

Levels & Trends in
**Child
Mortality**

Report 2010

Estimates Developed by the
UN Inter-agency Group for
Child Mortality Estimation



This report was prepared at UNICEF Headquarters by Danzhen You, Gareth Jones and Tessa Wardlaw on behalf of the United Nations Inter-agency Group for Child Mortality Estimation.

Organizations and individuals involved in generating country-specific estimates on child mortality

United Nations Children's Fund
Danzhen You, Tessa Wardlaw

World Health Organization
Ties Boerma, Colin Mathers, Mie Inoue, Mikkel Oestergaard

The World Bank
Eduard Bos, Emi Suzuki

United Nations Population Division
Francois Pelletier, Gerhard Heilig, Kirill Andreev, Patrick Gerland, Danan Gu, Nan Li, Thomas Spoorenberg

United Nations Economic Commission for Latin America and the Caribbean Population Division
Dirk Jaspers Faijer, Guiomar Bay, Tim Miller

Harvard University
Kenneth Hill

Consultant
Gareth Jones

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Kenneth Hill (Chair), Harvard University
Simon Cousens, London School of Hygiene and Tropical Medicine
Trevor Croft, Measure DHS, ICF Macro
Gareth Jones, Consultant

Michel Guillot, University of Pennsylvania
Jon Pedersen, Fafo
Neff Walker, Johns Hopkins University
John Wilmoth, University of California, Berkeley

Further thanks go to Mickey Chopra, Jimmy Kolker and Richard Morgan from UNICEF for their support. And special thanks to Khin Wityee Oo from UNICEF for her assistance in preparing the report.

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United Nations Children's Fund
3 UN Plaza, New York, New York, 10017 USA

World Health Organization
Avenue Appia 20, 1211 Geneva 27, Switzerland

The World Bank
1818 H Street, NW, Washington, DC, 20433 USA

United Nations Population Division
2 UN Plaza, New York, New York, 10017 USA

Introduction

Millennium Development Goal 4 (MDG 4) calls for reducing the under-five mortality rate by two-thirds between 1990 and 2015. As global momentum and investment for accelerating child survival grow, monitoring progress at the global and country levels has become even more critical. Generating accurate estimates of under-five mortality poses a considerable challenge because of the limited data available for many developing countries. In 2004 the United Nations established the Inter-agency Group for Child Mortality Estimation (IGME) to advance the work on monitoring progress towards MDG 4 and to enhance country capacity to produce timely and properly assessed estimates of child mortality. This

report presents the IGME's latest estimates of infant and under-five mortality and assesses progress towards MDG 4 at the country, regional and global levels.

The most recent IGME estimates show that nearly 8.1 million children under age five died in 2009—or more than 22,000 children a day. Still, these figures reflect substantial progress. Globally, the under-five mortality rate has fallen from 89 deaths per 1,000 live births in 1990 to 60 in 2009. But the rate of decline—a one-third reduction over 20 years—is insufficient to meet MDG 4, particularly in Sub-Saharan Africa, Southern Asia and Oceania.

PROGRESS TOWARDS MILLENNIUM DEVELOPMENT GOAL 4: KEY FACTS AND FIGURES

- Globally, the number of deaths among children under age five has fallen from 12.4 million in 1990 to 8.1 million in 2009. This means that more than 22,000 children under five die each day—12,000 fewer than in 1990.
- Since 1990 the global under-five mortality rate has fallen by a third—from 89 deaths per 1,000 live births in 1990 to 60 in 2009. All regions except Sub-Saharan Africa, Southern Asia and Oceania have seen reductions of at least 50 percent.
- The rate of decline in under-five mortality has accelerated over 2000–2009 compared with the 1990s.
- Northern Africa and Eastern Asia have made the most progress in reducing under-five mortality.
- The rate of decline in under-five mortality remains insufficient to reach Millennium Development Goal 4, particularly in Sub-Saharan Africa, Southern Asia and Oceania.
- The highest rates of child mortality continue to be in Sub-Saharan Africa, where 1 child in 8 dies before age five—nearly 20 times the average of 1 in 167 for developed regions. Southern Asia has the second highest rates, with about 1 child in 14 children dying before age five.
- Under-five mortality is increasingly concentrated in a few countries. About half of global under-five deaths in 2009 occurred in only five countries: India, Nigeria, Democratic Republic of the Congo, Pakistan and China. India, with 21 percent, and Nigeria, with 10 percent, together account for nearly a third of under-five deaths worldwide.
- Some 40 percent of under-five deaths occur within the first month of life, and some 70 percent occur within the first year of life.
- The two biggest killers of children under age five are pneumonia (18 percent of deaths) and diarrhoeal diseases (15 percent).

The UN Inter-agency Group for Child Mortality Estimation

The Inter-agency Group for Child Mortality Estimation (IGME) was formed in 2004 to share data on child mortality, harmonize estimates within the UN system, improve methods for child mortality estimation and produce consistent estimates of child mortality worldwide for reporting on progress towards the Millennium Development Goals. The IGME, led by the United Nations Children's Fund and the World Health Organization, also includes the World Bank and the United Nations Population Division of the Department of Economic and Social Affairs as full members.

The IGME's independent Technical Advisory Group, comprising eminent scholars and independent experts in demography, provides technical guidance on estimation methods, technical issues and strategies for data analysis and data quality assessment.

The IGME updates its child mortality estimates annually after reviewing newly available data and assessing data quality. This report contains the latest IGME estimates of child mortality at the country, regional and global levels. Country-specific estimates and the data used to derive them are available from the child mortality database of the IGME: **CME Info (www.childmortality.org)**.



Estimating Child Mortality

DATA SOURCES AND METHODOLOGY

Generating accurate estimates of under-five mortality poses a considerable challenge because of the limited availability of high-quality data for many developing countries.

Vital registration systems are the preferred source of data on child mortality because they collect information as events occur and cover the entire population. However, many developing countries lack vital registration systems that accurately record all births and deaths. Therefore, household surveys, such as the United Nations Children's Fund-supported Multiple Indicator Cluster Surveys and the US Agency for International Development-supported Demographic and Health Surveys, are the primary source of data on child mortality in developing countries.

The Inter-agency Group for Child Mortality Estimation seeks to compile all available national-level data on

child mortality, including data from vital registration systems, population censuses, household surveys and sample registration systems. For each country a regression line is then fitted to the data points that meet data quality standards established by the IGME and extrapolated to a common reference year: 2009 for the estimates presented in this report.

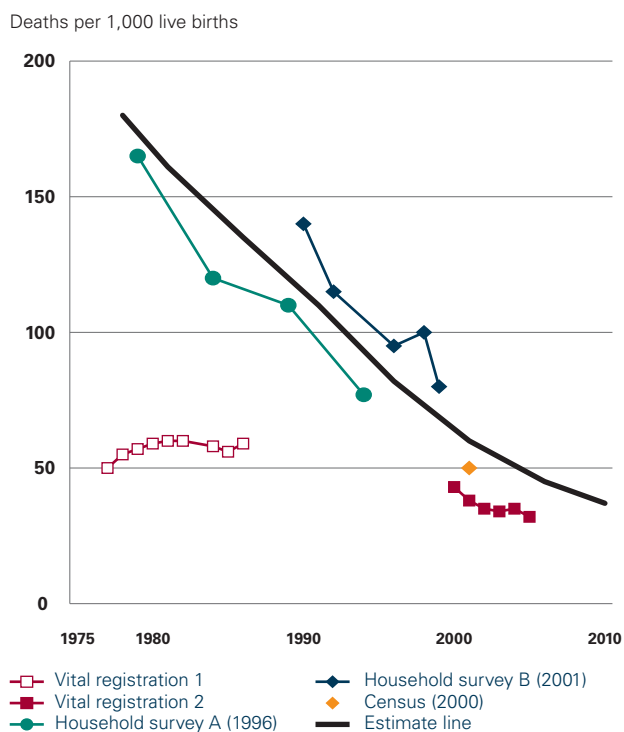
A substantial amount of newly available data has been incorporated into this year's estimation process. The increased data availability has resulted in substantial changes to the estimates of child mortality levels and trends for some countries, compared with previous estimates. Because the fitted line is based on the entire time series of data available for each country, the estimates presented in this report may differ from and not be comparable with those in previous reports.

If each country had a single source of high-quality data on child mortality covering the last 40 years, reporting on child mortality levels and trends would be straightforward. Reality is different. While industrialized countries and a few developing countries have such a source in their vital registration systems, the majority of countries do not. Furthermore, countries that have the largest impact on global and regional child mortality estimates have to rely on multiple sources of varied quality covering limited periods for their national estimates.

This section explains how child mortality estimates are derived from the available sources and the challenges faced in producing high-quality estimates. It focuses on the under-five mortality rate, but estimates of the infant mortality rate have similar issues.

Figure 1 shows a hypothetical country example. The country has several sources of data: two household surveys, A conducted in 1996 and B conducted in 2001; the 2000 population census; and vital registration data for two periods (1 and 2).

FIGURE 1 Source data and estimate line for the under-five mortality rate, hypothetical country, 1975–2010



Household survey A collected full birth histories, meaning that the women ages 15–49 who were interviewed were asked when each of their children had been born and the time of death of children who had died. Such data allow direct calculation of the probability that children die before a certain age. Collecting such detailed birth history data requires long questionnaires and well trained interviewers, but the data gathered can provide mortality rates covering periods extending up to 25 years before the survey and yield better trend information than do indirect data on child mortality (as household survey B does). Household survey B collected data from women ages 15–49 on the number of children they had ever given birth to and the number who had died by the time of the interview. Such data provide indirect information on the level of mortality affecting children and have proven to be a source of robust child mortality data, particularly of under-five mortality, for the 10–15 years preceding the survey or census.

The single census point in figure 1 is derived from data on births and deaths in the 12 months

immediately before the census; these data often underreport mortality. However, most censuses also collect indirect mortality data (as survey B does) and thus also provide retrospective mortality data.

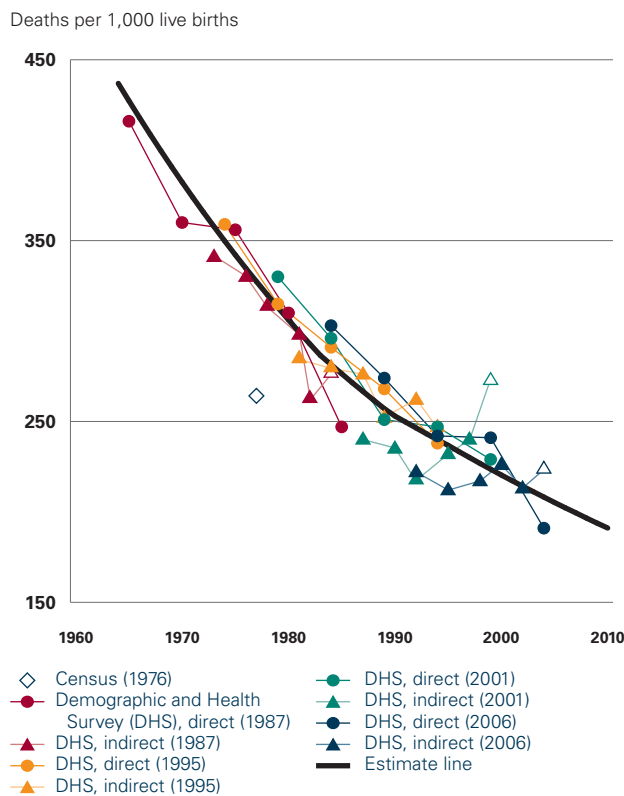
The vital registration data before 1990 underreport mortality, compared with data from surveys A and B. This is often the case when registration systems fail to record all childhood deaths, especially those during the neonatal period. However, the vital registration data after 1995 are more consistent with other sources, implying improved coverage of deaths.

The thick black line in figure 1 is fitted to the data sources and reports estimates of the under-five mortality rate for the country. There are many ways of fitting these data, from a straight line fit to complex curvilinear models. The primary methods used by the Inter-agency Group for Child Mortality Estimation are the multiple-spline regression and the locally weighted scatter-plot smoothing regression (for more detail on these methods see www.childinfo.org/mortality_methodology.html).

Whatever the method used to derive the estimates, data quality is critical. For example, the estimate line shown in figure 1 was fitted excluding data from vital registration 1 because these data grossly underreport under-five mortality. However, data from household surveys A and B are considered of acceptable and similar quality, so the estimate line is approximately equidistant between them. The census and vital registration 2 underreport mortality but are still used in fitting the estimate line, with a smaller influence on the line than data from household surveys A and B.

If household survey A data were of better quality than household survey B data, the estimate line would be much closer to the household survey A data; similarly, the estimate line would be closer to the household survey B data if its data were of higher quality. This range of possibilities for the estimate line between surveys A and B implies uncertainty in the estimate: for example, the under-five mortality rate estimate for 1990 ranges from 100 to 140 deaths per 1,000 live births. In addition, if the vital registration 2 data were missing, the estimate line would have no data after

FIGURE 2 Source data and estimate line for the under-five mortality rate, Mali, 1960–2010



2000 to guide its projection to 2009, yielding more uncertain recent estimates.

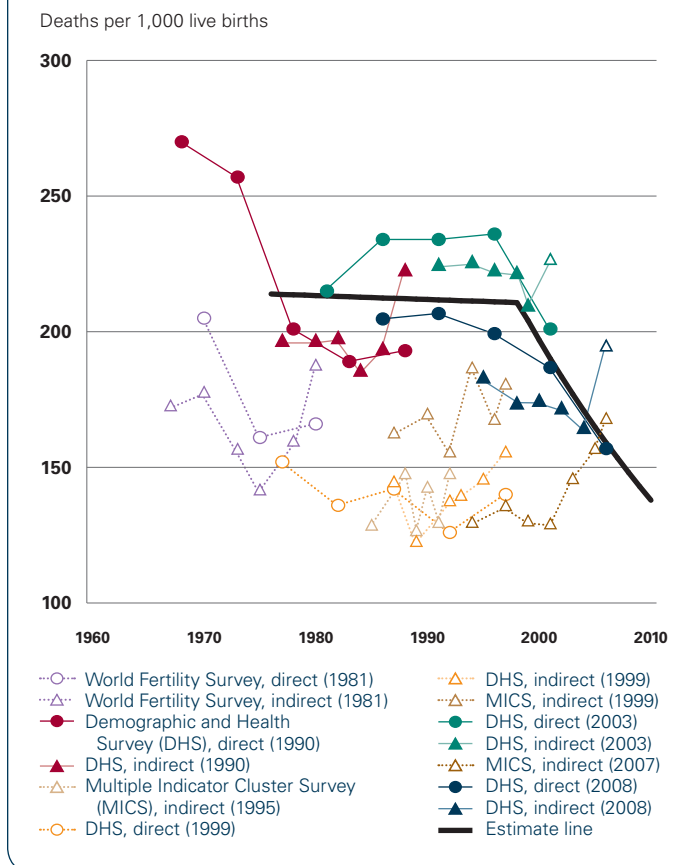
Thus, while the level of confidence attributable to under-five mortality rate estimates at the country level depends on the model used to fit the estimate line to the source data, the estimate line is even more affected by the quality of the data, particularly the most recent data. Data quality is generally reported in terms of sampling and nonsampling error. Because household surveys collect data from only a sample of the total population in a country, sampling error reflects the degree of uncertainty of reporting on the total population from a sample, with small samples generally resulting in larger sampling errors. However, sampling errors can be calculated from survey data.

Because censuses and vital registrations cover every birth and death, their data are not affected by sampling errors, but their data are affected by nonsampling errors, as are data from surveys. A common source of nonsampling error is non-response. If poorer women are missed by surveys, censuses and vital registrations, the data from these sources will likely understate the level of child mortality, because mortality is higher among the poor. And women who are uncomfortable recalling the recent death of a child may not report the death, which leads to underreporting. Nonsampling errors are often larger and more pervasive than sampling error and are difficult to detect and measure.

Actual country examples can provide useful insights on the impact of data quality. In Mali, for instance, the available data sources cluster over a narrow band, and the estimate line is fitted to all the data because they show considerable consistency (figure 2). Bangladesh, Benin, Indonesia, Peru and Venezuela have similar results.

Nigeria, by contrast, has one of the widest spreads of source data, with a range from 120 to 240 deaths per 1,000 live births over 1980–2000 (figure 3). In deriving the estimate line, all

FIGURE 3 Source data and estimate line for the under-five mortality rate, Nigeria, 1960–2010



sources with dotted lines in figure 3 are rated of lower quality and are not used. Other countries with wide ranges are Azerbaijan, China, Guyana, Mauritania and Tajikistan.

None of the foregoing examples includes a country with high HIV prevalence. In such countries a higher proportion of women with AIDS die and are thus unable to report on their children, who also have higher mortality, resulting in a downward bias to overall child mortality. In Namibia, for instance, the under-five mortality rate for 2001–06 from the 2006 Demographic and Health Survey had to be increased from 69 deaths per 1,000 live births to 78 deaths to account for the impact of AIDS. Similar adjustments were made for 17 countries in Sub-Saharan Africa (see www.childinfo.org/mortality_methodology.html).

Levels and Trends in Child Mortality, 1990–2009

The global under-five mortality rate has declined by a third, from 89 deaths per 1,000 live births in 1990 to 60 in 2009 (table 1). All regions except Sub-Saharan Africa, Southern Asia and Oceania have seen reductions of at least 50 percent (figures 4 and 5). The number of under-five deaths worldwide has declined from 12.4 million in 1990 to 8.1 million in 2009 (table 2).

At the regional level in 2009 the highest rates of under-five mortality continue to be in Sub-Saharan Africa, where 1 child in 8 died before age five (129 deaths per 1,000 live births), nearly double the average in developing regions (66) and nearly 20 times the average in developed regions (6). Of the 31 countries with under-five mortality of at least 100 deaths per 1,000 live births in 2009, 30 are in Sub-Saharan Africa.

Southern Asia has the second highest under-five mortality rate, 69 deaths per 1,000 live births or about 1 child in 14. Oceania is the only other region with an under-five mortality rate over 40 deaths per 1,000 live births.

In the developing world Northern Africa and Eastern Asia have made the most progress in reducing under-five mortality, with average annual rates of reduction of 5.9 percent and 4.5 percent, respectively, between 1990 and 2009. Figure 6 shows the countries with high under-five mortality rates (at least 40 deaths per 1,000 live births in 2009) that had the highest rates of decline between 1990 and 2009; 10 of them reduced under-five mortality by at least half. Of these, Timor-Leste, Nepal, Madagascar, Bangladesh, Eritrea and Lao People's Democratic Republic recorded at least a 60 percent drop, or an average annual rate of reduction of at least 5 percent. In absolute terms, Niger, Liberia, Timor-Leste, Madagascar, Malawi and Ethiopia have achieved the largest reductions (more than 100 deaths per 1,000 live births during the period).

In 2009 nearly 8.1 million children died before age five worldwide. These deaths were concentrated in two regions: Sub-Saharan Africa accounted for nearly half, and Southern Asia a third (figure 7).

Under-five mortality is increasingly concentrated: 70 percent of the world's under-five deaths in 2009 occurred in only 15 countries. About half occurred in five countries: India, Nigeria, Democratic Republic of the Congo, Pakistan and China (figure 8). India (21 percent) and Nigeria (10 percent) together account for nearly a third of all under-five deaths worldwide.

Overall, substantial progress has been made towards Millennium Development Goal 4 (MDG 4). In 2009 nearly 12,000 fewer children died every day than in 1990, the baseline year for the MDGs. The number of countries with an under-five mortality rate of at least 100 deaths per 1,000 live births has fallen from 52 in 1990 to 31 in 2009. Moreover, the annual rate of decline in under-five mortality has accelerated from 1.4 percent over the 1990s to 2.8 percent over 2000–2009.

Nevertheless, the rate of decline remains insufficient to achieve MDG 4 by 2015. Of the developing regions in table 1, all but 3—Sub-Saharan Africa, Southern Asia and Oceania—are on track to achieve the goal. However, those three regions accounted for 82 percent of global under-five deaths in 2009. Thus, achieving MDG 4 at the global level requires faster progress in those regions.

Also alarming is that only 9 of the 64 countries with high under-five mortality rates (at least 40 deaths per 1,000 live births in 2009) are on track to achieve MDG 4 (map 1). But at the same time, substantial advances are being made. For example, 4 of the 10 best-performing countries are in Sub-Saharan Africa (see figure 6), as are 5 of the 6 countries with the largest absolute reductions

TABLE 1 Levels and trends in the under-five mortality rate, 1990–2009 (deaths per 1,000 live births)

Region	1990	1995	2000	2005	2007	2008	2009	Decline, 1990–2009 (percent)	Average annual rate of reduction, 1990–2009 (percent)	Progress towards Millennium Development Goal 4 2009
Developing regions	99	95	84	74	70	68	66	33	2.1	Insufficient progress
Northern Africa	80	60	46	33	30	28	26	68	5.9	On track
Sub-Saharan Africa	180	175	160	143	136	133	129	28	1.8	Insufficient progress
Latin America and the Caribbean	52	43	33	27	24	23	23	56	4.3	On track
Eastern Asia	45	44	36	25	22	20	19	58	4.5	On track
Excluding China	28	36	29	18	18	17	17	39	2.6	On track
Southern Asia	122	110	95	79	74	72	69	43	3.0	Insufficient progress
Excluding India	131	118	101	86	81	80	78	40	2.7	Insufficient progress
South-eastern Asia	73	58	48	41	39	37	36	51	3.7	On track
Western Asia	66	56	44	36	33	32	31	53	4.0	On track
Oceania	76	69	65	62	60	60	59	22	1.3	Insufficient progress
Countries of the Commonwealth of Independent States	46	48	39	29	26	25	23	50	3.6	On track
In Europe	26	25	23	17	15	14	13	50	3.6	On track
In Asia	78	73	62	47	42	39	37	53	3.9	On track
Developed regions	12	9	8	7	6	6	6	50	3.6	On track
Transition countries of South-eastern Europe	31	25	20	15	13	12	11	65	5.5	On track
World	89	86	77	67	63	62	60	33	2.1	Insufficient progress

a "On track" indicates that under-five mortality is less than 40 deaths per 1,000 live births or that under-five mortality is at least 40 deaths per 1,000 live births and that the average annual rate of reduction is at least 4 percent; "insufficient progress" indicates that under-five mortality is at least 40 deaths per 1,000 live births and that the average annual rate of reduction is at least 1 percent but less than 4 percent. These standards may differ from those in other publications by Inter-agency Group for Child Mortality Estimation members.

TABLE 2 Levels and trends in the number of deaths of children under age five, 1990–2009 (thousands)

Region	1990	1995	2000	2005	2007	2008	2009	Decline, 1990–2009 (percent)	Share of global under-five deaths, 2009 (percent)
Developing regions	12,012	11,098	9,953	8,790	8,351	8,135	7,929	34	98.0
Northern Africa	311	199	159	118	106	101	96	69	1.2
Sub-Saharan Africa	3,927	4,196	4,194	4,117	4,055	4,015	3,976	–1	49.2
Latin America and the Caribbean	598	496	385	299	267	252	239	60	3.0
Eastern Asia	1,284	875	760	459	401	380	361	72	4.5
Excluding China	30	46	28	15	15	15	15	50	0.2
Southern Asia	4,727	4,375	3,701	3,146	2,906	2,789	2,677	43	33.1
Excluding India	1,595	1,396	1,205	1,058	1,001	975	951	40	11.8
South-eastern Asia	863	686	527	465	436	420	405	53	5.0
Western Asia	286	257	210	171	164	162	159	44	2.0
Oceania	15	15	16	15	15	15	15	0	0.2
Countries of the Commonwealth of Independent States	239	169	132	106	96	92	87	64	1.1
In Europe	83	46	46	36	32	30	28	66	0.3
In Asia	155	123	86	70	65	62	59	62	0.7
Developed regions	143	106	84	77	74	73	71	50	0.9
Transition countries of South-eastern Europe	26	13	12	7	6	6	6	77	0.1
World	12,393	11,373	10,169	8,973	8,521	8,299	8,087	35	100.0

FIGURE 4 Under-five mortality declined in all regions between 1990 and 2009

Under-five mortality rate, by region, 1990 and 2009 (deaths per 1,000 live births)

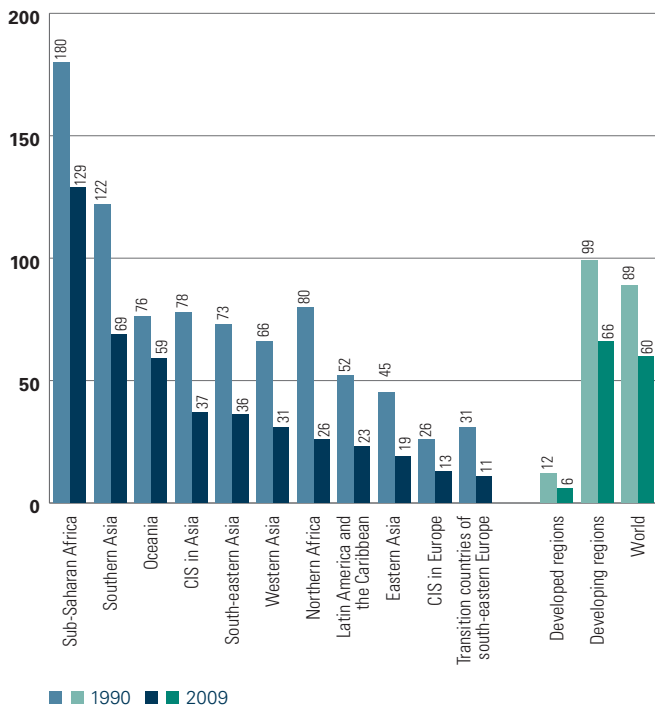


FIGURE 5 All regions except Southern Asia, Sub-Saharan Africa and Oceania reduced under-five mortality rate by at least 50 percent between 1990 and 2009

Decline in under-five mortality rate, by region, 1990–2009 (percent)

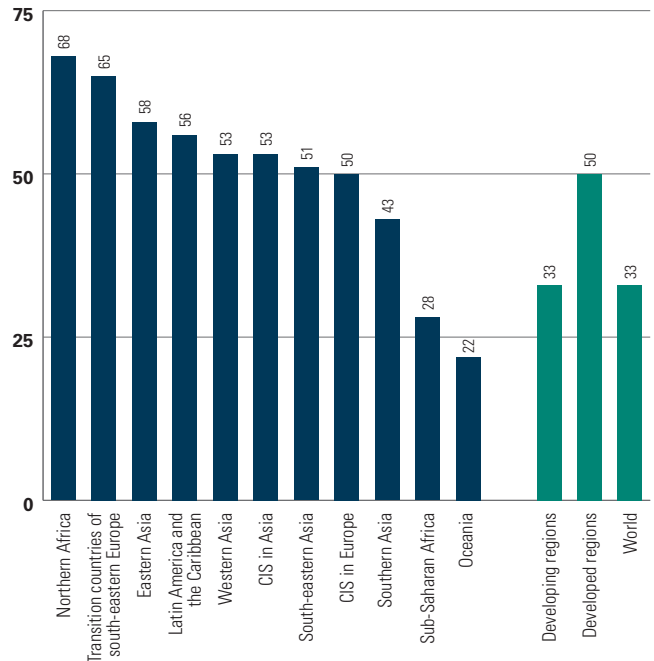


FIGURE 6 Of the 64 countries with high under-five mortality, 10 have seen reductions of at least 50 percent between 1990 and 2009

Decline in under-five mortality rate, 1990–2009, top 10 countries (percent)

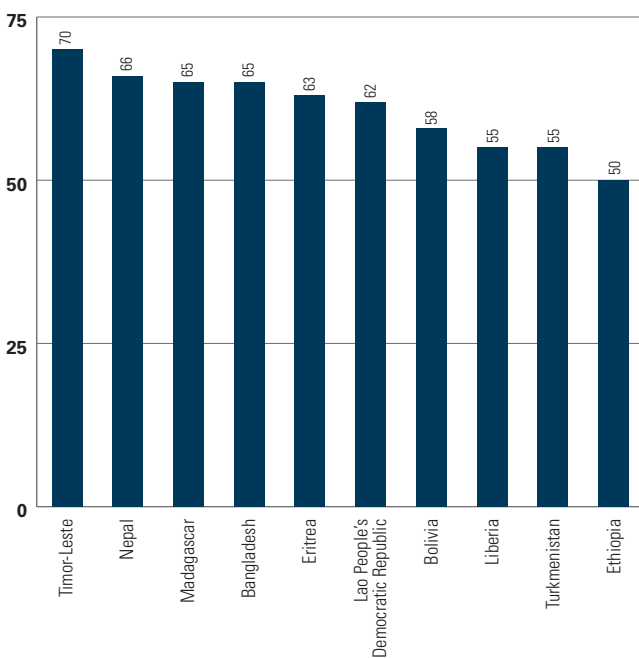
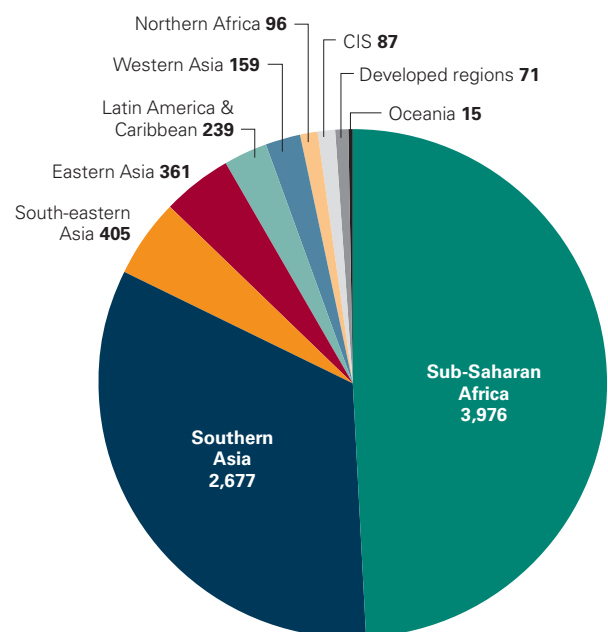


FIGURE 7 In 2009, 8.1 million children died before their fifth birthday

Number of under-five deaths, by region, 2009 (thousands)



in under-five mortality rate (more than 100 deaths per 1,000 live births).

There is thus increasing evidence that MDG 4 can be achieved, but only if countries in Sub-Saharan Africa, Southern Asia and Oceania target the biggest killers of children. In Sub-Saharan Africa diarrhoea, malaria and pneumonia cause more than half of under-five deaths. In Southern Asia more than half of all childhood deaths occur in the first 28 days after birth. For both regions undernutrition is an underlying cause of a third of under-five deaths (figure 9).

Despite the substantial progress in reducing child deaths, children from poorer or rural households remain disproportionately vulnerable across all regions. It is important to address these inequities in order to achieve MDG 4.

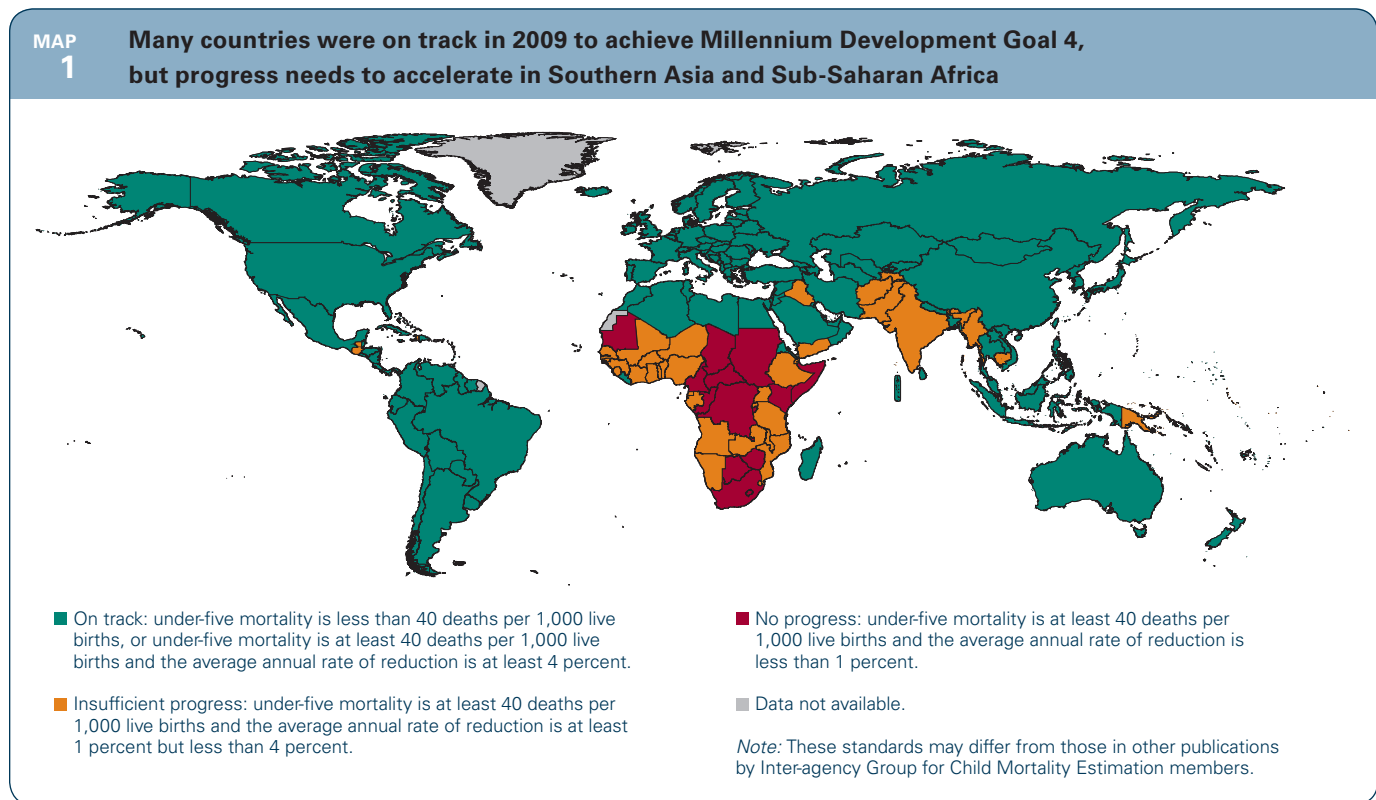
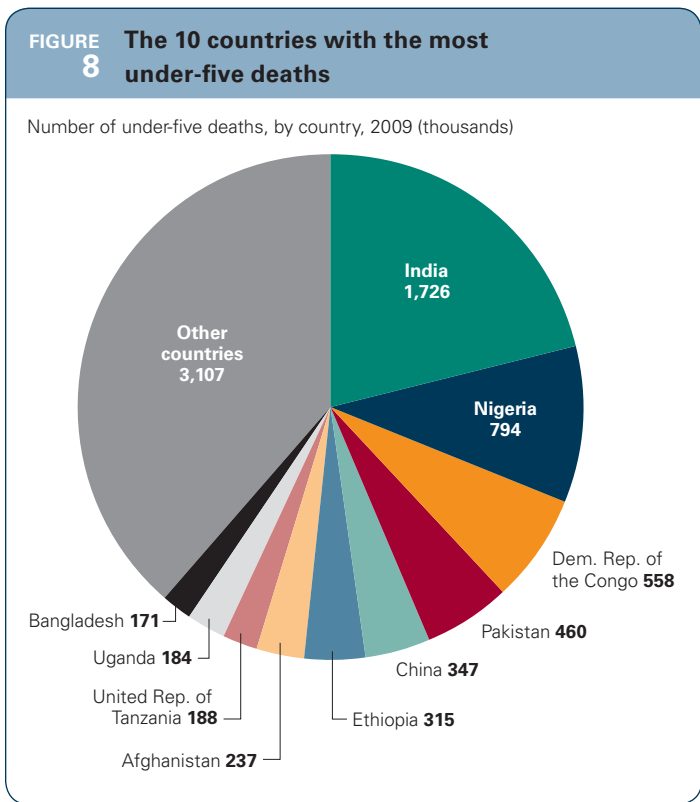
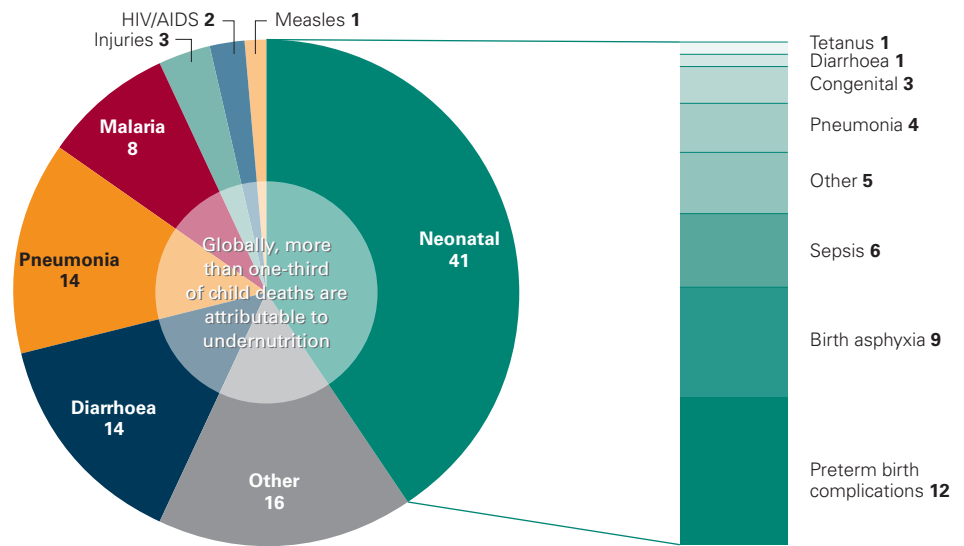


FIGURE 9 Revitalizing efforts against pneumonia and diarrhoea, while bolstering nutrition, could save millions of children

Causes of deaths among children under age five, 2008 (percent)



Source: Black R, Cousens S, Johnson H, Lawn J, Rudan I, Bassani D, Jha P, Campbell H, Walker C, Cibulskis R, Eisele T, Liu L, and Mathers C, for the Child Health Epidemiology Reference Group of WHO and UNICEF, 2010, "Global, Regional, and National Causes of Child Mortality in 2008: A Systematic Analysis," *Lancet* 375(9730): 1969–87.



Country, regional and global estimates of under-five and infant mortality

Country or territory	Under-five mortality rate (deaths per 1,000 live births)				Number of under-five deaths (thousands)		Infant mortality rate (deaths per 1,000 live births)		Number of infant deaths (thousands)	
	1990	2009	Millennium Development Goal target for 2015	Observed average annual rate of reduction, 1990–2009	1990	2009	1990	2009	1990	2009
Afghanistan	250	199	83	1.2	149	237	167	134	100	160
Albania	51	15	17	6.4	4	1	41	14	3	1
Algeria	61	32	20	3.4	47	23	51	29	39	21
Andorra	9	4	3	4.3	0	0	7	3	0	0
Angola	258	161	86	2.5	137	116	153	98	82	70
Antigua and Barbuda	—	12	—	—	—	0	—	11	—	0
Argentina	28	14	9	3.6	20	10	25	13	18	9
Armenia	56	22	19	4.9	5	1	48	20	4	1
Australia	9	5	3	3.1	2	1	8	4	2	1
Austria	9	4	3	4.3	1	0	8	3	1	0
Azerbaijan	98	34	33	5.6	20	6	78	30	16	5
Bahamas	25	12	8	3.9	0	0	17	9	0	0
Bahrain	16	12	5	1.5	0	0	14	10	0	0
Bangladesh	148	52	49	5.5	579	171	102	41	395	134
Barbados	18	11	6	2.6	0	0	15	10	0	0
Belarus	24	12	8	3.6	4	1	20	11	3	1
Belgium	10	5	3	3.6	1	1	9	4	1	0
Belize	43	18	14	4.6	0	0	35	16	0	0
Benin	184	118	61	2.3	38	39	111	75	23	25
Bhutan	148	79	49	3.3	3	1	91	52	2	1
Bolivia (Plurinational State of)	122	51	41	4.6	28	13	84	40	20	10
Bosnia and Herzegovina	23	14	8	2.6	2	1	21	13	1	0
Botswana	60	57	20	0.3	3	3	46	43	2	2
Brazil	56	21	19	5.2	196	61	46	17	159	50
Brunei Darussalam	11	7	4	2.4	0	0	9	5	0	0
Bulgaria	18	10	6	3.1	2	1	14	8	2	1
Burkina Faso	201	166	67	1.0	80	121	110	91	44	70
Burundi	189	166	63	0.7	48	46	114	101	29	28
Cambodia	117	88	39	1.5	41	32	85	68	28	26
Cameroon	148	154	49	-0.2	73	108	91	95	45	66
Canada	8	6	3	1.5	3	2	7	5	3	2
Cape Verde	63	28	21	4.3	1	0	49	23	1	0
Central African Republic	175	171	58	0.1	20	26	115	112	13	17
Chad	201	209	67	-0.2	54	100	120	124	33	59
Chile	22	9	7	4.7	6	2	18	7	5	2
China	46	19	15	4.7	1,255	347	37	17	1,031	302
Colombia	35	19	12	3.2	31	17	28	16	25	15
Comoros	128	104	43	1.1	2	2	90	75	1	2
Congo	104	128	35	-1.1	9	16	67	81	6	10
Cook Islands	18	15	6	1.0	0	0	16	13	0	0
Costa Rica	18	11	6	2.6	2	1	16	10	1	1
Côte d'Ivoire	152	119	51	1.3	76	83	105	83	53	58
Croatia	13	5	4	5.0	1	0	11	5	1	0
Cuba	14	6	5	4.5	2	1	10	4	2	0
Cyprus	10	4	3	4.8	0	0	9	3	0	0

Country, regional and global estimates of under-five and infant mortality

Country or territory	Under-five mortality rate (deaths per 1,000 live births)				Number of under-five deaths (thousands)		Infant mortality rate (deaths per 1,000 live births)		Number of infant deaths (thousands)	
	1990	2009	Millennium Development Goal target for 2015	Observed average annual rate of reduction, 1990–2009	1990	2009	1990	2009	1990	2009
Czech Republic	12	4	4	5.8	2	0	10	3	2	0
Democratic People's Republic of Korea	45	33	15	1.6	16	11	23	26	7	9
Democratic Republic of the Congo	199	199	66	0.0	350	558	126	126	225	352
Denmark	9	4	3	4.3	1	0	8	3	1	0
Djibouti	123	94	41	1.4	3	2	95	75	2	2
Dominica	18	10	6	3.1	0	0	15	8	0	0
Dominican Republic	62	32	21	3.5	13	7	48	27	10	6
Ecuador	53	24	18	4.2	16	7	41	20	12	6
Egypt	90	21	30	7.7	186	42	66	18	138	36
El Salvador	62	17	21	6.8	10	2	48	15	8	2
Equatorial Guinea	198	145	66	1.6	3	4	120	88	2	2
Eritrea	150	55	50	5.3	19	10	92	39	12	7
Estonia	17	6	6	5.5	0	0	13	4	0	0
Ethiopia	210	104	70	3.7	459	315	124	67	277	206
Fiji	22	18	7	1.1	0	0	19	15	0	0
Finland	7	3	2	4.5	0	0	6	3	0	0
France	9	4	3	4.3	6	3	7	3	5	2
Gabon	93	69	31	1.6	3	3	68	52	2	2
Gambia	153	103	51	2.1	6	6	104	78	4	5
Georgia	47	29	16	2.5	4	2	41	26	4	1
Germany	9	4	3	4.3	8	3	7	4	6	2
Ghana	120	69	40	2.9	68	50	76	47	43	34
Greece	11	3	4	6.8	1	0	9	3	1	0
Grenada	40	15	13	5.2	0	0	33	13	0	0
Guatemala	76	40	25	3.4	25	18	57	33	19	15
Guinea	231	142	77	2.6	63	54	137	88	37	34
Guinea-Bissau	240	193	80	1.1	10	12	142	115	6	7
Guyana	61	35	20	2.9	1	0	47	29	1	0
Haiti	152	87	51	2.9	38	24	105	64	26	17
Holy See	—	—	—	—	—	—	—	—	—	—
Honduras	55	30	18	3.2	10	6	43	25	8	5
Hungary	17	6	6	5.5	2	1	15	5	2	1
Iceland	7	3	2	4.5	0	0	6	2	0	0
India	118	66	39	3.1	3,133	1,726	84	50	2,223	1,316
Indonesia	86	39	29	4.2	386	163	56	30	250	124
Iran (Islamic Republic of)	73	31	24	4.5	138	43	55	26	102	36
Iraq	53	44	18	1.0	36	41	42	35	29	34
Ireland	9	4	3	4.3	0	0	8	4	0	0
Israel	11	4	4	5.3	1	1	10	3	1	0
Italy	10	4	3	4.8	5	2	8	3	5	2
Jamaica	33	31	11	0.3	2	2	28	26	2	1
Japan	6	3	2	3.6	8	3	5	2	5	2
Jordan	39	25	13	2.3	5	4	32	22	4	4

Country or territory	Under-five mortality rate (deaths per 1,000 live births)				Number of under-five deaths (thousands)		Infant mortality rate (deaths per 1,000 live births)		Number of infant deaths (thousands)	
	1990	2009	Millennium Development Goal target for 2015	Observed average annual rate of reduction, 1990–2009	1990	2009	1990	2009	1990	2009
Kazakhstan	60	29	20	3.8	24	9	51	26	21	8
Kenya	99	84	33	0.9	96	124	64	55	63	83
Kiribati	89	46	30	3.5	0	0	65	37	0	0
Kuwait	17	10	6	2.8	1	1	14	8	1	0
Kyrgyzstan	75	37	25	3.7	10	5	63	32	9	4
Lao People's Democratic Republic	157	59	52	5.2	27	10	108	46	19	8
Latvia	16	8	5	3.6	1	0	12	7	1	0
Lebanon	40	12	13	6.3	3	1	33	11	2	1
Lesotho	93	84	31	0.5	5	5	74	61	4	4
Liberia	247	112	82	4.2	24	16	165	80	16	11
Libyan Arab Jamahiriya	36	19	12	3.4	3	3	32	17	3	2
Liechtenstein	10	2	3	8.5	0	0	9	2	0	0
Lithuania	15	6	5	4.8	1	0	12	5	1	0
Luxembourg	9	3	3	5.8	0	0	8	2	0	0
Madagascar	167	58	56	5.6	82	38	102	41	53	27
Malawi	218	110	73	3.6	94	64	129	69	57	40
Malaysia	18	6	6	5.8	9	3	16	6	8	3
Maldives	113	13	38	11.4	1	0	80	11	1	0
Mali	250	191	83	1.4	96	101	139	101	53	54
Malta	11	7	4	2.4	0	0	10	6	0	0
Marshall Islands	49	35	16	1.8	0	0	39	29	0	0
Mauritania	129	117	43	0.5	10	12	81	74	6	8
Mauritius	24	17	8	1.8	0	0	21	15	0	0
Mexico	45	17	15	5.1	105	34	36	15	85	30
Micronesia (Federated States of)	58	39	19	2.1	0	0	45	32	0	0
Monaco	8	4	3	3.6	0	0	7	3	0	0
Mongolia	101	29	34	6.6	8	1	73	24	6	1
Montenegro	17	9	6	3.3	0	0	15	8	0	0
Morocco	89	38	30	4.5	63	25	69	33	48	22
Mozambique	232	142	77	2.6	132	121	155	96	87	81
Myanmar	118	71	39	2.7	126	70	84	54	86	53
Namibia	73	48	24	2.2	4	3	49	34	3	2
Nauru	—	44	—	—	—	0	—	36	—	0
Nepal	142	48	47	5.7	100	34	99	39	70	27
Netherlands	8	4	3	3.6	2	1	7	4	1	1
New Zealand	11	6	4	3.2	1	0	9	5	1	0
Nicaragua	68	26	23	5.1	10	4	52	22	7	3
Niger	305	160	102	3.4	124	122	144	76	59	61
Nigeria	212	138	71	2.3	895	794	126	86	532	500
Niue	—	—	—	—	—	—	—	—	—	—
Norway	9	3	3	5.8	1	0	7	3	0	0
Occupied Palestinian Territory	43	30	14	1.9	4	4	35	25	3	4

Country, regional and global estimates of under-five and infant mortality

Country or territory	Under-five mortality rate (deaths per 1,000 live births)				Number of under-five deaths (thousands)		Infant mortality rate (deaths per 1,000 live births)		Number of infant deaths (thousands)	
	1990	2009	Millennium Development Goal target for 2015	Observed average annual rate of reduction, 1990–2009	1990	2009	1990	2009	1990	2009
Oman	48	12	16	7.3	3	1	37	9	3	1
Pakistan	130	87	43	2.1	615	460	101	71	482	374
Palau	21	15	7	1.8	0	0	18	13	0	0
Panama	31	23	10	1.6	2	2	25	16	2	1
Papua New Guinea	91	68	30	1.5	13	14	67	52	10	11
Paraguay	42	23	14	3.2	6	3	34	19	5	3
Peru	78	21	26	6.9	51	13	62	19	41	12
Philippines	59	33	20	3.1	119	75	41	26	85	60
Poland	17	7	6	4.7	9	3	15	6	8	2
Portugal	15	4	5	7.0	2	0	12	3	1	0
Qatar	19	11	6	2.9	0	0	17	10	0	0
Republic of Korea	9	5	3	3.1	5	2	8	5	4	2
Republic of Moldova	37	17	12	4.1	3	1	30	15	3	1
Romania	32	12	11	5.2	13	3	25	10	10	2
Russian Federation	27	12	9	4.3	61	19	23	11	51	17
Rwanda	171	111	57	2.3	55	42	103	70	32	27
Saint Kitts and Nevis	26	15	9	2.9	0	0	22	13	0	0
Saint Lucia	20	20	7	0.0	0	0	16	19	0	0
Saint Vincent and the Grenadines	24	12	8	3.6	0	0	19	11	0	0
Samoa	50	25	17	3.6	0	0	40	21	0	0
San Marino	15	2	5	10.6	0	0	14	1	0	0
Sao Tome and Principe	95	78	32	1.0	0	0	62	52	0	0
Saudi Arabia	43	21	14	3.8	25	12	35	18	21	11
Senegal	151	93	50	2.6	47	43	73	51	23	24
Serbia	29	7	10	7.5	4	1	25	6	3	1
Seychelles	15	12	5	1.2	0	0	13	11	0	0
Sierra Leone	285	192	95	2.1	48	43	166	123	27	27
Singapore	8	3	3	5.2	0	0	6	2	0	0
Slovakia	15	7	5	4.0	1	0	13	6	1	0
Slovenia	10	3	3	6.3	0	0	9	2	0	0
Solomon Islands	38	36	13	0.3	0	1	31	30	0	0
Somalia	180	180	60	0.0	52	69	109	109	33	42
South Africa	62	62	21	0.0	66	66	48	43	51	45
Spain	9	4	3	4.3	4	2	8	4	3	2
Sri Lanka	28	15	9	3.3	10	5	23	13	8	4
Sudan	124	108	41	0.7	128	139	78	69	82	89
Suriname	51	26	17	3.5	0	0	44	24	0	0
Swaziland	92	73	31	1.2	3	3	67	52	3	2
Sweden	7	3	2	4.5	1	0	6	2	1	0
Switzerland	8	4	3	3.6	1	0	7	4	1	0
Syrian Arab Republic	36	16	12	4.3	17	10	30	14	14	9
Tajikistan	117	61	39	3.4	25	12	91	52	20	10
Thailand	32	14	11	4.4	34	13	27	12	29	12
The former Yugoslav Republic of Macedonia	36	11	12	6.2	1	0	32	10	1	0

Country or territory	Under-five mortality rate (deaths per 1,000 live births)				Number of under-five deaths (thousands)		Infant mortality rate (deaths per 1,000 live births)		Number of infant deaths (thousands)	
	1990	2009	Millennium Development Goal target for 2015	Observed average annual rate of reduction, 1990–2009	1990	2009	1990	2009	1990	2009
Timor-Leste	184	56	61	6.3	5	3	138	48	4	2
Togo	150	98	50	2.2	24	20	89	64	14	13
Tonga	23	19	8	1.0	0	0	19	17	0	0
Trinidad and Tobago	34	35	11	-0.2	1	1	30	31	1	1
Tunisia	50	21	17	4.6	11	3	40	18	9	3
Turkey	84	20	28	7.6	115	28	69	19	92	25
Turkmenistan	99	45	33	4.1	13	5	81	42	11	4
Tuvalu	53	35	18	2.2	0	0	42	29	0	0
Uganda	184	128	61	1.9	152	184	111	79	94	117
Ukraine	21	15	7	1.8	15	7	18	13	13	6
United Arab Emirates	17	7	6	4.7	1	0	15	7	1	0
United Kingdom	10	6	3	2.7	7	4	8	5	6	4
United Republic of Tanzania	162	108	54	2.1	174	188	99	68	108	121
United States	11	8	4	1.7	45	35	9	7	37	31
Uruguay	24	13	8	3.2	1	1	21	11	1	1
Uzbekistan	74	36	25	3.8	53	20	61	32	45	18
Vanuatu	40	16	13	4.8	0	0	33	14	0	0
Venezuela (Bolivarian Republic of)	32	18	11	3.0	18	10	27	15	15	9
Viet Nam	55	24	18	4.4	116	35	39	20	83	29
Yemen	125	66	42	3.4	75	56	88	51	53	44
Zambia	179	141	60	1.3	60	74	108	86	37	46
Zimbabwe	81	90	27	-0.6	31	33	54	56	20	21

Estimates of under-five and infant mortality by Millennium Development Goal regions^{a,b}

Developing regions	99	66	33	2.1	12,012	7,929	68	47	8,371	5,613
Northern Africa	80	26	27	5.9	311	96	61	23	237	85
Sub-Saharan Africa	180	129	60	1.8	3,927	3,976	109	81	2,401	2,503
Latin America and the Caribbean	52	23	17	4.3	598	239	41	19	476	199
Eastern Asia	45	19	15	4.5	1,284	361	36	16	1,049	314
Excluding China	28	17	9	2.6	30	15	18	14	18	12
Southern Asia	122	69	41	3.0	4,727	2,677	87	53	3,382	2,051
Excluding India	131	78	44	2.7	1,595	951	95	60	1,159	736
South-eastern Asia	73	36	24	3.7	863	405	50	29	592	317
Western Asia	66	31	22	4.0	286	159	52	26	224	132
Oceania	76	59	25	1.3	15	15	56	45	11	12
Countries of the Commonwealth of Independent States	46	23	15	3.6	239	87	38	21	199	77
In Europe	26	13	9	3.6	83	28	22	12	70	25
In Asia	78	37	26	3.9	155	59	64	33	129	52
Developed regions	12	6	4	3.6	143	71	10	5	118	61
Transition countries of south-eastern Europe	31	11	10	5.5	26	6	25	9	22	5
World	89	60	30	2.1	12,393	8,087	62	42	8,688	5,751

Country, regional and global estimates of under-five and infant mortality

Estimates of under-five and infant mortality by UNICEF regions^b

Region	Under-five mortality rate (deaths per 1,000 live births)				Number of under-five deaths (thousands)		Infant mortality rate (deaths per 1,000 live births)		Number of infant deaths (thousands)	
	1990	2009	Millennium Development Goal target for 2015	Observed average annual rate of reduction, 1990–2009	1990	2009	1990	2009	1990	2009
Africa	165	118	55	1.8	4,239	4,072	102	75	2,638	2,587
Sub-Saharan Africa	180	129	60	1.8	3,927	3,976	109	81	2,401	2,503
Eastern and Southern Africa	166	108	55	2.3	1,674	1,504	103	69	1,047	972
West and Central Africa	199	150	66	1.5	2,122	2,331	118	92	1,270	1,440
Middle East and North Africa	77	41	26	3.3	750	410	57	32	554	317
Asia	87	50	29	2.9	6,752	3,417	63	39	4,932	2,658
South Asia	125	71	42	3.0	4,589	2,635	89	55	3,280	2,015
East Asia and Pacific	53	26	18	3.7	2,162	782	40	21	1,652	643
Latin America and Caribbean	52	23	17	4.3	598	239	41	19	476	199
Central and Eastern Europe/Commonwealth of Independent States	51	21	17	4.7	381	120	42	19	313	108
Industrialized countries	10	6	3	2.7	117	66	8	5	97	56
Developing countries	99	66	33	2.1	12,167	7,988	68	47	8,500	5,665
Least developed countries	178	121	59	2.0	3,744	3,330	112	78	2,362	2,148
World	89	60	30	2.1	12,393	8,087	62	42	8,688	5,751

Estimates of under-five and infant mortality by World Health Organization regions^b

Region	Under-five mortality rate (deaths per 1,000 live births)				Number of under-five deaths (thousands)		Infant mortality rate (deaths per 1,000 live births)		Number of infant deaths (thousands)	
	1990	2009	Millennium Development Goal target for 2015	Observed average annual rate of reduction, 1990–2009	1990	2009	1990	2009	1990	2009
Africa	179	127	60	1.8	3,792	3,790	109	80	2,322	2,391
Americas	41	18	14	4.3	646	276	32	15	516	232
Eastern Mediterranean	104	72	35	1.9	1,515	1,147	77	54	1,127	868
Europe	34	13	11	5.1	439	144	28	12	362	127
South-East Asia	114	59	38	3.5	4,393	2,198	80	46	3,075	1,681
Western Pacific	46	21	15	4.1	1,605	527	36	18	1,283	448
World	89	60	30	2.1	12,393	8,087	62	42	8,688	5,751

Estimates of under-five and infant mortality by World Bank regions^b

Region	Under-five mortality rate (deaths per 1,000 live births)				Number of under-five deaths (thousands)		Infant mortality rate (deaths per 1,000 live births)		Number of infant deaths (thousands)	
	1990	2009	Millennium Development Goal target for 2015	Observed average annual rate of reduction, 1990–2009	1990	2009	1990	2009	1990	2009
Low income	170	117	57	2.0	3,583	3,196	108	75	2,269	2,071
Middle income	83	51	28	2.6	8,653	4,804	60	38	6,289	3,606
Lower middle income	90	57	30	2.4	7,673	4,427	64	42	5,502	3,291
Upper middle income	50	22	17	4.2	980	377	40	19	787	314
Low and middle income	97	65	32	2.1	12,235	8,000	67	46	8,558	5,677
East Asia and Pacific	54	26	18	3.8	2,157	779	41	21	1,647	641
Europe and Central Asia	51	21	17	4.5	381	120	42	19	313	108
Latin America and the Caribbean	52	22	17	4.4	597	238	42	19	475	199
Middle East and North Africa	75	33	25	4.4	591	257	57	27	447	216
South Asia	125	71	42	3.0	4,589	2,635	89	55	3,280	2,015
Sub-Saharan Africa	180	129	60	1.7	3,921	3,971	109	81	2,397	2,499
High income	12	7	4	3.1	158	87	10	6	130	74
World	89	60	30	2.1	12,393	8,087	62	42	8,688	5,751

Estimates of under-five and infant mortality by United Nations Population Division regions^b

Region	Under-five mortality rate (deaths per 1,000 live births)				Number of under-five deaths (thousands)		Infant mortality rate (deaths per 1,000 live births)		Number of infant deaths (thousands)	
	1990	2009	Millennium Development Goal target for 2015	Observed average annual rate of reduction, 1990–2009	1990	2009	1990	2009	1990	2009
More developed regions	15	7	5	3.9	226	99	12	6	188	86
Less developed regions	99	66	33	2.1	12,167	7,988	68	47	8,500	5,665
Least developed countries	178	121	59	2.0	3,744	3,330	112	78	2,362	2,148
Less developed regions, excluding least developed countries	82	50	27	2.6	8,423	4,658	60	38	6,138	3,517
Less developed regions, excluding China	114	74	38	2.2	10,912	7,641	77	52	7,469	5,363
Sub-Saharan Africa	180	129	60	1.7	3,927	3,976	109	81	2,401	2,503
Africa	165	118	55	1.7	4,239	4,072	102	75	2,638	2,587
Asia	84	48	28	3.0	7,323	3,665	61	37	5,381	2,869
Europe	17	7	6	4.6	168	57	15	6	140	49
Latin America and the Caribbean	52	23	17	4.4	598	239	41	19	476	199
Northern America	11	8	4	1.9	48	37	9	7	40	33
Oceania	36	29	12	1.1	18	17	27	22	14	13
World	89	60	30	2.1	12,393	8,087	62	42	8,688	5,751

— not available.

^a See next page for country classifications by region.^b The sum of the number of deaths by region may differ from the world total because of rounding.

Regional Classifications

The regional classifications that are referred to in the report and for which aggregate data are provided in the statistical table are Millennium Development Goal regions (see below). Aggregates presented for member organizations of the Inter-agency Group for Child Mortality Estimation may differ. Regions with the same names in different agencies may include different countries.

Developing countries

Eastern Asia

China, Democratic People's Republic of Korea, Mongolia, Republic of Korea

Latin America and the Caribbean

Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela (Bolivarian Republic of)

Northern Africa

Algeria, Egypt, Libyan Arab Jamahiriya, Morocco, Tunisia

Oceania

Cook Islands, Fiji, Kiribati, Marshall Islands, Micronesia (Federated States of), Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu

South-eastern Asia

Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste, Viet Nam

Southern Asia

Afghanistan, Bangladesh, Bhutan, India, Iran (Islamic Republic of), Maldives, Nepal, Pakistan, Sri Lanka

Sub-Saharan Africa

Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Equatorial

Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda; São Tomé and Príncipe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Togo, Uganda, United Republic of Tanzania, Zambia, Zimbabwe

Western Asia

Bahrain, Cyprus, Iraq, Israel, Jordan, Kuwait, Lebanon, Occupied Palestinian Territories, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Turkey, United Arab Emirates, Yemen

Countries of the Commonwealth of Independent States

In Europe

Belarus, Republic of Moldova, Russian Federation, Ukraine

In Asia

Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan

Developed countries

Albania, Andorra, Australia, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Canada, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Montenegro, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, The former Yugoslav Republic of Macedonia, United Kingdom, United States

Transition countries of South-eastern Europe

Albania, Bosnia and Herzegovina, Bulgaria, Montenegro, Romania, Serbia, The former Yugoslav Republic of Macedonia





The UN Inter-agency Group for Child Mortality Estimation

The Inter-agency Group for Child Mortality Estimation (IGME) was formed in 2004 to share data on child mortality, harmonize estimates within the UN system, improve methods for child mortality estimation and produce consistent estimates of child mortality worldwide for reporting on progress towards the Millennium Development Goals. The IGME, led by the United Nations Children's Fund and the World Health Organization, also includes the World Bank and the United Nations Population Division of the Department of Economic and Social Affairs as full members.

The IGME's independent Technical Advisory Group, comprising eminent scholars and independent experts in demography, provides technical guidance on estimation methods, technical issues and strategies for data analysis and data quality assessment.

The IGME updates its child mortality estimates annually after reviewing newly available data and assessing data quality. This report contains the latest IGME estimates of child mortality at the country, regional and global levels. Country-specific estimates and the data used to derive them are available at www.childmortality.org.