

Global, regional, and national causes of death in children and adolescents younger than 20 years: an open data portal with estimates for 2000–21



Almost 6·5 million children and adolescents younger than 20 years died globally in 2021, the vast majority from preventable causes.¹ Reliable and timely data on causes of death are needed to better focus the attention of the global community on improving the survival of children and adolescents and to guide effective policy and programmes. But no less importantly, these data must be publicly available and easily accessible.

We introduce an open [data portal](https://childmortality.org) with yearly estimates on causes of death for children and adolescents younger than 20 years for the period 2000–21. The data hosted in this portal are part of a joint effort between the Child and Adolescent Causes of Death Estimation (CA CODE) project and the United Nations Inter-agency Group for Child Mortality Estimation (UN IGME). The portal is managed by UNICEF and was first launched in 2008 by UN IGME, reporting global, regional, and national age-specific all-cause mortality estimates for stillbirths, children, and adolescents.¹ Cause-specific mortality estimates produced by the CA CODE project have now been incorporated for the first time, aiming to start a dialogue with countries about their mortality data to improve cause-specific estimates while increasing data transparency and use at the country level.

The CA CODE project builds upon previous extensive research on causes of death, which had been carried out in collaboration with WHO and other UN agencies.^{2–6} In addition to hosting all-cause mortality data and estimates, the childmortality.org portal now includes causes of death for 195 countries, nine world regions, and at the global level. The portal increases the transparency of the mortality estimation process by allowing analysis, comparisons, visualisations, and download of estimates on three cause-specific mortality indicators: number of deaths, mortality fractions, and rates (all reported with their uncertainty levels). Six age groups are represented: neonates (first 28 days of life), 1–59 months, younger than 5 years (aggregation of the previous two categories), 5–9 years, 10–14 years, and 15–19 years. For the oldest age group, estimates are also split by sex.

Causes of death are estimated separately for countries with high versus low mortality, by data availability, and by age group. Empirical cause-of-death data were gathered through systematic review, known investigator tracing, and procurement of national and subnational studies. We adapted the Bayesian least absolute shrinkage and selection operator (known as LASSO) approach⁷ to address data scarcity, enhance

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For more on the **data portal** see
<https://childmortality.org>

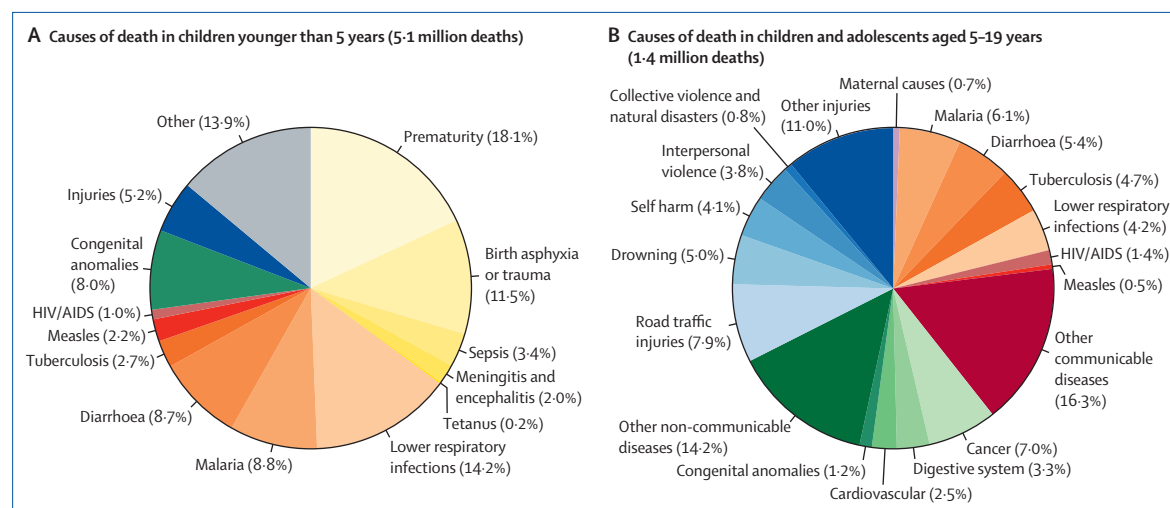


Figure: Global causes of death in children younger than 5 years (A) and in children and adolescents aged 5–19 years (B) in 2021

robustness, and assess the uncertainty of the estimates on a coherent framework. All-cause mortality estimates were harmonised with UN IGME, and estimates for a small number of low-burden causes (eg, measles, collective violence, or HIV/AIDS) were systematically integrated from WHO and UNAIDS. Additional details on the methods have been published previously.^{5,6,8} These estimates have been reviewed and endorsed by WHO Member States through country consultation.

At the global level, there were 6 491 000 deaths in children and adolescents younger than 20 years in 2021, with 5 096 000 (78.5%) deaths in children younger than 5 years and 1 395 000 (21.5%) deaths in children and adolescents aged 5–19 years. Prematurity was the main cause of death in people younger than 20 years, with almost 1 million deaths in 2021, representing 18.1% of deaths in children younger than 5 years (figure). Lower respiratory infections (784 600 total deaths, 14.2% of deaths in children younger than 5 years, and 4.2% of deaths in those aged 5–19 years), birth asphyxia or trauma (588 200 deaths, 11.5% of deaths in children younger than 5 years), and malaria (535 400 deaths, 8.8% of deaths in children younger than 5 years and 6.1% of deaths in those aged 5–19 years) are the next leading causes of death. Also noticeable are road traffic injuries with 109 900 global deaths in 2021, representing 7.9% of deaths in those aged 5–19 years (figure). Country-specific and cause-specific death rates by age and year can also be visualised on a world map in the data portal. For example, Côte d'Ivoire, a country with 12 600 estimated premature neonatal deaths in 2021 has one of the highest rates, with 13.8 premature neonatal deaths per 1000 live births.

Health and development before adulthood are crucial for human capital and for promoting healthy ageing across the life course.⁹ Under the Sustainable Development Goals (SDG) agenda, priority is given to the wellbeing and health of individuals of all ages, with specific targets to decrease early mortality due to maternal causes, communicable diseases, non-communicable diseases, and injuries for 2016–30.¹⁰ Progress is still needed to improve the survival of

children and adolescents. Countries are requesting data to develop strategies targeting the leading causes of death in their populations to reduce mortality effectively.^{5,6} These estimates are now publicly available on the childmortality.org portal to meet this need and to spur progress towards the SDG survival targets by 2030.

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