Special Communication

Global and National Burden of Diseases and Injuries Among Children and Adolescents Between 1990 and 2013
Findings From the Global Burden of Disease 2013 Study

Global Burden of Disease Pediatrics Collaboration

IMPORTANCE The literature focuses on mortality among children younger than 5 years. Comparable information on nonfatal health outcomes among these children and the fatal and nonfatal burden of diseases and injuries among older children and adolescents is scarce.

OBJECTIVE To determine levels and trends in the fatal and nonfatal burden of diseases and injuries among younger children (aged <5 years), older children (aged 5-9 years), and adolescents (aged 10-19 years) between 1990 and 2013 in 188 countries from the Global Burden of Disease (GBD) 2013 study.

EVIDENCE REVIEW Data from vital registration, verbal autopsy studies, maternal and child death surveillance, and other sources covering 14 244 site-years (ie, years of cause of death data by geography) from 1980 through 2013 were used to estimate cause-specific mortality. Data from 35 620 epidemiological sources were used to estimate the prevalence of the diseases and sequelae in the GBD 2013 study. Cause-specific mortality for most causes was estimated using the Cause of Death Ensemble Model strategy. For some infectious diseases (eg, HIV infection/AIDS, measles, hepatitis B) where the disease process is complex or the cause of death data were insufficient or unavailable, we used natural history models. For most nonfatal health outcomes, DisMod-MR 2.0, a Bayesian metaregression tool, was used to meta-analyze the epidemiological data to generate prevalence estimates.

FINDINGS Of the 7.7 (95% uncertainty interval [UI], 7.4-8.1) million deaths among children and adolescents globally in 2013, 6.28 million occurred among younger children, 0.48 million among older children, and 0.97 million among adolescents. In 2013, the leading causes of death were lower respiratory tract infections among younger children (905 059 deaths; 95% UI, 810 304-998 125), diarrheal diseases among older children (38 325 deaths; 95% UI, 30 365-47 678), and road injuries among adolescents (115 186 deaths; 95% UI, 105 185-124 870). Iron deficiency anemia was the leading cause of years lived with disability among children and adolescents, affecting 619 (95% UI, 618-621) million in 2013. Large between-country variations exist in mortality from leading causes among children and adolescents. Countries with rapid declines in all-cause mortality between 1990 and 2013 also experienced large declines in most leading causes of death, whereas countries with the slowest declines had stagnant or increasing trends in the leading causes of death. In 2013, Nigeria had a 12% global share of deaths from lower respiratory tract infections and a 38% global share of deaths from malaria. India had 33% of the world's deaths from neonatal encephalopathy. Half of the world's diarrheal deaths among children and adolescents occurred in just 5 countries: India, Democratic Republic of the Congo, Pakistan, Nigeria, and Ethiopia.

CONCLUSIONS AND RELEVANCE Understanding the levels and trends of the leading causes of death and disability among children and adolescents is critical to guide investment and inform policies. Monitoring these trends over time is also key to understanding where interventions are having an impact. Proven interventions exist to prevent or treat the leading causes of unnecessary death and disability among children and adolescents. The findings presented here show that these are underused and give guidance to policy makers in countries where more attention is needed.

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The current literature focuses on mortality rates and time trends among children younger than 5 years. There is little comparable information on the fatal and nonfatal burden of diseases and injuries among older children and adolescents. Children and adolescents constitute about a third of the world's population and their health status is important for every country and society.

Global mortality rates among younger children (aged <5 years) have been declining since 1990, but striking variations in both the levels and trends exist across countries.[1,2] For example, the number of deaths in children younger than 5 years per 1000 live births varied from 2.3 (95% uncertainty interval [UI], 1.8-2.9) in Singapore to 152.5 (95% UI, 130.6-177.4) in Guinea-Bissau in 2013.[2] The annualized rates of change in mortality of younger children for 1990 through 2013 varied from −6.8% in Oman to 0.1% in Zimbabwe, and only 27 of 138 developing countries are estimated to have achieved the target of Millennium Development Goal 4, a two-thirds reduction of 1990 mortality levels by 2015 (equivalent to an annualized rate of change of −4.4%).[2] Although between-country variations in mortality among younger children have been reported, information on nonfatal health outcomes among these children is scarce. Moreover, there has been little systematic data collection and reporting on the fatal and nonfatal burden of diseases and injuries among older children and adolescents. Knowing the current burden and trends of the leading causes of death and disability in these age groups is critically important to shed light on areas that need more attention. In this study, we identified levels and trends in the fatal and nonfatal burden of diseases and injuries among younger children (aged <5 years), older children (aged 5-9 years), and adolescents (defined by the United Nations as those aged 10-19 years[3]) from 1990 through 2013 in 188 countries based on the results from the Global Burden of Disease (GBD) 2013 study.

Key Points

Question: What are the levels and trends of fatal and nonfatal global burden of diseases and injuries among children and adolescents during the last 2 decades?

Findings: Of the 7.7 million deaths among children and adolescents globally in 2013, more than 80% occurred among younger children and, of the 135.6 million years lived with disability, nearly 60% were contributed by adolescents. Developing countries with rapid declines in all-cause mortality between 1990 and 2013 also experienced large declines in mortality for most leading causes of death during the same period, whereas for countries with the slowest declines in all-cause mortality there was either a stagnant or increasing trend in most of the leading causes of death.

Meaning: Detailed information on causes of death and nonfatal health outcomes in children and adolescents by age, sex, and country over time is an essential input into policy decision making on resource allocation to disease prevention and treatment programs.

Methods

Detailed methods of the GBD study have been published elsewhere[1,4-6] and we provide only a brief description here. The study components relevant to the current article are shown in eFigure 1 in the Supplement.

Cause-specific mortality was estimated using a database of vital registration, verbal autopsy studies, maternal and child death surveillance, and other sources covering 14 244 site-years (the number of years for which cause of death data were available for a particular geographic area such as a country or demographic surveillance site) from 1980 to 2013.[1] Of the 14 244 site-years, 5039 were from vital registration systems, 3860 from cancer registry, 1798 from sibling history, 1433 from police records, 1430 from surveillance, 538 from verbal autopsy studies, and 146 from other sources including surveys, census, hospital, and burial or mortuary. The quality and comparability of the cause of death data were assessed and enhanced through multiple steps that have been reported in detail previously.[1] Sample key steps include developing more than 100 maps to convert causes of death observed in the raw data to the GBD 2013 cause list and identifying deaths being assigned to ill-defined or intermediate causes rather than underlying causes of death, which were redistributed to more specific underlying causes.[1,7] Moreover, data that were reported in aggregated categories were split into estimates of age- and sex-specific deaths using the observed global pattern of relative risks of death for a cause by age and sex and the local age and sex distribution of the population.[7] Country-specific data sources and citations for each cause and data before and after redistribution are shown in the online data visualization of the cause of death database at http://vizhub.healthdata.org/cod/.[8]

For most causes, we used the Cause of Death Ensemble Model (CODEm) strategy,[1,7,9,10] which has been widely used for generating global health estimates. The CODEm strategy evaluates a large number of potential models that apply different functional forms (mixed-effects models and space-time gaussian process regression models) to mortality rates or cause fractions with varying combinations of predictive covariates. An ensemble of models that performs best on out-of-sample predictive validity tests is selected for each cause of death. For some infectious diseases (eg, human immunodeficiency virus [HIV] infection/AIDS, measles, hepatitis B) where the disease process is complex or the cause of death data were insufficient or unavailable, we used natural history models (ie, models developed based on the natural history of diseases). For example, the natural history model for HIV/AIDS took into consideration the nature of HIV epidemics in particular countries as well as HIV mortality rates among those receiving and not receiving antiretroviral therapy, which were not captured in the cause of death data.[11] Years of life lost due to premature mortality were calculated by multiplying the number of deaths at each age by a standard life expectancy at that age.[1,7]

The prevalence of diseases and their disabling consequences, called *sequelae* in the GBD, were estimated using an epidemiological database compiling data from systematic reviews on prevalence, incidence, remission, mortality risk, and severity distributions of the diseases and injuries included in the GBD. There were 35 620 data sources (mainly covered from 1990-2013) that include studies published in the scientific literature, nationally representative household surveys, antenatal clinic surveillance data, disease notifications, disease registries, hospital admissions data, outpatient visit data, population-based cancer registries, and other

administrative data. Household surveys including the Demographic and Health Surveys, Multiple Indicator Cluster Surveys, Living Standards Measurement Studies, Reproductive Health Surveys, and other national health surveys included in the Global Health Data Exchange were systematically screened for relevant data. For some diseases (eg, measles and pertussis), case notifications reported to the World Health Organization up to 2013 were used as input data. A full list of citations for sources organized by country is available in the appendix of a previous GBD article (pages 97-653).[5] Epidemiological data for most causes were meta-analyzed with DisMod-MR 2.0,[5] a Bayesian metaregression tool that adjusts for variations in study methods between data sources and enforces consistency between data for different parameters such as incidence and prevalence. The tool evaluates all the data through a geographical cascade of 4 levels (global, superregion, region, and country). First, all data in the world are evaluated to estimate the fixed effects on age, sex, study-level, and country-level covariates and the random effects for countries, regions, and superregions (we grouped regions into 7 superregions for analytical purposes[4]). The outputs of the global level are then used as prior information for the next superregion level of the cascade. After fitting the model to each superregion's data, the results are fed as priors to the region-specific fits, and finally region fits are used as a prior when modeling a country's results for a particular period. For countries and periods for which little or no data are available, the estimation is facilitated by country characteristics and random effects on superregion, region, and country. For this purpose, a database of country covariates for 93 topic areas and 242 variants was created using data from household surveys, censuses, official reports, administrative data, and systematic reviews.[1,5] The sources and imputation methods used to generate time series for the covariates have been reported previously.[1] DisMod-MR 2.0 also allows the user to add strong prior knowledge on the age pattern and/or epidemiological parameters including incidence, remission, and excess mortality rate. For example, major depressive disorder cannot be detected at very young ages, and we set a prior of 0 incidences in children younger than 4 years. The assumptions and priors by individual condition have been reported in the appendix of a previous GBD article (pages 654-684).[5] Years lived with disability (YLDs) were computed by multiplying the prevalence of each sequela by a disability weight.[5] Because we applied disability weights to prevalence in calculating YLDs, the most prevalent cause of disability (defined as any departure from full health) is not necessarily the leading cause of YLDs. For instance, mild vision impairment and caries are very common but cause relatively little disability.

Disability weights for a set of 235 health states were estimated by pairwise comparison methods presenting pairs of lay health state descriptions to respondents in surveys conducted among the general population in 9 countries and an open web-based survey.[12] Each of the 2337 sequelae defined for 301 diseases and injuries mapped to 1 or a combination of the 235 health states. Sequelae are the direct consequences of disease or injury.[4] Sequelae that are common across different diseases or injuries are called *health states*.[4] For example, severe anemia due to malaria is a sequela that shares the health state of severe anemia with a number of other diseases such as hookworm disease and maternal hemorrhage. Disability-adjusted life-years (DALYs) were computed as the sum of years of life lost due to premature mortality and YLDs for each country, age, sex, and year. A full list of causes of death and disability and the corresponding *International Classification of Diseases, Ninth Revision* (*ICD-9*) and *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision* (*ICD-10*) codes have been reported in previous GBD articles.[1,5]

The GBD classifies countries into developed (Australasia, North America, all of Europe, Brunei, Japan, Singapore, and South Korea) and developing (all other countries) rather than using the World Bank income classification of low-, middle-, and high-income countries. As the income status of a country may change over time, it makes reporting on time series for country groupings with a varying composition more difficult. Although we realize that the inclusion of some countries in either the developed or developing category is controversial, we have opted to use the GBD classification in this article as it illustrates important differences in the levels and trends of mortality and DALY rates between the 2 sets of countries.

Results

Global Mortality and Leading Causes of Death in 2013

In 2013, there were 7.7 (95% UI, 7.4-8.1) million deaths among children and adolescents globally, of which 6.28 million occurred among younger children, 0.48 million among older children, and 0.97 million among adolescents (**Table 1**, **Table 2**, and eTables 1-4 in the Supplement).

Among all children and adolescents, the leading causes of death were predominantly those common in younger children (**Figure 1**, **Figure 2**, and **Figure 3**) because of the large share of deaths in children younger than 5 years. The leading causes of death among younger children (aged <5 years) globally in 2013 were lower respiratory tract infections (905 059 deaths; 95% UI, 810 304-998 125), preterm birth complications (742 381 deaths; 95% UI, 591 348-910 767), neonatal encephalopathy following birth trauma and asphyxia (643 765 deaths; 95% UI, 515 010-760 486), malaria (586 844 deaths; 95% UI, 451 969-756 864), and diarrheal diseases (519 666 deaths; 95% UI, 438 795-593 675) (Table 2, Figure 2, and eTable 1 in the Supplement). These 5 causes accounted for 3.4 million deaths or 54% of all deaths among children younger than 5 years. Five other causes accounted for an additional 24% of deaths: congenital anomalies (495 319 deaths; 95% UI, 424 788-590 319), neonatal sepsis (366 041 deaths; 95% UI, 233 155-510 770), other neonatal disorders (276 231 deaths; 95% UI, 219 603-350 681), protein-energy malnutrition (225 906 deaths; 95% UI, 168 497-280 129), and meningitis (141 952 deaths; 95% UI, 105 060-182 518) (Table 2 and eTable 1 in the Supplement). The leading cause of death among younger children in each country in 2013 is shown in a map (eFigure 2 in the Supplement). Lower respiratory tract infections, malaria, and diarrheal diseases were the prevailing leading causes of death in sub-Saharan African countries. Lower respiratory tract infections were also the leading cause for some countries in Asia. Neonatal encephalopathy was the most common cause of death in some South Asian countries. Preterm birth complications and congenital anomalies were the leading causes of death among countries in North America, Australasia, Europe, East Asia, and most countries in Latin America and the Caribbean.

Table 1. Number of Deaths and Age-Standardized Rates per 100 000 Children and Adolescents for the Top 10 Global Causes of Death in the 50 Most Populous Countries by Child and Adolescent Population, Aged 0 to 19 Years, Both Sexes, 2013

Location	Deaths, No. (Age-Standardized Rate/100 000 Children and Adolescents)										
	All Causes	Lower Respiratory Tract Infections	Preterm Birth Complications	Malaria	Neonatal Encephalopathy	Diarrheal Diseases	Congenital Anomalies	Neonatal Sepsis	Other Neonatal Disorders	Protein-Energy Malnutrition	Road Injuries
Global	7 722 750 (307.4)	978 680 (38.9)	742 381 (29.3)	652 820 (26.1)	643 765 (25.4)	590 607 (23.5)	533 165 (21.1)	366 041 (14.4)	276 231 (10.9)	245 899 (9.8)	220 064 (8.9)
Developing	7 586 066 (339.6)	972 977 (43.4)	726 053 (32.0)	652 820 (29.3)	637 629 (28.1)	589 834 (26.4)	508 095 (22.6)	363 566 (16.1)	268 355 (11.9)	245 744 (11.0)	205 864 (9.4)
Developed	136 684 (48.3)	5703 (2.0)	16 328 (6.0)	0	6136 (2.3)	772 (0.3)	25 070 (9.1)	2476 (0.9)	7876 (2.9)	156 (0.1)	14 200 (4.7)
Afghanistan	115 094 (622.9)	24 525 (131.4)	13 420 (71.1)	905 (5.0)	4098 (21.7)	12 344 (66.2)	13 050 (69.7)	1010 (5.4)	6295 (33.4)	934 (5.0)	3624 (20.9)
Algeria	27 429 (166.2)	1178 (7.2)	6617 (38.0)	3 (0.0)	1945 (11.2)	673 (4.0)	4746 (27.7)	1671 (9.6)	1180 (6.8)	364 (2.2)	1535 (10.5)
Angola	95 184 (603.1)	14 534 (88.9)	4991 (28.9)	9632 (60.2)	4577 (26.6)	10 733 (66.9)	6578 (39.5)	2563 (14.9)	3071 (17.8)	5510 (34.1)	2605 (19.5)
Argentina	13 944 (106.2)	799 (6.1)	2245 (17.6)	0	483 (3.8)	167 (1.3)	2714 (21.1)	658 (5.2)	523 (4.1)	141 (1.1)	914 (6.6)
Bangladesh	162 876 (277.1)	15 631 (27.2)	19 077 (33.4)	10 (0.0)	28 412 (49.7)	2200 (3.7)	8703 (15.0)	13 856 (24.3)	6537 (11.5)	3275 (5.6)	1950 (3.0)
Brazil	80 486 (135.6)	5163 (9.0)	11 257 (20.5)	19 (0.0)	5364 (9.8)	2028 (3.6)	11 897 (21.3)	5730 (10.4)	3790 (6.9)	1020 (1.8)	5808 (8.6)
Cameroon	95 403 (683.9)	14 765 (102.9)	6130 (40.8)	16 138 (116.4)	5709 (38.0)	7651 (54.2)	5650 (38.9)	5079 (33.8)	1605 (10.7)	4682 (33.5)	2638 (21.8)
China	336 465 (97.8)	27 874 (8.1)	37 467 (11.0)	33 (0.0)	29 759 (8.7)	2845 (0.8)	55 076 (16.1)	3675 (1.1)	9229 (2.7)	1211 (0.4)	30 332 (8.6)
Colombia	24 375 (141.1)	1951 (11.5)	2341 (14.1)	19 (0.1)	1166 (7.0)	820 (4.8)	3807 (22.6)	778 (4.7)	767 (4.6)	713 (4.2)	1433 (8.0)
Cote d'Ivoire	81 205 (653.3)	13 633 (106.5)	6858 (51.0)	13 385 (109.4)	5778 (42.9)	6635 (52.8)	4591 (35.4)	4614 (34.4)	1616 (12.1)	3809 (30.9)	1569 (14.8)
Democratic Republic of the Congo	387 210 (822.7)	61 499 (126.1)	26 984 (51.7)	37 453 (79.8)	16 564 (31.8)	62 988 (132.7)	20 396 (41.1)	9836 (18.9)	9710 (18.7)	34 389 (72.4)	4246 (10.9)
Egypt	53 993 (157.5)	7977 (22.9)	5787 (16.6)	3 (0.0)	581 (1.7)	3390 (9.7)	13 272 (38.2)	1042 (3.0)	1545 (4.4)	185 (0.5)	2144 (6.5)
Ethiopia	273 571 (503.9)	40 963 (74.5)	20 328 (36.0)	16 642 (30.8)	17 243 (30.5)	25 585 (47.2)	12 461 (22.5)	16 090 (28.6)	10 072 (17.9)	10 482 (19.4)	4933 (9.7)
France	4789 (31.9)	70 (0.5)	335 (2.3)	0	318 (2.2)	38 (0.3)	831 (5.6)	111 (0.8)	288 (2.0)	2 (0.0)	589 (3.8)
Germany	4187 (30.0)	63 (0.4)	658 (5.1)	0	202 (1.6)	17 (0.1)	858 (6.5)	60 (0.5)	133 (1.0)	1 (0.0)	456 (2.9)
Ghana	66 581 (479.5)	6628 (47.1)	6086 (42.0)	11 890 (85.8)	4806 (33.1)	2433 (17.4)	3422 (24.1)	6561 (45.3)	1521 (10.5)	5239 (37.6)	1464 (11.5)
India	1 640 176 (348.8)	178 266 (38.2)	211 108 (45.4)	25 652 (5.4)	212 686 (45.7)	109 366 (23.3)	76 898 (16.5)	94 299 (20.3)	91 118 (19.6)	24 163 (5.2)	27 072 (5.6)
Indonesia	192 905 (218.4)	29 910 (34.2)	19 396 (22.6)	555 (0.6)	25 303 (29.5)	11 377 (12.8)	13 789 (15.8)	7381 (8.6)	7646 (8.9)	1817 (2.0)	9081 (9.8)
Iran	34 199 (130.8)	1850 (7.0)	8148 (30.5)	6 (0.0)	1357 (5.1)	679 (2.6)	7950 (30.0)	327 (1.2)	2101 (7.9)	75 (0.3)	2219 (8.9)
Iraq	36 974 (200.0)	3172 (16.9)	7416 (38.6)	0	1063 (5.5)	1682 (8.9)	6431 (33.9)	1727 (9.0)	1310 (6.8)	141 (0.8)	1204 (7.0)
Italy	3440 (31.2)	54 (0.5)	537 (5.2)	0	183 (1.8)	9 (0.1)	668 (6.3)	70 (0.7)	209 (2.0)	2 (0.0)	468 (3.8)
Japan	5498 (25.9)	253 (1.2)	292 (1.5)	0	131 (0.7)	31 (0.2)	1249 (6.2)	91 (0.5)	200 (1.0)	5 (0.0)	461 (2.0)
Kenya	105 250 (393.6)	18 068 (65.4)	8380 (29.7)	6416 (23.8)	7065 (25.0)	13 011 (47.8)	6396 (23.0)	6363 (22.5)	2110 (7.5)	5393 (19.8)	1280 (5.3)
Madagascar	54 762 (402.5)	7544 (54.4)	5011 (34.7)	2693 (20.6)	1655 (11.5)	7075 (51.8)	2497 (17.7)	2823 (19.6)	2479 (17.2)	3803 (28.2)	660 (5.6)
Malaysia	6067 (58.8)	345 (3.4)	401 (4.2)	2 (0.0)	214 (2.2)	49 (0.5)	1038 (10.7)	211 (2.2)	244 (2.5)	4 (0.0)	849 (7.5)
Mexico	54 288 (124.4)	4624 (10.9)	6280 (15.2)	0	2850 (6.9)	1588 (3.7)	10 674 (25.3)	2975 (7.2)	1449 (3.5)	1003 (2.3)	3735 (7.9)
Morocco	23 976 (180.9)	1364 (10.3)	5299 (38.7)	2 (0.0)	2590 (18.9)	364 (2.7)	2451 (18.3)	1789 (13.1)	495 (3.6)	108 (0.8)	1051 (8.4)
Mozambique	105 323 (624.1)	9586 (54.9)	4704 (25.8)	24 578 (145.3)	5458 (29.9)	5474 (32.1)	3596 (20.3)	5937 (32.6)	3513 (19.3)	2706 (15.9)	1227 (8.6)

(continued)

Table 1. Number of Deaths and Age-Standardized Rates per 100 000 Children and Adolescents for the Top 10 Global Causes of Death in the 50 Most Populous Countries by Child and Adolescent Population, Aged 0 to 19 Years, Both Sexes, 2013 (continued)

	Deaths, No. (Age-Standardized Rate/100 000 Children and Adolescents)										
Location	All Causes	Lower Respiratory Tract Infections	Preterm Birth Complications	Malaria	Neonatal Encephalopathy	Diarrheal Diseases	Congenital Anomalies	Neonatal Sepsis	Other Neonatal Disorders	Protein-Energy Malnutrition	Road Injuries
Myanmar	44 632 (258.9)	9227 (54.5)	5175 (30.9)	2243 (12.4)	4685 (28.0)	1882 (11.0)	3927 (23.1)	1980 (11.8)	1047 (6.2)	170 (1.0)	1026 (5.4)
Nepal	28 664 (255.5)	4598 (42.2)	2536 (23.9)	148 (1.2)	4123 (38.8)	2269 (20.2)	1126 (10.2)	2349 (22.1)	1354 (12.7)	416 (3.7)	425 (3.3)
Niger	109 268 (788.9)	15 722 (109.7)	5545 (34.6)	24 007 (173.7)	4375 (27.4)	18 851 (136.0)	3808 (25.8)	3507 (21.8)	2081 (13.1)	7241 (52.8)	1217 (11.5)
Nigeria	997 325 (856.7)	118 643 (98.6)	61 669 (47.6)	246 283 (213.1)	60 479 (46.7)	47 410 (40.4)	40 960 (33.3)	45 349 (35.1)	18 926 (14.7)	45 785 (39.8)	34 466 (34.2)
Pakistan	416 805 (505.1)	64 527 (78.5)	36 320 (43.6)	1461 (1.8)	64 388 (77.2)	52 326 (63.9)	17 408 (21.1)	34 161 (41.2)	12 441 (14.9)	4297 (5.3)	7434 (9.0)
Peru	16 931 (150.6)	2399 (21.4)	1879 (17.1)	2 (0.0)	1463 (13.3)	382 (3.4)	1974 (17.8)	1276 (11.6)	243 (2.2)	323 (2.9)	856 (7.4)
Philippines	86 334 (196.7)	12 350 (28.1)	10 566 (24.0)	51 (0.1)	5117 (11.6)	3745 (8.5)	10 053 (22.9)	4078 (9.3)	3378 (7.7)	1225 (2.8)	1898 (4.4)
Russia	24 697 (83.4)	1904 (6.2)	1837 (5.9)	0	993 (3.2)	208 (0.7)	4508 (14.6)	473 (1.5)	2326 (7.5)	68 (0.2)	1852 (6.7)
Saudi Arabia	9198 (89.0)	200 (1.9)	1906 (18.4)	2 (0.0)	397 (3.8)	92 (0.9)	2402 (22.9)	715 (6.9)	208 (2.0)	14 (0.1)	992 (10.0)
South Africa	58 342 (288.2)	6613 (32.6)	4371 (21.7)	35 (0.2)	3251 (16.1)	6908 (34.0)	2312 (11.4)	1772 (8.8)	5112 (25.3)	1390 (6.8)	1274 (6.3)
South Korea	3210 (31.9)	77 (0.8)	371 (4.3)	0	90 (1.0)	9 (0.1)	439 (4.9)	74 (0.9)	145 (1.7)	1 (0.0)	410 (3.5)
Sudan	70 379 (316.1)	6750 (30.0)	15 800 (67.9)	4202 (19.0)	1628 (7.0)	7607 (33.5)	10 076 (44.0)	643 (2.8)	2559 (11.0)	261 (1.2)	1512 (7.7)
Tanzania	167 958 (517.4)	26 533 (79.1)	8086 (23.1)	24 870 (76.2)	8948 (25.5)	11 371 (35.0)	9743 (28.6)	8409 (24.0)	6085 (17.4)	8386 (25.4)	1910 (6.6)
Thailand	15 783 (104.2)	1029 (7.2)	1669 (13.2)	14 (0.1)	666 (5.3)	156 (1.1)	2023 (15.4)	579 (4.6)	297 (2.4)	4 (0.0)	2338 (12.9)
Turkey	30 251 (125.7)	1638 (6.8)	4785 (20.7)	0	1345 (5.8)	290 (1.2)	7402 (31.6)	1214 (5.2)	2185 (9.4)	65 (0.3)	1637 (6.3)
Uganda	147 277 (545.7)	16 561 (59.9)	10 838 (36.8)	25 022 (93.1)	10 733 (36.4)	9608 (35.1)	6433 (22.7)	8604 (29.2)	4409 (15.0)	7606 (27.8)	3136 (13.7)
United Kingdom	5498 (37.6)	194 (1.3)	1164 (8.2)	0	243 (1.7)	55 (0.4)	1082 (7.5)	77 (0.5)	114 (0.8)	2 (0.0)	390 (2.5)
United States	45 241 (55.4)	846 (1.0)	6822 (8.8)	0	1650 (2.1)	174 (0.2)	7007 (8.9)	806 (1.0)	2399 (3.1)	19 (0.0)	5872 (6.8)
Uzbekistan	27 850 (244.5)	9908 (87.2)	1673 (14.7)	0	4454 (39.2)	396 (3.5)	2248 (19.8)	298 (2.6)	955 (8.4)	6 (0.1)	675 (5.9)
Venezuela	13 132 (116.4)	876 (7.8)	1418 (12.9)	4 (0.0)	566 (5.1)	494 (4.4)	1859 (16.7)	733 (6.6)	192 (1.7)	235 (2.1)	1096 (9.5)
Vietnam	36 163 (132.1)	5591 (20.8)	5522 (21.1)	73 (0.3)	2270 (8.7)	279 (1.0)	4862 (18.2)	1053 (4.0)	515 (2.0)	9 (0.0)	3063 (10.0)
Yemen	46 038 (342.3)	4377 (32.5)	9343 (67.7)	3554 (26.9)	1391 (10.1)	5500 (40.7)	6191 (45.4)	345 (2.5)	2237 (16.2)	153 (1.1)	1650 (12.9)

Table 2. Number of Deaths and Rates per 100 000 Children and Adolescents for the Top 10 Global Causes of Death in the 50 Most Populous Countries by Child and Adolescent Population, Younger Than 5 Years, Both Sexes, 2013

Location	Deaths, No. (Rate/100 000 Children and Adolescents)										
	All Causes	Lower Respiratory Tract Infections	Preterm Birth Complications	Neonatal Encephalopathy	Malaria	Diarrheal Diseases	Congenital Anomalies	Neonatal Sepsis	Other Neonatal Disorders	Protein-Energy Malnutrition	Meningitis
Global	6 279 920 (951.5)	905 059 (137.1)	742 381 (112.5)	643 765 (97.5)	586 844 (88.9)	519 666 (78.7)	495 319 (75.1)	366 041 (55.5)	276 231 (41.9)	225 906 (34.2)	141 952 (21.5)
Developing	6 193 574 (1 055.7)	900 384 (153.5)	726 053 (123.8)	637 629 (108.7)	586 844 (100.0)	518 963 (88.5)	472 671 (80.6)	363 566 (62.0)	268 355 (45.7)	225 796 (38.5)	140 814 (24.0)
Developed	86 346 (117.8)	4675 (6.4)	16 328 (22.3)	6136 (8.4)	0	703 (1.0)	22 648 (30.9)	2476 (3.4)	7876 (10.7)	110 (0.2)	1138 (1.6)
Afghanistan	94 721 (1 919.6)	22 657 (459.2)	13 420 (272.0)	4098 (83.1)	436 (8.8)	11 916 (241.5)	12 203 (247.3)	1010 (20.5)	6295 (127.6)	761 (15.4)	4721 (95.7)
Algeria	22 942 (514.7)	976 (21.9)	6617 (148.4)	1945 (43.6)	1 (0.0)	634 (14.2)	4558 (102.2)	1671 (37.5)	1180 (26.5)	340 (7.6)	331 (7.4)
Angola	83 369 (1 950.1)	13 668 (319.7)	4991 (116.7)	4577 (107.1)	8987 (210.2)	9722 (227.4)	6307 (147.5)	2563 (59.9)	3071 (71.8)	5229 (122.3)	2659 (62.2)
Argentina	9828 (287.0)	644 (18.8)	2245 (65.6)	483 (14.1)	0	155 (4.5)	2545 (74.3)	658 (19.2)	523 (15.3)	120 (3.5)	143 (4.2)
Bangladesh	128 228 (843.5)	14 800 (97.3)	19 077 (125.5)	28 412 (186.9)	4 (0.0)	1718 (11.3)	7457 (49.1)	13 856 (91.1)	6537 (43.0)	2806 (18.5)	1257 (8.3)
Brazil	54 076 (362.0)	4255 (28.5)	11 257 (75.4)	5364 (35.9)	9 (0.1)	1919 (12.8)	11 246 (75.3)	5730 (38.4)	3790 (25.4)	919 (6.2)	816 (5.5)
Cameroon	82 515 (2234.5)	13 981 (378.6)	6130 (166.0)	5709 (154.6)	14 638 (396.4)	7160 (193.9)	5411 (146.5)	5079 (137.5)	1605 (43.5)	4376 (118.5)	2675 (72.4)
China	239 013 (265.1)	26 095 (28.9)	37 467 (41.5)	29 759 (33.0)	11 (0.0)	2626 (2.9)	50 853 (56.4)	3675 (4.1)	9229 (10.2)	1088 (1.2)	2789 (3.1)
Colombia	16 332 (362.7)	1739 (38.6)	2341 (52.0)	1166 (25.9)	11 (0.2)	781 (17.3)	3595 (79.8)	778 (17.3)	767 (17.0)	655 (14.5)	314 (7.0)
Cote d'Ivoire	70 182 (2 162.0)	12 977 (399.8)	6858 (211.3)	5778 (178.0)	12 022 (370.4)	6199 (191.0)	4394 (135.4)	4614 (142.1)	1616 (49.8)	3527 (108.6)	2402 (74.0)
Democratic Republic of the Congo	340 416 (2 736.6)	58 309 (468.7)	26 984 (216.9)	16 564 (133.2)	34 629 (278.4)	57 183 (459.7)	19 520 (156.9)	9836 (79.1)	9710 (78.1)	32 916 (264.6)	8985 (72.2)
Egypt	41 267 (447.6)	7371 (79.9)	5787 (62.8)	581 (6.3)	1 (0.0)	3273 (35.5)	12 306 (133.5)	1042 (11.3)	1545 (16.8)	173 (1.9)	164 (1.8)
Ethiopia	229 333 (1 615.1)	38 427 (270.6)	20 328 (143.2)	17 243 (121.4)	15 276 (107.6)	22 209 (156.4)	11 763 (82.8)	16 090 (113.3)	10 072 (70.9)	9603 (67.6)	7397 (52.1)
France	2967 (75.3)	50 (1.3)	335 (8.5)	318 (8.1)	0	34 (0.9)	744 (18.9)	111 (2.8)	288 (7.3)	1 (0.0)	31 (0.8)
Germany	2539 (73.1)	38 (1.1)	658 (18.9)	202 (5.8)	0	12 (0.4)	743 (21.4)	60 (1.7)	133 (3.8)	1 (0.0)	24 (0.7)
Ghana	56 588 (1 537.9)	6090 (165.5)	6086 (165.4)	4806 (130.6)	10 737 (291.8)	2245 (61.0)	3219 (87.5)	6561 (178.3)	1521 (41.3)	4888 (132.8)	1284 (34.9)
India	1 249 673 (1 022.1)	154 884 (126.7)	211 108 (172.7)	212 686 (174.0)	9453 (7.7)	80 225 (65.6)	69 283 (56.7)	94 299 (77.1)	91 118 (74.5)	19 483 (15.9)	8659 (7.1)
Indonesia	148 807 (639.9)	28 186 (121.2)	19 396 (83.4)	25 303 (108.8)	129 (0.6)	8700 (37.4)	12 240 (52.6)	7381 (31.7)	7646 (32.9)	1424 (6.1)	4968 (21.4)
Iran	27 378 (390.5)	1645 (23.5)	8148 (116.2)	1357 (19.4)	4 (0.1)	647 (9.2)	7462 (106.4)	327 (4.7)	2101 (30.0)	70 (1.0)	208 (3.0)
Iraq	29 942 (607.8)	2900 (58.9)	7416 (150.5)	1063 (21.6)	0	1599 (32.5)	6018 (122.2)	1727 (35.1)	1310 (26.6)	127 (2.6)	673 (13.7)
Italy	2060 (73.2)	37 (1.3)	537 (19.1)	183 (6.5)	0	8 (0.3)	591 (21.0)	70 (2.5)	209 (7.4)	1 (0.0)	14 (0.5)
Japan	3158 (58.5)	168 (3.1)	292 (5.4)	131 (2.4)	0	27 (0.5)	1137 (21.1)	91 (1.7)	200 (3.7)	3 (0.1)	29 (0.5)
Kenya	89 504 (1 244.0)	17 324 (240.8)	8380 (116.5)	7065 (98.2)	5743 (79.8)	11 925 (165.7)	6146 (85.4)	6363 (88.4)	2110 (29.3)	5062 (70.4)	3160 (43.9)
Madagascar	45 736 (1 278.3)	6885 (192.4)	5011 (140.1)	1655 (46.3)	1767 (49.4)	6345 (177.3)	2352 (65.8)	2823 (78.9)	2479 (69.3)	3367 (94.1)	1169 (32.7)
Malaysia	3349 (133.8)	218 (8.7)	401 (16.0)	214 (8.5)	1 (0.0)	39 (1.5)	951 (38.0)	211 (8.4)	244 (9.8)	3 (0.1)	72 (2.9)
Mexico	38 097 (336.9)	4249 (37.6)	6280 (55.5)	2850 (25.2)	0	1419 (12.6)	9837 (87.0)	2975 (26.3)	1449 (12.8)	832 (7.4)	247 (2.2)
Morocco	19 441 (567.5)	1211 (35.3)	5299 (154.7)	2590 (75.6)	0	325 (9.5)	2316 (67.6)	1789 (52.2)	495 (14.5)	100 (2.9)	326 (9.5)
Mozambique	87 913 (1 940.5)	9010 (198.9)	4704 (103.8)	5458 (120.5)	21 497 (474.5)	4870 (107.5)	3431 (75.7)	5937 (131.0)	3513 (77.5)	2480 (54.7)	2008 (44.3)
Myanmar	34 098 (760.9)	8691 (193.9)	5175 (115.5)	4685 (104.6)	721 (16.1)	1611 (36.0)	3459 (77.2)	1980 (44.2)	1047 (23.4)	157 (3.5)	560 (12.5)

(continued)

Table 2. Number of Deaths and Rates per 100 000 Children and Adolescents for the Top 10 Global Causes of Death in the 50 Most Populous Countries by Child and Adolescent Population, Younger Than 5 Years, Both Sexes, 2013 (continued)

Location	Deaths, No. (Rate/100 000 Children and Adolescents)										
	All Causes	Lower Respiratory Tract Infections	Preterm Birth Complications	Neonatal Encephalopathy	Malaria	Diarrheal Diseases	Congenital Anomalies	Neonatal Sepsis	Other Neonatal Disorders	Protein-Energy Malnutrition	Meningitis
Nepal	22 241 (754.6)	4384 (148.7)	2536 (86.0)	4123 (139.9)	63 (2.1)	1897 (64.4)	972 (33.0)	2349 (79.7)	1354 (45.9)	323 (11.0)	206 (7.0)
Niger	97 824 (2 669.4)	14 845 (405.1)	5545 (151.3)	4375 (119.4)	22 819 (622.7)	17 426 (475.5)	3579 (97.7)	3507 (95.7)	2081 (56.8)	6799 (185.5)	3560 (97.2)
Nigeria	892 598 (2 930.4)	113 255 (371.8)	61 669 (202.5)	60 479 (198.6)	235 483 (773.1)	44 743 (146.9)	39 396 (129.3)	45 349 (148.9)	18 926 (62.1)	43 299 (142.2)	18 872 (62.0)
Pakistan	348 496 (1 619.4)	61 669 (286.6)	36 320 (168.8)	64 388 (299.2)	367 (1.7)	48 321 (224.5)	15 729 (73.1)	34 161 (158.7)	12 441 (57.8)	3367 (15.6)	17 091 (79.4)
Peru	13 209 (446.9)	2041 (69.1)	1879 (63.6)	1463 (49.5)	1 (0.0)	349 (11.8)	1864 (63.1)	1276 (43.2)	243 (8.2)	281 (9.5)	149 (5.0)
Philippines	65 074 (564.6)	10 432 (90.5)	10 566 (91.7)	5117 (44.4)	16 (0.1)	3287 (28.5)	9014 (78.2)	4078 (35.4)	3378 (29.3)	1002 (8.7)	1438 (12.5)
Russia	16 255 (196.2)	1656 (20.0)	1837 (22.2)	993 (12.0)	0	203 (2.4)	4119 (49.7)	473 (5.7)	2326 (28.1)	47 (0.6)	353 (4.3)
Saudi Arabia	6775 (241.3)	121 (4.3)	1906 (67.9)	397 (14.2)	1 (0.0)	81 (2.9)	2194 (78.1)	715 (25.5)	208 (7.4)	10 (0.4)	17 (0.6)
South Africa	40 647 (758.0)	6061 (113.0)	4371 (81.5)	3251 (60.6)	21 (0.4)	6510 (121.4)	2201 (41.0)	1772 (33.0)	5112 (95.3)	1352 (25.2)	574 (10.7)
South Korea	1764 (76.0)	55 (2.4)	371 (16.0)	90 (3.9)	0	7 (0.3)	397 (17.1)	74 (3.2)	145 (6.2)	0	10 (0.4)
Sudan	59 503 (993.6)	6046 (101.0)	15 800 (263.8)	1628 (27.2)	3446 (57.5)	7173 (119.8)	9553 (159.5)	643 (10.7)	2559 (42.7)	237 (4.0)	1007 (16.8)
Tanzania	145 246 (1 680.0)	25 290 (292.5)	8086 (93.5)	8948 (103.5)	22 604 (261.5)	9951 (115.1)	9411 (108.9)	8409 (97.3)	6085 (70.4)	7967 (92.1)	3593 (41.6)
Thailand	7675 (213.8)	680 (18.9)	1669 (46.5)	666 (18.5)	5 (0.1)	113 (3.1)	1823 (50.8)	579 (16.1)	297 (8.3)	2 (0.1)	83 (2.3)
Turkey	22 002 (350.5)	1273 (20.3)	4785 (76.2)	1345 (21.4)	0	253 (4.0)	7014 (111.7)	1214 (19.3)	2185 (34.8)	43 (0.7)	210 (3.3)
Uganda	127 340 (1 773.3)	15 339 (213.6)	10 838 (150.9)	10 733 (149.5)	22 449 (312.6)	8776 (122.2)	6153 (85.7)	8604 (119.8)	4409 (61.4)	7176 (99.9)	4906 (68.3)
United Kingdom	3785 (98.9)	158 (4.1)	1164 (30.4)	243 (6.3)	0	50 (1.3)	969 (25.3)	77 (2.0)	114 (3.0)	1 (0.0)	56 (1.5)
United States	28 013 (133.1)	627 (3.0)	6822 (32.4)	1650 (7.8)	0	150 (0.7)	6350 (30.2)	806 (3.8)	2399 (11.4)	14 (0.1)	238 (1.1)
Uzbekistan	22 318 (742.7)	9217 (306.8)	1673 (55.7)	4454 (148.2)	0	376 (12.5)	2121 (70.6)	298 (9.9)	955 (31.8)	4 (0.1)	214 (7.1)
Venezuela	7973 (268.9)	763 (25.7)	1418 (47.8)	566 (19.1)	2 (0.1)	465 (15.7)	1675 (56.5)	733 (24.7)	192 (6.5)	210 (7.1)	117 (4.0)
Vietnam	26 628 (370.8)	5321 (74.1)	5522 (76.9)	2270 (31.6)	23 (0.3)	222 (3.1)	4411 (61.4)	1053 (14.7)	515 (7.2)	6 (0.1)	230 (3.2)
Yemen	38 030 (1 083.1)	3879 (110.5)	9343 (266.1)	1391 (39.6)	2645 (75.3)	5177 (147.4)	5883 (167.5)	345 (9.8)	2237 (63.7)	138 (3.9)	708 (20.2)

Figure 1. Top 25 Global Causes of Death for the 50 Most Populous Countries by Child and Adolescent Population, Both Sexes, Ages 0 to 19 Years, 2013

Location	Lower respiratory tract infections	Preterm birth complications	Malaria	Neonatal encephalopathy	Diarrheal diseases	Congenital anomalies	Neonatal sepsis	Other neonatal disorders	Protein-energy malnutrition	Road injuries	Meningitis	HIV/AIDS	Drowning	Hemoglobinopathies	Intestinal infectious diseases	Sexually transmitted diseases	Measles	Tuberculosis	Whooping cough	Self-harm	Mechanical forces	Fire and heat	Foreign body	Interpersonal violence	Other neoplasms
Global	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Developing	1	2	3	4	5	6	7	8	9	10	11	12	14	13	15	16	17	18	19	22	20	21	23	24	25
Afghanistan	1	2	20	7	4	3	18	5	19	8	6	98	9	21	17	46	13	14	12	35	24	25	44	16	38
Algeria	7	1	89	3	8	2	4	6	13	5	11	97	12	20	9	21	16	44	57	46	39	26	49	42	19
Angola	1	6	3	7	2	4	12	9	5	11	8	10	15	14	22	13	33	17	23	36	24	18	19	34	30
Argentina	4	2	132	8	17	1	5	6	19	3	16	51	11	25	54	33	129	46	40	9	15	23	7	10	13
Bangladesh	3	2	104	1	13	6	5	8	10	14	17	88	4	24	7	9	27	49	28	11	31	54	33	22	16
Brazil	7	2	85	6	10	1	5	8	14	4	13	51	9	31	15	19	124	50	62	12	26	33	11	3	17
Cameroon	2	4	1	5	3	6	7	13	8	11	10	9	16	15	18	12	14	24	19	47	26	22	20	37	34
China	6	2	102	4	22	1	14	9	34	3	15	45	5	29	42	47	87	43	62	12	7	30	19	18	11
Colombia	4	3	63	6	8	1	9	10	11	5	15	64	7	41	17	23	132	47	57	14	20	28	12	2	16
Cote d'Ivoire	1	3	2	5	4	7	6	11	8	12	10	9	15	14	16	18	13	20	19	45	22	24	28	74	33
Democratic Republic of the Congo	2	5	3	7	1	6	10	11	4	17	9	13	12	8	21	14	18	15	25	35	22	19	37	30	36
Egypt	2	3	110	15	4	1	12	7	36	6	27	83	11	14	9	73	45	62	54	31	34	44	52	37	20
Ethiopia	1	3	5	4	2	9	6	12	11	15	14	10	18	27	17	13	8	16	7	32	23	20	38	21	26
Ghana	2	4	1	6	9	7	3	12	5	13	10	11	17	8	15	18	14	21	44	46	22	27	26	36	37
India	3	2	13	1	4	7	5	6	15	12	26	37	9	36	8	14	33	10	28	11	25	17	20	39	22
Indonesia	1	3	38	2	5	4	10	9	16	7	11	36	6	22	12	17	8	15	13	46	45	27	21	50	43
Iran	5	1	85	6	9	2	15	4	43	3	17	119	7	20	8	48	23	52	62	12	16	10	18	25	33
Iraq	3	1	0	8	5	2	4	6	39	7	10	64	12	25	13	71	30	41	11	36	21	20	56	9	15
Kenya	1	4	6	5	2	7	8	12	9	16	10	3	17	18	14	13	11	15	19	37	24	20	36	26	21
Madagascar	1	3	8	11	2	9	7	10	5	16	12	18	20	22	17	4	6	21	29	39	30	28	47	41	27
Malaysia	4	3	88	8	22	1	9	5	66	2	14	45	6	21	7	26	17	47	51	16	31	39	11	15	13
Mexico	3	2	131	6	8	1	5	9	13	4	26	71	11	39	16	33	130	52	61	14	24	35	10	7	17
Morocco	5	1	110	2	14	3	4	10	32	6	12	75	7	34	9	8	23	31	68	21	20	30	50	37	18
Mozambique	3	8	1	6	5	9	4	10	11	14	12	2	20	22	17	7	15	16	18	41	27	19	36	26	24
Myanmar	1	2	5	3	7	4	6	9	32	11	14	30	8	21	10	13	12	23	19	35	28	18	31	29	25
Nepal	1	3	27	2	5	7	4	6	14	13	15	50	11	33	9	8	46	16	29	12	34	17	40	30	19
Niger	3	5	1	7	2	8	9	10	4	14	6	22	16	12	18	11	20	17	19	65	24	23	31	52	32
Nigeria	2	4	1	5	6	9	8	13	7	10	12	11	16	3	20	14	15	17	23	93	22	19	28	50	37
Pakistan	1	4	36	2	3	7	5	9	14	10	6	72	11	24	8	17	15	13	25	49	35	22	12	20	31
Peru	1	3	103	4	8	2	5	13	9	7	17	68	11	36	14	10	132	28	27	23	21	31	6	18	20
Philippines	1	2	72	4	7	3	6	8	14	12	11	41	10	34	5	32	9	20	23	30	52	47	21	18	26
Saudi Arabia	9	2	72	5	13	1	4	8	43	3	30	34	6	14	7	41	66	42	47	20	15	18	39	28	24
South Africa	3	5	63	6	2	7	8	4	9	10	14	1	16	37	18	13	28	12	17	20	19	24	21	11	25
Sudan	4	1	5	8	3	2	15	6	34	9	11	19	20	18	12	10	14	31	42	39	23	27	45	28	37
Tanzania	1	10	2	7	3	5	8	11	9	16	12	6	18	19	17	4	13	15	36	49	24	21	35	25	22
Thailand	5	3	59	6	18	2	7	12	86	1	15	44	4	30	11	32	38	55	70	9	19	42	25	8	16
Turkey	4	2	128	6	18	1	7	3	45	5	25	74	16	20	8	37	17	48	50	10	14	36	24	21	27
Uganda	2	3	1	4	5	9	7	12	8	13	10	6	17	20	16	11	15	14	19	120	18	22	29	24	27
Uzbekistan	1	4	0	2	8	3	16	6	72	7	15	82	5	28	48	44	122	36	86	10	9	13	20	26	22
Venezuela	5	3	88	7	8	1	6	16	13	4	19	61	12	31	17	9	132	49	36	10	18	32	11	2	15
Vietnam	1	2	45	6	14	3	7	11	82	5	15	56	4	18	9	19	8	36	34	26	17	43	13	24	16
Yemen	4	1	5	8	3	2	16	6	39	7	9	55	13	21	12	14	15	22	11	41	27	17	50	29	40
Developed	7	2	130	6	26	1	13	4	49	3	20	51	9	36	34	40	102	56	67	5	17	19	16	10	11
France	16	3	0	5	22	1	11	6	67	2	23	61	13	37	29	46	96	65	56	7	19	25	15	17	8
Germany	14	2	0	5	29	1	15	8	78	3	21	88	13	34	45	39	69	87	75	4	19	25	18	17	7
Italy	13	2	0	5	38	1	12	4	71	3	25	46	14	24	17	22	120	68	72	11	19	32	15	20	6
Japan	6	4	0	11	31	1	15	8	55	3	27	116	7	23	28	29	97	63	62	2	19	21	12	14	5
Russia	3	5	0	8	23	1	13	2	35	4	15	36	6	54	33	50	121	40	67	7	22	12	11	10	19
South Korea	11	3	128	9	38	1	12	5	77	2	31	97	6	28	29	30	107	34	69	4	20	23	16	15	8
United Kingdom	6	1	0	5	21	2	15	12	77	3	16	104	20	35	28	49	116	69	57	11	17	25	18	23	7
United States	13	2	0	8	29	1	14	5	64	3	23	55	9	33	41	43	127	84	60	7	10	17	21	6	11

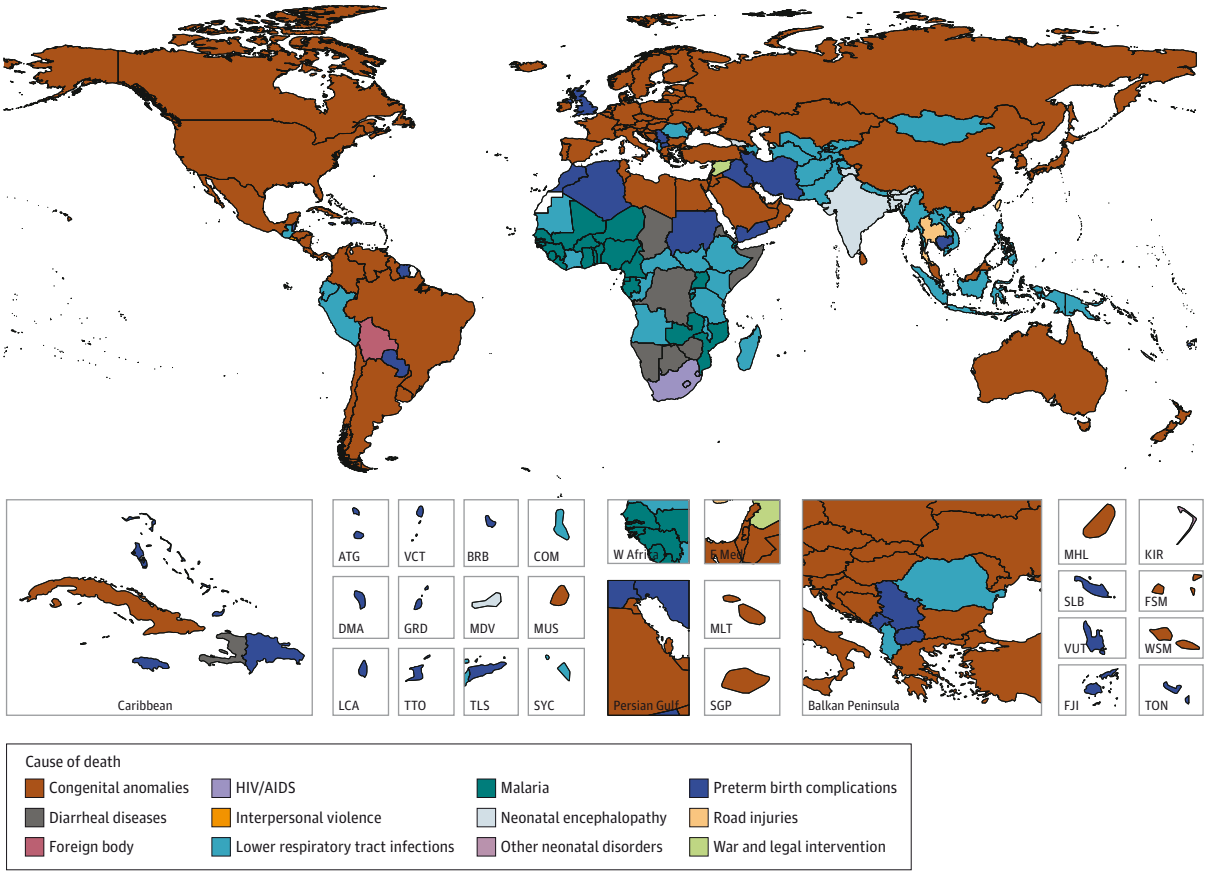
Colors correspond to the ranking of the leading causes of death, with dark red as the most common cause and dark green as the least common cause for the location indicated. The numbers inside each box indicate the ranking. HIV indicates human immunodeficiency virus infection.

Figure 2. Top 25 Global Causes of Death for the 50 Most Populous Countries by Child and Adolescent Population, Both Sexes, Younger Than 5 Years, 2013

Location	Lower respiratory tract infections	Preterm birth complications	Neonatal encephalopathy	Malaria	Diarrheal diseases	Congenital anomalies	Neonatal sepsis	Other neonatal disorders	Protein-energy malnutrition	Meningitis	Sexually transmitted diseases	Hemoglobinopathies	Measles	Drowning	Road injuries	HIV/AIDS	Intestinal infectious diseases	Whooping cough	Foreign body	Tuberculosis	Mechanical forces	Other infectious diseases	Fire and heat	Iron deficiency anemia	Tetanus
Global	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Developing	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	22	21	25	23	24
Afghanistan	1	2	7	21	4	3	13	5	16	6	35	18	10	9	14	75	20	8	34	17	26	24	22	19	12
Algeria	6	1	3	84	8	2	4	5	9	11	15	24	12	21	7	80	13	46	45	47	39	41	22	31	58
Angola	1	6	7	3	2	4	10	8	5	9	11	14	28	16	15	12	24	20	19	18	23	22	17	13	49
Argentina	4	2	6	91	9	1	3	5	13	11	19	17	88	12	10	46	48	25	7	45	33	35	18	54	76
Bangladesh	3	2	1	79	11	6	4	7	10	14	8	19	16	5	25	64	9	15	18	52	23	24	37	34	60
Brazil	5	1	4	65	7	2	3	6	9	10	12	32	80	13	11	59	15	45	8	49	31	27	25	34	64
Cameroon	2	4	5	1	3	6	7	11	8	9	10	15	13	17	14	12	19	18	20	27	25	24	22	16	41
China	4	2	3	83	15	1	9	7	24	13	36	25	68	5	8	39	38	47	12	53	6	44	27	51	43
Colombia	3	2	4	60	5	1	6	7	8	12	17	39	91	10	11	72	18	46	9	50	27	32	23	43	61
Cote d'Ivoire	1	3	5	2	4	7	6	10	8	9	16	12	11	18	13	17	20	14	24	21	25	26	22	15	19
Democratic Republic of the Congo	1	5	7	3	2	6	8	9	4	10	12	11	15	13	20	18	22	23	26	16	25	19	17	14	44
Egypt	2	3	12	87	4	1	8	5	21	22	52	13	29	14	10	64	11	43	44	71	45	18	40	35	57
Ethiopia	1	3	4	6	2	9	5	10	11	13	12	23	8	19	18	14	17	7	30	15	22	25	21	16	20
Ghana	3	4	6	1	9	7	2	10	5	11	17	8	12	16	13	18	15	34	22	31	23	37	28	14	21
India	3	2	1	21	6	7	4	5	10	22	9	33	24	15	29	48	8	19	12	13	25	11	27	28	14
Indonesia	1	3	2	45	5	4	7	6	15	9	13	23	8	11	14	26	12	10	16	38	43	24	22	36	25
Iran	4	1	5	67	7	2	13	3	31	15	42	19	16	8	6	89	11	50	14	51	17	32	10	40	65
Iraq	3	1	7	0	5	2	4	6	31	9	61	26	27	14	10	57	19	8	49	36	32	28	18	41	77
Kenya	1	3	4	7	2	6	5	12	8	9	13	18	11	19	17	10	14	16	30	15	24	25	20	21	29
Madagascar	1	3	11	10	2	9	6	8	5	12	4	22	7	20	21	18	17	19	38	25	28	14	24	13	33
Malaysia	4	2	5	69	15	1	6	3	53	10	14	21	9	12	11	47	8	27	7	46	39	22	33	58	70
Mexico	3	2	5	91	7	1	4	6	9	19	22	41	90	14	10	69	13	51	8	55	35	36	32	39	75
Morocco	5	1	2	86	11	3	4	7	22	10	6	32	18	9	8	67	13	57	48	34	21	36	27	28	60
Mozambique	3	7	5	1	6	10	4	9	11	12	8	22	13	24	16	2	19	15	31	18	25	26	17	20	21
Myanmar	1	2	3	10	6	4	5	7	21	11	9	24	8	12	33	39	13	14	23	52	34	26	18	31	48
Nepal	1	3	2	27	5	7	4	6	10	13	8	26	34	11	25	50	12	15	23	18	28	17	16	40	14
Niger	3	5	6	1	2	7	9	10	4	8	11	12	18	15	19	29	21	16	27	17	22	23	20	14	13
Nigeria	2	4	5	1	7	9	6	11	8	12	13	3	15	16	10	14	23	21	25	18	22	27	17	19	50
Pakistan	2	4	1	44	3	7	5	8	11	6	14	26	12	13	16	54	9	17	10	19	30	22	23	39	27
Peru	1	2	4	81	7	3	5	11	9	13	10	30	92	14	8	73	18	17	6	41	28	29	26	33	62
Philippines	2	1	4	69	7	3	5	6	13	11	21	34	8	12	20	35	9	15	14	27	46	41	37	25	39
Saudi Arabia	9	2	4	64	11	1	3	5	32	19	24	14	55	7	6	26	8	29	33	52	15	47	16	41	53
South Africa	2	4	5	54	1	7	8	3	9	12	10	33	23	18	15	6	19	13	16	14	24	22	21	48	72
Sudan	4	1	7	5	3	2	12	6	23	10	9	17	11	32	13	25	15	30	38	35	33	28	24	27	47
Tanzania	1	8	6	2	4	5	7	10	9	11	3	19	12	17	18	13	16	33	31	14	23	25	21	20	29
Thailand	3	2	4	56	10	1	5	7	63	11	12	22	19	6	9	41	8	50	13	66	36	16	33	55	59
Turkey	5	2	4	88	10	1	6	3	33	12	22	20	11	32	9	49	7	39	14	45	35	38	30	53	68
Uganda	2	3	4	1	5	8	6	12	7	10	9	20	13	19	14	11	17	16	23	15	18	22	21	29	25
Uzbekistan	1	4	2	0	7	3	8	5	52	12	32	19	83	6	15	74	36	66	14	47	9	18	10	31	82
Venezuela	3	2	5	68	6	1	4	10	9	12	7	27	92	13	11	71	15	19	8	53	23	33	24	54	72
Vietnam	2	1	5	45	13	3	6	8	63	12	15	21	7	4	14	46	9	22	10	59	24	30	32	70	48
Yemen	4	1	7	5	3	2	13	6	26	8	11	23	14	15	10	45	17	9	42	29	34	27	18	19	16
Developed	6	2	4	90	18	1	7	3	40	13	26	31	67	10	8	47	30	50	9	55	12	23	15	59	75
France	13	2	4	0	14	1	6	5	50	15	36	32	64	12	8	55	24	44	9	57	21	23	20	59	70
Germany	10	2	3	0	23	1	7	5	60	14	28	27	42	13	11	62	37	59	12	72	19	24	20	52	69
Italy	8	2	4	0	22	1	5	3	53	17	13	24	82	21	11	57	16	52	10	60	19	25	29	40	66
Japan	4	2	6	0	21	1	8	3	47	20	17	23	59	9	11	84	27	51	7	56	13	24	22	64	66
Russia	4	3	5	0	13	1	8	2	28	10	34	45	82	9	12	29	30	51	7	37	19	46	11	41	78
South Korea	8	2	4	87	26	1	7	3	60	24	21	28	65	11	6	82	27	55	9	38	15	30	23	64	57
United Kingdom	5	1	4	0	12	2	7	6	59	10	31	34	77	20	14	78	26	45	13	60	15	17	18	62	74
United States	9	1	5	0	22	2	6	4	55	18	32	28	86	10	7	56	39	46	12	66	8	19	14	60	75

Colors correspond to the ranking of the leading causes of death, with dark red as the most common cause and dark green as the least common cause for the location indicated. The numbers inside each box indicate the ranking. HIV indicates human immunodeficiency virus infection.

Figure 3. Top Cause of Death by Country for Children and Adolescents Aged 0 to 19 Years, Both Sexes, 2013



Foreign body indicates foreign body in lung and pulmonary aspiration; HIV, human immunodeficiency virus infection; and neonatal encephalopathy, neonatal encephalopathy following birth trauma and asphyxia. ATG indicates Antigua and Barbuda; BRB, Barbados; COM, Comoros; DMA, Dominica; E Med, Eastern Mediterranean; FJI, Fiji; FSM, Federated States of Micronesia; GRD, Grenada; KIR, Kiribati; LCA, Saint Lucia; MDV, Maldives; MHL, Marshall Islands; MLT, Malta; MUS, Mauritius; SGP, Singapore; SLB, Solomon Islands; SYC, Seychelles; TLS, Timor-Leste; TON, Tonga; TTO, Trinidad and Tobago; VCT, Saint Vincent and the Grenadines; VUT, Vanuatu; W Africa, West Africa; and WSM, Samoa.

Among older children (aged 5-9 years), the most common cause of death in 2013 was diarrheal disease (38 325 deaths; 95% UI, 30 365-47 678), followed by lower respiratory tract infections (37 431 deaths; 95% UI, 30 713-44 837), road injuries (36 577 deaths; 95% UI, 31 097-41 896), intestinal infectious diseases (mainly typhoid and paratyphoid) (36 110 deaths; 95% UI, 20 561-57 277), and malaria (35 212 deaths; 95% UI, 26 187-46 691) (eTable 2 and eFigure 3 in the Supplement). These 5 causes accounted for 181 000 deaths or 39% of deaths among 5- to 9-year-old children. Five other causes accounted for an additional 23% of deaths: drowning (31 500 deaths; 95% UI, 25 452-42 630), HIV/AIDS (28 211 deaths; 95% UI, 26 407-30 307), hemoglobinopathies (20 229 deaths; 95% UI, 6077-42 394), congenital anomalies (17 508 deaths; 95% UI, 14 677-20 722), and meningitis (13 577 deaths; 95% UI, 10 777-16 863) (eTable 2 in the Supplement). Country-specific leading causes of death among children aged 5 to 9 years are shown in eFigure 4 in the Supplement. Road injuries were the leading cause of death for countries in North America, Latin America and the Caribbean, and Australasia, while drowning was the most common cause of death in most countries in Eastern Europe, East Asia, and Southeast Asia. Intestinal infectious diseases and lower respiratory tract infections were the leading causes for countries in South Asia, while diarrheal diseases, HIV/AIDS, and malaria were the leading causes for countries in sub-Saharan Africa.

Among adolescents (aged 10-19 years), the leading cause of death in 2013 was road injuries (115 186 deaths; 95% UI, 105 185-124 870), followed by HIV/AIDS (75 564 deaths; 95% UI, 69 254-82 629), self-harm (59 114 deaths; 95% UI, 47 914-70 864), drowning (51 013 deaths; 95% UI, 43 533-68 179), and intestinal infectious diseases (44 171 deaths; 95% UI, 24 318-72 643) (eTable 3 and eFigure 5 in the Supplement). These 5 leading causes accounted for 34% of all deaths in this age group. Another 5 causes contributed an additional 17% of all deaths: interpersonal violence (38 300 deaths; 95% UI, 27 452-45 009), lower respiratory tract infections (36 190 deaths; 95% UI, 31 124-42 361), diarrheal diseases (32 616 deaths; 95% UI, 26 725-38 766), malaria (30 764 deaths; 95% UI, 25 003-38 940), and tuberculosis (29 257 deaths; 95% UI, 23 880-34 091) (eTable 3 in the Supplement). Country-specific leading causes of death among adolescents in 2013 are shown in eFigure 6 in the Supplement. Injury-

related deaths were the leading causes in most countries except for those in sub-Saharan Africa, where HIV/AIDS was the dominant leading cause of death. Self-harm was the most common cause of death for some parts of Asia and Eastern Europe.

Contributions to Global Child and Adolescent Deaths According to Population Proportion

Table 1 shows the number of deaths and age-standardized mortality rates for the 10 leading causes among children and adolescents at the global level and in the 50 countries with the largest child and adolescent populations. In 2013, there were 2.5 billion children and adolescents in the world, and the 50 countries represented 73% of this population (eTable 5 in the Supplement). In 2013, Nigeria had about 4% of the world's children and adolescents (eTable 5 in the Supplement) but a 12% global share of deaths from lower respiratory tract infections and a 38% global share of deaths from malaria (Table 1). India had nearly 20% of the world's child and adolescent population but 33% of the world's deaths from neonatal encephalopathy. Half of the world's deaths from diarrheal diseases among children and adolescents occurred in just 5 countries: India, Democratic Republic of the Congo, Pakistan, Nigeria, and Ethiopia, which together represented 30% of the world's pediatric population in 2013 (Table 1 and eTable 5 in the Supplement).

Mortality Time Trends

The global decline in mortality between 1990 and 2013 was faster among younger children (annual percentage change [APC], −3.0%) and older children (APC, −2.9%) than adolescents (APC, −1.6%) (eTables 6-8 in the Supplement). The corresponding APC figures in developing countries were −3.1%, −3.0%, and −1.7%, respectively, and those in developed countries were −3.5%, −3.9%, and −2.5%, respectively (eTables 6-8 in the Supplement).

Among children younger than 5 years, countries in which all-cause mortality declined rapidly experienced these large declines in most of the leading causes of death (eTable 6 in the Supplement). For example, Oman, China, and Maldives, the 3 countries with the fastest declining mortality rates for children younger than 5 years, showed an annual reduction of 5.6% or greater in mortality from at least 6 of the 10 leading causes of death (eTable 6 in the Supplement). Countries with the slowest declines (Vanuatu, Fiji, Swaziland, Lesotho, and Zimbabwe) showed either a stagnant or increasing trend in most of the 10 leading causes (eTable 6 in the Supplement). Similarly, among older children and adolescents, countries with a rapid decline in all-cause mortality experienced greater declines for most of the leading causes of death in these age groups (eTables 7-9 in the Supplement).

Global YLDs and Prevalence of the Leading Causes of Disability

In 2013, disability caused 135.6 million YLDs among children and adolescents, of which 26.4 million affected children younger than 5 years, 29.6 million affected older children, and 79.6 million affected adolescents (data not shown).

Leading causes of YLDs largely overlapped among the 3 age groups. Iron deficiency anemia was the most common cause of YLDs in younger children, older children, and adolescents in 2013 (**Table 3** and eTables 10-13 in the Supplement), affecting 619 (95% UI, 618-621) million prevalent cases in 2013. The 50 countries with the largest child and adolescent population contributed to 86% of global iron deficiency anemia cases in this population (Table 3). India contributed the largest number of cases (147.9 million), followed by China (75.8 million) and Nigeria (24.7 million). The prevalence of children and adolescents with iron deficiency anemia was highest in Afghanistan (41.0%), followed by Yemen (39.8%) and Senegal (38.5%) (Table 3 and eTable 13 in the Supplement).

Skin diseases were the second leading cause of YLDs among children and adolescents in 2013 (Table 3). Younger and older children were most commonly affected by viral skin diseases and dermatitis, whereas adolescents were mainly affected by acne vulgaris (data not shown). Depressive disorders were the third most common cause of YLDs among children and adolescents, with the prevalence in adolescents being 4 times as high as that in older children (2.8% vs 0.7%, respectively) (Table 3 and eTables 11 and 12 in the Supplement).

Among other leading causes of YLDs among children and adolescents, conduct disorder, anxiety disorders, low back and neck pain, and migraine mainly affected older children and adolescents, whereas sense organ diseases and hemoglobinopathies affected all 3 age groups (Table 3 and eTables 10-12 in the Supplement). Among sense organ diseases, uncorrected refractive error and hearing loss were the most frequently occurring causes in all 3 age groups (data not shown). The country-, year-, age-, and sex-specific distributions of YLDs for each cause and their subcategories are viewable in an interactive online visualization tool at http://vizhub.healthdata.org/gbd-compare.[13]

DALYs Among Children and Adolescents

Figure 4 shows DALY rates for leading causes among boys and girls aged 0 to 19 years at the global level and in the 50 countries with the largest child and adolescent populations. Age group–specific leading causes of DALYs are shown in eFigures 7, 8, and 9 in the Supplement. The rankings of leading causes of deaths and DALYs are similar if the percentage of contribution to the disease burden by mortality is high, which is especially the case for the main conditions affecting younger children (Figure 2 and eFigure 7 in the Supplement). Sex differences were small in younger children but larger in some of the causes among adolescents. For instance, transport injuries, drowning, and interpersonal violence among adolescent boys were much higher than among adolescent girls (eFigure 9 in the Supplement). The most striking sex differences were observed in Venezuela, Colombia, and Brazil for interpersonal violence (eFigure 9 in the Supplement). Maternal disorders were common causes of DALYs among adolescent girls in sub-Saharan African and South Asian countries (eFigure 9 in the Supplement).

Time Trends in DALYs

Among all children and adolescents, the leading causes of DALYs were dominated by those common in children younger than 5 years (**Figure 5** and **Figure 6**), who had the greatest share of deaths. Lower respiratory tract infections remained the leading cause of DALYs among children younger than 5 years in both 1990 and 2013, but the number and rate of DALYs declined during the 23 years by 58% and 59%, respectively (Figure 6). Preterm birth complications and neonatal encephalopathy rose in rank (from third and fourth to second and third, respectively) because of their

Table 3. Number of Prevalent Cases and Age-Standardized Rate for the Top 10 Global Causes of Years Lived With Disability in Children and Adolescents in the 50 Most Populous Countries by Child and Adolescent Population, Aged 0 to 19, Both Sexes, 2013

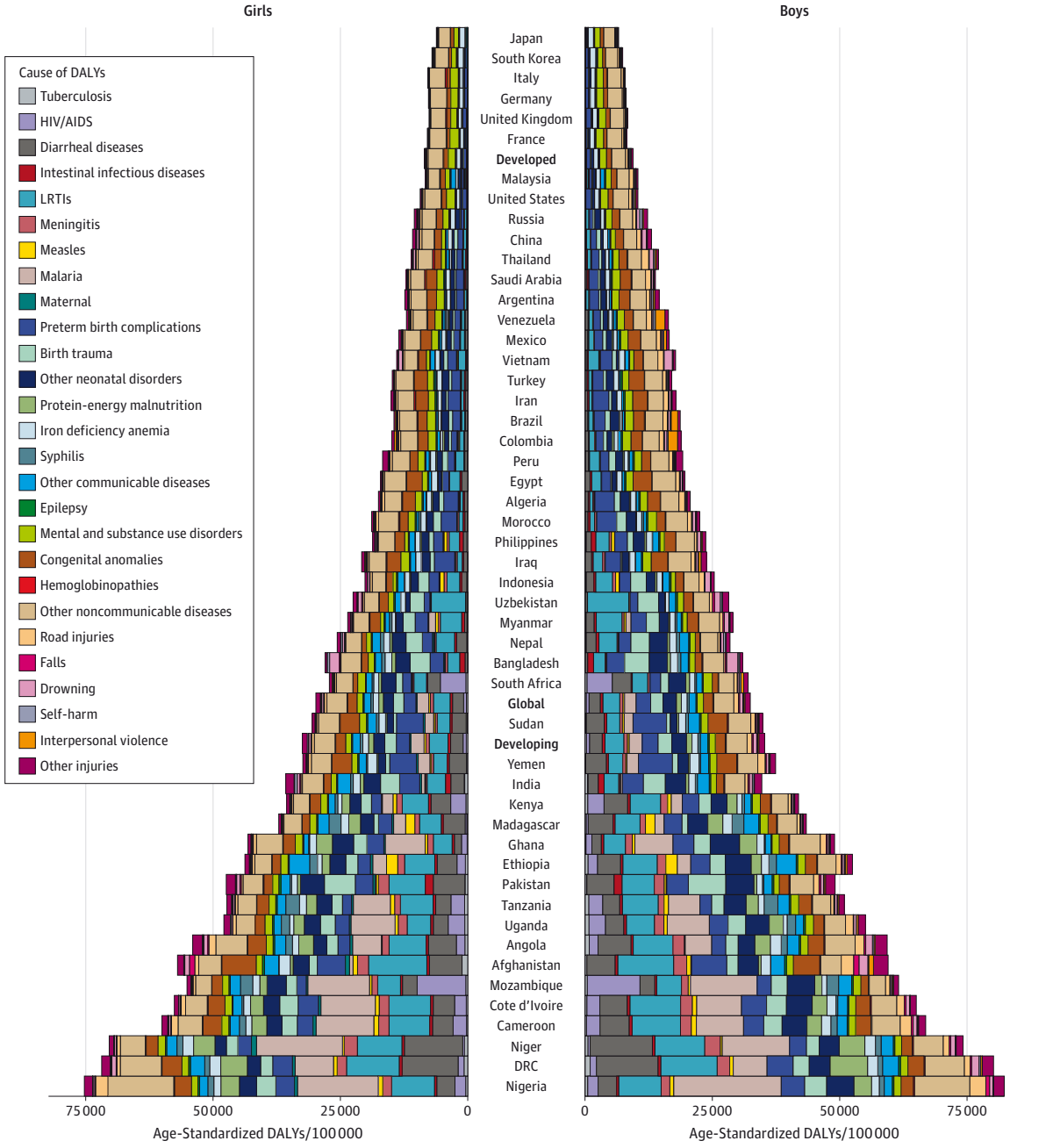
Location	Prevalent Cases, No. (Age-Standardized Rate, %)									
	Iron Deficiency Anemia	Skin Diseases	Depressive Disorders	Low Back and Neck Pain	Conduct Disorder	Sense Organ Diseases	Diarrheal Diseases	Anxiety Disorders	Migraine	Hemoglobinopathies
Global	619 605 056 (25.1)	660 642 176 (26.8)	38 112 752 (1.5)	55 550 072 (2.2)	47 630 912 (1.9)	171 179 648 (6.9)	32 115 848 (1.3)	54 400 176 (2.2)	135 462 464 (5.5)	686 931 456 (27.8)
Developing	559 020 288 (25.6)	579 689 344 (26.7)	32 712 120 (1.5)	44 444 064 (2.0)	41 606 516 (1.9)	155 748 528 (7.2)	31 785 562 (1.4)	44 414 392 (2.1)	118 650 488 (5.5)	639 235 968 (29.3)
Developed	60 592 520 (21.3)	80 951 928 (27.5)	5 400 086 (1.8)	11 102 756 (3.7)	6 024 180 (2.0)	15 434 175 (5.4)	332 252 (0.1)	9 983 493 (3.4)	16 811 666 (5.7)	47 716 020 (16.6)
Afghanistan	7 332 846 (41.0)	4 238 545 (24.9)	63 781 (0.4)	315 433 (1.9)	440 995 (2.6)	1 239 438 (6.9)	376 116 (2.0)	450 584 (2.7)	772 277 (4.6)	4 566 996 (25.5)
Algeria	3 441 017 (24.1)	3 470 004 (25.8)	201 336 (1.5)	236 100 (1.8)	334 774 (2.6)	930 226 (6.6)	261 559 (1.6)	351 731 (2.7)	591 396 (4.5)	2 388 454 (16.8)
Angola	2 713 103 (21.3)	3 875 611 (32.4)	269 830 (2.5)	190 895 (1.8)	226 593 (2.1)	1 270 567 (10.3)	333 494 (2.2)	155 545 (1.5)	488 563 (4.4)	5 490 424 (43.2)
Argentina	2 160 695 (16.2)	3 761 645 (27.3)	227 945 (1.6)	339 210 (2.4)	278 913 (2.0)	691 635 (5.1)	3179 (0.0)	603 244 (4.4)	275 705 (2.0)	2 012 420 (15.0)
Bangladesh	20 854 394 (33.4)	16 710 643 (25.5)	1 233 841 (1.9)	2 151 134 (3.2)	1 209 422 (1.8)	3 802 958 (6.0)	646 328 (1.1)	2 042 371 (3.1)	5 743 748 (8.7)	17 882 126 (28.4)
Brazil	7 029 418 (11.1)	19 921 510 (28.8)	1 259 185 (1.8)	2 443 170 (3.4)	1 634 301 (2.3)	6 052 039 (9.2)	581 602 (1.0)	3 586 669 (5.1)	2 995 137 (4.3)	16 326 374 (25.0)
Cameroon	2 827 804 (22.6)	2 398 197 (21.3)	190 652 (1.8)	209 882 (2.0)	227 608 (2.1)	1 032 729 (8.8)	250 795 (1.9)	227 137 (2.1)	541 121 (4.9)	4 793 160 (39.9)
China	75 771 496 (22.6)	96 197 600 (27.4)	2 265 622 (0.6)	7 576 406 (2.1)	5 283 304 (1.5)	19 313 980 (5.7)	2 186 853 (0.6)	3 939 810 (1.1)	6 980 461 (2.0)	66 767 232 (19.5)
Colombia	2 612 874 (14.8)	3 317 298 (18.4)	361 618 (2.0)	410 055 (2.2)	418 405 (2.3)	1 382 299 (7.7)	213 754 (1.2)	745 607 (4.1)	606 699 (3.3)	4 254 938 (23.9)
Cote d'Ivoire	2 869 279 (26.2)	2 764 364 (27.2)	181 328 (1.9)	167 405 (1.7)	204 280 (2.1)	1 008 279 (9.7)	233 121 (2.0)	203 593 (2.1)	482 507 (4.9)	5 860 560 (55.1)
Democratic Republic of the Congo	12 028 243 (30.4)	11 787 841 (32.5)	810 434 (2.4)	541 768 (1.7)	699 967 (2.1)	4 720 162 (12.8)	981 748 (2.2)	483 213 (1.5)	1 481 869 (4.4)	18 834 114 (49.3)
Egypt	9 012 794 (27.1)	7 656 056 (23.8)	370 386 (1.2)	1 190 205 (3.7)	825 220 (2.6)	2 364 621 (7.2)	510 698 (1.5)	749 422 (2.3)	1 505 614 (4.7)	10 056 616 (30.4)
Ethiopia	11 906 531 (22.7)	18 870 550 (37.1)	1 458 751 (3.0)	703 566 (1.5)	1 027 051 (2.1)	4 496 158 (8.9)	767 576 (1.4)	1 225 066 (2.5)	1 132 576 (2.3)	14 459 131 (28.3)
France	3 162 781 (20.6)	5 085 942 (32.5)	302 551 (1.9)	624 919 (4.0)	391 268 (2.5)	853 257 (5.5)	6555 (0.0)	833 962 (5.3)	995 247 (6.3)	2 131 999 (13.8)
Germany	3 159 099 (22.0)	4 599 480 (29.7)	223 628 (1.4)	1 010 594 (6.3)	390 249 (2.5)	869 605 (5.9)	6245 (0.0)	707 790 (4.5)	897 465 (5.7)	2 352 558 (16.1)
Ghana	3 279 134 (25.3)	2 446 959 (20.2)	269 538 (2.3)	173 416 (1.5)	248 948 (2.1)	1 073 870 (8.6)	135 822 (1.0)	245 960 (2.1)	579 341 (4.8)	5 862 193 (46.3)
India	147 866 688 (30.8)	144 154 592 (29.3)	7 943 998 (1.6)	9 226 282 (1.9)	9 112 211 (1.8)	32 171 082 (6.7)	10 306 493 (2.2)	9 776 147 (2.0)	45 574 424 (9.2)	165 971 520 (34.4)
Indonesia	23 082 472 (24.7)	19 602 020 (20.9)	604 057 (0.7)	1 232 236 (1.3)	1 418 120 (1.5)	7 193 820 (7.7)	1 007 852 (1.1)	993 326 (1.1)	4 704 706 (5.0)	25 875 604 (27.7)
Iran	5 400 623 (22.1)	5 761 539 (23.8)	425 132 (1.7)	660 969 (2.7)	610 969 (2.6)	1 510 187 (6.2)	430 757 (1.7)	642 066 (2.7)	1 193 648 (4.9)	6 171 506 (25.2)
Iraq	4 657 270 (26.9)	3 741 314 (22.9)	238 071 (1.5)	294 504 (1.9)	478 578 (2.9)	1 133 282 (6.6)	270 184 (1.5)	919 248 (5.6)	786 549 (4.9)	5 514 278 (32.2)
Italy	2 208 197 (19.3)	3 802 988 (31.9)	172 715 (1.4)	550 715 (4.5)	297 079 (2.5)	800 834 (6.9)	5442 (0.0)	455 132 (3.8)	1 253 207 (10.5)	2 877 173 (25.0)
Japan	5 947 348 (27.2)	5 647 052 (24.5)	292 760 (1.2)	592 367 (2.5)	476 060 (2.0)	831 355 (3.8)	9719 (0.0)	381 128 (1.6)	1 011 451 (4.3)	1 959 192 (8.8)
Kenya	4 945 485 (19.6)	6 308 646 (28.5)	685 965 (3.3)	350 701 (1.7)	439 564 (2.1)	2 096 825 (9.2)	340 966 (1.3)	319 931 (1.5)	702 950 (3.3)	10 051 371 (42.9)
Madagascar	3 398 545 (27.1)	2 534 052 (21.5)	361 294 (3.2)	160 125 (1.4)	238 143 (2.1)	1 221 466 (10.2)	179 199 (1.3)	179 241 (1.6)	280 226 (2.4)	4 636 076 (37.9)
Malaysia	1 658 848 (16.2)	2 250 309 (20.4)	81 936 (0.7)	149 345 (1.3)	166 296 (1.5)	575 626 (5.4)	21 918 (0.2)	285 860 (2.5)	383 955 (3.4)	2 533 710 (24.0)
Mexico	8 608 476 (18.5)	9 144 078 (19.1)	1 029 133 (2.1)	888 059 (1.8)	1 116 740 (2.3)	3 292 484 (7.0)	497 630 (1.1)	1 160 518 (2.4)	1 674 620 (3.4)	6 700 752 (14.4)
Morocco	3 020 575 (24.8)	3 683 524 (29.9)	169 903 (1.4)	340 260 (2.7)	314 774 (2.6)	891 072 (7.3)	202 905 (1.6)	326 990 (2.7)	527 746 (4.2)	3 517 012 (28.7)
Mozambique	3 569 652 (23.4)	2 923 215 (21.4)	376 918 (2.9)	166 509 (1.4)	269 505 (2.1)	1 319 990 (9.4)	195 956 (1.2)	200 002 (1.6)	371 252 (2.9)	4 984 920 (34.3)
Myanmar	3 749 215 (21.0)	3 763 255 (20.3)	123 529 (0.6)	229 676 (1.2)	281 221 (1.5)	1 579 330 (8.7)	105 457 (0.6)	204 372 (1.1)	911 798 (4.8)	6 276 282 (34.7)

(continued)

Table 3. Number of Prevalent Cases and Age-Standardized Rate for the Top 10 Global Causes of Years Lived With Disability in Children and Adolescents in the 50 Most Populous Countries by Child and Adolescent Population, Aged 0 to 19, Both Sexes, 2013 (continued)

Location	Prevalent Cases, No. (Age-Standardized Rate, %)									
	Iron Deficiency Anemia	Skin Diseases	Depressive Disorders	Low Back and Neck Pain	Conduct Disorder	Sense Organ Diseases	Diarrheal Diseases	Anxiety Disorders	Migraine	Hemoglobinopathies
Nepal	3 896 646 (31.0)	3 042 602 (23.2)	135 016 (1.0)	421 234 (3.2)	242 823 (1.8)	693 879 (5.4)	179 090 (1.5)	286 757 (2.2)	1 148 806 (8.6)	1 912 174 (15.0)
Niger	3 522 047 (30.9)	2 410 055 (25.6)	170 336 (2.0)	111 350 (1.4)	188 449 (2.1)	999 215 (9.8)	322 986 (2.5)	186 776 (2.1)	448 099 (4.9)	4 482 896 (41.9)
Nigeria	24 720 332 (24.9)	25 323 874 (29.4)	1 481 373 (1.8)	2 477 954 (3.1)	1 745 272 (2.1)	6 919 968 (7.6)	1 300 393 (1.2)	1 690 025 (2.0)	4 178 561 (4.9)	53 729 512 (56.8)
Pakistan	22 113 446 (27.1)	25 429 536 (30.8)	1 214 347 (1.5)	1 469 120 (1.8)	1 511 480 (1.8)	5 118 624 (6.3)	1 594 437 (2.0)	1 765 968 (2.1)	6 745 028 (8.2)	16 630 634 (20.3)
Peru	2 627 255 (22.8)	2 322 444 (19.6)	242 315 (2.0)	223 803 (1.9)	276 890 (2.3)	919 818 (7.9)	191 123 (1.7)	359 244 (3.0)	915 026 (7.7)	1 480 244 (12.7)
Philippines	11 150 432 (25.4)	9 307 344 (21.3)	275 411 (0.6)	1 026 651 (2.4)	659 048 (1.5)	3 972 324 (9.1)	381 269 (0.9)	463 169 (1.1)	2 098 499 (4.8)	8 347 250 (19.1)
Russia	6 090 342 (21.2)	4 833 236 (17.8)	523 996 (2.0)	636 408 (2.4)	547 980 (2.1)	1 796 431 (6.4)	90 226 (0.3)	494 719 (1.9)	1 971 138 (7.4)	3 447 237 (12.2)
Saudi Arabia	2 286 151 (21.5)	3 204 233 (32.4)	192 765 (1.9)	264 819 (2.7)	263 068 (2.6)	758 576 (7.3)	170 280 (1.6)	258 739 (2.6)	483 857 (4.9)	4 540 608 (43.4)
South Africa	5 159 018 (25.5)	5 397 856 (26.7)	348 786 (1.7)	408 048 (2.0)	415 093 (2.1)	1 726 566 (8.5)	241 299 (1.2)	672 602 (3.3)	890 644 (4.4)	2 835 948 (14.0)
South Korea	2 875 140 (28.0)	2 955 092 (24.9)	122 304 (0.9)	498 049 (3.8)	247 234 (2.1)	446 216 (4.2)	4425 (0.0)	255 656 (2.1)	974 364 (7.9)	843 204 (7.9)
Sudan	6 138 748 (30.6)	4 588 169 (24.5)	223 781 (1.2)	473 051 (2.6)	473 888 (2.6)	1 502 186 (7.6)	412 693 (1.9)	490 279 (2.7)	902 967 (4.9)	4 400 068 (22.1)
Tanzania	6 867 952 (23.8)	7 587 108 (30.1)	751 729 (3.2)	320 849 (1.4)	499 204 (2.1)	2 059 415 (7.8)	430 098 (1.4)	370 869 (1.6)	653 218 (2.7)	9 701 801 (35.6)
Thailand	2 218 648 (13.7)	3 950 348 (22.3)	125 973 (0.7)	176 500 (0.9)	271 934 (1.5)	1 121 922 (6.7)	84 203 (0.6)	195 711 (1.1)	1 419 518 (7.8)	5 687 484 (34.2)
Turkey	6 251 246 (24.6)	8 073 130 (30.5)	387 904 (1.5)	873 888 (3.3)	680 494 (2.6)	1 503 149 (5.9)	407 041 (1.7)	734 689 (2.8)	1 997 641 (7.5)	5 650 598 (22.1)
Uganda	3 970 910 (16.1)	4 647 124 (22.2)	622 216 (3.2)	308 970 (1.6)	410 578 (2.1)	1 886 161 (8.7)	475 153 (1.8)	313 328 (1.6)	602 755 (3.1)	8 473 717 (37.8)
United Kingdom	2 966 546 (20.3)	5 018 414 (33.1)	181 497 (1.2)	648 266 (4.2)	376 388 (2.5)	819 044 (5.5)	6741 (0.0)	390 157 (2.6)	924 021 (6.1)	2 619 553 (17.7)
United States	15 992 132 (19.3)	26 350 414 (30.7)	2 050 206 (2.4)	3 241 876 (3.7)	1 375 879 (1.6)	4 037 732 (4.8)	33 152 (0.0)	3 987 614 (4.6)	2 809 268 (3.2)	18 102 976 (21.6)
Uzbekistan	2 272 136 (20.4)	1 762 122 (15.4)	203 936 (1.7)	198 432 (1.7)	235 947 (2.1)	736 265 (6.5)	57 520 (0.5)	230 302 (2.0)	878 042 (7.7)	1 637 579 (14.5)
Venezuela	1 438 655 (12.6)	2 340 201 (20.4)	224 245 (1.9)	221 679 (1.9)	265 702 (2.3)	796 519 (7.0)	115 015 (1.0)	275 549 (2.4)	446 818 (3.9)	2 337 759 (20.5)
Vietnam	7 160 936 (25.5)	6 063 204 (20.7)	235 859 (0.8)	509 638 (1.7)	442 505 (1.5)	1 831 238 (6.4)	348 806 (1.3)	219 648 (0.7)	1 477 531 (4.9)	6 972 515 (24.4)
Yemen	5 108 383 (39.8)	3 214 463 (25.4)	49 653 (0.4)	190 046 (1.5)	338 034 (2.7)	869 423 (6.8)	216 751 (1.6)	335 131 (2.7)	600 865 (4.8)	3 989 276 (31.1)

Figure 4. Age-Standardized Rates of Disability-Adjusted Life-Years (DALYs) per 100 000 Children and Adolescents Aged 0 to 19 Years, 2013



Causes are listed in order starting from 0 on the horizontal axes. Developed indicates the rates for developed countries; global, the global rates; and developing, the rates for developing countries. DRC indicates Democratic Republic of the Congo; HIV, human immunodeficiency virus infection; and LRTIs, lower respiratory tract infections.

relatively slower rates of decline than diarrheal diseases, which dropped from second to fifth with a 67% decrease in DALY rates (Figure 6). The rate for measles also notably declined (from 8th to 14th), with an 84% decrease in DALY rates between 1990 and 2013 (Figure 6).

Among older children and adolescents, iron deficiency anemia remained the leading cause of DALYs in both 1990 and 2013, with a modest decrease in the number and rate of DALYs during the 23 years (eFigures 10 and 11 in the Supplement). The rank of HIV/AIDS increased from 101st to 6th among adolescents, 78th to 10th among older children, and 33rd to 17th among younger children between 1990 and 2013, with a statistically significant increase in both DALY counts and rates (Figure 6 and eFigures 10 and 11 in the Supplement). Full details of the results by age, sex, geography, and period can be viewed in the online interactive visualization tool (http://vizhub.healthdata.org/gbd-compare).[13]

Figure 5. Top 25 Global Causes of Disability-Adjusted Life-Years (DALYs) in Children and Adolescents Aged 0 to 19 Years, Both Sexes, 1990 and 2013

1990			2013				
Mean DALYs	Rank	Leading Causes	Leading Causes	Rank	Mean DALYs	Median % Change in Global DALY Counts[a]	Median % Change in Global DALY Rates[a]
196 734 064	1	Lower respiratory tract infections	Lower respiratory tract infections	1	83 453 288	-57.6[b]	-58.8[b]
156 920 016	2	Diarrheal diseases	Preterm birth complications	2	66 913 364	-51.3[b]	-51.9[b]
136 722 400	3	Preterm birth complications	Malaria	3	57 167 132	-5.5	-9.3
76 351 952	4	Neonatal encephalopathy	Neonatal encephalopathy	4	56 856 708	-25.4[b]	-26.3[b]
61 123 632	5	Congenital anomalies	Diarrheal diseases	5	55 076 972	-64.9[b]	-66.1[b]
59 355 096	6	Malaria	Congenital anomalies	6	48 243 644	-19.2[b]	-21.3[b]
50 314 268	7	Other neonatal disorders	Neonatal sepsis	7	31 631 792	6.2	4.7
45 315 760	8	Measles	Iron deficiency anemia	8	26 926 860	-21.8[b]	-27.2[b]
35 175 244	9	Protein-energy malnutrition	Other neonatal disorders	9	24 690 226	-51.1[b]	-51.8[b]
34 482 508	10	Iron deficiency anemia	Protein-energy malnutrition	10	23 275 150	-33.8[b]	-35.9[b]
30 791 336	11	Meningitis	Road injuries	11	17 315 342	-25.9[b]	-31.8[b]
29 904 474	12	Neonatal sepsis	Hemoglobinopathies	12	17 199 214	8.5	3.1
29 576 492	13	Drowning	Meningitis	13	15 299 012	-50.3[b]	-52.2[b]
25 211 894	14	Tetanus	HIV/AIDS	14	13 460 036	304.8[b]	295.1[b]
23 614 698	15	Road injuries	Skin diseases	15	13 201 860	11.2[b]	0.4
20 804 222	16	Sexually transmitted diseases	Drowning	16	13 121 178	-57.3[b]	-59.7[b]
14 713 240	17	Intestinal infectious diseases	Intestinal infectious diseases	17	11 468 289	-21.9[b]	-27.1[b]
14 485 264	18	Hemoglobinopathies	Sexually transmitted diseases	18	11 276 496	-45.5[b]	-46.8[b]
13 969 256	19	Tuberculosis	Depressive disorders	19	8 720 946	22.4[b]	8.3[b]
11 866 152	20	Skin diseases	Measles	20	7 944 781	-83.0[b]	-83.7[b]
11 819 906	21	Whooping cough	Tuberculosis	21	6 620 939	-51.4[b]	-54.7[b]
11 435 010	22	Mechanical forces	Low back and neck pain	22	6 448 055	13.2[b]	-0.5
9 606 849	23	Fire and heat	Conduct disorder	23	5 741 088	15.6[b]	2.5[b]
7 239 153	24	COPD	Sense organ diseases	24	5 623 924	-0.8	-9.6[b]
7 099 481	25	Depressive disorders	Whooping cough	25	5 212 189	-56.2	-57.6
	33	Low back and neck pain	Mechanical forces	26			
	34	Sense organ diseases	Fire and heat	31			
	38	Conduct disorder	COPD	43			
	55	HIV/AIDS	Tetanus	44			

Communicable, maternal, neonatal, and nutritional; Noncommunicable; Injuries

Solid lines connecting the 1990 and 2013 charts indicate increased or unchanged rank; dotted lines, decreased rank; COPD, chronic obstructive pulmonary disease; and HIV, human immunodeficiency virus infection.

[a] Calculated at the 1000 draw level.

[b] Changes that are statistically significant ($P < .05$).

Discussion

This is the first of a series of annual updates to identify levels and trends in the fatal and nonfatal burden of diseases and injuries among children and adolescents at the country level. Of the 7.7 million deaths among children and adolescents globally in 2013, more than 80% occurred among younger children. Of the 135.6 million YLDs among children and adolescents in 2013, nearly 60% of the YLDs were contributed by adolescents. Leading causes of death among children and adolescents in 2013 fell into 4 main categories: neonatal, congenital, infectious diseases, and injuries. Developing and developed countries had both similarities and differences in the leading causes of death. In both sets of countries, preterm birth complications and congenital anomalies were common causes of death among children younger than 5 years, whereas injuries were major causes of death in adolescents. Infectious diseases including lower respiratory tract infections, neonatal sepsis, malaria, diarrheal diseases, HIV/AIDS, typhoid, and tuberculosis remained major challenges in developing nations. In several countries, vaccine-preventable diseases such as measles and pertussis were still among the 10 leading causes of death, indicating a need to strengthen immunization programs in those countries. Leading causes of YLDs largely overlapped among the 3 age groups, with iron deficiency anemia and skin diseases being the first and second most common causes of YLDs among children and adolescents.

Figure 6. Top 25 Global Causes of Disability-Adjusted Life-Years (DALYs) in Children Younger Than 5 Years, Both Sexes, 1990 and 2013

1990			2013			Median % Change in Global DALY Counts[a]	Median % Change in Global DALY Rates[a]
Mean DALYs	Rank	Leading Causes	Leading Causes	Rank	Mean DALYs		
186 064 688	1	Lower respiratory tract infections	Lower respiratory tract infections	1	77 833 176	-58.1[b]	-59.4[b]
141 961 888	2	Diarrheal diseases	Preterm birth complications	2	64 995 980	-52.4[b]	-53.8[b]
135 992 192	3	Preterm birth complications	Neonatal encephalopathy	3	56 070 636	-25.9[b]	-28.1[b]
75 854 408	4	Neonatal encephalopathy	Malaria	4	50 573 184	-1.2	-4.2
56 322 264	5	Congenital anomalies	Diarrheal diseases	5	48 496 548	-65.9[b]	-67.0[b]
50 254 368	6	Malaria	Congenital anomalies	6	43 394 044	-21.1[b]	-23.5[b]
50 034 704	7	Other neonatal disorders	Neonatal sepsis	7	31 631 792	6.2	2.9
40 191 520	8	Measles	Other neonatal disorders	8	24 124 848	-51.9[b]	-53.4[b]
33 228 548	9	Protein-energy malnutrition	Protein-energy malnutrition	9	21 744 328	-34.6[b]	-36.6[b]
29 904 474	10	Neonatal sepsis	Meningitis	10	12 305 894	-52.4[b]	-53.8[b]
25 749 860	11	Meningitis	Hemoglobinopathies	11	11 139 507	6.4	3.2
24 370 838	12	Tetanus	Sexually transmitted diseases	12	10 383 397	-45.7[b]	-47.4[b]
19 235 590	13	Sexually transmitted diseases	Iron deficiency anemia	13	9 377 653	-33.6[b]	-35.6[b]
18 193 660	14	Drowning	Measles	14	6 990 036	-83.1[b]	-83.6[b]
14 219 549	15	Iron deficiency anemia	Drowning	15	6 932 633	-63.0[b]	-64.1[b]
11 241 127	16	Whooping cough	Road injuries	16	5 822 856	-36.9[b]	-38.9[b]
9 434 525	17	Hemoglobinopathies	HIV/AIDS	17	5 517 001	82.3[b]	76.7[b]
9 310 316	18	Road injuries	Intestinal infectious diseases	18	5 341 676	-24.4[b]	-26.7[b]
8 790 621	19	Mechanical forces	Whooping cough	19	4 932 885	-56.6	-57.9
7 710 265	20	Tuberculosis	Foreign body	20	4 159 089	-38.9	-40.8
7 027 280	21	Intestinal infectious diseases	Tuberculosis	21	3 672 592	-50.4[b]	-51.9[b]
6 566 014	22	Foreign body	Other infectious diseases	22	3 532 254	-25.6	-27.8
5 947 247	23	Fire and heat	Mechanical forces	23	3 190 592	-65.1	-66.2[b]
5 740 204	24	Neonatal hemolytic disease	Fire and heat	24	2 729 898	-54.9[b]	-56.3[b]
5 269 538	25	COPD	Tetanus	25	2 721 063	-87.9[b]	-88.3[b]
	26	Other infectious diseases	Neonatal hemolytic disease	31			
	33	HIV/AIDS	COPD	38			

Communicable, maternal, neonatal, and nutritional; Noncommunicable; Injuries

Solid lines connecting the 1990 and 2013 charts indicate increased or unchanged rank; dotted lines, decreased rank; COPD, chronic obstructive pulmonary disease; and HIV, human immunodeficiency virus infection.

[a] Calculated at the 1000 draw level.

[b] Changes that are statistically significant ($P < .05$).

Trends from the leading causes of death in younger children varied widely across countries. Countries with greater declines in all-cause child mortality tended to have a rapid decline in mortality rates for most of the main causes of death, suggesting that general improvements in health services and public health interventions for a wide range of health problems (eg, improved management of childhood illnesses, immunization, mass distribution of insecticide-treated bed nets, and improved access to prenatal, obstetric, and postnatal care) rather than single disease programs determine success. The declines in poverty levels and improvements in living conditions over time might have also contributed to the declines in mortality. Countries with slowly declining or stagnant trends in all-cause mortality in children younger than 5 years generally showed similar trends in mortality rates for the leading causes. Most of these deaths, especially in developing countries, could be prevented by a concerted response from health systems and public health interventions.

The typical leading causes of death in younger children such as lower respiratory tract infections and diarrheal diseases were also common causes of death for older children in many developing countries, indicating that interventions targeting the former should extend to cover the latter. Mortality and DALY rates for lower respiratory tract infections and diarrheal diseases declined during the past 23 years, but they were still among the top 5 causes for both younger and older children in 2013. In fact, lower respiratory tract infections were the first leading cause of death among younger children, whereas diarrheal diseases were the most common cause of death among older children. These deaths are largely avoidable through case identification and proper management and prevention of risk factors. Unsafe water, sanitation, and hand-washing practices are largely responsible for diarrheal disease–related deaths, whereas household air pollution and ambient air pollution are important risk factors for deaths from lower respiratory tract infec-

tions in both younger and older children, with undernutrition being an additional key risk factor for both lower respiratory tract infections and diarrheal diseases among younger children.[14] Proven interventions[15-17] exist to reduce exposures to these risk factors but uptake is insufficient.

The decline in all-cause mortality rates among adolescents between 1990 and 2013 was slower than that among younger and older children. Road injuries were the leading cause of death among adolescents globally, with a stagnant or increasing trend in most developing countries. Many countries inadequately implement proven road safety practices (eg, safety measures for road users and vehicles, road infrastructure, and postcrash care).[18] With increasing motorization, these trends are likely to worsen unless decisive action is taken.

Self-harm was the second most common cause of injury-related death among adolescents. While the most common suicidal methods differ across geography, restricting access to common lethal means has proven to be effective in reducing suicide rates.[19,20] For example, pesticide ingestion is a commonly used method of suicide among young people in developing countries.[21] Prohibition of toxic pesticides in Sri Lanka and South Korea has been shown to reduce both the overall and method-specific suicide rates.[22,23] National suicide prevention strategies can play a role in preventing suicide, but such strategies are lacking in many countries worldwide.[20] Mental and substance use disorders contributed to two-thirds of all suicide DALYs in the world, indicating the importance of early detection and effective management of these disorders as part of suicide prevention strategies.[24]

Drowning was among the 10 leading causes of death among older children and adolescents and the 14th leading cause of death among younger children in 2013. Lack of barriers to water sites and absence of close supervision are key risk factors for drowning among younger children in both developing and developed countries.[25,26] Older children and adolescents usually drown during nonrecreational or daily activities in developing countries but during recreational activities in developed countries.[27] Risk of death from drowning is especially high in rural areas in developing countries, where unfenced water sources are close to the homes, without any emergency medical care facilities or capacity to perform resuscitation for the drowning child.[25,27] In developed countries, failure to wear life jackets during boating activities and alcohol use among adolescents during water-related recreation are among the risk factors for drowning.[26,27]

In addition to injuries, infectious diseases were important causes of death among adolescents in developing countries, especially HIV/AIDS, lower respiratory tract infections, intestinal infectious diseases, diarrheal diseases, malaria, and tuberculosis. The mortality rates for all these diseases except HIV/AIDS are decreasing. Deaths from HIV/AIDS among adolescents are concentrated in sub-Saharan Africa and have been increasing since 1990. This trend differs from that in all age groups, where it increased after 1990, peaked around 2005, and then declined steadily after antiretroviral treatment became more widely available.[11] Low rates of HIV testing, an important step toward HIV treatment, and poor access to antiretroviral treatment among adolescents[28] might explain some of the increases in HIV/AIDS mortality in this age group. Although much emphasis has been placed on prevention of HIV infection among adolescents, little attention has been given to the care of those who were infected during infancy.[29] High rates of children orphaned by HIV/AIDS, the necessity of guardian consent to undergo HIV testing, and the lack of clear policies and guidance regarding consent and HIV testing among minors are some of the barriers to HIV testing and care for older children and adolescents.[29,30]

Leading causes of disability among all children and adolescents were dominated by causes common in adolescents because of a larger share of YLDs by this age group. However, iron deficiency anemia, the largest cause of disability, is common in both younger and older children and adolescents. The high demand of nutrients for growth, blood loss during menstruation in adolescent girls, and hookworm infections (especially in developing countries) put children and adolescents at risk for this deficiency. Although iron supplementation is effective, challenges exist in terms of distribution, cost, and compliance.[31] Other cost-effective interventions exist, including food fortification and biofortification of crops, with the latter being a way of reaching rural populations with limited access to marketed fortified foods.[31,32]

Compared with changes in the causes of mortality that are generally showing decreasing rates in all age groups,[1] there are smaller changes, if at all, in the prevalence of many causes of disability (data not shown). The slow decline in disabling conditions is not specific to children and adolescents but a more common feature across the age span.[5] Major depressive disorder, conduct disorder, and anxiety disorders were major causes of disability among older children and adolescents in 2013. Whereas identification and treatment of these disorders are important, prevention of modifiable risk factors such as child abuse and neglect, bullying, and intimate partner violence should also be a priority.[33] Other common causes of disability such as low back and neck pain, migraine, and skin disorders also showed little change. Musculoskeletal disorders have drawn more attention since the GBD 2010 study, but there is still limited policy discussion on the approaches to deal with and/or prevent the leading causes of low back and neck pain.[5,34,35] Migraine and other headache disorders generally attract low health care priority despite the disability attributed to them.[36]

The general limitations of the GBD study also apply to this report. These limitations have been discussed widely and in detail in the published GBD 2013 articles and we summarize the relevant limitations here.[1,2,5,6,11] First, there were variations in the instrument used for collection of verbal autopsy data, which might reduce the between-country comparability of cause of death data. Moreover, the quality of the medical certification of causes of death (eg, diagnostic accuracy) might have also influenced our estimates. Second, although redistribution of ill-defined or intermediate causes to specific underlying causes improved the comparability of cause of death data, it could yield results different from official statistics of countries. This could happen because the redistribution used global or regional algorithms, which did not pick up variations across countries in terms of certification practices or the timing of implementation of coding rules. We plan to use more country-specific redistribution algorithms in future rounds of the GBD study. Third, the fact that the sum of cause-specific mortality estimates must equal all-cause mortality for a particular country, age, sex, and year is a strength of the GBD study approach, but it also has a limitation. Causes of death with very wide UIs (eg, hemoglobinopathies) tend to be adjusted downward relative to causes with narrower UIs. Fourth, in general, the epidemiological data coverage for the period 2006 to 2013 was relatively lower than the period 1998 to 2005, although there were variations by disease. For example, the percentages of countries that have epidemiological data on low back and neck pain for the periods

1998 to 2005 and 2006 to 2013 were 41.5% and 13.3%, respectively. The lower coverage for the latter might be explained by the lag in data collection, analyses, and publications.[5] For some diseases such as tuberculosis, the data coverage is higher for the recent years (91.5% for the period 1998-2005 vs 98.4% for 2006-2013). A systematic quantification of the geographical and temporal coverage of the input epidemiological data by cause has been reported in detail previously.[5] Making estimates for every country over time is challenging especially for those with little or no data. We had to make use of sophisticated modeling techniques to borrow strength across geography and covariates to help predict for countries and years with sparse data. The lack of data for a particular geography is reflected by wider UIs. Finally, for some causes of disability, long-term consequences in later years of life are not reflected in this article. For example, long-term impairments due to preterm birth complications, neonatal encephalopathy, and Down syndrome after age 19 years were not counted in the DALY rankings because we focused only on the burden of disease experienced by those aged 0 to 19 years.

Conclusions

Understanding the levels and trends as well as geography of the leading causes of death and disability among children and adolescents is critical to guide investment and inform policies. Monitoring these trends over time is also key to understanding where interventions are having an effect and where more attention is needed. The vast majority of deaths in children and adolescents are preventable. Proven interventions exist to prevent diarrheal and respiratory diseases, neonatal conditions, iron deficiency anemia, and road injuries, which result in some of the highest burdens of unnecessary death and disability among children and adolescents. The findings presented herein show that these and other available interventions are underused and point to where more attention is needed. The findings indicate that proven health interventions could save millions of lives. Despite the general decline in mortality, the speed of the decline could still be faster.

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