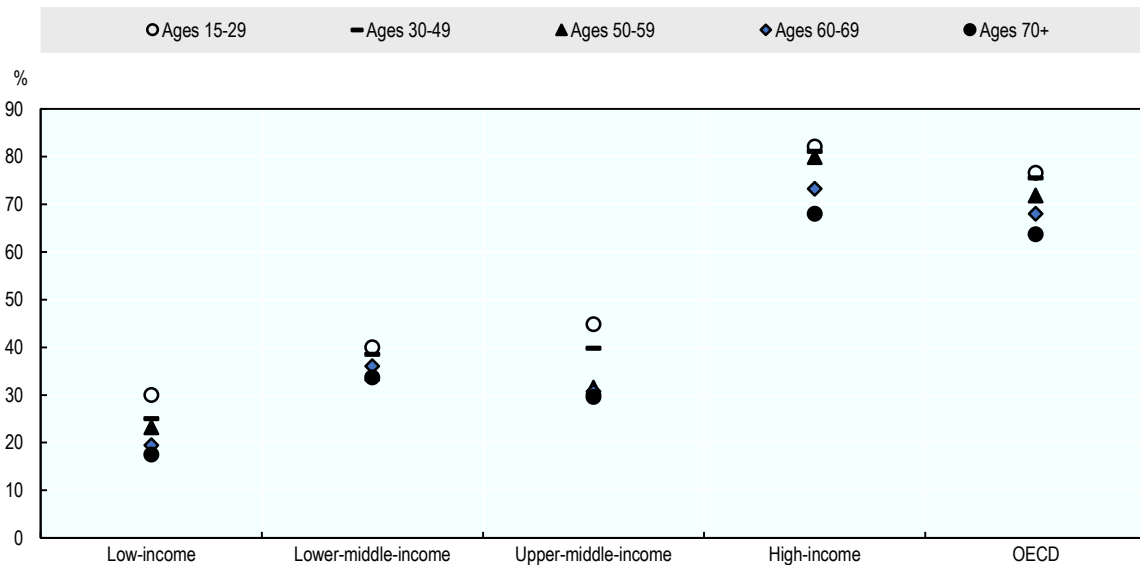
Age disparities

23. For each country income group, Figure 4.1 illustrates the percentage of the population who reports being able to swim without assistance within each age group. In general, the percentage of individuals who are able to swim is lower among older age groups, and, among individuals of similar age, the percentage of those who are able to swim is higher in countries with higher levels of economic development. For instance, in low-income countries, 32% of 15- to 29-year-olds report being able to swim, 25% among 30- to 49-year-olds, 23% among 50- to 59-year-olds, 19% among 60- to 69-year-olds, and 18% among individuals aged 70 and above. In high-income countries, these percentages are 84%, 81%, 80%, 73%, and 68%, respectively.

24. The finding that swimming ability is lower among older individuals could be due to the fact that more and more individuals in younger cohorts learnt how to swim, mirroring expansion in literacy, following the long-term expansion of education systems. However, it could also reflect the fact that the ability to swim without assistance decreases as individuals age because of health and mobility problems. If the latter is the case, then a more exact country comparison would require taking into account country-specific age distributions. Such comparison would probably reveal even wider disparities across countries, since high-income countries tend to have older populations and are those with the highest rates of individuals reporting being able to swim without assistance. Figure 4.1 also reveals that the generally strong positive association between country income and swimming abilities does not seem to hold among older age groups when comparing lower-middle-income and upper-middle-income countries. A higher percentage of individuals aged 50 and above reports being able to swim without assistance in lower-middle-income countries than in upper-middle-income countries (35% compared to 32% for age group 50-59, 36% compared to 31% for age group 60-69, and 34% compared to 30% for age group 70+).

Figure 4.1. Age disparities in swimming ability, by country income group (2019)

Percentage of the population aged 15 and older who report being able to swim without assistance, by age group



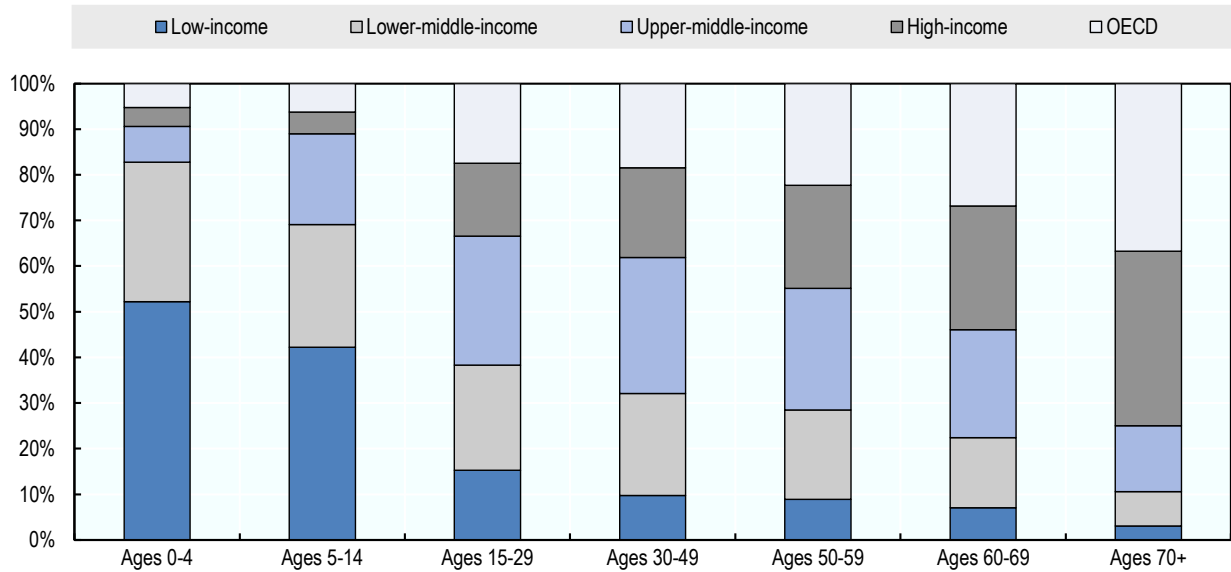
Note: The figure shows the percentage of the population aged 15 and older who report being able to swim without assistance by age group.
 Source: Adapted from World Bank (2022^[33]), World Bank Current Classification by Income (database), <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>; World Risk Poll (2019^[34]), The Lloyd's Register Foundation World Risk Poll Report 2019, <https://wrp.lrfoundation.org.uk/>.

25. Figure 4.2 illustrates differences in drowning deaths by age group. Figure 4.2 shows a shift in the share of age groups that accounts for most of the drownings from younger to older age groups with increasing income levels. In low-income countries, toddlers and children up to the age of 14 are at the highest risk of drowning. The share of toddlers aged 0 to 4 amounts to 46%, and the share of children aged 5 to 14 makes up for 26% of all reported drowning fatalities. In contrast, people aged 15 to 50 are the groups facing the highest risk in middle-income countries (15% and 18% for ages 15 to 29 in lower-middle- and upper-middle-income countries, respectively, and 17% and 23% for ages 30 to 49 in lower-middle- and upper-middle-income countries, respectively). The elderly belong to the relatively highest risk group in high-income countries. 46% of drownings can be attributed to those aged 70 and above, a share that is similar to the percentage of toddlers in low-income countries. Among high-income countries, one particular case highlighted in the literature is the high number of elderly drownings in Japan (see Box 4.1).

26. The clear distinction of drowning risk across age groups sheds light on potential underlying factors that contribute to increased risks. Among toddlers, drownings occur most frequently in pools, bathtubs, or small bodies of waters, which are more predominant in low- and middle-income countries (e.g. ponds, wells, and cisterns) (Borse et al., 2011^[75]; Tyler et al., 2017^[61]). Moreover, fatal drowning incidences among toddlers are frequently associated with insufficient fencing barriers (Browne, Lewis-Michl and Stark, 2003^[58]) or lack of supervision (Peden and Franklin, 2019^[59]; Peden, Franklin and Pearn, 2017^[60]; Tyler et al., 2017^[61]). In this context, ensuring that women know how to swim and know about water safety is an important component of strategies aimed at reducing drowning in young children (see Box 4.2). In contrast, middle-aged adults mostly drown in open waters, whereas the highest share of drownings among the elderly occur in bathtubs (Bessereau et al., 2015^[52]; Browne, Lewis-Michl and Stark, 2003^[58]; Quan, 2003^[76]).

Figure 4.2. Percentage of drownings, by age group and country income group (2019)

Drownings in a given age group as a percentage of total drownings



Note: The figure shows the share of drownings by age group and by country income group.

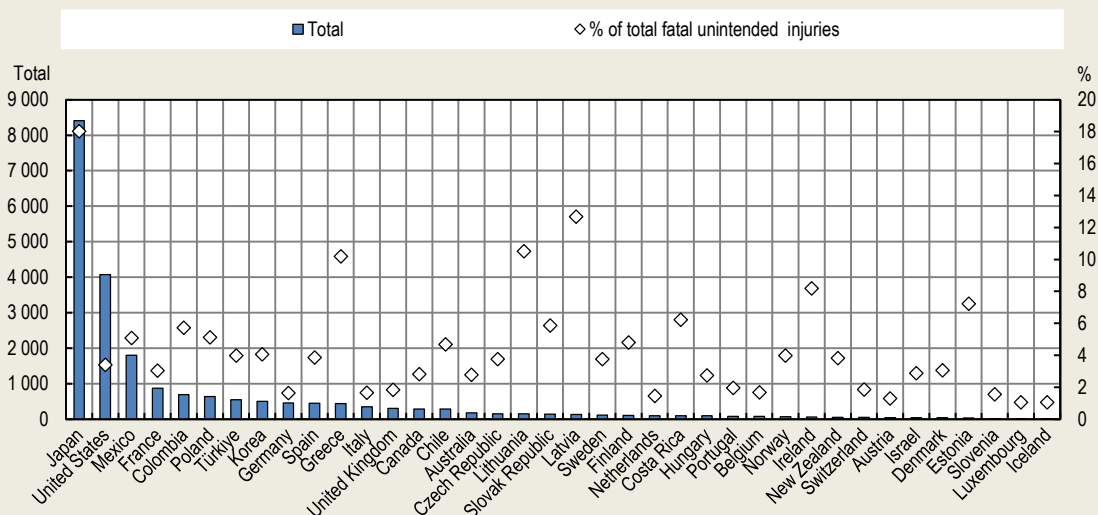
Source: Adapted from WHO (2020^[47]), Global Health Estimates 2019: Deaths by Cause, Age, Sex, by Country and by Region, 2000-2019 (database), <https://www.who.int/data/global-health-estimates>; World Bank (2022^[33]), World Bank Current Classification by Income (database), <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>.

Box 4.1. Old age drownings in Japan

Among OECD countries, by far the highest number of drowning deaths occur in Japan. Figure 4.3 shows that, in 2019, there were 8 409 drowning cases in Japan, with nearly 20% of unintentional deaths being attributed to drowning. To put this number into perspective, as a percentage of other fatal unintentional injuries, drowning deaths are almost twice as high as road injuries in Japan. In other OECD countries, the opposite is the case. For example, in the United States, deaths due to road injuries are around ten times higher than drowning deaths, while, in Mexico, deaths due to road injuries are nine times higher than deaths due to drowning.

Figure 4.3. Drowning deaths, OECD countries (2019)

Total drownings and total drownings as a percentage of total fatal unintended injuries in 2019



Note: Countries are sorted in descending order of the percentage of drowning deaths.

Source: Adapted from WHO (2020^[47]), Global Health Estimates 2019: Deaths by Cause, Age, Sex, by Country and by Region, 2000-2019 (database), <https://www.who.int/data/global-health-estimates>.

In Japan, the majority of drowning deaths occur among the elderly (Lin et al., 2015^[77]). Figure 4.4 shows that around 82% of drownings in Japan occur among adults aged 70 and older, 10% among 60 to 69-year olds, and less than 10% among people under the age of 60. The pattern of higher drowning rates among the elderly as compared to the younger generations is exactly opposite of what is observed in low-income countries, where drowning deaths are especially prevalent among young children under the age of 14.

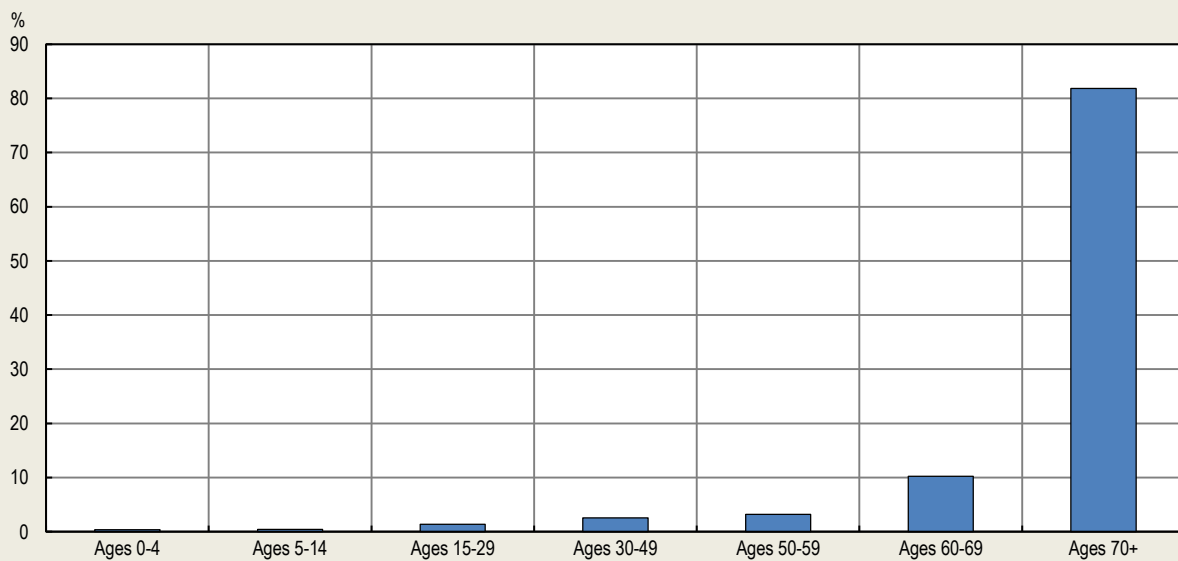
The majority of drowning deaths in Japan occur because of fatal bath-related accidents, which makes Japan a very exceptional case, as, in the majority of countries, unintentional drownings happen in natural water (Lin et al., 2015^[77]). In addition to that, bathtub drownings follow a seasonal trend and happen most frequently during the winter season (Chiba et al., 2005^[78]; Hayashi et al., 2010^[79]; Satoh et al., 2013^[80]; Suzuki et al., 2015^[81]). Bathing in Japan typically involves sitting in very hot water up to shoulder depths of approximately 40 degrees to 42 degrees, and bathtubs are relatively deep (Satoh et al., 2013^[80]). While the precise mechanism of bath-related deaths is unclear, it may be related to rapid changes in body temperature that occur between ambient temperature before bathing and the bath water temperature (Chiba et al., 2005^[78]; Suzuki et al., 2015^[81]). This temperature difference is then

assumed to influence the cardiovascular system and hemodynamic, ultimately contributing significantly to death, especially among the elderly (Chiba et al., 2005^[78]; Suzuki et al., 2015^[81]).

The fact that despite increasing awareness of the problem, the elderly continue to take traditional baths, presumably because of the personal happiness and satisfaction they derive from bathing, highlights how individuals may make choices which lead to an increased risk of suffering a negative personal outcome in order to derive personal benefits. At the societal level, the increased risk of drowning that accompanies traditional Japanese hot bathes may be offset by the welfare gains that are associated with bathing.

Figure 4.4. Drownings in Japan, by age group (2019)

Percentage of drownings by age group



Note: The figure shows the percentage of drownings for each age group in Japan.

Source: Adapted from WHO (2020^[47]), Global Health Estimates 2019: Deaths by Cause, Age, Sex, by Country and by Region, 2000-2019 (database), <https://www.who.int/data/global-health-estimates>.

Source: Chiba et al., (2005^[78]), Risk factors of sudden death in the Japanese hot bath in the senior population, <https://doi.org/10.1016/j.forsciint.2004.04.085>; Hayashi et al., (2010^[79]), Bath-related deaths in Kagoshima, the southwest part of Japan, <https://doi.org/10.1258/msl.2009.009002>; Lin et al., (2015^[77]), Unintentional drowning mortality, by age and body of water: an analysis of 60 countries, <https://doi.org/10.1136/injuryprev-2013-041110> ; Satoh et al., (2013^[80]), The American Journal of Forensic Medicine and Pathology, [doi: 10.1097/PAF.0b013e31828d68c7](https://doi.org/10.1097/PAF.0b013e31828d68c7). PMID: 23629407 ; Suzuki et al., (2015^[81]), Characteristics of Sudden Bath-Related Death Investigated by Medical Examiners in Tokyo, Japan, <https://doi.org/10.2188/jea.JE20140068>.

Box 4.2. Reducing drowning rates among children by investing in women's swimming ability

Research suggests that there is a positive correlation between a mother's and her child's swimming abilities, even if the mother is not the one teaching her child how to swim (Hunter et al., 2015^[31]). As drowning rates among toddlers and young children are particularly high in low-income countries, where women traditionally take care of their children, teaching women how to swim could, therefore, help prevent some of these drownings. Moreover, considering that women and children are disproportionately affected by water-related natural disasters (see Box 4.4), it is important for women to learn how to swim, as this could not only help them save their own but also their children's lives. The Women's Swimming Project in Sri Lanka (I Can Swim Can You, n.d.^[82]) is designed to equip women with the ability to swim with the aim of lowering their and their children's drowning risk. It offers free lessons to teenage girls and women to teach them how to float on the water and breathe. Once they have mastered floating, they receive swimming lessons. Women who have successfully participated in these classes are then encouraged to teach their new floating, breathing, and swimming skills to their children and other non-swimmers of their community. Thus, in addition to enabling these teenage girls and women to develop their swimming abilities and, therefore, potentially saving not only theirs but also other people's lives, the project teaches them leadership skills. These additional, newly gained skills have a positive impact on the teenage girls' and women's confidence and, in some cases, encourage them to attend university and start professional careers (The New Humanitarian, 2016^[83]).

Source: Hunter et al. (2015^[31]), *Swimming and Gendered Vulnerabilities: Evidence from the Northern and Central Philippines*, <https://doi.org/10.1080/08941920.2015.1046097>; I Can Swim Can You (n.d.^[82]), *I Can Swim Can You: Overview*, <http://www.icanswimcanyou.com/index.asp?lang=en>; The New Humanitarian (2016^[83]), *Why Teaching Women to Swim Helps Children, Too*, <https://deeply.thenewhumanitarian.org/womenandgirls/community/2016/07/12/malalas-birthday-wish-education-for-every-girl>.

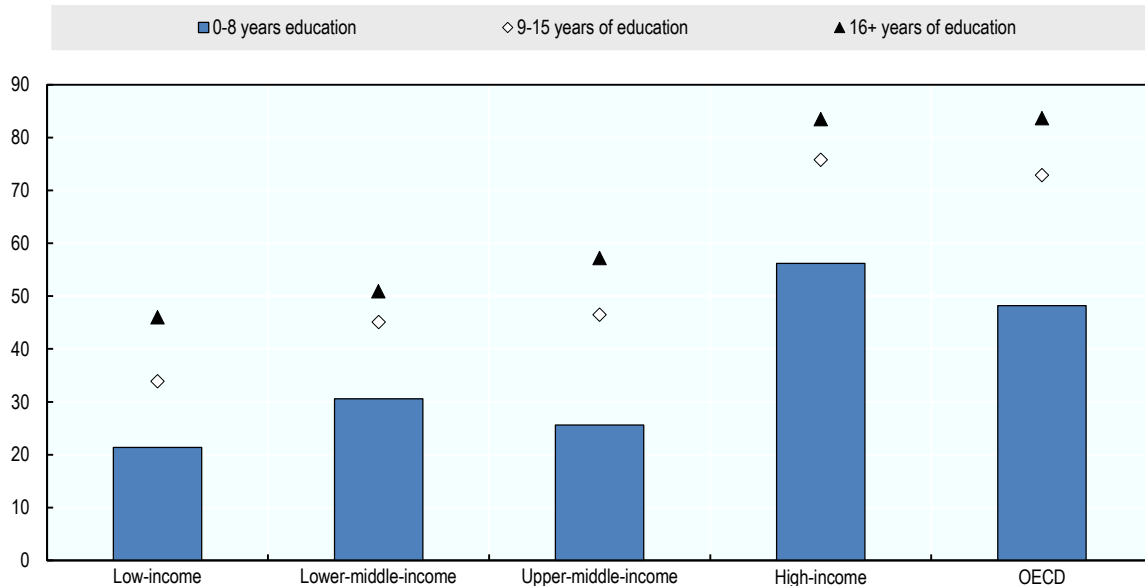
Disparities by level of educational attainment

27. The ability to swim without assistance and the risk of drowning differ by level of educational attainment. Figure 4.5 shows that, irrespective of level of economic development, individuals who attended school for longer are more likely to report being able to swim without assistance than individuals who attended school for fewer years. In low-income countries, for example, among people with a maximum of 8 years of education, on average 21% report being able to swim. This share is 34% among those who attended between 9 and 15 years of education, while among those with more than 16 years of education, 46% report being able to swim without assistance. In contrast, in high-income countries, among people with a maximum of 8 years of education, on average 59% report being able to swim while this share is 76% and 84% among those who attend between 9 and 15 years of education and those with more than 16 years of education, respectively.

28. For a specific educational level, the proportion of proficient swimmers increases with level of economic development. For example, among those with more than 16 years of education, 46% report being able to swim in low-income countries, 51% in lower-middle-countries, 57% in upper-middle countries and 84% in high-income and OECD countries, respectively. The only exception are people with 0-8 years of education in upper-middle-income countries who report a slightly lower swimming ability compared to the same educational group in lower-middle-income countries.

Figure 4.5. Swimming ability, by education and country income group (2019)

Percentage of the population aged 25 and older who report being able to swim without assistance by country income group and by years of education



Source: Adapted from World Bank (2022^[33]), World Bank Current Classification by Income (database), <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>; World Risk Poll (2019^[34]), The Lloyd's Register Foundation World Risk Poll Report 2019, <https://wrp.lfoundation.org.uk/>.

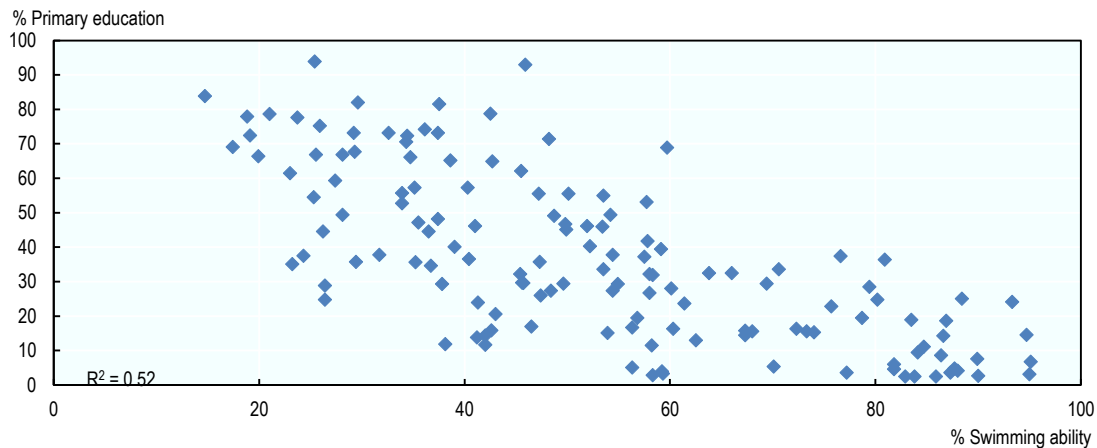
29. The positive association between educational attainment and the ability to swim was identified in previous studies. For example, a study conducted among adolescents aged 13 to 18 years in Washington State, United States, found that among students with mothers who had achieved more than an upper-secondary school degree 75% participated in swimming lessons, compared to 44% of those with mothers who completed, at most, an upper-secondary degree (Sakamoto et al., 2020^[84]). Similarly, previous empirical evidence suggests that swimming proficiency is lower among students residing in low socio-economic status areas (Willcox-Pidgeon, Peden and Scarr, 2020^[85]) and among students attending low-decile socio-economic status schools (Moran, 2008^[26]). Interestingly, differences in swimming proficiency among individuals with a different socio-economic background also exist in countries where swimming lessons are a mandatory part of the school curriculum (Pilgaard et al., 2020^[86]). The association between swimming ability and socio-economic background mirrors evidence found for the association between socio-economic background and general physical activity (Bann et al., 2019^[87]; Graf and Cecchini, 2019^[88]) and academic skills (Aikens and Barbarin, 2008^[89]; Broer, Bai and Fonseca, 2019^[90]). Underlying reasons for socio-economic disparities in physical activity in general and swimming more specifically could be that disadvantaged students tend to live in neighbourhoods with poorer general physical design and lower proximity to sports facilities (van Lenthe, Brug and Mackenbach, 2005^[32]). Furthermore, socio-economically advantaged individuals may have been socialised to hold more positive attitudes towards physical activity (Seabra et al., 2013^[91]), or lack of financial resources to participate in facilities which require an entrance fee, such as swimming pools (Dagkas and Stathi, 2007^[92]).

30. The positive individual level association between years of education completed and swimming ability illustrated in Figure 4.5 is also mirrored by a country-level correlation between the share of individuals in a country who completed, at most, primary school and the percentage of individuals who report being able to swim without assistance. Figure 4.6 shows a strong negative association between the percentage of individuals in a country who obtained, at most, primary education and the percentage of

people who are able to swim without assistance. In other words, the higher the share of people with only basic educational qualifications, the lower is the average swimming ability in a given country.

Figure 4.6. Country level association between educational level and swimming ability (2019)

Correlation between the percentage of the adult population who obtained at most primary school and the percentage of the population who reports being able to swim without assistance



Note: The figure shows the correlation between the share of completed primary educated (y-axis) and the percentage of people who are able to swim without assistance (x-axis). While Belarus and Russia are not among the data points shown in this figure, their data is included in the R² calculation.

Source: Adapted from World Risk Poll (2019^[34]), The Lloyd's Register Foundation World Risk Poll Report 2019, <https://wrp.lfoundation.org.uk/>; World Bank (2022^[33]), World Bank Current Classification by Income (database), <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>.

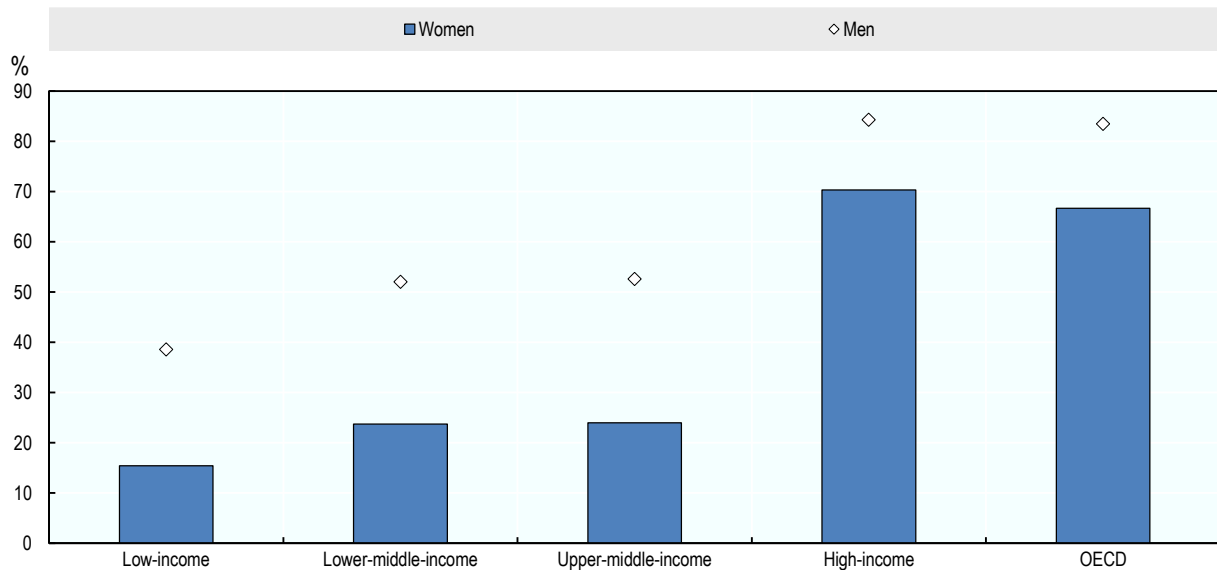
Disparities between men and women

31. Figure 4.7 shows that men are more likely to report being able to swim than women in countries of different levels of economic development. In low-income countries, 15% of women report being able to swim without assistance. This figure is 24% in lower-middle- and upper-middle-income countries, 70% in high-income countries, and 67% in OECD countries. Among men, 39% report being able to swim without assistance in low-income countries, 52% and 53% in lower-middle- and upper-middle-income countries, and 85% in high-income and OECD countries. Country specific results are available in the annex (see Annex Figure A A.1).

32. These results are consistent with prior research: empirical studies identified a gender gap in swimming ability in more well-defined settings (Berukoff and Hill, 2010^[30]; Hunter et al., 2015^[31]; McCool et al., 2008^[25]; Moran et al., 2012^[93]; Moran, 2008^[26]; Morgan, Ozanne-Smith and Triggs, 2009^[94]; Willcox-Pidgeon, Kool and Moran, 2017^[27]) and reflects the general finding that women are less likely than men to participate in physical activity (Bann et al., 2019^[87]; Graf and Cecchini, 2019^[88]; Kirby, Levin and Inchley, 2011^[95]; Luque-Casado et al., 2021^[96]; Ricardo et al., 2022^[97]; Vilhjalmsdottir and Kristjansdottir, 2003^[98]). The literature examining reasons for the gender gap in participation in physical activity highlights the key role of societal gender norms (de Looze et al., 2019^[74]; Demetriades and Esplen, 2009^[99]) that guide many parents to support sons more actively compared than girls to be physically active (Telford et al., 2016^[100]). Box 4.3 reviews some of the explicit and implicit barriers that reduce women's participation in swimming activities and what can be done to dismantle them.

Figure 4.7. Swimming ability, by gender and country income group (2019)

Percentage of male and female respondents aged 15 and older who reported being able to swim without assistance



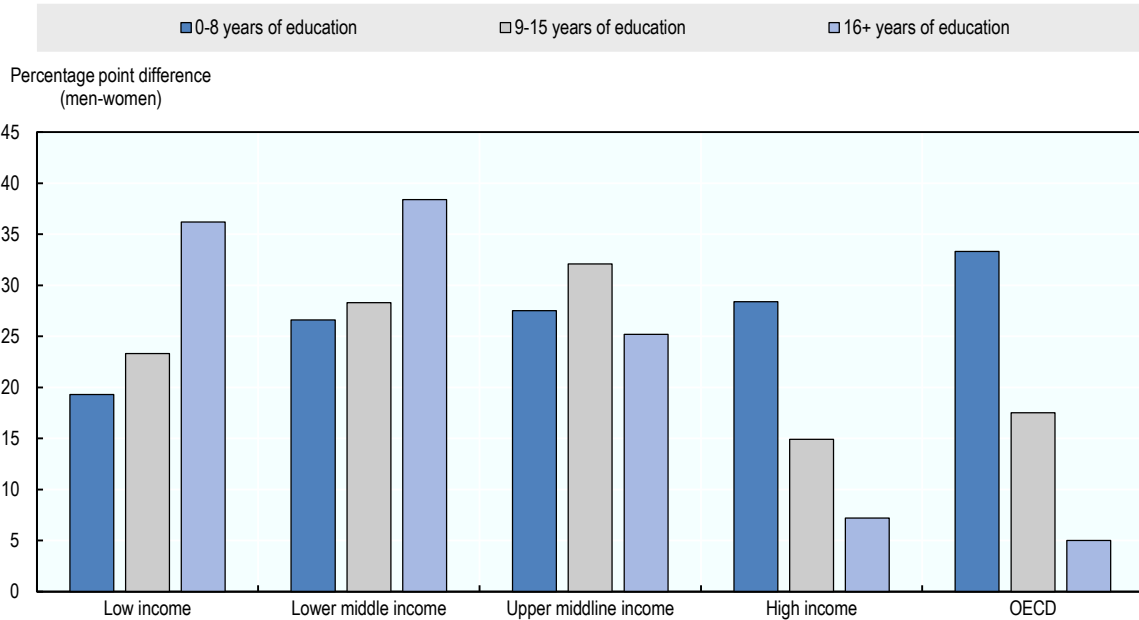
Note: The figure shows the percentage of women (bars) and men (markers) within one country income group who reported being able to swim without assistance.

Source: Adapted from World Bank (2022^[33]), World Bank Current Classification by Income (database), <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>; World Risk Poll (2019^[34]), The Lloyd's Register Foundation World Risk Poll Report 2019, <https://wrp.lrfoundation.org.uk/>.

33. Men are more likely to report being able to swim without assistance across age groups and educational levels. Figure 4.8 shows differences in self-reported swimming ability among men and women with a different level of educational attainment. Across all educational levels, men are more likely to report being able to swim than women. Interestingly, in low- and lower-middle-income countries, the gender gap is widest among the most well-educated while in high-income and OECD countries, gender differences are smallest among the most well-educated. In low-income countries, for example, the data suggests that among those with a maximum of eight years of education, men are 18 percentage points more likely to be able to swim, while this difference increases to 36 percentage points among those with more than 16 years of education. In high-income countries, however, the gender gap in swimming amounts to 28 percentage points among those with a maximum of 8 years of education but 7 percentage points among those with more than 16 years of education. These differences could reflect the fact that in low- and lower-middle-income countries, virtually no one with few qualifications knows how to swim, irrespective of their gender and therefore only among the well-educated gender gaps become apparent. By contrast, when access to swimming is more prevalent in a country, the economic empowerment and cultural capital that result from education could be factors that help women narrow the participation gap. Results for high-income countries could also reflect cohort effects and long-term trends in gender differences in educational participation.

Figure 4.8. Swimming ability, by gender, education, and country income group (2019)

Percentage point difference between male and female respondents' reports of their ability to swim without assistance, by educational level and country income group



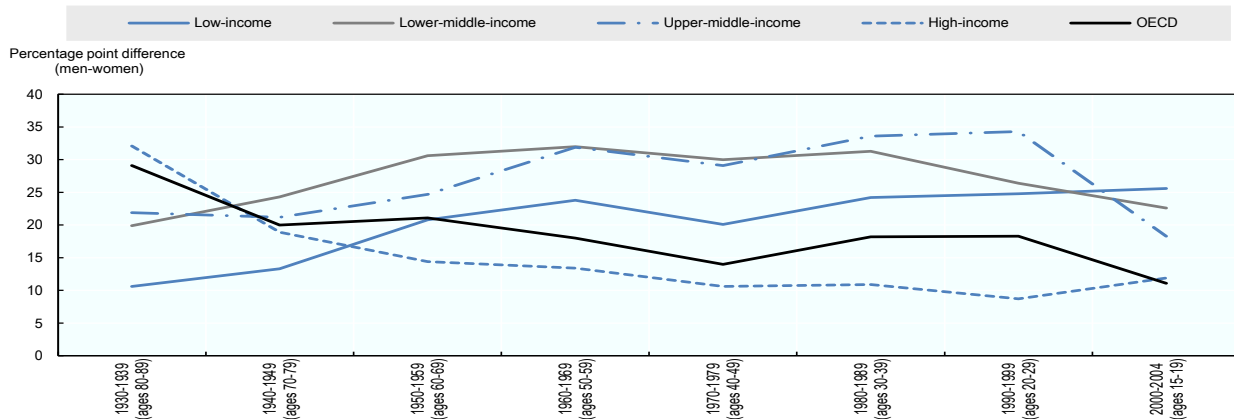
Note: The figure shows the percentage point difference between men's and women's within one country income group which report being able to swim without assistance by educational level of the population aged 25 and older.

Source: Adapted from World Bank (2022^[33]), World Bank Current Classification by Income (database), <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>; World Risk Poll (2019^[34]), The Lloyd's Register Foundation World Risk Poll Report 2019, <https://wrp.lfoundation.org.uk/>.

34. Figure 4.9 illustrates gender differences in self-reported swimming ability by birth cohort. For high-income countries, the figure shows that gender differences in self-reported swimming ability are smaller among younger individuals. In high-income countries, among individuals who were born between 1940 and 1949, men were around 19 percentage points more likely to report being able to swim without assistance than women. By contrast, among the youngest birth cohort – individuals born between 2000 and 2004 –, young men were 12 percentage points more likely than young women to report being able to swim without assistance. By contrast, among low-income, lower-middle-income, and upper-middle-income countries no such difference can be identified.

Figure 4.9. Swimming ability, by gender, birth cohort, and country income group (2019)

Percentage point difference between male and female respondents' self-reported ability to swim, by birth cohort and country income group



Note: The figure illustrates the percentage point difference between men's and women's self-reported ability to swim without assistance.

Source: Adapted from World Bank (2022^[33]), World Bank Current Classification by Income (database), <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>; World Risk Poll (2019^[34]), The Lloyd's Register Foundation World Risk Poll Report 2019, <https://wrp.lrfoundation.org.uk/>.

Box 4.3. No one should be left behind: Initiatives towards more equity in swimming ability

Several reasons could explain why women are less likely to report being able to swim than men. These include, among others, cultural and religious norms, lower levels of engagement in physical activity in general, fear of judgement, and struggles with one's body image. Because lack of engagement is potentially due to a variety of factors, the relative importance of which could vary depending on context, tackling the gender gap in swimming requires action at multiple levels and needs to be adapted to local context and circumstances. Normalising the use of a diverse range of swimwear so that girls and women feel comfortable going in water no matter their body shape and willingness to show their body in social situations is important. And so is educating girls and women about swimming while menstruating, so that they feel comfortable going in water at any stage of their cycle. It is also important to raise awareness among boys and men, by teaching them about the detrimental impact the male gaze has on women and by reducing the general stigma attached to periods, for instance (Benshaul-Tolonen et al., 2020^[101]; Mahon, Tripathy and Singh, 2015^[102]; UNESCO, 2018^[103]). Yet, information campaigns and advocacy efforts in these directions mainly tackle the symptoms but not the societal roots of why many girls and women do not swim. The many disadvantages and restrictions girls face worldwide are deeply engrained in our cultures and societies. Therefore, structural changes are required to eliminate the gender disparity of swimming abilities.

Around the world, there have been numerous initiatives, some at the national and others at a local level, to draw attention to the fact that many women do not learn how to swim or do not feel comfortable in water and so lose confidence in their swimming ability or lose proficiency over time.

Body image and menstruation

A negative image of one's body is something that many young people, especially women, struggle with. According to the Health Behaviour in School-Aged Children survey conducted by the World Health Organisation (WHO) in 2018, 24% of 11-year-old girls, 33% of 13-year-old girls and 36% of 15-year-old girls perceived themselves to be overweight whereas among boys these figures were 21%, 23% and 22% respectively. This is in line with other studies that suggest that girls are more likely to be dissatisfied with the way their body looks (Berukoff and Hill, 2010^[30]; VicHealth, 2004^[104]). Girls are also more likely to experience and suffer from external pressures coming from media but also family and peers (Berukoff and Hill, 2010^[30]; Fox, 2007^[105]). Therefore,

girls tend to not only struggle with their own body image insecurities but usually also face judgement from their surroundings. Often, people who are dissatisfied with the way their body looks are less inclined to participate in physical activity, as some studies suggest (Andrew, Tiggemann and Clark, 2016^[106]; Kopcakova et al., 2014^[107]; Mental Health Foundation, 2019^[108]). The fear of being judged for the way one looks or moves discourages many girls to engage in sports.

For this reason, in England, (United Kingdom), Sport England started the national “This Girl Can” (TGC) campaign in 2015 (Sport England, 2021^[109]). The campaign involved screening clips of women of different ages, body types, and socio-economic backgrounds exercising and engaging in various physical activities on national television, cinemas, YouTube, and different online media platforms. The aim was to create positive role models for women and help them realise that, no matter their situation, women can and do exercise. When seeing women similar to them – with similar body types, age groups, or socio-economic status –, women can realise that, like the women in the videos, they can engage in physical activities, too. Since starting the campaign, TGC has gathered a large female following on social media and attracted different partners that now provide more opportunities for women to become physically active. For instance, the Gosport Leisure Centre in Gosport, Portsmouth, offers ladies-only sessions for women of all swimming abilities, where they receive tailored advice and motivational support from a female swimming instructor (The News Portsmouth, 2017^[110]). Overall, there is strong evidence that the TGC campaign has had a positive impact on women’s attitudes and behaviours when it comes to physical activity. The proportion of women who enjoyed exercising was higher in 2020 than in 2014, while many reported that their increase in activity was linked to the campaign (Sport England, 2021^[109]). Moreover, following the first campaign phase, 250 000 more women indicated being active at least once a week, thus, lowering the gender gap from 1.8 million in summer 2015 to 1.6 million in autumn 2016 (Sport England, 2021^[109]).

Another way to tackle body insecurity in swimming is the provision of more diverse swimwear, including gender-neutral swimwear and swimwear that covers larger if not most parts of the body for those who feel uncomfortable showing their skin or whose religion does not allow them to show much of their body. Moreover, for those whose hair does not fit into traditional swimming caps, there should be alternative models allowing for more hair. Following students’ wishes to show less skin and wanting to ensure that children do not feel uncomfortable during swimming lessons because of their gender, a Tokyo-based company has designed genderless school swimwear, consisting of a long-sleeved top and knee-long pants. Several Japanese junior high schools will introduce this new gender-neutral uniform in academic years 2022 and 2023 (The Mainichi, 2022^[111]).

Finally, girls’ concerns regarding swimming while being on their period should be taken seriously and addressed appropriately. While allowances should be made to allow girls to skip swimming lessons during their period in case they felt uncomfortable going in water, opportunities should be developed to help girls catch up on missed lessons, so that they are not deprived of swimming skills development opportunities. In York Community High School in Illinois, United States, for instance, girls can sit out swimming lessons for up to three days and still earn full points by walking leaps instead. Girls have the possibility to take additional days off; however, then they need to catch up on the missed swimming lessons (This Is York, 2017^[112]).

However, girls should also be provided adequate information so that misconceptions around swimming while menstruating does not prevent those who would want to take part in swimming activities to do so if only there was less stigma and adequate information about how swimming while menstruating is not only possible but can be beneficial to reduce the pain some girls and women experience. Education systems are currently failing to reduce the stigma attached to female hygiene and are not equipping children and their caretakers with the important information that swimming while menstruating is neither unhygienic, nor does it increase the risks of getting an infection, nor, when swimming in the ocean, of attracting sharks (a Google © search for ‘Will a shark attack me if I’m on my period’ yields over 3 million results; and a search for ‘Can shark smell period blood’ over 4 million results).

In many parts of the world, access to menstrual products is limited and not affordable for everyone. It is necessary to remove these accessibility barriers and provide proper hygiene education. Girls and their caretakers should be made aware that using tampons or menstrual cups allows them to swim without the risk of leaking, that they should simply change their tampons regularly, and that using dark swimwear reduces the risk of any small spots that may occur being noticed by others (Cosmopolitan, 2021^[113]; Penn Medicine, 2016^[114]). In fact, when considering hygiene in controlled environments like swimming pools, threats are much more likely to come from people not showering before entering the pool and urinating in water. A study conducted in Italy

indicated that over 1 in 10 swimmers reported having urinated in water, and men were considerably more likely to report having urinated in a swimming pool than women (Pasquarella et al., 2014_[115]).

Religion and cultural norms

In some cultures, due to religious beliefs, it is not considered appropriate for women to show certain parts of their body in public or swim together with men, which makes it more difficult for girls to learn how to swim than for boys. Some measures to reduce these barriers for women include women-only swimming hours or culturally appropriate swimwear.

Although swimming pool operators in Sweden had already introduced separate swimming hours by gender in the late 1990s, this concept has been much more widely implemented with the rise in migration. By offering female-only swimming hours, swimming pool operators enable women, who, due to religious beliefs, would not be allowed to swim with men, to take swimming lessons and develop their swimming skills (Daily Mail, 2016_[116]). While a nation-wide debate emerged whether female-only swimming hours constitute a discrimination against men, the Swedish Equality Ombudsman found that only in rare cases the Swedish anti-discrimination law should allow for separate swimming hours by gender. However, according to the Ombudsman, helping women who, otherwise, would not be able to learn how to swim constitutes a justified purpose for offering female-only swimming hours (Library of Congress, 2017_[117]).

Despite being surrounded by the sea, most girls in Zanzibar, Tanzania, never learn how to swim because of their religious beliefs and the absence of culturally appropriate swimwear. The NGO Panje Project teaches schoolchildren survival swimming and offers safe rescue skills piloted programmes. To ensure that girls can participate without disrespecting their religious beliefs, the project has begun to provide the girls with burkinis – full-length swimsuits – and to organise girls-only classes with female instructors. Moreover, girls who participated in the programmes are encouraged to teach others – whereby they create a sustainable teaching cycle (National Geographic, 2017_[118]).

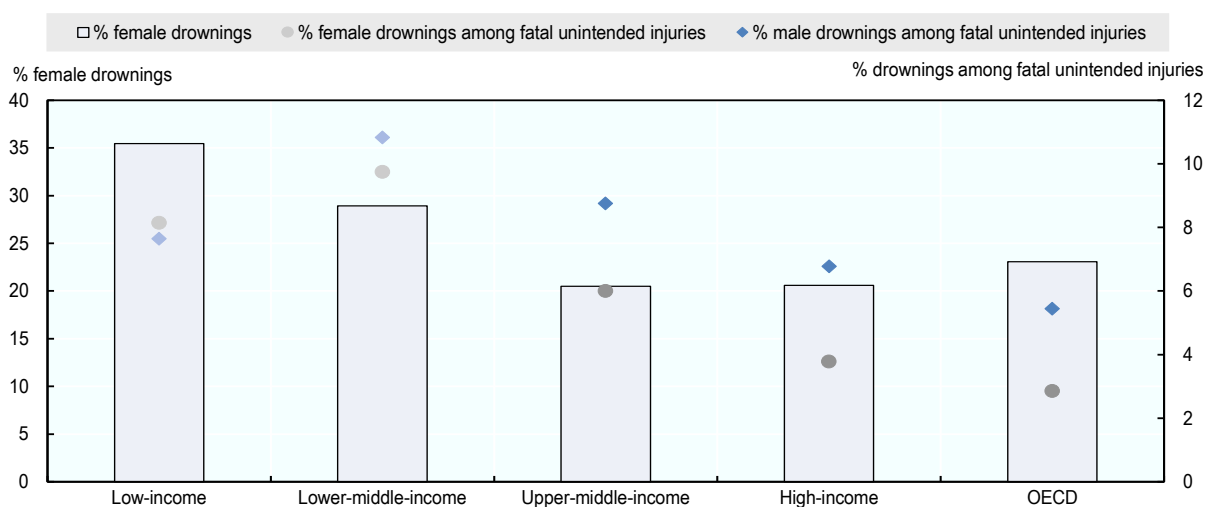
Source: Andrew, Tiggemann and Clark (2016_[106]), Predictors and health-related outcomes of positive body image in adolescent girls: A prospective study, <https://doi.org/10.1037/dev0000095>; Benshaul-Tolonen et al. (2020_[101]), Period teasing, stigma and knowledge: A survey of adolescent boys and girls in Northern Tanzania, <https://doi.org/10.1371/journal.pone.0239914>; Berukoff and Hill (2010_[30]), A Study of Factors That Influence the Swimming Performance of Hispanic High School Students, <https://doi.org/10.25035/ijare.04.04.07>; Cosmopolitan (2021_[113]), Everything you need to know about whether you can go swimming on your period, <https://www.cosmopolitan.com/uk/body/health/a12053820/is-it-safe-to-swim-on-period/>; Daily Mail (2016_[116]), Swedish swimming pools introduce women-only sessions to accommodate rising number of Muslim population, <https://www.dailymail.co.uk/news/article-3617465/Swedish-swimming-pools-introduce-women-sessions-accommodate-rising-number-Muslim-population.html>; Fox (2007_[105]), Mirror, mirror: A summary of research findings on body image, <http://www.sirc.org/publik/mirror.html>; Költő et al. (2020_[119]), The Irish Health Behaviour in School-aged Children (HBSC) Study 2018, Mental Health Foundation (2019_[108]), Body image in childhood, <https://www.mentalhealth.org.uk/explore-mental-health/articles/body-image-report-executive-summary/body-image-childhood>; National Geographic (2017_[118]), On 'Burkini Island' Muslim Girls Can Finally Learn to Swim, <https://www.nationalgeographic.com/photography/article/burkini-swimming-zanzibar-girls-boyiazis>; Pasquarella et al. (2014_[115]), What about behaviours in swimming pools? Results of an Italian multicentre study, <https://doi.org/10.1016/j.microc.2013.09.024>; Penn Medicine (2016_[114]), Women's Health Blog - Swimming and Your Period: Gross or Go For It?, <https://www.pennmedicine.org/updates/blogs/womens-health/2016/june/swimming-and-your-period-5-myths-debunked>; Sport England (2021_[109]), This Girl Can: Campaign Summary, https://sportengland-production-files.s3.eu-west-2.amazonaws.com/s3fs-public/2022-05/TGC%20Campaign%20summary%202021_0.pdf?VersionId=8j5WaQWxjRZy95JkiyT8s_8efCG.8IIE; The Mainichi (2022_[111]), Tokyo company sells genderless school swimwear, reflecting student concerns, <https://mainichi.jp/english/articles/20220613/p2a/00m/0li/009000c>; The News Portsmouth (2017_[110]), Gosport instructor is encouraging women to learn to swim, <https://www.portsmouth.co.uk/news/gosport-instructor-encouraging-women-learn-swim-1080498>; This Is York (2017_[112]), Swim policy for girls: unjust or reasonable?, <https://thisisyork.org/13708/opinions/swim-policy-for-girls-unjust-or-reasonable/>; UNESCO (2018_[103]), International technical guidance on sexuality education: An evidence-informed approach (Revised edition), <https://www.unfpa.org/sites/default/files/pub-pdf/ITGSE.pdf>; VicHealth (2004_[104]), Parliamentary Inquiry into issues relating to the development of body image among young people and associated effects on their health and wellbeing, <https://www.vichealth.vic.gov.au/~media/programsandprojects/healthyeating/healthyeatingadvocacy/vichealth%20body%20image%20response.ashx>.

35. The gender gap in drowning deaths is reversed: Figure 4.10 shows that men are more likely to be drowning victims than women globally and the gender gap appears to be most pronounced in high-income countries where drowning incidents are comparatively less prevalent. In 2019, for every 100 drowning

victims registered in low-income countries, 65 were men. In lower-middle-income and upper-middle-income countries these figures were 71 and 80. In high-income and OECD countries they were 79 and 77. The finding of higher drownings among men across countries of different income groups is also consistent with the literature that analyses different data sources (Bessereau et al., 2015^[52]; Donson and Van Niekerk, 2012^[120]; Kiakalayeh et al., 2008^[121]; Langley et al., 2001^[122]). Crucially, women and children are more likely to be among victims in drowning incidents during flooding events (see Box 4.4).

Figure 4.10. Percentage of drownings, by gender and country income group (2019)

Share of female drownings among all drownings, share of female drownings among all female victims of fatal unintended injuries, share of male drownings among all male victims of fatal unintended injuries



Note: Figure shows the share of female drownings among all drownings on the left y-axis (bars), and share of female (male) drownings among all fatal unintended injuries of females (males) on the right y-axis (markers). Markers in light colours denote that differences in the percentage of male and female drownings among fatal unintended injuries do not significantly differ at the 5% significance level.

Source: Adapted from WHO (2020^[47]), Global Health Estimates 2019: Deaths by Cause, Age, Sex, by Country and by Region, 2000-2019 (database), <https://www.who.int/data/global-health-estimates>; World Bank (2022^[33]), World Bank Current Classification by Income (database), <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>.

36. Men are not only more likely than women to drown. They are also more likely to be involved in unintentional fatal injuries than women. However, the higher incidence of drowning among men does not simply reflect their higher likelihood of dying in fatal unintended events: men have higher rates of drowning deaths over unintended fatal injuries than women in almost all country income groups. For example, the percentage of male drownings among fatal unintended injuries in lower-middle-income countries is 11%, a difference that is not significant at the 5 percent significance level. Among women this figure is 10%. In high-income and OECD countries the percentage of drownings among fatal unintended injuries among men is 7% and 5% and among women it is 4% and 3%, respectively. Among unintentional injuries, higher absolute mortality rates among men are not only found for the cause of drowning but also for road injuries (González-Sánchez et al., 2018^[123]; Mannocci et al., 2018^[124]). However, when mortality rates due to road fatal injuries are weighted by hours travelled, González-Sánchez (2018^[123]) find that women suffer higher traffic fatal injuries than men. Driving is another important life skill in modern economies in which women do not enjoy parity with men. In some countries women are not free to drive when, where and with whom they choose. In most countries, when a man and a woman share a ride, the man is the one behind the wheel. Whether formally or informally, women's ability to drive is curtailed by lack of access to driving or lack of access to driving practice.

Box 4.4. Women are at higher risk of drowning in natural water-related disasters: Evidence from South and Southeast Asia

While there is consistent evidence that on average men are more likely to drown than women globally, the distribution of drowning victims appears to be different when drownings that occur in natural disasters, such as cyclones, tsunamis, or flooding, are considered. In the 1991 cyclone disasters in Bangladesh, for example, women and children accounted for about 90% of the victims (Schmuck, 2002^[125]). Women and children were also more likely to die than men in the 2004 tsunamis in South and Southeast Asia (Hunter et al., 2015^[31]; Oxfam, 2005^[126]). For instance, the Indian city Cuddalore recorded two and a half times more female victims (391) than male victims (146), while in Pachaankuppam village in India all drowning victims were female (Oxfam, 2005^[126]). A recent study analysed how an inequality-adjusted human development index (IHDI), which is the Human Development Index (HDI) of the average person in a country, relates to flood fatalities in India, using data from 1983 to 2013. While the sample mean results suggest a decrease in the number of drowning victims with an increase in IHDI, the association appears to be less pronounced among women than men, suggesting that human development translates less easily into lower fatalities among women (Roy Chowdhury, Parida and Agarwal Goel, 2021^[127]).

A number of reasons could explain why women in some low-income countries are more likely to die in the event of a natural water-related disaster compared to men. On one hand, the share of women who are able to swim or climb trees, both of which are useful competencies to have when the water level rises, is lower than men's (Cannon, 2002^[128]; Hunter et al., 2015^[31]; Oxfam, 2005^[126]). Moreover, women tend to face several mobility barriers. They usually feel responsible for taking care of the children and the elderly; therefore, they are more likely to stay behind and try to help them instead of prioritising their own safety first (Alam and Collins, 2010^[129]; Cannon, 2002^[128]; Hunter et al., 2015^[31]; Oxfam, 2005^[126]). Clothing (e.g. sarees in Bangladesh) and long hair are further obstacles that restrict women from moving freely in water (Alam and Collins, 2010^[129]). In Bangladesh, the stigma attached to women leaving their house and moving in public leaves many women paralysed of fear of shame when they should be seeking shelter (Cannon, 2002^[128]).

However, it is crucial to note that women are also more likely to be directly exposed to the dangers that come with natural disasters. On the one hand, poverty is one of the main factors contributing to drowning vulnerability in natural disasters. As women are more likely to live in poverty than men are, they are more exposed to the risks of such disasters (Azad, Hossain and Nasreen, 2013^[130]; Cannon, 2002^[128]). Moreover, the kind of jobs that women do also influence their vulnerability. For instance, in rural India, many women participate in outdoor farming activities, whereas, in Vietnam, many women in flood-prone areas commute and trade on boats, both of which are related to higher risk exposure in the event of flooding (Oxfam, 2012^[131]; Padmanaban, 2021^[132]). Furthermore, due to patriarchy, women tend to have limited possibilities to participate in decision-making, which includes emergency planning and action. Women are also less likely to be informed about weather warnings and strategies in what to do in the event of flooding (Alam and Collins, 2010^[129]; De Silva and Jayathilaka, 2014^[133]; Oxfam, 2012^[131]; Padmanaban, 2021^[132]; Roy Chowdhury, Parida and Agarwal Goel, 2021^[127]). Roy Chowdhury, Parida, and Agarwal Goel (2021^[127]) illustrate the importance of including women in decision-making. In their study on how IHDI relates to the number of flooding fatalities, they argue that the success of India's state Kerala in lowering the number of female flooding deaths can be attributed to the policies that aimed at empowering women. However, it is necessary to change the perception of women as "vulnerable victims" as this might further exclude them from decision-making processes (Dang, 2022^[134]; Oxfam, 2005^[126]).

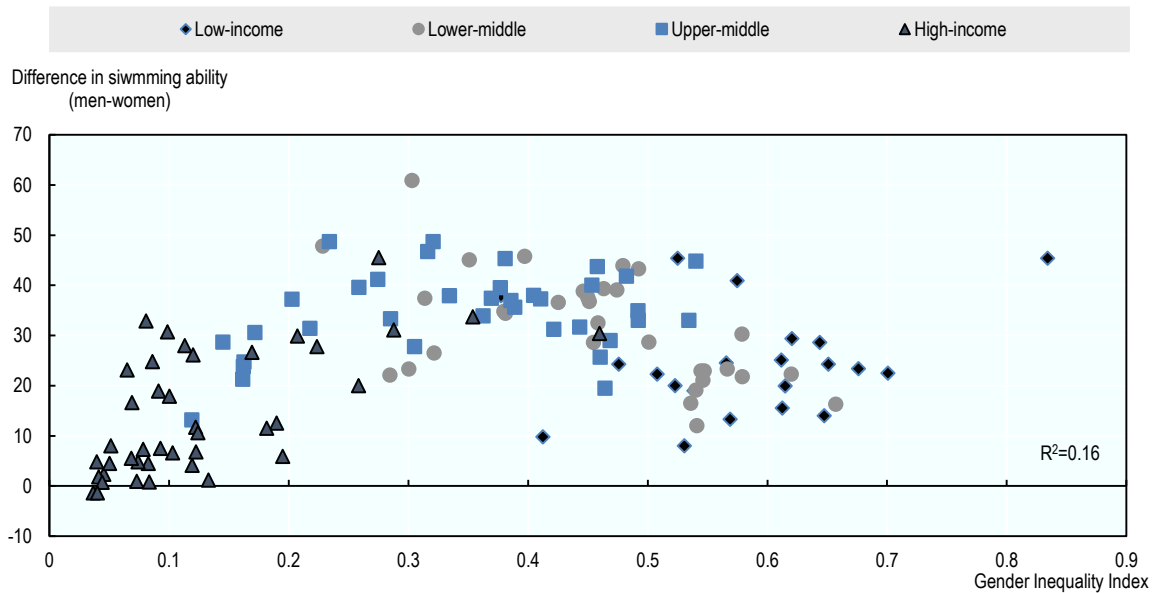
Source: Alam and Collins (2010_[129]), Cyclone disaster vulnerability and response experiences in coastal Bangladesh, <https://doi.org/10.1111/j.1467-7717.2010.01176.x>; Azad, Hossain and Nasreen (2013_[130]), Flood-induced vulnerabilities and problems encountered by women in northern Bangladesh, <https://doi.org/10.1007/s13753-013-0020-z>; Cannon (2002_[128]), Gender and climate hazards in Bangladesh, <https://doi.org/10.1080/13552070215906>; Dang (2022_[134]), Patterns of Vulnerability Among Women in Urban Flooding in Can Tho City, Vietnam, <https://doi.org/10.5539/ass.v18n3p27>; De Silva and Jayathilaka (2014_[133]), Gender in the context of Disaster Risk Reduction: A Case Study of a Flood Risk Reduction Project in the Gampaha District in Sri Lanka, [https://doi.org/10.1016/s2212-5671\(14\)01013-2](https://doi.org/10.1016/s2212-5671(14)01013-2); Hunter et al. (2015_[31]), Swimming and Gendered Vulnerabilities: Evidence from the Northern and Central Philippines, <https://doi.org/10.1080/08941920.2015.1046097>; Oxfam (2012_[131]), Flood Preparedness in Viet Nam: A systematic gender-aware approach, <https://policy-practice.oxfam.org/resources/flood-preparedness-in-viet-nam-a-systematic-gender-aware-approach-247211/>; Oxfam (2005_[126]), The tsunami's impact on women, <https://oxfamlibrary.openrepository.com/bitstream/handle/10546/115038/bn-tsunami-impact-on-women-250305-en.pdf>; Padmanaban (2021_[132]), Why Are Women More Vulnerable to Flooding in India?, <https://doi.org/10.1029/2021eo157781>; Roy Chowdhury, Parida and Agarwal Goel (2021_[127]), Does inequality-adjusted human development reduce the impact of natural disasters? A gendered perspective, <https://doi.org/10.1016/j.worlddev.2021.105394>; Schmuck (2002_[125]), Empowering women in Bangladesh, <https://reliefweb.int/report/bangladesh/empowering-women-bangladesh>.

37. Previous results suggest that men are more likely than women to report being able to swim without assistance and estimated drowning deaths are higher among men than women. At first glance, these results might appear to be counterintuitive, as it seems obvious to associate the ability to swim with the ability to protect oneself from drowning in water situations. However, this contradictory picture can be reconciled when considering the range of possibilities that individuals may engage in when they are able to swim because they are less likely to fear drowning. On the one hand, swimming competence has a preventive function and can protect from drowning. On the other, swimming competence provides the opportunity to be near water during leisure time or at work (e.g. fishery), which is associated with an increased exposure to water and risky situations. In fact, studies report evidence that drowning victims are not necessarily non-swimmers (Brenner, Saluja and Smith, 2003_[135]). For example, statistics provided by the Canadian Red Cross (2020_[136]) reveal that between 2011 and 2014, swimming victims were on average 12% strong and 14% average/intermediate swimmers. That means 1 out of 4 people who drowned had sufficient swimming skills.

38. Figure 4.11 highlights the country level association between the gender gap in swimming ability and the extent to which women lag behind men in labour market opportunities, active political representation, educational attainment and health. Results identify an inverted U shape association between the gender gap in swimming ability and broader gender inequalities. At low levels of gender inequality, the gender gap in swimming ability in favour of men is larger in countries where broader gender inequalities are more pronounced. However, at comparatively higher levels of gender inequality, the gender gap in favour of men in swimming ability is smaller in countries where broader gender inequalities are more pronounced. This can be explained by the fact that the vast majority of countries with very low levels of societal level gender equality are low-income countries in which very few men and women report being able to swim.

Figure 4.11. Country level association between the gender gap in swimming ability and broader societal level gender inequality

Correlation between the percentage point difference between men and women who are able to swim and the Gender Inequality Index



Note: The figure shows the correlation between the percentage point difference in swimming ability between men and women (y-axis) and the Gender inequality index (x-axis). While Belarus and Russia are not among the data points shown in this figure, their data is included in the R^2 calculation. Different markers indicate income country groups.

Source: Adapted from World Bank (2022^[33]), World Bank Current Classification by Income (database), <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>; World Risk Poll (2019^[34]), The Lloyd's Register Foundation World Risk Poll Report 2019, <https://wrp.lfoundation.org.uk/>; United Nations Development Programme (UNDP) (2019^[137]), Human development data, <http://hdr.undp.org/en/data/>.

39. While this section focused on age disparities, disparities by level of educational attainment, and disparities between men and women, it should be mentioned that the literature also suggests that ethnic minorities and migrant populations in both low- and high-income countries are at higher risk of drowning (see Box 4.5).

Box 4.5. Differences in swimming ability among ethnic minorities and immigrant populations: Australia's multicultural communities as a case study

The Lloyd's World Risk Poll does not contain information on ethnic or migration backgrounds. However, the literature suggests that ethnic minorities and migrant populations in both low- and high-income countries are at higher risk of drowning (Australian Water Safety Council, 2021^[138]; WHO, 2014^[50]; Willcox-Pidgeon et al., 2020^[139]). For instance, in the United States, Black, Hispanic, and Latino populations record the highest drowning rates (Felton et al., 2015^[140]; Gilchrist and Parker, 2014^[141]), while, in Australia and Canada, Aboriginal and Torres Strait Islander peoples and Aboriginal people, respectively, disproportionately fall victim to drowning incidences (Australian Water Safety Council, 2021^[138]; Giles et al., 2014^[142]). Differences in swimming ability, experience in water, as well as knowledge of beach safety practices and learning opportunities are some of the reasons for the over-representation of ethnic minority groups and immigrants in drowning statistics. However, it is

important to acknowledge the more pervasive underlying issues, such as different education levels and socio-economic statuses as well as cultural and religious factors (Clifford et al., 2018^[143]; WHO, 2014^[50]; Willcox-Pidgeon et al., 2020^[139]).

Australia has one of the lowest drowning rates per capita in the world (Franklin et al., 2020^[48]). However, the Aboriginal and Torres Strait Islander peoples as well as regional and remote communities and multicultural communities are identified as being at higher risk of drowning. Multicultural communities include migrants, international students, and overseas visitors (Australian Water Safety Council, 2021^[138]). While the general perception of Australians is an over-representation of migrants in Australian drowning statistics, Willcox-Pidgeon et al. (2021^[144]) find that this is only true for certain sub-populations and that differences exist in length of stay, location, and activity before drowning. For instance, while those born in Australia were more likely to drown while being on a boat or diving in rivers or ocean locations, overseas-born residents and tourists were more likely to drown while swimming or rock fishing at beaches and near rocks (Willcox-Pidgeon et al., 2021^[144]). Long-term residents would usually be aged 55 or above, come from an English-speaking country, and drown in rivers, whereas more recent-term residents were more likely to be rather young, come from a non-English-speaking country, and drown at the beach (Willcox-Pidgeon et al., 2021^[144]).

From 2009/10 to 2018/19, Australia recorded 899 overseas-born resident and overseas tourist drowning deaths – on average, 73 overseas-born resident deaths and 17 overseas tourist deaths per year (Australian Water Safety Council, 2021^[138]). According to a ten-year-long national study on overseas-born drowning deaths in Australia (2005/06 to 2014/15), foreign-born migrants and tourists made up for 27% of total drowning fatalities, whereas the crude rate was 1.15 per 100 000 overseas-born residents and tourists in Australia (Royal Life Saving Australia, 2018^[145]). The highest numbers of drownings concerned people from China (10%), New Zealand (6%), and England (United Kingdom) (6%), while Chinese Taipei, South Korea, and Ireland had the highest crude rates (3.94 per 100 000 people in Chinese Taipei, 3.72 per 100 000 South Koreans, and 3.16 per 100 000 Irish people) (Royal Life Saving Australia, 2018^[145]).

Reasons for overseas-born drowning deaths are many and vary by circumstances. Poor swimming abilities (Drozdowski et al., 2015^[146]; Williamson et al., 2012^[147]), limited understanding of water safety in general and, more specifically, in the Australian context (Ballantyne, Carr and Hughes, 2005^[148]; Clifford et al., 2018^[143]; Moran and Ferner, 2016^[149]), and inattention and increased risk-behaviour when on vacation or exchange semester (e.g. alcohol and illegal drug consumption or participation in aquatic activities without being fully aware of the risks) (Clifford et al., 2018^[143]; Wilks and Pendergast, 2009^[150]; Wilks et al., 2005^[151]) are some of the more common factors that contribute to drowning fatalities of overseas-born residents and tourists. Moreover, many of Australia's beaches do not have lifeguards or volunteer surf lifesaving services. Holiday accommodations are located all along the Australian coast, often in close proximity to unpatrolled beaches, particularly in less populated areas, this emphasises the importance of being familiar with Australian beach hazards (Clifford et al., 2018^[143]; Surf Life Saving Australia, 2021^[152]).

Despite the country's overall low drowning rates, the Australian government recognises the above-mentioned challenges and, therefore, includes a special focus on multicultural communities within its Water Safety Strategy 2030 (Australian Water Safety Council, 2021^[138]). More concretely, it plans to provide culturally appropriate swimming, water safety, and lifesaving programmes, multilingual resources, and dedicated funding streams. In addition, it mentions cultural competency programmes for aquatic industry staff and community ambassador programmes as example actions in its 2030 strategy. It also identifies key activities in different areas (research, policy, advocacy, collaboration, education, safe environments, and workforce) to achieve medium-term changes in knowledge, policy, practice, awareness, and behaviour (Australian Water Safety Council, 2021^[138]).

By collecting data and conducting research, more informed policies can be introduced. These are needed to ensure the availability of sufficient funding for tailored programmes for the diverse multicultural communities. The programmes and campaigns based on best practice guidelines aim at increasing water safety and drowning risk awareness among multicultural communities, who, ideally by 2030, will increasingly engage in safe water practices and participate in swimming and aquatic activities. Through the increased provision of tailored and culturally appropriate programmes, the Australian government hopes to reduce drowning fatalities of overseas-born residents and tourists by 50% by 2030 (Australian Water Safety Council, 2021^[138]).

Source: Australian Water Safety Council (2021^[138]), Australian Water Safety Strategy 2030, https://www.royallifesaving.com.au/_data/assets/pdf_file/0003/43275/AWS_Strategy2030_Final-for-web.pdf; Ballantyne, Carr and Hughes (2005^[148]), Between the flags: an assessment of domestic and international university students' knowledge of beach safety in Australia, <https://doi.org/10.1016/j.tourman.2004.02.016>; Clifford et al. (2018^[143]), Beach safety knowledge of visiting international study abroad students to Australia, <https://doi.org/10.1016/j.tourman.2018.06.032>; Drozdowski et al. (2015^[146]), The Experiences of Weak and Non-Swimmers Caught in Rip Currents at Australian Beaches, <https://doi.org/10.1080/00049182.2014.953735>; Felton et al. (2015^[140]), Unintentional, non-fatal drowning of children: US trends and racial/ethnic disparities, <https://doi.org/10.1136/bmjopen-2015-008444>; Franklin et al. (2020^[48]), The burden of unintentional drowning: global, regional and national estimates of mortality from the Global Burden of Disease 2017 Study, <https://doi.org/10.1136/injuryprev-2019-043484>; Gilchrist and Parker (2014^[141]), Racial/Ethnic Disparities in Fatal Unintentional Drowning Among Persons Aged ≤29 Years — United States, 1999–2010, <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6319a2.htm>; Giles et al. (2014^[142]), Drowning in the Social Determinants of Health: Understanding Policy's Role in High Rates of Drowning in Aboriginal Communities in Canada, <https://doi.org/10.5663/aps.v3i1-2.21706>; Moran and Ferner (2016^[149]), Water Safety and Aquatic Recreation among International Tourists in New Zealand, <https://doi.org/10.25035/ijare.10.01.05>; Royal Life Saving Australia (2018^[145]), A ten year national study of overseas born drowning deaths 2005/06 to 2014/15, https://www.royallifesaving.com.au/_data/assets/pdf_file/0004/37525/RLS_OverseasBorn_10YearReport_FINAL_single_page_LR.pdf; Surf Life Saving Australia (2021^[152]), National Coastal Safety Report 2021, https://issuu.com/surflifesavingaustralia/docs/ncsr_2021; WHO (2014^[50]), Global report on drowning: Preventing a leading killer, <https://apps.who.int/iris/handle/10665/143893>; Wilks and Pendergast (2009^[150]), Beach safety and millennium youth: travellers and sentinels., <https://doi.org/10.1079/9781845936013.0098>; Wilks et al. (2005^[151]), Tourists and Beach Safety in Queensland, Australia, <https://doi.org/10.3727/154427305774865796>; Willcox-Pidgeon et al. (2021^[144]), Epidemiology of unintentional fatal drowning among migrants in Australia, <https://doi.org/10.1111/1753-6405.13102>; Willcox-Pidgeon et al. (2020^[139]), Identifying a gap in drowning prevention: high-risk populations, <https://doi.org/10.1136/injuryprev-2019-043432>; Williamson et al. (2012^[147]), A comparison of attitudes and knowledge of beach safety in Australia for beachgoers, rural residents and international tourists, <https://doi.org/10.1111/j.1753-6405.2012.00888.x>.

5. Conclusions

40. Although it is important for children and young adults to learn higher order cognitive skills, it is also essential for them to acquire life skills, such as learning how to safely engage in physical exercise and use their body to go about in work and everyday life. Learning how to swim fulfils several functions: it empowers individuals to make choices, have agency, and be free to choose core aspects of their life, it allows them to participate actively in water-related activities, whether for pleasure or for work, it reduces the risk of drowning, and it has positive mental and physical health effects.

41. In many circumstances, knowing how to swim can prevent life-threatening consequences, such as drowning – a leading cause of death worldwide and the third leading cause of unintentional fatal injuries (WHO, 2017^[45]). Swimming is also an important form of physical exercise, which can have positive effects on an individual's physical and mental health. Swimming is not only a basic life skill that can save one's life and promote healthier lives, but it also allows individuals to engage safely in labour market opportunities. Those who acquire the ability to swim have the agency and freedom to take on jobs and activities near or on the water, such as fishing, aquaculture, naval engineering, marine biology, the installation and trouble-shooting of off-shore wind farms, sea/ocean conservation, and deep water installation of cables and pipes. Individuals who are able to swim can also safely use boats and vessels to cross waterways. In many developing countries, water crossings via bridges are not always available and, particularly during flooding and monsoon seasons, boats, however precarious, are the only means to be able to travel across communities. Swimming, in other words, enhances individuals' capabilities to be who they would like to be as well as to pursue the jobs they value and do what they would like to do. In this sense, swimming promotes individuals' freedom and empowerment.

42. Notwithstanding the relevance of efforts to map how well or poorly education systems worldwide are equipping individuals with key information processing skills, such as literacy and numeracy, this work makes clear that major inequalities persist even in life skills, such as the ability to swim without assistance. Such inequalities certify that the substantive freedom many groups have to engage in activities that can enhance their subjective well-being, their economic prospects, and their safety, is restricted and curtailed. When individuals do not know how to swim, their choice set is restricted. Climate change and environmental degradation may increase the welfare losses that arise because of lack of swimming ability and ability in other life skills such as cycling around the world.

43. Although the ability to swim without assistance is an important life skill, this paper indicates that major between-country and within-country between-group differences in swimming ability exist. Using data from the 2019 World Risk Poll (a module included in the Gallup World Poll) (Lloyd's Register Foundation, 2020^[21]), the paper illustrates that individuals in high income countries are considerably more likely to report being able to swim without assistance than individuals in low-income countries. In addition, even though the number of global drowning cases has decreased constantly over the past two decades, between-country differences in drowning deaths remain substantial. For example, the percentage of drowning deaths among unintentional fatal injuries almost twice as high in lower-middle-income as in high-income countries.

44. The paper also highlights striking differences within countries based on age, educational attainment and gender. In particular, the paper shows that women are less likely to be able to swim without assistance than men in virtually all countries, birth cohorts, and levels of education. For example, while in high-income countries the difference in the ability to swim between men and women is 14 percentage points, it is 28 percentage points in lower-middle-income countries. Importantly, given that gender differences in the ability to swim seem to mirror gender differences existing in key academic

information-processing skills, such as literacy and numeracy, this paper furthers the notion that education and, in particular, girls and women's education is crucial in promoting capabilities and empowerment. An important limitation of the study is that in the absence of cross-country comparable data on existing efforts in the public provision of swimming instruction and their cost, it is not possible to estimate and compare costs and benefits that arise from investments in the promotion of swimming skills worldwide with those arising from alternative investments in building other life skills or other academic and non-academic skills.

45. The paper also reveals important differences in swimming abilities across birth cohorts: the number of individuals who report being able to swim without assistance decreases with age. Given the cross-sectional nature of the data used in this work, it is impossible to disentangle age and cohort effects. It is possible that the lower ability to swim identified among older individuals could be due to the fact that individuals may 'unlearn' how to swim properly as they age or could feel less confident to swim because of poorer health. However, it is also possible that, among younger cohorts, more and more individuals entered formal schooling and stayed in school for longer. As a result, they may have participated in compulsory swimming classes or may have participated in after-school activities as children and young adults.

46. The ability to swim is in fact strongly related to individuals' educational attainment. For instance, the paper finds that, in all contexts, individuals who attend school for longer are more likely to report being able to swim without assistance than individuals who attend school for fewer years. Across OECD countries, for example, among people with a maximum of 8 years of education, 62% report being able to swim, while it is 76% among those with 9-15 years of education and 86% among those with more than 16 years of education.

47. The nuances identified in the paper in who is able to swim and the many reasons as to why individuals do not know how to swim emphasise the need for prevention strategies to be adapted to the unique circumstances of different risk groups. The paper also indicated that reducing skill disparities between men and women is important to ensure that both can fully and equally participate in today's society, in education and training, and in the labour market. Providing women with competences and skills, such as the ability to swim without assistance, could expand the spectrum of their possibility, the choice to participate in a range of labour market activities, and freedom of movement.

48. The gender gap in swimming ability underscores the pervasiveness of gender disparities in societies at all levels of economic development, across cultural traditions and religious beliefs. Swimming requires women to expose their bodies more than almost any other social activity. In some contexts, women are encouraged not to swim with men, curtailing their opportunity to learn how to swim and to swim if they learn, or they are encouraged or required to expose their bodies as little as possible. In other contexts, women's perceived body image is low, which makes them feel uncomfortable to expose their body. In all countries, although menstruation is compatible with swimming and can in fact relieve period pain, stigma leads many young girls to avoid going in water when they are menstruating and many others avoid swimming altogether fearing unforeseen bleeding. Ensuring that women learn how to swim and feel comfortable with themselves so that they maintain their swimming ability can not only save their lives and broaden their horizons but also save the lives of their children. Children whose mothers know how to swim are more likely to learn to swim and are less likely to drown when they are small.

49. Highlighting the pervasiveness of inequalities in swimming abilities is especially timely because of the COVID-19 pandemic, the war in Ukraine, and climate change. The COVID-19 pandemic led many schools and swimming pools to close, preventing millions of children from learning how to swim. Given this, it is important to put in place measures that allow for these children to catch up and gain the abilities that they missed out on as a result of the pandemic. The war in Ukraine further threatens the ability of children to learn how to swim, given the rising energy prices that could impact whether swimming pools are able to remain open or not. Finally, climate change and the increase in extreme weathers, such as heatwaves and flooding, also adds urgency to the need to promote swimming skills.

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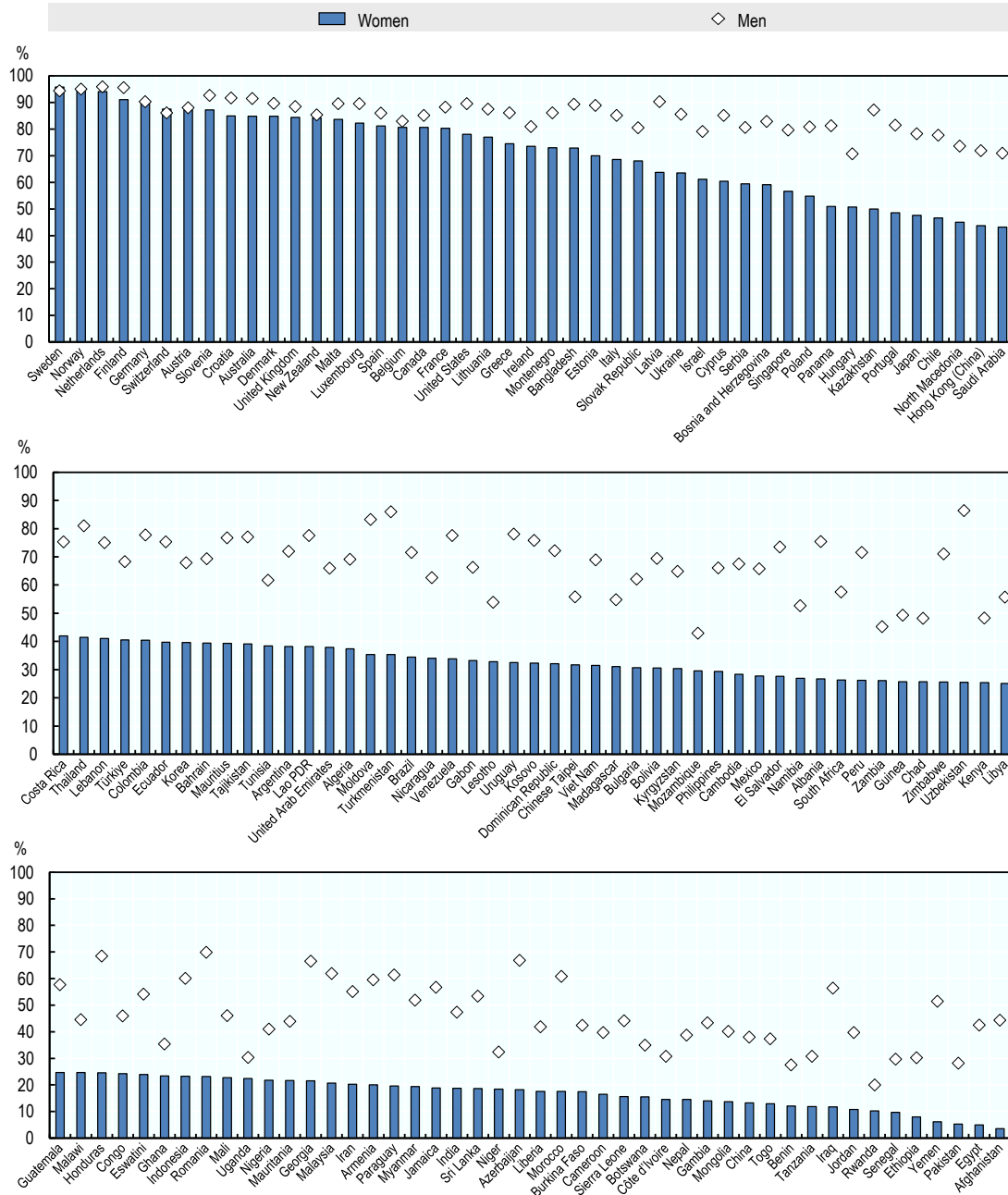
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Annex A. Swimming ability, by gender and country

Figure A A.1. Swimming ability by gender and country (2019)



Note: The figure shows the percentage of women (bars) and men (markers) aged 15 and older within individual countries who reported being able to swim without assistance.

Source: Adapted from World Bank (2022^[33]), World Bank Current Classification by Income (database), <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>; World Risk Poll (2019^[34]), The Lloyd's Register Foundation World Risk Poll Report 2019, <https://wrp.lrfoundation.org.uk/>.