Levels & Trends in

Child Mortality

Report 2015

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

unicef

World Health Organization

WORLD BANK GROUP

United Nations

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PROGRESS TOWARDS MILLENNIUM DEVELOPMENT GOAL 4: KEY FACTS AND FIGURES

- Substantial global progress has been made in reducing child deaths since 1990. The number of under-five deaths worldwide has declined from 12.7 (12.6, 13.0)[1] million in 1990 to 5.9 (5.7, 6.4) million in 2015 – 16,000 every day compared with 35,000 in 1990.

- Since 1990, the global under-five mortality rate has dropped 53 percent, from 91 (89, 92) deaths per 1,000 live births in 1990 to 43 (41, 46) in 2015.

- The world as a whole has been accelerating progress in reducing the under-five mortality rate – its annual rate of reduction increased from 1.8 percent in 1990–2000 to 3.9 percent in 2000–2015.

- Promisingly, sub-Saharan Africa, the region with the highest under-five mortality rate in the world, has also registered a substantive acceleration. Its annual rate of reduction increased from 1.6 percent in 1990s to 4.1 percent in 2000–2015.

- The remarkable decline in under-five mortality since 2000 has saved the lives of 48 million children under age five – children who would not have survived to see their fifth birthday if the under-five mortality rate from 2000 onward remained at the same level as in 2000.

- Between 1990 and 2015, 62 of the 195 countries with available estimates met the Millennium Development Goal (MDG) 4 target of a two-thirds reduction in the under-five mortality rate between 1990 and 2015. Among them, 24 are low- and lower-middle income countries.

- Despite these gains, progress remains insufficient to reach MDG 4 globally and in many regions, particularly in Caucasus and Central Asia, Oceania, Southern Asia and sub-Saharan Africa.

- Accelerating progress in child survival urgently requires greater attention to ending preventable child deaths in Southern Asia and sub-Saharan Africa. 1 child in 12 in sub-Saharan Africa dies before his or her fifth birthday – far higher than the average ratio of 1 in 147 in high-income countries. Southern Asia has the second-highest under-five mortality rate in the world – about 1 child in 19 dies before age five.

- Globally, the neonatal mortality rate fell from 36 (35, 38) deaths per 1,000 live births in 1990 to 19 (18, 21) in 2015, and the number of neonatal deaths declined from 5.1 (4.9, 5.3) million to 2.7 (2.5, 2.9) million. However, the decline in neonatal mortality from 1990 to 2015 has been slower than that of post-neonatal under-five mortality: 47 percent compared with 58 percent globally.

- Most child deaths are caused by diseases that are readily preventable or treatable with proven, cost-effective and quality-delivered interventions. Infectious diseases and neonatal complications are responsible for the vast majority of under-five deaths globally.

- An acceleration of the pace of progress is urgently required to achieve the Sustainable Development Goal (SDG) target on child survival, particularly in high mortality countries in sub-Saharan Africa. To achieve the SDG target of an under-five mortality rate of 25 or fewer deaths per 1,000 live births by 2030, a total of 47 countries need to increase their pace of progress. Among these, 30 countries must at least double their current rate of reduction, and 11 of those 30 countries must at least triple their current rate of reduction.

Introduction

Child mortality is a core indicator for child health and well-being. In 2000, world leaders agreed on the Millennium Development Goals (MDGs) and called for reducing the under-five mortality rate by two thirds between 1990 and 2015 – known as the MDG 4 target. In recent years, the Global Strategy for Women's and Children's Health launched by United Nations Secretary-General Ban Ki-moon and the Every Woman Every Child movement boosted global momentum in improving newborn and child survival as well as maternal health. In June 2012, world leaders renewed their commitment during the global launch of Committing to Child Survival: A Promise Renewed, aiming for a continued post-2015 focus to end preventable child deaths. With the end of the MDG era, the international community is in the process of agreeing on a new framework – the Sustainable Development Goals (SDGs). The proposed SDG target for child mortality represents a renewed commitment to the world's children: By 2030, end preventable deaths of newborns and children under five years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 deaths per 1,000 live births and under-five mortality to at least as low as 25 deaths per 1,000 live births.

In the concluding year of the MDGs, it is time to take stock of what has been achieved so far, to consider whether the promises made to children worldwide have been fulfilled, and to share success stories or, conversely, learn lessons from failures. As the SDGs are endorsed in New York in September this year, the United Nations Secretary-General will launch a renewed Global Strategy for Women's, Children's and Adolescents' Health. The strategy is a road map to achieving the ambitious SDG goal on health: "Ensure healthy lives and promote well-being for all at all ages," including to end preventable deaths of newborns and children. It is time to look beyond, to the post-2015 SDGs, to identify potential challenges to ending preventable deaths of newborns and children under age five.

Evidence-based estimation of child mortality is a cornerstone for tracking progress towards child survival goals and for planning national and global health strategies, policies and interventions on child health and well-being. The United Nations Inter-agency Group for Child Mortality Estimation (UN IGME) updates child mortality estimates annually. This report presents the group's latest estimates of under-five, infant and neonatal mortality up to the year 2015, and assesses progress at the country, regional and global levels. The report also provides an overview on the estimation methods used for child mortality indicators.

Levels and Trends in Child Mortality

Progress in the MDG era

Major progress has been made in reducing child mortality throughout the world. Encouragingly, this progress has been accelerating in recent years and has saved millions of lives of children under age five. Yet, despite substantial gains, progress is insufficient to achieve the MDG 4 target.

Remarkable progress: The world has made substantial progress in improving child survival in the past 25 years. The global under-five mortality rate dropped 53 (50, 55) percent, from 91 (89, 92) deaths per 1,000 live births in 1990 to 43 (41, 46) in 2015 (Table 1). Over the same period, the annual number of under-five deaths dropped from 12.7 million to 5.9 million (Table 2).

At the regional level, all MDG regions except Oceania have more than halved the under-five mortality rate. Eastern Asia, Latin America and the Caribbean, and Northern Africa have reduced the under-five mortality rate by two thirds or more since 1990 (Table 1 and Figure 1). At the country level, about a third of countries (62) have reduced their under-five mortality by two thirds or more and achieved the MDG 4 target set in 2000. Among them are 12 low-income countries (Cambodia, Ethiopia, Eritrea, Liberia, Madagascar, Malawi, Mozambique, Nepal, Niger, Rwanda, Uganda, and United Republic of Tanzania) another dozen are lower-middle income countries (Armenia, Bangladesh, Bhutan, Bolivia (Plurinational State of), Egypt, El Salvador, Georgia, Indonesia, Kyrgyzstan, Nicaragua, Timor-Leste and Yemen). An additional 74 countries reduced their under-five mortality rates by at least half, and another 41 countries by at least 30 percent.

TABLE 1 **Levels and trends in the under-five mortality rate, by Millenium Development Goal region, 1990-2015**

	Under-five mortality rate (deaths per 1,000 live births)								Annual rate of reduction (percent)		
Region	1990	1995	2000	2005	2010	2015	MDG target 2015	Decline (percent) 1990–2015	1990–2015	1990–2000	2000–2015
Developed regions	15	11	10	8	7	**6**	**5**	60	3.7	3.9	3.5
Developing regions	100	94	83	69	57	**47**	**33**	54	3.1	1.8	3.9
Northern Africa	73	57	44	35	28	**24**	**24**	67	4.4	5.0	4.1
Sub-Saharan Africa	180	172	154	127	101	**83**	**60**	54	3.1	1.6	4.1
Latin America and the Caribbean	54	42	32	25	24	**18**	**18**	67	4.4	5.2	3.9
Caucasus and Central Asia	73	74	63	49	39	**32**	**24**	56	3.3	1.4	4.6
Eastern Asia	53	46	37	24	16	**11**	**18**	79	6.3	3.7	8.1
Eastern Asia excluding China	27	33	30	19	16	**14**	**9**	49	2.7	-1.1	5.3
Southern Asia	126	109	92	76	62	**51**	**42**	59	3.6	3.2	3.9
Southern Asia excluding India	126	109	93	79	68	**59**	**42**	53	3.0	3.0	3.1
South-eastern Asia	72	59	49	40	33	**27**	**24**	62	3.9	3.9	3.9
Western Asia	66	54	43	35	27	**22**	**22**	66	4.3	4.3	4.3
Oceania	74	70	67	64	57	**51**	**25**	32	1.5	1.1	1.9
World	**91**	**85**	**76**	**63**	**52**	**43**	**30**	**53**	**3.0**	**1.8**	**3.9**

Note: All calculations are based on unrounded numbers.

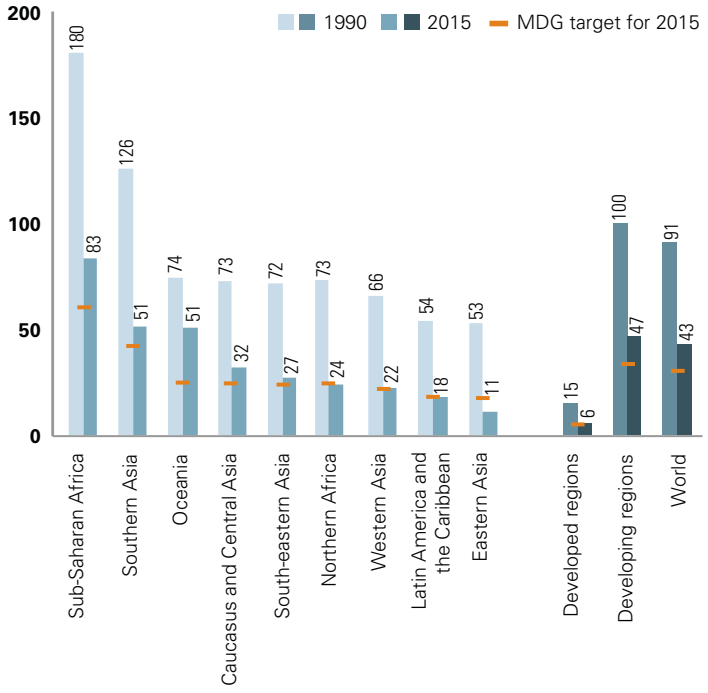
TABLE 2 **Levels and trends in the number of deaths of children under age five, by Millennium Development Goal region, 1990-2015**

Region	Under-five deaths (thousands)						Decline (percent) 1990–2015	Share of global under-five deaths (percent)	
	1990	1995	2000	2005	2010	2015		1990	2015
Developed regions	223	154	129	111	96	80	64	1.7	1.3
Developing regions	12,526	10,840	9,654	8,189	6,917	5,865	53	98.3	98.7
Northern Africa	280	194	142	121	111	114	59	2.2	1.9
Sub-Saharan Africa	3,871	4,079	4,114	3,748	3,292	2,947	24	30.4	49.6
Latin America and the Caribbean	632	494	378	280	258	196	69	5.0	3.3
Caucasus and Central Asia	145	120	88	72	68	62	58	1.1	1.0
Eastern Asia	1,662	851	615	424	266	194	88	13.0	3.3
Eastern Asia excluding China	28	42	30	18	15	12	55	0.2	0.2
Southern Asia	4,796	4,154	3,566	2,916	2,398	1,891	61	37.6	31.8
Southern Asia excluding India	1,439	1,215	1,053	872	803	690	52	11.3	11.6
South-eastern Asia	856	702	542	457	371	331	61	6.7	5.6
Western Asia	270	231	192	156	136	117	57	2.1	2.0
Oceania	14	15	16	16	15	13	6	0.1	0.2
World	**12,749**	**10,994**	**9,783**	**8,299**	**7,013**	**5,945**	**53**	**100.0**	**100.0**

Note: All calculations are based on unrounded numbers.

FIGURE 1 **Under-five mortality declined in all regions between 1990 and 2015**

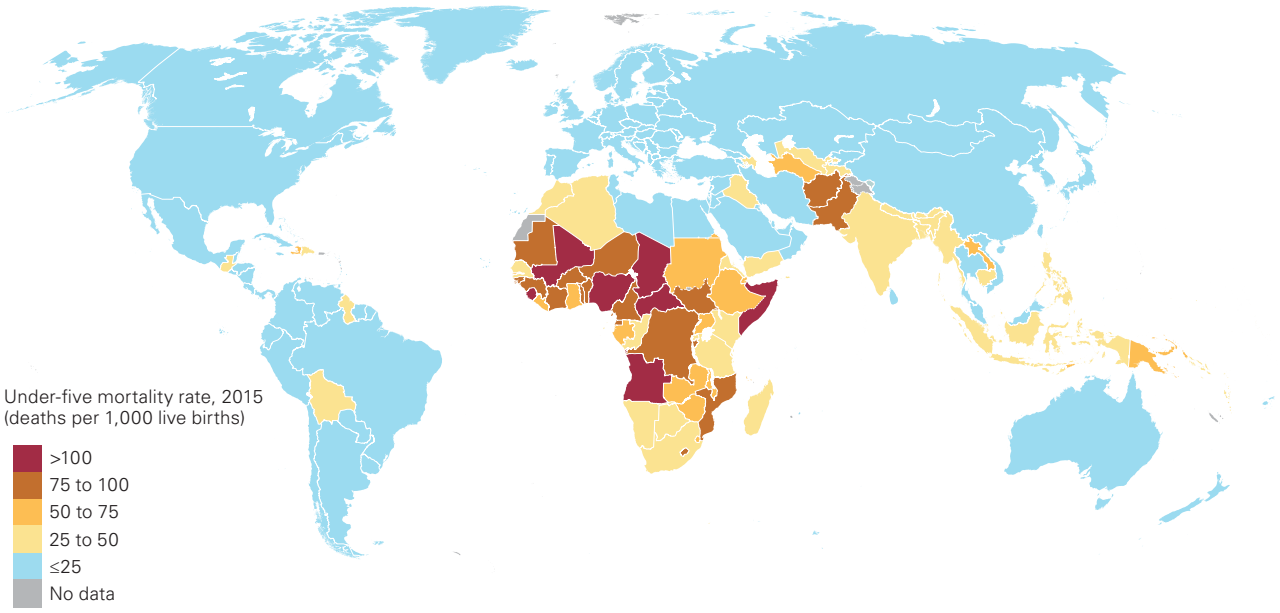
Under-five mortality rate by Millennium Development Goal region, 1990 and 2015 (deaths per 1,000 live births)



Acceleration in progress: Encouragingly, progress in improving child survival has been accelerated in the 2000–2015 period compared with the 1990s. Globally, the annual rate of reduction in the under-five mortality rate has increased from 1.8 (1.6, 1.9) percent in 1990–2000 to 3.9 (3.4, 4.1) percent in 2000–2015. Especially promising, sub-Saharan Africa, the region with the highest under-five mortality rate in the world (Map 1), has also registered an acceleration in reducing under-five mortality. Its annual rate of reduction increased from 1.6 (1.4, 1.7) percent in the 1990s to 4.1 (3.4, 4.6) percent in 2000–2015. Of the 49 sub-Saharan African countries, all but 5 had a higher annual rate of reduction in the 2000–2015 period as compared with the 1990s (Map 2). Also, 21 sub-Saharan African countries have at least tripled their annual rates of reduction from the 1990s or reversed an increasing mortality trend in 2000–2015 compared with the 1990s: Angola, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Congo, Côte d'Ivoire, Gabon, Kenya, Lesotho, Mauritania, Namibia, Rwanda, Senegal, Sierra Leone, Somalia, South Africa, Swaziland, Zambia and Zimbabwe.

MAP 1 **Children in sub-Saharan Africa and Southern Asia face a higher risk of dying before their fifth birthday**

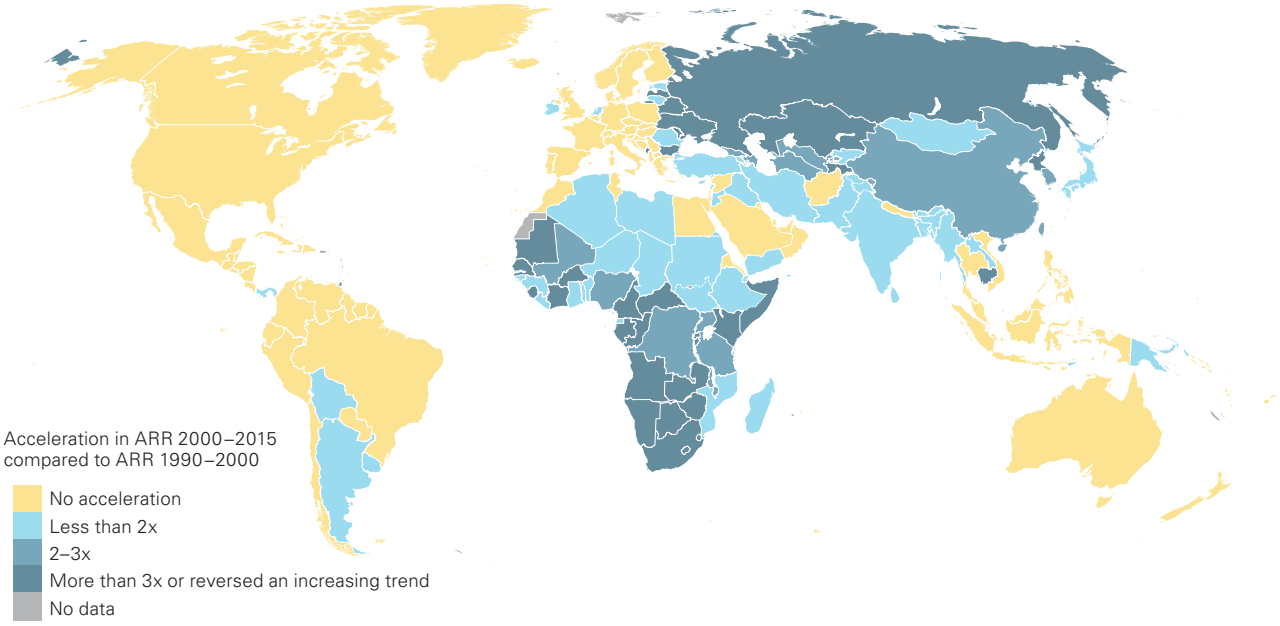
Under-five mortality rate (deaths per 1,000 live births) in 2015, by country



Notes: The classification is based on unrounded numbers. This map does not reflect a position by UN IGME agencies on the legal status of any country or territory or the delimitation of any frontiers.

MAP 2 **A total of 21 sub-Saharan African countries have at least tripled their rate of progress in recent years or reversed an increasing mortality trend in 2000–2015 compared with the 1990s**

Annual rate of reduction (ARR) in under-five mortality in 1990–2000 and 2000–2015 by country



Notes: The classification is based on unrounded numbers. This map does not reflect a position by UN IGME agencies on the legal status of any country or territory or the delimitation of any frontiers.

Lives saved: The remarkable improvements in child survival since 2000 have saved the lives of 48 million children under age five – children who survived as the under-five mortality rate has fallen from 2000 onward. These children would have died had mortality remained at the same level as in 2000 in each country. Accelerated progress since 2000 has saved the lives of about 18 million children globally, accounting for nearly 40 percent of the 48 million children saved. In other words, 18 million children would not have survived to see their fifth birthday had the under-five mortality rate declined at the same pace it did in the 1990s.[2]

Unfinished business: Yet, despite substantial gains in improving child survival, progress has been insufficient to achieve MDG 4 worldwide. The 53 percent decline in the under-five mortality rate globally is far from the two-thirds reduction required to meet the MDG 4 target. If current trends continue, the world as a whole would reach the MDG 4 target in 2026 – more than 10 years behind schedule. The toll of under-five deaths over the past two decades is staggering: between 1990 and 2015, 236 (234, 240) million children worldwide died before their fifth birthday – more than today's population of Brazil, the world's fifth-most populous country. Had the necessary steady progress been made since 2000 to achieve MDG 4, 14 million more children would have survived to age five since 2000.

The work that remains in the SDG era

Child survival remains an urgent concern. It is unacceptable that about 16,000 children still die every single day – equivalent to 11 deaths occurring every minute. Without any further acceleration to the current pace of reduction in under-five mortality, a projected 69 million children – more than the current population of Thailand – will die before they reach their fifth birthday between now and 2030, the SDG target year, with 3.6 million of these lives lost in the year 2030 alone. These numbers are still unacceptably high. A concerted effort is needed to further accelerate the pace of progress, and countries and the international community must invest further to end preventable child deaths.

Which areas to focus on: Sub-Saharan Africa remains the region with the highest under-five mortality rate in all regions in the world, with 1 child in 12 dying before his or her fifth birthday – far higher than the average ratio of 1 in 147 in high-income countries. The region is home to most of the highest mortality countries in the world (Map 1). The seven countries with an under-five mortality rate above 100 are all located in sub-Saharan Africa. Moreover, extended efforts are needed to provide the necessary services and interventions given the expected growing number of births and child populations in this region – with a 95 percent probability the number of children under age five in sub-Saharan Africa will grow by an extra 26–57 million (with a median of 42 million), from 157 million in 2015 to between 183 and 214 million in 2030.[3] The region may face unique challenges in reducing the number of child deaths: the number of under-five deaths in sub-Saharan Africa may increase or stagnate even with a declining under-five mortality rate if the decline in the mortality rate does not outpace the increase in population, as observed during the 1990s.

Southern Asia is another region where acceleration in reducing child mortality is urgently required. The under-five mortality rate in this region is still high – 51 deaths per 1,000 live births in 2015. Three in 10 global under-five deaths occur in Southern Asia.

Which age group to focus on: The first 28 days of life – the neonatal period – are the most vulnerable time for a child's survival. Neonatal mortality is becoming increasingly important not only because the share of under-five deaths occurring during the neonatal period has been increasing, but also because the health interventions needed to address the major causes of neonatal deaths generally differ from those needed to address other under-five deaths, and are closely linked to those that are necessary to protect maternal health.

Globally, the neonatal mortality rate fell from 36 (35, 38) deaths per 1,000 live births in 1990 to 19 (18, 21) in 2015, and the number of neonatal deaths declined from 5.1 (4.9, 5.3) million to 2.7 (2.5, 2.9) million (Table 3). However, the decline in neonatal mortality over 1990–2015 has been slower than that of post-neonatal under-five mortality (1-59 months): 47 percent, compared with 58 percent globally. This pattern applies to most low- and middle-income countries (Figure 2).

TABLE 3 **Neonatal mortality rate, number of neonatal deaths and neonatal deaths as a share of under-five deaths, by Millennium Development Goal region, 1990 and 2015**

Region	Neonatal mortality rate (deaths per 1,000 live births)			Number of neonatal deaths (thousands)		Neonatal deaths as a share of under-five deaths (percent)		
	1990	2015	Decline (percent) 1990–2015	1990	2015	1990	2015	Relative increase (percent) 1990–2015
Developed regions	8	3	58	116	44	52	55	5
Developing regions	40	21	47	4,990	2,639	40	45	13
Northern Africa	31	14	56	117	66	42	58	38
Sub-Saharan Africa	46	29	38	994	1,027	26	35	36
Latin America and the Caribbean	22	9	58	255	102	40	52	29
Caucasus and Central Asia	29	16	44	57	31	40	51	29
Eastern Asia	29	6	81	939	100	57	52	-9
Eastern Asia excluding China	12	7	38	11	7	41	53	30
Southern Asia	57	29	49	2,179	1,078	45	57	26
Southern Asia excluding India	56	32	42	642	382	45	55	24
South-eastern Asia	28	13	52	326	165	38	50	31
Western Asia	29	12	57	117	64	43	55	27
Oceania	28	22	22	5	6	37	43	15
World	**36**	**19**	**47**	**5,106**	**2,682**	**40**	**45**	**13**

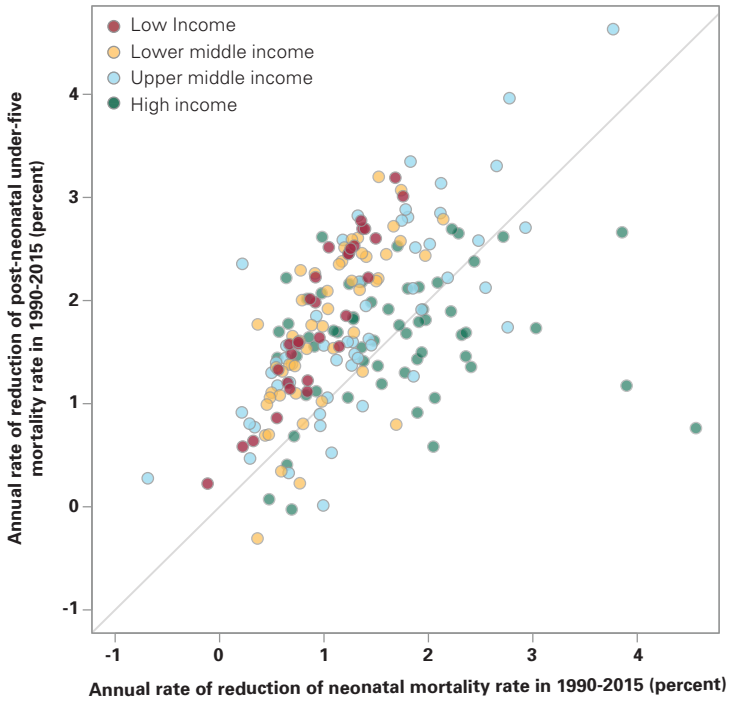
Note: All calculations are based on unrounded numbers.

Our projections indicate that if current trends continue, around half of the 69 million child deaths between 2016 and 2030 will occur during the neonatal period. The share of neonatal deaths is projected to increase from 45 percent of under-five deaths in 2015 to 52 percent in 2030. Moreover, 63 countries need to accelerate progress to reach the SDG target of a neonatal mortality rate of 12 deaths per 1,000 live births by 2030 – more than the 47 countries for the under-five mortality target.

For too many babies, their day of birth is also their day of death: almost 1 million neonatal deaths occur on the day of birth, and close to 2 million die in the first week of life. In order to continue to accelerate progress, it is critical to ensure that every pregnant woman and every newborn has access to and receives good quality care and life-saving interventions. The vast majority of maternal and newborn deaths can be prevented by relatively straightforward effective interventions. Quality of care in delivering these interventions along the continuum of care during pre-pregnancy, antenatal, intra-partum, childbirth and post-natal periods is paramount to ensure progress.[2]

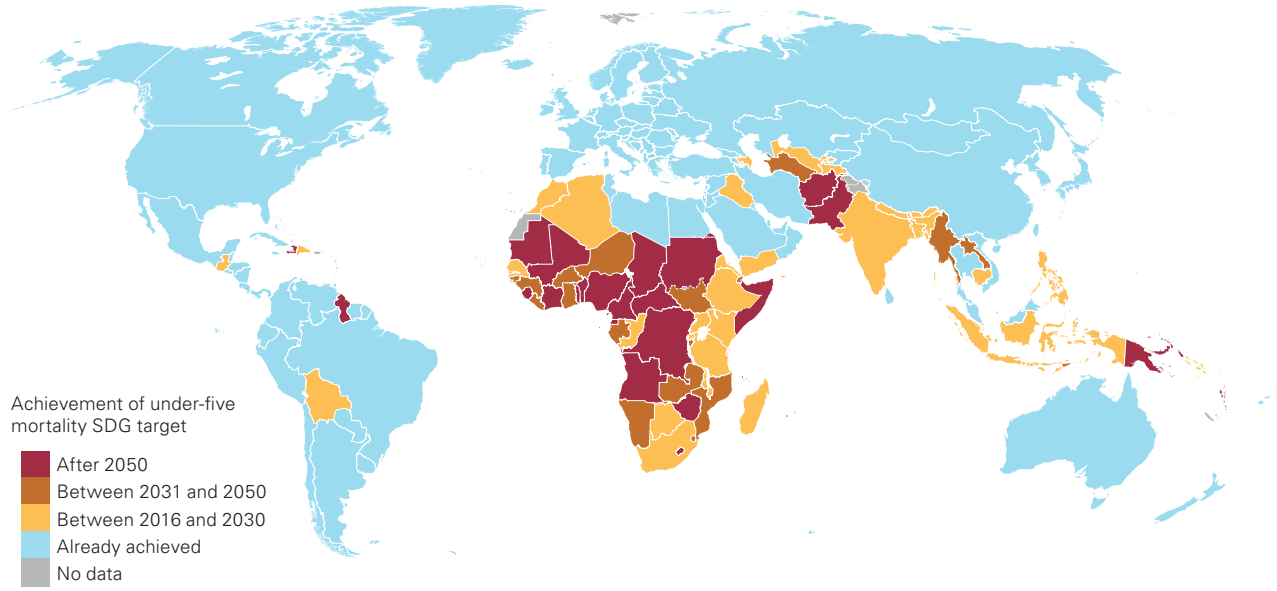
FIGURE 2 **Progress in reducing neonatal mortality rate is slower than for the post-neonatal under-five mortality rate in the majority of countries**

The annual rate of reduction in the neonatal mortality rate (0-27 days) and post-neonatal under-five mortality rate (1-59 months), 1990–2015



MAP 3 **Current progress must be accelerated to reach the SDG target**

Achievement of SDG target on child mortality by year, and by country, if current trends continue in each country



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While focus is needed to prevent neonatal deaths, continued preventive and curative life-saving interventions need to be provided to children beyond the neonatal period in countries where the post-neonatal under-five mortality rate is still high, in particular in 29 sub-Saharan African countries, where post-neonatal under-five deaths account for at least 60 percent of under-five deaths.

Which conditions to focus on: Understanding the causes of child mortality provides important public health insights. Renewing the promise of survival for children relies on tracking and addressing the leading causes of deaths. Infectious diseases (such as pneumonia and diarrhoea) and neonatal complications are responsible for the vast majority of under-five deaths globally. According to the latest estimates by WHO and the Maternal and Child Epidemiology Estimation Group[4] of the 5.9 million deaths in children under five that occurred in 2015, about half were caused by infectious diseases and conditions such as pneumonia, diarrhoea, malaria, meningitis, tetanus, HIV and measles. The main killers of children under age five in 2015 include preterm birth complications (18 per cent), pneumonia (16 per cent), intrapartum-related complications (12 per cent), diarrhoea (9 per cent) and sepsis/meningitis (9 per cent). Importantly, almost half of all under-five deaths are attributable to undernutrition,[5] while more than 80 percent of neonatal deaths occur among newborn infants of low birth weight in the highest burden settings.[6] In summary, most child deaths are caused by diseases that are readily preventable or treatable with proven, cost-effective interventions. Action must be taken immediately to save children's lives by expanding effective preventive and curative interventions.

Acceleration urgently required to achieve SDG target: Currently, 79 countries have an under-five mortality rate above 25, and 47 of them will not meet the proposed SDG target of 25 deaths per 1,000 live births by 2030 if they continue their current trends in reducing under-five mortality. The acceleration needed to reach the goals in those 47 countries is substantial – 30 countries must at least double their current rate of reduction, and 11 of those 30 countries must at least triple their current rate of reduction.

Among these 47 countries, 34 are in sub-Saharan Africa. If current trends continue, many of these countries are not expected to meet the SDG target until after 2050 (Map 3). If all countries meet the SDG target by 2030, a total of 56 million children would die – 38 million less than the 94 million children under the age of 5 who would die between 2016 and 2030 if under-five mortality rates remain at today's levels.

The challenge of meeting the SDG target of a neonatal mortality rate of 12 or fewer deaths per 1,000 live births is more substantial. To reach that target, 63 countries will need to accelerate their current rates of reduction.

Focus for low mortality countries: Of the 195 countries with available estimates, 116 have already achieved the SDG target with an under-five mortality rate of 25 or fewer deaths per 1,000 live births. Of these low-mortality countries, a third have an under-five mortality rate that is below 5, and 16 are still above 20. If current trends continue, 44 of these low-mortality countries are not expected to meet today's under-five mortality rate of the high-income countries of 6.8 deaths per 1,000 live births by 2030, and around 6 million children would die in these 116 countries between 2016 and 2030. By contrast, if all these countries, by 2016, reduced their under-five mortality rate to the current lowest level of 2·3 deaths per 1,000 live births observed among countries with more than 10,000 live births in 2015, an additional 3.5 million children would be saved between 2016 and 2030. This means that there is still work to be done in improving child survival even within this group of countries.

Wide gaps in child mortality across sub-groups or areas within countries have been documented in this group of nations, warranting a call for an equity-focused approach to reducing child mortality. For example, Brazil is one of the countries that succeeded in significantly reducing child mortality. The country as a whole has met MDG 4 – the under-five mortality rate in Brazil declined from 61 in 1990 to 16 in 2015, a 73 percent reduction. Although Brazil has also managed to reduce regional inequities in child mortality in the past 25 years, disparities still persist in the country. Out of roughly 5,500 municipalities, more than 1,000 municipalities had an under-five mortality rate below 5 deaths per 1,000 live births in 2013, but in 32 municipalities, the rate exceeded 80 deaths per 1,000 live births. In addition, indigenous children are twice as likely to die before reaching their first birthday as other Brazilian children. These examples illustrate that even for countries with relatively low levels of mortality, greater efforts to reduce disparities at the sub-national level and across different groups are required to achieve equity in child survival and lower mortality levels overall. Therefore, much work remains to give every child a fair chance of survival even in low-mortality countries.

The substantial progress in reducing child mortality over the past 25 years provides a clear message: with the right commitments, concerted efforts and political will, bold and ambitious goals are within reach. Despite limited resources, 24 out of 81 low-income and lower-middle-income countries have met the MDG target for reducing under-five mortality by two thirds. Nearly 70 percent of all countries have at least halved their rates of child mortality. The 48 million children whose lives have been saved since 2000 are living evidence of the power of global commitments. Despite the substantial progress, the unfinished business of child survival looms large. Some 69 million children are at risk of dying before their fifth birthday in the next 15 years if current trends continue without acceleration. Every single child death represents the loss of a unique human being. Countries and the international community must take immediate action to further accelerate the pace of progress to fulfil the promise to children. Without intensified efforts to reduce child mortality, particularly in the highest mortality areas and in contexts of persistent inequities, the SDG targets will be unattainable. Child survival must remain at the heart of the post-2015 SDG agenda.

Estimating Child Mortality

The United Nations Inter-agency Group for Child Mortality Estimation (UN IGME) was established in 2004 to harmonize child mortality estimates within the United Nations system for reporting on progress towards child survival goals, to improve methods for child mortality estimation and to enhance country capacity to produce timely and properly assessed estimates of child mortality. UN IGME includes UNICEF, WHO, the World Bank and the Population Division of the United Nations Department of Economic and Social Affairs as full members.

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

UN IGME updates its child mortality estimates annually after reviewing newly available data and assessing data quality. These estimates are widely used in UNICEF's flagship publications, the United Nations Secretary-General's MDG report, and publications by other United Nations agencies, governments and donors.

In this chapter, we summarize the methods that UN IGME uses to generate child mortality estimates.

Overview

To minimize the errors for each estimate of child mortality, as well as harmonize trends over time and produce up-to-date and properly assessed estimates, UN IGME follows a broad strategy that includes:

1. Compiling all available nationally representative data relevant to the estimation of child mortality, including data from vital registration systems, population censuses, household surveys and sample registration systems;
2. Assessing data quality, recalculating data inputs and, if necessary, making adjustments by applying standard methods; and
3. Fitting a statistical model to these data to generate a smooth trend curve that averages over possibly disparate estimates from the different data sources for a country, and extrapolating the model to a target year, in this case 2015.

To increase the transparency of the estimation process, UN IGME has developed a child mortality database that is available publicly on the web portal CME Info (<www.childmortality.org>). The database includes all available data and shows estimates for every country. It is updated whenever new estimates are generated and finalized.

Data Sources

If each country had a single source of high-quality data covering the past few decades, reporting on child mortality levels and trends would be straightforward. But few countries do, and the limited availability of high-quality data over time for many countries makes generating accurate estimates of child mortality a considerable challenge.

Nationally representative estimates of child mortality can be derived from a number of different sources, including civil registration and sample surveys. Demographic surveillance sites and hospital data are excluded, as they are rarely representative. The preferred source of data is a civil registration system, which records births and deaths on a continuous basis. If registration is complete and the system functions efficiently, the resulting estimates will be accurate and timely.

Most low- and middle-income countries, however, do not have well-functioning vital registration systems. In such cases, household surveys, such as the UNICEF-supported Multiple Indicator

Cluster Surveys (MICS), the United States Agency for International Development-supported Demographic and Health Surveys (DHS) and periodic population censuses have become the primary source of data on child mortality. These surveys, which ask women about the survival of their children, provide the basis of child mortality estimates for a majority of low- and middle-income countries. The data from such surveys, however, are often subject to sampling or/and non-sampling errors, which might be substantial.

The first step in the process of arriving at estimates of levels and recent trends of the under-five, infant and neonatal mortality rates involves compiling all newly available empirical data. The full set of empirical data used in this analysis is publicly available from the UN IGME web portal (<http://childmortality.org/> under 'Underlying data'). The 2015 update to the UN IGME database included about 5,700 new or updated country-year data points on child mortality under age five from more than 130 data series. As of July 2015, the database contains 17,000 country-year data points from more than 1,500 data series across 195 countries from 1990 (or earlier) to 2015. The increased availability of empirical data has substantially changed the estimates generated by UN IGME for some countries from previous editions, partly because the fitted trend line is based on the entire time series of data available for each country. The estimates presented in this report may differ from and are not necessarily comparable with previous sets of UN IGME estimates or underlying country data.

Data from civil registration systems

Civil registration data are the preferred data source for under-five, infant and neonatal mortality estimation. The calculation of the under-five mortality rates (U5MR) and infant mortality rates (IMR) from civil registration data is derived from a standard period abridged life table. For civil registration data (with available data on the number of deaths and mid-year populations), annual observations were initially constructed for all observation years in a country. For country-years in which the coefficient of variation exceeded 10 percent, deaths and mid-year populations were pooled over longer periods, starting from more recent years and combining those with adjacent previous years, to reduce spurious fluctuations in countries where small numbers of births and deaths were observed.

The coefficient of variation is defined to be the stochastic standard error of the 5q0 (5q0=U5MR/1,000) or 1q0 (1q0=IMR/1,000) observation divided by the value of the 5q0 or 1q0 observation. The stochastic standard error of the observation is calculated using a Poisson approximation using live birth numbers from the World Population Prospects, given by sqrt(5q0 /lb) (or similarly sqrt(1q0 /lb), where lb is the number of live births in the year of the observation.[7] After this recalculation of the civil registration data is done, the standard errors are set to a minimum of 2.5 percent for input into the model.

Survey data

The majority of survey data comes in one of two forms: the full birth history, which asks women for the date of birth of each of their children, whether the children are still alive and, if not, the age at death; and the summary birth history, which asks women only about the number of children they have given birth to and the number that have died (or equivalently the number still alive).

Full birth history data, collected by all DHS surveys and increasingly also MICS surveys, allow the calculation of child mortality indicators for specific time periods in the past.[8] This allows DHS and MICS to publish child mortality estimates for three 5-year periods before the survey, that is, 0 to 4, 5 to 9 and 10 to 14. UN IGME has recalculated estimates for calendar year periods, using single calendar years for periods shortly before the survey, and gradually increasing the number of years for periods further in the past to cover a 25-year period prior to the survey, whenever survey microdata are available. The cut-off points for a given survey for shifting from estimates for single calendar years to two years, or two years to three, etc., are based on the estimates' coefficients of variation (a measure of sampling uncertainty).[9]

In general, summary birth history data, collected by censuses and many household surveys, use the age of the woman as an indicator of the age of her children and their exposure time to the risk of dying, and employ models to estimate

mortality indicators for periods in the past for women ages 25–29 through ages 45–49. This method is well known, but has several shortcomings. In 2014, UN IGME changed the method of estimating summary birth histories to one based on classification of women by the time that has passed since their first birth.

The main benefits of this new method over the previous one are that: First, it generally has lower sampling errors. Second, it avoids the problematic assumption that the estimates derived for each age group adequately represent the mortality of the whole population, and thus is less susceptible to the selection effect of young women who give birth early, since all women who give birth necessarily must have a first birth and therefore are not selected for. Third, the method tends to show less fluctuation over time, in particular in countries with relatively low fertility and mortality.[10] UN IGME considers the improvements in the estimates based on time since first birth worthwhile when compared with the estimates derived from the classification by age of mother. In cases where the information on time since first birth is available, UN IGME has reanalysed the data using the new method and only uses this version of estimates.

Moreover, following advice from UN IGME's Technical Advisory Group, child mortality estimates from a summary birth history were not included when estimates from a full birth history in the same survey were available.[11]

Adjustment for missing mothers in high HIV prevalence settings

In populations severely affected by HIV and AIDS, HIV-positive children will be more likely to die than other children, and will also be less likely to be reported because their mothers will have been more likely to die also, without scaling up antiretroviral therapy. Child mortality estimates will thus be biased downward. The magnitude of the bias will depend on the extent to which the elevated under-five mortality of HIV-positive children is not reported because of the deaths of their mothers. UN IGME's Technical Advisory Group developed a method to adjust AIDS-related mortality for each survey data observation from full birth histories during HIV and AIDS epidemics (1980–present), by adopting a set of simplified but reasonable assumptions about the distribution of births to HIV-positive women, primarily relating to the duration of their infection, vertical transmission rates, and survival times of both mothers and children from the time of the birth.[12] This method was applied to all World Fertility Surveys, as well as the DHS and MICS surveys with full birth histories.

Adjustment for under-reporting of infant deaths

Early infant mortality data from civil registration is incomplete in some European countries. A European report on perinatal indicators, for example, noted a wide variation on how European countries define infant mortality, due to differences in birth and death registration practices (that is, differences in the cut-off points for acceptable weight or estimated gestation period to be registered as a birth and subsequent death).[13,14] These discrepancies can lead to under-reporting of infant deaths by some countries, particularly when compared with countries that use a broader definition for live birth. The international discrepancies in data may have existed for some time, but had been overlooked due to much higher infant mortality rates in the past. Now that rates are so much lower, however, differences in registration may be more important in explaining inter-country differences in infant mortality.[15]

Therefore, child mortality was first adjusted before running the regression model. UN IGME examined the strong evidence that early neonatal deaths are under-reported for the Russian Federation and agreed that an adjustment of the order of 25 percent should be made to the Russian estimates of infant mortality based on the published analyses. This problem was also known to be present for some other Eastern European countries.[16] UN IGME carried out an analysis of the ratio of early neonatal (under 7 days) deaths to total neonatal deaths. The average value of this ratio for Western European countries was 0.77, with few values below 0.70. A statistical analysis of this ratio for available country-years found that the ratio was significantly lower than the Western European average for the following countries: Belarus, Bulgaria, Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Romania, Russian Federation, Slovakia and Spain. In only four countries did this ratio change significantly over

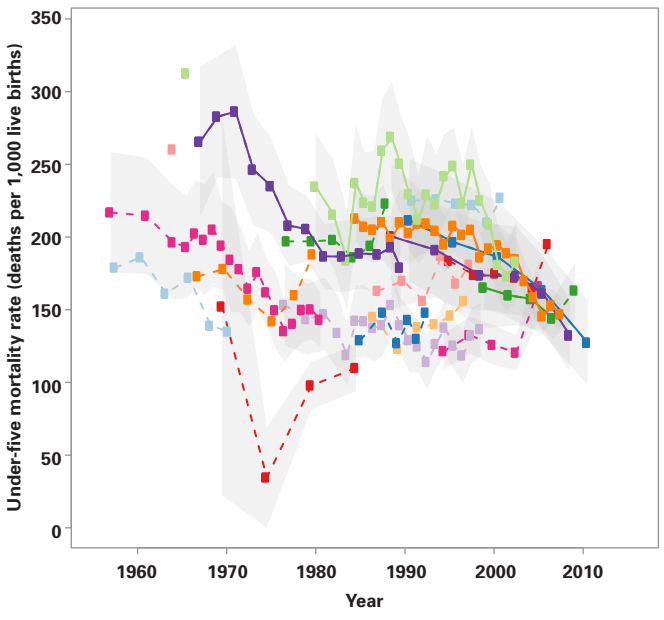
time, and in all cases it was decreasing not increasing.

Based on this analysis, it was decided to apply a 10 percent upward adjustment to under-five mortality for Belarus, Hungary and Lithuania; and a 20 percent adjustment for the other countries, including the Russian Federation. In all cases, a single country-specific correction factor was applied to the entire time series, except for Estonia, from 1992 onward.

Systematic and random measurement error

Data from different sources require different calculation methods and may suffer from different errors, such as random errors in sample surveys or systematic errors due to misreporting. As a result, different surveys often yield widely different estimates of under-five mortality rates (U5MR, the probability of dying before age five) for a given time period as illustrated in Figure 3. In order to reconcile these differences and take better account of the systematic biases associated with the various types of data inputs, UN IGME's Technical Advisory Group has developed an estimation method to fit a smoothed trend curve to a set of observations and to extrapolate that trend to a defined time point, in this case 2015. This method is described in the following section.

FIGURE 3 **Empirical data of under-five mortality rate in Nigeria**



Note: All data available for the country are shown as coloured points, with observations from the same data series joined by lines. Grey bands in the left plot represent the standard errors of the observations where available. Series considered, but not included into the statistical modelling due to substantial non-sampling errors or omissions, appear with dashed lines.

Exclusion of data sources

Whatever the method used to derive the estimates, data quality is critical. UN IGME assesses data quality and does not include data sources with substantial non-sampling errors or omissions as underlying empirical data in its statistical model to derive UN IGME estimates.

Estimation of under-five mortality rates

U5MR estimates were produced using the Bayesian B-spline Bias-reduction model, referred to as the B3 model.[7,17] The model was developed, validated and used to produce previous rounds of the UN IGME child mortality estimates published in 2013[18] and 2014.[19]

In the B3 model, log(U5MR) is estimated with a flexible splines regression model. The spline regression model is fitted to all U5MR observations (i.e., country-year data points) in the country. An observed value for U5MR is considered to be the true value for U5MR multiplied by an error factor, i.e., observed U5MR = true U5MR * error, or on the log-scale, log(observed U5MR) = log(true U5MR) + log(error), where error refers to the relative difference between an observation and the true value. While estimating the true U5MR, properties of the errors that provide information about the quality of the observation, or in other words, the extent of error that is expected, are taken into account. These properties include: the standard error of the observation (due to sampling) or its stochastic error (for vital registration data to capture the uncertainty in outcomes of random events); the type of data source (e.g., DHS versus census); the type of data collection method (e.g., full or summary birth histories); the difference between the observation reference date and the survey time; and if the observation is part of a specific data series (and how consistent the data series is with other series with overlapping observation periods). These properties are summarized in the so-called data model. When estimating the U5MR, the data model accounts for the errors in empirical data, including the average systematic biases associated with different types of data sources, using

information on data quality for different types of data sources from every country.

Compared with the previously applied Loess estimation approach, the B3 model better accounts for data errors, including biases and sampling and non-sampling errors in the data. It can better capture short-term fluctuations in the under-five mortality rate and its annual rate of reduction, and thus is better able to account for evidence of acceleration in the decline of under-five mortality from new surveys. Validation exercises show that the B3 model also performs better in short-term projections.

Figure 4 displays plots of the U5MR over time for Senegal, used here for illustrative purposes only.

The B3 model described above is applied to obtain estimates of the U5MR for all countries except the Democratic Republic of Korea, where a non-standard method was employed. A more complete technical description of the B3 model is available elsewhere.[7]

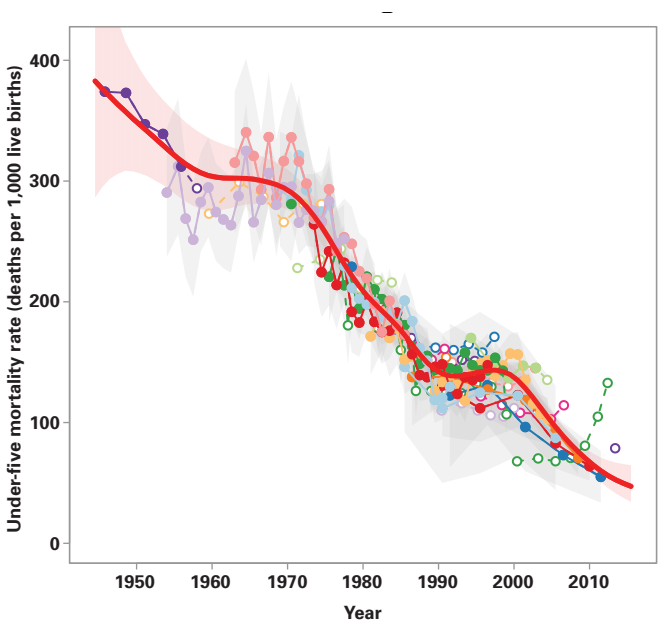
Estimation of infant mortality rates

For countries with high-quality vital registration data, a variation of the B3 model is used to obtain infant mortality rates (IMR, the probability of dying before age 1) estimates, whereby estimates are constructed for the logit transform of r, i.e., log(r/1-r), where r is the ratio of the IMR to the median B3 estimates of U5MR in the corresponding country-year. The transform is used to restrict the IMR to be lower than the U5MR. For the remaining countries without high-quality vital registration data, the IMR is derived from the U5MR through the use of model life tables that contain known regularities in the age patterns of child mortality.[20]

Adjustment in curve fitting for rapidly changing under-five and infant mortality rates driven by HIV and AIDS

To capture the extraordinarily rapid changes in child mortality driven by HIV and AIDS over the epidemic period in some countries, the regression models were fitted to data points for the U5MR from all other causes than HIV and AIDS, and then estimates from the Joint United Nations Programme on HIV/AIDS (UNAIDS) of AIDS-related under-five mortality were added

FIGURE 4 **Empirical under-five mortality data and estimates from the B3 model for Senegal**



Note: The B3 estimates are in red, and 90 percent uncertainty intervals for the under-five mortality rate are given by the pink bands. All data available for the country are shown as coloured points, with observations from the same data series joined by lines. Solid points and lines represent data series/observations that were included for curve-fitting. Grey bands represent the standard errors of the observations where available.

to estimates from the regression model.[21] This method was used for 17 countries where the HIV prevalence rate exceeded 5 percent at any point in time since 1980. Specifically, the steps taken included:

1. Compiling and assessing the quality of all newly available nationally representative data relevant to the estimation of child mortality;

2. Adjusting survey data to account for possible biases in data collection and in HIV and AIDS epidemic;

3. Using UNAIDS estimates of AIDS-related child mortality21 to adjust the data points from 1980 onward to exclude AIDS deaths;

4. Fitting the standard B3 model to the observations to AIDS-free data points;

5. Extrapolating the model to the target year, in this case 2015;

6. Adding back estimates of deaths due to AIDS (from UNAIDS); and

7. For the epidemic period, a non-AIDS curve of IMR is derived from U5MR using model life tables and then the UNAIDS estimates of AIDS deaths for children under age 1 are added to generate the final IMR estimates.

Estimation of under-five and infant mortality rates due to conflict and natural disasters

Deaths caused by major humanitarian crises are difficult to capture in household surveys or censuses. Estimated deaths for major humanitarian crises were derived from various data sources from 1990 to present. Data of natural disasters were obtained from the International Disaster Database of the Centre for Research on the Epidemiology of Disasters,[22] with under-five proportions estimated as described elsewhere[23] and conflict deaths were taken from the datasets of the Uppsala Conflict Data Project and the Peace Research Institute Oslo, as well as reports prepared by the United Nations and other organizations. Estimated child deaths due to major humanitarian crises were included if they met the following criteria:

1. The humanitarian crisis was isolated to a few years; and

2. Under-five humanitarian crisis deaths were >10% of under-five non-humanitarian crisis deaths; and

3. Humanitarian crisis U5MR > 0.2 per 1,000; and

4. Number of under-five humanitarian crisis deaths >10 deaths;

   or

5. High-quality vital registration data are available and should not be smoothed by the B3 model.

These criteria resulted in 16 different humanitarian crises being explicitly incorporated into the IGME estimates. Humanitarian crisis deaths were included in the under-five mortality estimates by first excluding data points from humanitarian crisis years, fitting the B3 model to the remaining data, and then adding the humanitarian crisis-specific death rate to the fitted B3 curve. Humanitarian crisis death estimates are uncertain, but presently no uncertainty around these deaths is included in the U5MR uncertainty intervals; instead, it is assumed that the relative uncertainty in the adjusted U5MR is equal to the relative uncertainty in the non-adjusted U5MR. This assumption will be revisited in future years based on further research and upon improved historical data availability on natural disasters and crises-affected populations.

UN IGME also reviewed recent humanitarian crises, namely the Ebola virus disease outbreak in West Africa and the Nepal 2015 earthquake. Based on currently available data, neither of these crises appear to have led directly to under-five deaths greater than 10 percent of non-crisis under-five deaths and were therefore not explicitly included in these estimates. However, it is noted that the broader impact of these disasters on health systems could lead to a greater number of child deaths than is currently estimated, and UN IGME will review new data, if available, in the next estimation round.

Estimation of under-five and infant mortality rates by sex

In 2012, UN IGME started producing estimates of U5MR for males and females separately.[24] In many countries, fewer sources have provided data by sex; instead, the data are for both sexes combined. For this reason, rather than estimate U5MR trends by sex directly from reported mortality levels by sex, UN IGME uses the available data by sex to estimate a time trend in the sex ratio (male/female ratio) of U5MR instead. Bayesian methods for the UN IGME estimation of sex ratios with a focus on the estimation and identification of countries with outlying levels or trends were used. A more complete technical description of the model is available elsewhere.[25]

Estimation of neonatal mortality

The neonatal mortality rate is defined as the probability of dying before 28 days per 1,000 live births. In 2015, UN IGME's method for estimating such rates was updated. The new Bayesian methodology is similar to that used to estimate U5MR and estimates by sex. It has the advantage that, compared with the previous model, it can

capture empirical data trends in neonatal mortality rates within countries and over time for all countries. A more complete technical description of the new model is available elsewhere.[26]

For neonatal mortality in HIV-affected and humanitarian crisis-affected populations, the ratio is estimated initially for non-AIDS and non-crisis deaths. After estimation, humanitarian crisis neonatal deaths are added back on to the neonatal deaths to compute the total estimated neonatal death rate. No AIDS deaths are added back to the neonatal mortality rate, because it is assumed that AIDS-related deaths only affect child mortality after the first month of life.

Estimation of uncertainty intervals

Given the inherent uncertainty in child mortality estimates, 90 percent uncertainty intervals are used by the UN IGME instead of the more conventional 95 percent ones: While reporting intervals that are based on higher levels of uncertainty (i.e., 95 percent instead of 90 percent) would have the advantage that the chance of not having included the true value in the interval is smaller, the disadvantage of choosing higher uncertainty levels is that intervals lose their utility to present meaningful summaries of a range of likely outcomes if the indicator of interest is highly uncertain. Given this trade-off and the substantial uncertainty associated with child mortality estimates, UN IGME chose to report 90 percent uncertainty intervals, or, in other words, intervals for which there is a 90 percent chance that they contain the true value, to encourage wider use and interpretation of the uncertainly intervals.

Country consultation

In 2015, WHO and UNICEF undertook joint country consultations to give each country's ministry of health and national statistics office the opportunity to review all data inputs and the draft estimates for its country. The objective was to identify relevant data not included in the UN IGME database, and to allow countries to review and provide feedback on estimates. It was not a country clearance process. In 2015, 88 of 195 countries sent responses, and 45 of those provided comments or additional data. After the consultations, the UN IGME draft estimates were revised for 33 countries using new data.

Notes

1. Values in parentheses indicate 90 percent uncertainty intervals for the estimates.

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STATISTICAL TABLE

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

Country	Under-five mortality rate (U5MR) with 90 percent uncertainty interval (deaths per 1,000 live births)									Millennium Development Goal target for 2015	Annual rate of reduction (ARR) (percent) 1990–2015		
	1990			2000			2015						
	U5MR	Lower bound	Upper bound	U5MR	Lower bound	Upper bound	U5MR	Lower bound	Upper bound		ARR	Lower bound	Upper bound
Afghanistan	**181**	163	202	**137**	126	150	**91**	70	119	60	**2.7**	1.6	3.9
Albania	**41**	36	46	**26**	23	31	**14**	8	25	14	**4.3**	1.9	6.6
Algeria	**47**	44	50	**40**	39	41	**26**	24	27	16	**2.4**	2.1	2.8
Andorra	**9**	5	14	**5**	4	6	**3**	2	5	3	**4.4**	1.2	7.5
Angola	**226**	202	255	**217**	190	247	**157**	95	254	75	**1.5**	-0.4	3.4
Antigua and Barbuda	**26**	18	36	**16**	14	17	**8**	6	12	9	**4.6**	2.6	6.7
Argentina	**28**	27	28	**20**	20	21	**13**	11	14	9	**3.2**	2.7	3.6
Armenia	**50**	45	55	**30**	27	33	**14**	11	18	17	**5.0**	3.9	6.2
Australia	**9**	9	9	**6**	6	6	**4**	4	4	3	**3.5**	3.2	3.9
Austria	**10**	9	10	**6**	5	6	**4**	3	4	3	**4.0**	3.6	4.4
Azerbaijan	**95**	86	105	**74**	66	83	**32**	20	52	32	**4.4**	2.3	6.3
Bahamas	**24**	22	25	**16**	15	17	**12**	9	16	8	**2.7**	1.5	3.8
Bahrain	**23**	22	24	**13**	12	13	**6**	5	7	8	**5.2**	4.7	5.8
Bangladesh	**144**	140	148	**88**	85	91	**38**	32	44	48	**5.4**	4.8	6.0
Barbados	**18**	17	19	**16**	15	18	**13**	10	17	6	**1.3**	0.2	2.4
Belarus	**17**	16	17	**14**	14	15	**5**	4	5	6	**5.1**	4.8	5.6
Belgium	**10**	10	10	**6**	6	6	**4**	4	5	3	**3.6**	3.1	3.9
Belize	**40**	35	45	**25**	24	27	**17**	14	20	13	**3.5**	2.6	4.4
Benin	**180**	168	191	**145**	135	156	**100**	78	127	60	**2.4**	1.4	3.3
Bhutan	**134**	118	152	**80**	72	88	**33**	24	45	45	**5.6**	4.3	7.0
Bolivia (Plurinational State of)	**124**	118	131	**80**	75	86	**38**	28	52	41	**4.7**	3.5	6.0
Bosnia and Herzegovina	**18**	18	19	**9**	9	10	**5**	5	6	6	**4.9**	4.3	5.5
Botswana	**54**	47	62	**83**	66	100	**44**	22	79	18	**0.9**	-1.6	3.7
Brazil	**61**	56	66	**32**	29	35	**16**	16	17	20	**5.2**	4.9	5.6
Brunei Darussalam	**12**	12	13	**9**	9	10	**10**	9	12	4	**0.7**	0.1	1.3
Bulgaria	**22**	22	23	**21**	20	22	**10**	10	11	7	**3.0**	2.6	3.4
Burkina Faso	**202**	189	215	**186**	172	200	**89**	65	119	67	**3.3**	2.1	4.5
Burundi	**172**	155	190	**152**	135	172	**82**	50	130	57	**3.0**	1.1	5.0
Cabo Verde	**63**	61	65	**36**	34	37	**25**	22	28	21	**3.8**	3.3	4.3
Cambodia	**117**	109	126	**108**	100	118	**29**	20	41	39	**5.6**	4.1	7.2
Cameroon	**138**	128	148	**150**	138	164	**88**	50	148	46	**1.8**	-0.3	4.0
Canada	**8**	8	8	**6**	6	6	**5**	4	6	3	**2.1**	1.5	2.7
Central African Republic	**177**	160	195	**175**	157	195	**130**	87	197	59	**1.2**	-0.5	2.9
Chad	**215**	199	232	**190**	175	206	**139**	94	203	72	**1.7**	0.2	3.3
Chile	**19**	19	20	**11**	11	11	**8**	7	10	6	**3.4**	2.7	4.3
China	**54**	50	59	**37**	35	39	**11**	9	13	18	**6.5**	5.7	7.2
Colombia	**35**	33	38	**25**	23	27	**16**	11	24	12	**3.2**	1.6	4.7
Comoros	**125**	111	140	**101**	81	119	**74**	39	145	42	**2.1**	-0.6	4.6
Congo	**94**	82	106	**122**	110	135	**45**	30	67	31	**2.9**	1.3	4.6
Cook Islands	**24**	22	27	**17**	15	19	**8**	5	12	8	**4.4**	2.7	6.1
Costa Rica	**17**	17	17	**13**	13	13	**10**	8	12	6	**2.2**	1.3	3.1
Côte d'Ivoire	**153**	142	164	**146**	134	159	**93**	72	119	51	**2.0**	1.0	3.0
Croatia	**13**	13	13	**8**	8	9	**4**	4	5	4	**4.4**	3.8	4.9
Cuba	**13**	13	14	**8**	8	9	**6**	5	6	4	**3.5**	3.1	4.0

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

Country	Number of under-five deaths with 90 percent uncertainty interval (thousands)						Sex-specific under-five mortality rate (deaths per 1,000 live births)				Infant mortality rate (deaths per 1,000 live births)		Number of infant deaths (thousands)		Neonatal mortality rate (deaths per 1,000 live births)		Number of neonatal deaths (thousands)	
	1990			2015			1990		2015									
	Under-five deaths	Lower bound	Upper bound	Under-five deaths	Lower bound	Upper bound	Male	Female	Male	Female	1990	2015	1990	2015	1990	2015	1990	2015
Afghanistan	**100**	90	113	**94**	71	125	186	176	95	87	123	66	69	67	53	36	30	36
Albania	**3**	3	4	**1**	0	1	45	37	15	13	35	13	3	1	13	6	1	0
Algeria	**39**	36	42	**24**	23	26	51	43	27	24	40	22	33	21	22	16	18	15
Andorra	**0**	0	0	**0**	0	0	9	8	3	3	8	2	0	0	4	1	0	0
Angola	**122**	108	141	**169**	99	292	236	215	165	149	134	96	74	104	59	49	33	53
Antigua and Barbuda	**0**	0	0	**0**	0	0	28	23	9	7	24	6	0	0	15	5	0	0
Argentina	**20**	20	21	**10**	8	11	31	25	14	11	24	11	18	8	15	6	11	5
Armenia	**4**	4	4	**1**	0	1	55	45	16	13	43	13	3	1	23	7	2	0
Australia	**2**	2	2	**1**	1	1	10	8	4	3	8	3	2	1	5	2	1	1
Austria	**1**	1	1	**0**	0	0	11	8	4	3	8	3	1	0	5	2	0	0
Azerbaijan	**20**	18	22	**7**	4	12	103	87	34	29	76	28	16	7	36	18	7	4
Bahamas	**0**	0	0	**0**	0	0	25	22	13	11	20	10	0	0	14	7	0	0
Bahrain	**0**	0	0	**0**	0	0	24	22	6	6	20	5	0	0	15	1	0	0
Bangladesh	**528**	511	545	**119**	103	139	147	141	40	35	100	31	363	97	63	23	234	74
Barbados	**0**	0	0	**0**	0	0	20	16	14	12	16	12	0	0	12	8	0	0
Belarus	**2**	2	3	**1**	1	1	19	14	5	4	14	3	2	0	9	2	1	0
Belgium	**1**	1	1	**1**	0	1	11	9	5	4	8	3	1	0	5	2	1	0
Belize	**0**	0	0	**0**	0	0	44	36	18	15	32	14	0	0	19	8	0	0
Benin	**39**	36	42	**37**	29	48	187	172	104	95	108	64	24	24	46	32	10	12
Bhutan	**3**	2	3	**0**	0	1	140	127	36	30	93	27	2	0	44	18	1	0
Bolivia (Plurinational State of)	**29**	27	31	**9**	7	13	131	118	42	35	86	31	20	8	42	20	10	5
Bosnia and Herzegovina	**1**	1	1	**0**	0	0	20	16	6	5	16	5	1	0	11	4	1	0
Botswana	**2**	2	3	**2**	1	5	58	50	47	40	42	35	2	2	26	22	1	1
Brazil	**219**	202	237	**52**	50	55	66	55	18	15	51	15	181	47	24	9	86	29
Brunei Darussalam	**0**	0	0	**0**	0	0	13	11	11	9	9	9	0	0	6	4	0	0
Bulgaria	**3**	2	3	**1**	1	1	25	19	12	9	18	9	2	1	12	6	1	0
Burkina Faso	**79**	73	85	**60**	44	82	210	194	94	83	103	61	40	42	46	27	18	18
Burundi	**46**	41	51	**37**	22	61	182	162	88	76	104	54	28	25	42	29	11	13
Cabo Verde	**1**	1	1	**0**	0	0	67	58	27	22	48	21	1	0	22	12	0	0
Cambodia	**41**	38	45	**10**	7	15	125	109	32	25	85	25	29	9	41	15	14	5
Cameroon	**71**	65	76	**71**	40	124	146	130	94	82	86	57	44	47	41	26	21	21
Canada	**3**	3	3	**2**	2	2	9	7	5	5	7	4	3	2	4	3	2	1
Central African Republic	**21**	19	23	**21**	14	33	184	169	137	123	115	92	14	15	51	43	6	7
Chad	**61**	56	66	**83**	55	125	224	205	146	131	116	85	33	51	54	39	16	24
Chile	**6**	5	6	**2**	2	2	21	17	9	7	16	7	5	2	9	5	3	1
China	**1,634**	1,503	1,790	**182**	152	216	56	52	11	10	42	9	1,319	156	30	6	928	93
Colombia	**31**	29	33	**12**	8	18	39	31	18	14	29	14	26	10	18	9	16	6
Comoros	**2**	2	2	**2**	1	4	132	117	79	68	88	55	2	1	50	34	1	1
Congo	**8**	7	9	**7**	5	11	99	88	49	41	61	33	5	5	29	18	3	3
Cook Islands	**0**	0	0	**0**	0	0	27	22	9	7	21	7	0	0	13	4	0	0
Costa Rica	**1**	1	1	**1**	1	1	19	15	11	9	14	9	1	1	9	6	1	0
Côte d'Ivoire	**76**	70	82	**75**	58	98	164	140	101	84	105	67	53	55	51	38	26	31
Croatia	**1**	1	1	**0**	0	0	14	11	5	4	11	4	1	0	8	3	0	0
Cuba	**2**	2	3	**1**	1	1	15	12	6	5	11	4	2	0	7	2	1	0

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

	Under-five mortality rate (U5MR) with 90 percent uncertainty interval (deaths per 1,000 live births)										Annual rate of reduction (ARR) (percent) 1990–2015		
	1990			2000			2015			Millennium Development Goal target for 2015			
Country	U5MR	Lower bound	Upper bound	U5MR	Lower bound	Upper bound	U5MR	Lower bound	Upper bound		ARR	Lower bound	Upper bound
Cyprus	**11**	11	12	**7**	6	7	**3**	2	4	4	**5.7**	4.6	6.7
Czech Republic	**15**	14	15	**7**	6	7	**3**	3	4	5	**5.8**	5.4	6.2
Democratic People's Republic of Korea	**43**	34	56	**60**	47	77	**25**	20	32	14	**2.2**	2.2	2.2
Democratic Republic of the Congo	**187**	169	205	**161**	147	178	**98**	71	130	62	**2.6**	1.4	3.9
Denmark	**9**	9	9	**6**	5	6	**4**	3	4	3	**3.7**	3.0	4.4
Djibouti	**119**	103	138	**101**	87	119	**65**	44	95	40	**2.4**	0.8	4.1
Dominica	**17**	16	19	**15**	14	17	**21**	17	28	6	**-0.9**	-2.0	0.2
Dominican Republic	**60**	57	64	**41**	38	45	**31**	24	40	20	**2.7**	1.6	3.7
Ecuador	**57**	51	63	**34**	30	39	**22**	14	35	19	**3.9**	1.9	5.8
Egypt	**86**	82	90	**47**	44	50	**24**	19	30	29	**5.1**	4.2	6.0
El Salvador	**59**	54	65	**32**	29	36	**17**	12	23	20	**5.1**	3.7	6.5
Equatorial Guinea	**190**	163	222	**152**	136	173	**94**	65	133	63	**2.8**	1.3	4.4
Eritrea	**151**	138	166	**89**	81	98	**47**	31	71	50	**4.7**	3.0	6.4
Estonia	**20**	20	21	**11**	11	12	**3**	3	4	7	**7.8**	7.0	8.4
Ethiopia	**205**	190	221	**145**	134	157	**59**	41	83	68	**5.0**	3.6	6.5
Fiji	**30**	25	35	**25**	23	26	**22**	19	26	10	**1.1**	0.3	2.0
Finland	**7**	7	7	**4**	4	5	**2**	2	3	2	**4.3**	3.7	4.9
France	**9**	9	9	**5**	5	6	**4**	4	5	3	**3.0**	2.4	3.4
Gabon	**93**	81	108	**85**	74	100	**51**	36	70	31	**2.4**	1.0	4.0
Gambia	**170**	152	191	**119**	105	135	**69**	45	104	57	**3.6**	1.9	5.4
Georgia	**48**	43	53	**36**	32	40	**12**	10	15	16	**5.6**	4.5	6.4
Germany	**9**	8	9	**5**	5	6	**4**	4	4	3	**3.3**	3.0	3.6
Ghana	**127**	121	135	**101**	95	107	**62**	48	78	42	**2.9**	1.9	3.9
Greece	**13**	12	13	**8**	8	8	**5**	4	5	4	**4.0**	3.5	4.5
Grenada	**23**	22	25	**16**	15	17	**12**	9	16	8	**2.7**	1.6	3.9
Guatemala	**81**	76	87	**51**	46	56	**29**	19	44	27	**4.1**	2.4	5.8
Guinea	**238**	223	255	**170**	159	183	**94**	72	122	79	**3.7**	2.7	4.8
Guinea-Bissau	**229**	204	257	**178**	160	197	**93**	69	121	76	**3.6**	2.5	4.9
Guyana	**60**	55	67	**47**	42	52	**39**	29	54	20	**1.7**	0.4	3.0
Haiti	**146**	137	156	**105**	97	113	**69**	56	88	49	**3.0**	2.1	3.9
Holy See	-	-	-	-	-	-	-	-	-	-	-	-	-
Honduras	**58**	54	63	**37**	34	41	**20**	16	27	19	**4.2**	3.1	5.3
Hungary	**19**	19	20	**11**	11	12	**6**	5	7	6	**4.7**	4.3	5.1
Iceland	**6**	6	7	**4**	4	5	**2**	1	3	2	**4.7**	3.1	6.2
India	**126**	122	130	**91**	88	95	**48**	42	53	42	**3.9**	3.4	4.4
Indonesia	**85**	81	89	**52**	50	55	**27**	23	33	28	**4.5**	3.8	5.3
Iran (Islamic Republic of)	**58**	53	63	**35**	32	38	**16**	12	21	19	**5.2**	4.0	6.5
Iraq	**54**	50	59	**45**	41	49	**32**	25	42	18	**2.1**	1.0	3.2
Ireland	**9**	9	10	**7**	7	7	**4**	3	4	3	**3.8**	3.1	4.3
Israel	**12**	11	12	**7**	7	7	**4**	4	5	4	**4.3**	3.7	4.9
Italy	**10**	10	10	**6**	5	6	**4**	3	4	3	**4.1**	3.6	4.6
Jamaica	**31**	26	36	**22**	19	25	**16**	10	24	10	**2.7**	0.8	4.4

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

Country	Number of under-five deaths with 90 percent uncertainty interval (thousands)						Sex-specific under-five mortality rate (deaths per 1,000 live births)				Infant mortality rate (deaths per 1,000 live births)		Number of infant deaths (thousands)		Neonatal mortality rate (deaths per 1,000 live births)		Number of neonatal deaths (thousands)	
	1990			2015			1990		2015									
	Under-five deaths	Lower bound	Upper bound	Under-five deaths	Lower bound	Upper bound	Male	Female	Male	Female	1990	2015	1990	2015	1990	2015	1990	2015
Cyprus	**0**	0	0	**0**	0	0	12	10	3	3	10	3	0	0	6	2	0	0
Czech Republic	**2**	2	2	**0**	0	0	17	13	4	3	13	3	2	0	10	2	2	0
Democratic People's Republic of Korea	**16**	12	20	**9**	7	12	47	39	28	22	33	20	12	7	22	14	8	5
Democratic Republic of the Congo	**294**	264	326	**305**	218	408	195	178	105	91	120	75	192	233	42	30	66	94
Denmark	**1**	1	1	**0**	0	0	10	8	4	3	7	3	0	0	4	3	0	0
Djibouti	**3**	3	4	**1**	1	2	128	110	71	59	93	54	3	1	50	33	1	1
Dominica	**0**	0	0	**0**	0	0	18	16	23	20	14	20	0	0	11	16	0	0
Dominican Republic	**13**	12	13	**7**	5	9	65	55	34	28	47	26	10	6	25	22	5	5
Ecuador	**17**	16	19	**7**	4	11	62	52	24	19	44	18	14	6	24	11	7	4
Egypt	**167**	159	175	**66**	52	83	86	86	25	23	63	20	123	57	33	13	65	36
El Salvador	**9**	9	10	**2**	1	2	64	54	19	15	46	14	7	2	23	8	4	1
Equatorial Guinea	**3**	3	4	**3**	2	4	199	179	101	88	128	68	2	2	51	33	1	1
Eritrea	**20**	18	22	**8**	5	12	162	140	51	41	93	34	12	6	34	18	4	3
Estonia	**0**	0	1	**0**	0	0	23	18	3	3	17	2	0	0	14	2	0	0
Ethiopia	**446**	411	486	**184**	125	261	217	192	65	54	122	41	268	130	61	28	135	87
Fiji	**1**	1	1	**0**	0	0	32	27	24	20	25	19	1	0	17	10	0	0
Finland	**0**	0	0	**0**	0	0	7	6	3	2	6	2	0	0	4	1	0	0
France	**7**	6	7	**3**	3	4	10	8	5	4	7	4	5	3	4	2	3	2
Gabon	**3**	3	4	**3**	2	4	100	86	55	46	61	36	2	2	32	23	1	1
Gambia	**7**	6	8	**6**	4	8	178	163	74	64	80	48	3	4	51	30	2	2
Georgia	**4**	4	5	**1**	1	1	53	42	13	11	41	11	4	1	25	7	2	0
Germany	**7**	7	7	**3**	2	3	10	7	4	3	7	3	6	2	3	2	3	1
Ghana	**70**	66	74	**54**	42	69	135	120	67	56	80	43	44	38	42	28	24	25
Greece	**1**	1	1	**0**	0	1	14	12	5	4	11	4	1	0	10	3	1	0
Grenada	**0**	0	0	**0**	0	0	25	22	13	11	18	11	0	0	13	6	0	0
Guatemala	**27**	25	29	**13**	8	20	86	76	32	26	60	24	20	11	29	13	10	6
Guinea	**63**	58	68	**42**	32	56	246	230	99	88	141	61	37	28	63	31	17	14
Guinea-Bissau	**10**	9	12	**6**	4	8	245	213	100	85	136	60	6	4	65	40	3	3
Guyana	**1**	1	1	**1**	0	1	67	53	44	34	47	32	1	1	30	23	1	0
Haiti	**37**	34	40	**18**	14	23	154	137	75	63	101	52	25	13	39	25	10	7
Holy See	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Honduras	**11**	10	11	**3**	3	4	63	53	23	18	45	17	8	3	22	11	4	2
Hungary	**3**	3	3	**1**	0	1	21	17	6	5	17	5	3	0	14	4	2	0
Iceland	**0**	0	0	**0**	0	0	7	6	2	2	5	2	0	0	4	1	0	0
India	**3,357**	3,236	3,481	**1,201**	1,063	1,348	122	130	46	49	88	38	2,338	946	57	28	1,537	696
Indonesia	**395**	376	414	**147**	121	178	91	78	30	24	62	23	286	125	30	14	138	74
Iran (Islamic Republic of)	**110**	101	120	**21**	16	29	58	57	16	15	45	13	84	18	27	10	50	13
Iraq	**35**	32	39	**39**	29	51	58	50	35	29	42	27	28	32	27	18	18	22
Ireland	**0**	0	0	**0**	0	0	10	8	4	3	8	3	0	0	5	2	0	0
Israel	**1**	1	1	**1**	1	1	12	11	4	4	10	3	1	1	6	2	1	0
Italy	**6**	5	6	**2**	1	2	11	9	4	3	8	3	5	1	6	2	4	1
Jamaica	**2**	2	2	**1**	0	1	34	27	18	14	25	14	1	1	21	12	1	0

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

Country	Under-five mortality rate (U5MR) with 90 percent uncertainty interval (deaths per 1,000 live births)										Annual rate of reduction (ARR) (percent) 1990–2015		
	1990			2000			2015			Millennium Development Goal target for 2015			
	U5MR	Lower bound	Upper bound	U5MR	Lower bound	Upper bound	U5MR	Lower bound	Upper bound		ARR	Lower bound	Upper bound
Japan	**6**	6	6	**5**	4	5	**3**	3	3	2	**3.4**	3.1	3.6
Jordan	**37**	34	39	**28**	26	30	**18**	13	24	12	**2.9**	1.6	4.1
Kazakhstan	**53**	48	58	**44**	40	47	**14**	12	16	18	**5.3**	4.6	6.0
Kenya	**102**	96	109	**108**	100	117	**49**	38	64	34	**2.9**	1.8	4.0
Kiribati	**96**	84	111	**71**	62	80	**56**	37	84	32	**2.2**	0.4	3.9
Kuwait	**18**	17	19	**13**	12	13	**9**	8	9	6	**2.9**	2.5	3.3
Kyrgyzstan	**65**	57	74	**49**	43	54	**21**	19	24	22	**4.5**	3.7	5.1
Lao People's Democratic Republic	**162**	148	179	**118**	105	132	**67**	49	90	54	**3.6**	2.4	4.8
Latvia	**20**	20	21	**17**	16	18	**8**	6	11	7	**3.8**	2.5	5.0
Lebanon	**33**	29	36	**20**	17	24	**8**	5	14	11	**5.5**	3.3	7.8
Lesotho	**88**	80	96	**117**	108	126	**90**	70	115	29	**-0.1**	-1.1	0.9
Liberia	**255**	234	278	**182**	168	198	**70**	54	92	85	**5.2**	4.1	6.2
Libya	**42**	36	48	**28**	27	30	**13**	10	18	14	**4.5**	3.1	6.0
Liechtenstein	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithuania	**17**	16	17	**12**	11	12	**5**	4	6	6	**4.6**	3.9	5.4
Luxembourg	**9**	8	10	**5**	4	5	**2**	1	3	3	**6.1**	4.8	7.6
Madagascar	**161**	150	172	**109**	100	119	**50**	32	75	54	**4.7**	3.0	6.4
Malawi	**242**	229	257	**174**	164	186	**64**	47	91	81	**5.3**	3.9	6.6
Malaysia	**17**	16	17	**10**	10	10	**7**	6	8	6	**3.5**	3.0	3.9
Maldives	**94**	85	103	**44**	40	49	**9**	7	11	31	**9.6**	8.6	10.4
Mali	**254**	238	271	**220**	203	237	**115**	73	176	85	**3.2**	1.5	5.0
Malta	**11**	11	12	**8**	7	9	**6**	5	8	4	**2.3**	1.3	3.3
Marshall Islands	**50**	43	59	**41**	35	49	**36**	26	50	17	**1.3**	-0.2	2.9
Mauritania	**118**	106	131	**114**	101	127	**85**	49	144	39	**1.3**	-0.8	3.6
Mauritius	**23**	22	24	**19**	18	19	**14**	10	18	8	**2.1**	1.0	3.3
Mexico	**47**	43	51	**26**	24	28	**13**	12	15	16	**5.0**	4.5	5.6
Micronesia (Federated States of)	**56**	45	68	**54**	38	77	**35**	16	78	19	**1.9**	-1.2	4.9
Monaco	**8**	7	9	**5**	5	6	**4**	3	4	3	**3.2**	2.2	4.1
Mongolia	**108**	100	117	**63**	57	69	**22**	16	30	36	**6.3**	5.1	7.6
Montenegro	**17**	16	18	**14**	13	15	**5**	4	6	6	**5.0**	4.1	6.0
Morocco	**80**	75	86	**50**	46	55	**28**	21	37	27	**4.3**	3.1	5.4
Mozambique	**240**	222	259	**171**	159	185	**79**	62	101	80	**4.5**	3.5	5.5
Myanmar	**110**	101	121	**82**	76	90	**50**	38	65	37	**3.2**	2.0	4.4
Namibia	**74**	67	80	**76**	69	83	**45**	33	63	25	**1.9**	0.6	3.2
Nauru	**57**	35	92	**41**	35	48	**35**	22	56	19	**1.9**	-1.0	4.8
Nepal	**141**	132	150	**81**	75	86	**36**	28	46	47	**5.5**	4.5	6.5
Netherlands	**8**	8	9	**6**	6	6	**4**	3	4	3	**3.1**	2.7	3.6
New Zealand	**11**	11	12	**7**	7	8	**6**	5	7	4	**2.7**	2.0	3.4
Nicaragua	**67**	62	72	**40**	37	44	**22**	14	36	22	**4.4**	2.4	6.4
Niger	**328**	309	349	**227**	212	245	**96**	71	128	109	**4.9**	3.8	6.2
Nigeria	**213**	199	226	**187**	175	199	**109**	83	140	71	**2.7**	1.7	3.7
Niue	**14**	9	20	**23**	15	35	**23**	10	50	5	**-2.0**	-5.6	1.5
Norway	**9**	8	9	**5**	5	5	**3**	2	3	3	**4.8**	4.1	5.4

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

Country	Number of under-five deaths with 90 percent uncertainty interval (thousands)						Sex-specific under-five mortality rate (deaths per 1,000 live births)				Infant mortality rate (deaths per 1,000 live births)		Number of infant deaths (thousands)		Neonatal mortality rate (deaths per 1,000 live births)		Number of neonatal deaths (thousands)	
	1990			2015			1990		2015									
	Under-five deaths	Lower bound	Upper bound	Under-five deaths	Lower bound	Upper bound	Male	Female	Male	Female	1990	2015	1990	2015	1990	2015	1990	2015
Japan	**8**	8	8	**3**	3	3	7	6	3	3	5	2	5	2	3	1	3	1
Jordan	**4**	4	4	**4**	3	5	38	35	19	17	30	15	3	3	20	11	2	2
Kazakhstan	**21**	19	23	**6**	5	6	59	46	16	12	45	13	18	5	22	7	9	3
Kenya	**100**	93	107	**74**	57	97	108	97	53	45	66	36	65	54	27	22	27	34
Kiribati	**0**	0	0	**0**	0	0	102	89	61	51	69	44	0	0	36	24	0	0
Kuwait	**1**	1	1	**1**	1	1	19	16	9	8	15	7	1	1	10	3	0	0
Kyrgyzstan	**9**	8	10	**4**	3	4	71	59	24	19	54	19	7	3	25	12	3	2
Lao People's Democratic Republic	**29**	26	32	**12**	8	16	172	152	73	61	111	51	20	9	55	30	10	5
Latvia	**1**	1	1	**0**	0	0	23	18	9	7	17	7	1	0	12	5	1	0
Lebanon	**2**	2	2	**1**	0	1	34	31	9	8	27	7	2	1	21	5	1	0
Lesotho	**5**	4	5	**6**	4	7	95	81	97	83	71	69	4	4	40	33	2	2
Liberia	**23**	21	26	**11**	8	14	268	242	75	65	170	53	15	8	57	24	5	4
Libya	**6**	5	7	**2**	1	2	45	38	15	12	36	11	5	1	21	7	3	1
Liechtenstein	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-
Lithuania	**1**	1	1	**0**	0	0	18	15	6	5	13	3	1	0	10	3	1	0
Luxembourg	**0**	0	0	**0**	0	0	10	8	2	2	7	2	0	0	4	1	0	0
Madagascar	**82**	76	88	**40**	26	61	168	153	54	45	98	36	52	29	40	20	21	16
Malawi	**106**	99	113	**40**	29	58	252	232	68	60	143	43	63	27	49	22	21	14
Malaysia	**8**	8	8	**4**	3	4	19	15	8	6	14	6	7	3	9	4	4	2
Maldives	**1**	1	1	**0**	0	0	100	88	9	8	68	7	1	0	43	5	0	0
Mali	**98**	91	106	**83**	52	131	264	245	120	108	131	75	50	54	73	38	28	27
Malta	**0**	0	0	**0**	0	0	12	10	7	6	10	5	0	0	8	4	0	0
Marshall Islands	**0**	0	0	**0**	0	0	55	46	40	32	40	30	0	0	20	17	0	0
Mauritania	**9**	8	10	**11**	6	19	127	109	96	80	78	65	6	9	46	36	4	5
Mauritius	**0**	0	0	**0**	0	0	26	20	15	12	20	12	0	0	15	8	0	0
Mexico	**115**	105	126	**31**	28	35	50	43	14	12	37	11	92	27	21	7	51	17
Micronesia (Federated States of)	**0**	0	0	**0**	0	0	60	51	38	31	43	29	0	0	26	19	0	0
Monaco	**0**	0	0	**0**	0	0	9	7	4	3	6	3	0	0	4	2	0	0
Mongolia	**8**	7	9	**2**	1	2	123	92	27	18	77	19	6	1	32	11	2	1
Montenegro	**0**	0	0	**0**	0	0	18	16	5	4	15	4	0	0	11	3	0	0
Morocco	**56**	52	60	**20**	15	26	85	75	30	25	63	24	43	17	37	18	25	13
Mozambique	**140**	128	154	**82**	64	107	249	230	83	74	160	57	93	60	62	27	36	29
Myanmar	**121**	110	134	**46**	35	61	118	102	55	45	78	40	83	36	47	26	50	24
Namibia	**4**	3	4	**3**	2	5	79	68	49	41	50	33	3	2	28	16	1	1
Nauru	**0**	0	0	**0**	0	0	61	52	39	32	44	29	0	0	29	23	0	0
Nepal	**98**	92	105	**20**	16	25	141	140	38	34	98	29	68	16	59	22	41	12
Netherlands	**2**	2	2	**1**	1	1	9	7	4	3	7	3	1	1	5	2	1	0
New Zealand	**1**	1	1	**0**	0	0	13	10	6	5	9	5	1	0	4	3	0	0
Nicaragua	**10**	9	11	**3**	2	4	72	61	25	20	51	19	7	2	24	10	3	1
Niger	**133**	123	143	**88**	65	119	332	324	100	91	138	57	56	54	55	27	22	25
Nigeria	**849**	789	912	**750**	567	980	223	202	115	102	126	69	502	484	50	34	201	240
Niue	**0**	0	0	**0**	0	0	15	12	25	20	12	20	0	0	8	13	0	0
Norway	**1**	0	1	**0**	0	0	10	8	3	2	7	2	0	0	4	2	0	0

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

	Under-five mortality rate (U5MR) with 90 percent uncertainty interval (deaths per 1,000 live births)										Annual rate of reduction (ARR) (percent) 1990–2015		
	1990			2000			2015			Millennium Development Goal target for 2015			
Country	U5MR	Lower bound	Upper bound	U5MR	Lower bound	Upper bound	U5MR	Lower bound	Upper bound		ARR	Lower bound	Upper bound
Oman	**39**	35	45	**17**	15	19	**12**	11	13	13	**4.9**	4.3	5.6
Pakistan	**139**	134	144	**112**	108	117	**81**	65	102	46	**2.1**	1.2	3.1
Palau	**36**	31	42	**27**	23	31	**16**	9	30	12	**3.2**	0.6	5.7
Panama	**31**	27	35	**26**	22	30	**17**	11	28	10	**2.4**	0.4	4.4
Papua New Guinea	**89**	80	99	**79**	67	91	**57**	35	96	30	**1.8**	-0.3	3.8
Paraguay	**47**	42	51	**34**	29	39	**21**	13	32	16	**3.3**	1.4	5.1
Peru	**80**	76	84	**39**	36	41	**17**	14	21	27	**6.2**	5.3	7.1
Philippines	**58**	54	62	**40**	37	43	**28**	21	37	19	**2.9**	1.8	4.1
Poland	**17**	17	18	**9**	9	10	**5**	5	6	6	**4.8**	4.3	5.3
Portugal	**15**	14	15	**7**	7	7	**4**	3	4	5	**5.6**	4.8	6.3
Qatar	**21**	19	22	**12**	12	13	**8**	7	9	7	**3.8**	3.3	4.3
Republic of Korea	**7**	7	7	**6**	6	6	**3**	3	4	2	**2.9**	2.6	3.2
Republic of Moldova	**33**	28	39	**31**	26	37	**16**	11	23	11	**3.0**	1.3	4.5
Romania	**38**	37	38	**27**	26	28	**11**	10	13	13	**4.9**	4.4	5.4
Russian Federation	**26**	26	27	**23**	23	24	**10**	8	11	9	**4.0**	3.4	4.6
Rwanda	**152**	143	161	**184**	170	199	**42**	30	58	51	**5.2**	3.8	6.5
Saint Kitts and Nevis	**28**	26	31	**19**	17	21	**11**	8	15	9	**4.0**	2.5	5.4
Saint Lucia	**23**	21	24	**18**	17	19	**14**	11	18	8	**1.8**	0.8	2.9
Saint Vincent and the Grenadines	**25**	23	26	**22**	21	24	**18**	15	23	8	**1.2**	0.2	2.1
Samoa	**31**	27	35	**22**	19	25	**18**	12	24	10	**2.3**	0.9	3.9
San Marino	**11**	9	14	**6**	4	8	**3**	1	6	4	**5.3**	2.2	8.3
Sao Tome and Principe	**111**	98	126	**89**	76	105	**47**	28	81	37	**3.4**	1.3	5.6
Saudi Arabia	**44**	36	55	**23**	20	26	**15**	9	26	15	**4.5**	2.0	6.8
Senegal	**140**	133	148	**135**	127	144	**47**	34	65	47	**4.4**	3.1	5.6
Serbia	**28**	28	29	**13**	12	13	**7**	6	8	9	**5.8**	5.1	6.5
Seychelles	**17**	15	18	**14**	13	16	**14**	11	17	6	**0.8**	-0.3	1.8
Sierra Leone	**264**	243	286	**236**	219	254	**120**	98	145	88	**3.1**	2.4	4.0
Singapore	**8**	7	8	**4**	4	4	**3**	2	3	3	**4.2**	3.3	5.1
Slovakia	**18**	17	18	**12**	11	12	**7**	7	8	6	**3.5**	3.2	3.8
Slovenia	**10**	10	11	**6**	5	6	**3**	2	3	3	**5.5**	4.9	6.2
Solomon Islands	**40**	34	46	**33**	29	38	**28**	17	45	13	**1.4**	-0.6	3.4
Somalia	**180**	151	220	**174**	138	225	**137**	80	242	60	**1.1**	-0.9	3.0
South Africa	**60**	52	68	**75**	67	86	**41**	31	53	20	**1.6**	0.3	2.8
South Sudan	**253**	211	298	**182**	156	213	**93**	58	143	84	**4.0**	2.1	6.0
Spain	**11**	11	11	**7**	6	7	**4**	3	5	4	**3.9**	3.2	4.7
Sri Lanka	**21**	21	22	**16**	16	17	**10**	9	11	7	**3.1**	2.8	3.4
State of Palestine	**44**	41	48	**30**	27	32	**21**	16	28	15	**3.0**	1.8	4.1
Sudan	**128**	119	137	**106**	98	115	**70**	57	86	43	**2.4**	1.5	3.3
Suriname	**48**	41	56	**34**	27	44	**21**	11	42	16	**3.2**	0.5	6.0
Swaziland	**75**	64	86	**128**	116	142	**61**	43	86	25	**0.8**	-0.6	2.2
Sweden	**7**	7	7	**4**	4	4	**3**	3	3	2	**3.3**	2.8	3.8
Switzerland	**8**	8	8	**6**	6	6	**4**	3	5	3	**3.0**	2.3	3.6
Syrian Arab Republic	**37**	34	40	**23**	22	25	**13**	9	18	12	**4.2**	2.8	5.6

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

Country	Number of under-five deaths with 90 percent uncertainty interval (thousands)						Sex-specific under-five mortality rate (deaths per 1,000 live births)				Infant mortality rate (deaths per 1,000 live births)		Number of infant deaths (thousands)		Neonatal mortality rate (deaths per 1,000 live births)		Number of neonatal deaths (thousands)	
	1990			2015			1990		2015									
	Under-five deaths	Lower bound	Upper bound	Under-five deaths	Lower bound	Upper bound	Male	Female	Male	Female	1990	2015	1990	2015	1990	2015	1990	2015
Oman	**3**	2	3	**1**	1	1	43	36	13	10	32	10	2	1	17	5	1	0
Pakistan	**593**	570	618	**432**	341	551	141	136	85	77	106	66	459	351	64	46	281	245
Palau	**0**	0	0	**0**	0	0	40	32	18	15	31	14	0	0	19	9	0	0
Panama	**2**	2	2	**1**	1	2	34	28	19	15	26	15	2	1	17	10	1	1
Papua New Guinea	**12**	11	14	**12**	7	20	95	84	62	53	65	45	9	9	32	25	4	5
Paraguay	**6**	6	7	**3**	2	4	50	43	23	18	37	18	5	2	23	11	3	1
Peru	**53**	50	56	**10**	8	13	84	75	18	15	56	13	38	8	28	8	18	5
Philippines	**118**	110	126	**66**	49	87	64	53	31	25	41	22	84	52	20	13	40	30
Poland	**9**	9	10	**2**	2	2	19	15	6	5	15	5	8	2	11	3	6	1
Portugal	**2**	2	2	**0**	0	0	16	13	4	3	12	3	1	0	7	2	1	0
Qatar	**0**	0	0	**0**	0	0	23	19	9	7	18	7	0	0	11	4	0	0
Republic of Korea	**4**	4	4	**2**	1	2	7	7	4	3	6	3	3	1	3	2	2	1
Republic of Moldova	**3**	2	3	**1**	0	1	37	29	18	14	27	14	2	1	19	12	2	1
Romania	**15**	15	15	**2**	2	2	42	34	12	10	31	10	12	2	14	6	5	1
Russian Federation	**59**	58	60	**19**	16	22	30	22	11	8	22	8	49	16	14	5	31	10
Rwanda	**50**	47	54	**14**	10	20	160	143	45	38	93	31	31	10	41	19	14	6
Saint Kitts and Nevis	**0**	0	0	**0**	0	0	31	26	11	10	23	8	0	0	18	7	0	0
Saint Lucia	**0**	0	0	**0**	0	0	25	20	16	13	19	13	0	0	13	9	0	0
Saint Vincent and the Grenadines	**0**	0	0	**0**	0	0	27	22	20	17	20	17	0	0	13	12	0	0
Samoa	**0**	0	0	**0**	0	0	34	28	19	16	26	15	0	0	17	10	0	0
San Marino	**0**	0	0	**0**	0	0	12	10	3	3	10	3	0	0	7	1	0	0
Sao Tome and Principe	**1**	0	1	**0**	0	1	117	104	52	43	71	35	0	0	28	17	0	0
Saudi Arabia	**25**	20	31	**9**	5	16	47	42	16	14	36	13	20	8	22	8	13	5
Senegal	**44**	41	46	**27**	20	37	147	134	54	44	70	42	22	24	40	21	13	12
Serbia	**4**	4	4	**1**	1	1	30	27	7	6	25	6	4	1	18	4	3	0
Seychelles	**0**	0	0	**0**	0	0	18	15	15	12	14	12	0	0	11	9	0	0
Sierra Leone	**46**	42	51	**26**	21	32	276	252	127	113	157	87	27	19	54	35	9	8
Singapore	**0**	0	0	**0**	0	0	8	7	3	3	6	2	0	0	4	1	0	0
Slovakia	**1**	1	2	**0**	0	0	20	15	8	7	16	6	1	0	13	4	1	0
Slovenia	**0**	0	0	**0**	0	0	12	9	3	2	9	2	0	0	6	1	0	0
Solomon Islands	**0**	0	1	**0**	0	1	43	36	31	26	32	24	0	0	16	12	0	0
Somalia	**51**	42	63	**61**	34	115	188	172	143	130	108	85	31	38	45	40	13	18
South Africa	**64**	56	73	**42**	31	57	66	54	47	37	47	34	51	34	20	11	22	11
South Sudan	**66**	54	81	**39**	24	63	263	243	98	87	150	60	40	26	67	39	18	17
Spain	**5**	5	5	**2**	1	2	12	10	4	4	9	4	4	1	7	3	3	1
Sri Lanka	**7**	7	7	**3**	3	3	23	19	11	9	18	8	6	3	14	5	5	2
State of Palestine	**4**	4	4	**3**	2	4	47	42	23	19	36	18	3	3	22	12	2	2
Sudan	**100**	93	108	**89**	72	111	134	120	75	65	80	48	64	61	41	30	33	39
Suriname	**1**	0	1	**0**	0	0	52	43	24	19	41	19	0	0	23	12	0	0
Swaziland	**3**	2	3	**2**	2	3	80	69	65	56	56	45	2	2	22	14	1	1
Sweden	**1**	1	1	**0**	0	0	8	6	3	3	6	2	1	0	4	2	0	0
Switzerland	**1**	1	1	**0**	0	0	9	7	4	4	7	3	1	0	4	3	0	0
Syrian Arab Republic	**17**	15	18	**6**	4	8	40	34	14	12	30	11	14	5	17	7	7	3

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

Country	Under-five mortality rate (U5MR) with 90 percent uncertainty interval (deaths per 1,000 live births)									Millennium Development Goal target for 2015	Annual rate of reduction (ARR) (percent) 1990–2015		
	1990			2000			2015						
	U5MR	Lower bound	Upper bound	U5MR	Lower bound	Upper bound	U5MR	Lower bound	Upper bound		ARR	Lower bound	Upper bound
Tajikistan	**108**	98	120	**93**	81	106	**45**	29	72	36	**3.5**	1.6	5.3
Thailand	**37**	34	40	**23**	20	26	**12**	8	20	12	**4.4**	2.4	6.3
The former Yugoslav Republic of Macedonia	**37**	35	38	**16**	15	17	**6**	3	8	12	**7.6**	6.0	9.8
Timor-Leste	**176**	159	195	**110**	100	121	**53**	36	76	59	**4.8**	3.3	6.4
Togo	**146**	136	157	**121**	112	130	**78**	65	94	49	**2.5**	1.8	3.2
Tonga	**22**	18	26	**18**	15	21	**17**	11	26	7	**1.1**	-0.8	3.0
Trinidad and Tobago	**31**	26	36	**29**	22	40	**20**	10	44	10	**1.6**	-1.6	4.4
Tunisia	**57**	50	65	**32**	27	37	**14**	11	19	19	**5.6**	4.3	6.9
Turkey	**75**	70	80	**40**	36	43	**14**	13	15	25	**6.8**	6.4	7.2
Turkmenistan	**91**	78	104	**82**	69	96	**51**	26	95	30	**2.3**	-0.2	4.9
Tuvalu	**57**	49	68	**43**	38	48	**27**	16	45	19	**3.0**	0.8	5.1
Uganda	**187**	177	199	**148**	139	158	**55**	41	74	62	**4.9**	3.7	6.1
Ukraine	**20**	18	22	**19**	17	21	**9**	8	10	7	**3.1**	2.5	3.8
United Arab Emirates	**17**	14	19	**11**	11	12	**7**	6	8	6	**3.5**	2.7	4.3
United Kingdom	**9**	9	10	**7**	6	7	**4**	4	5	3	**3.2**	2.5	3.8
United Republic of Tanzania	**165**	156	175	**131**	122	140	**49**	34	70	55	**4.9**	3.4	6.4
United States	**11**	11	11	**8**	8	9	**7**	5	8	4	**2.2**	1.5	2.9
Uruguay	**23**	23	24	**17**	16	17	**10**	9	11	8	**3.3**	2.8	3.7
Uzbekistan	**72**	63	81	**63**	54	74	**39**	19	80	24	**2.4**	-0.4	5.2
Vanuatu	**36**	30	42	**29**	24	33	**28**	19	41	12	**1.0**	-0.7	2.7
Venezuela (Bolivarian Republic of)	**30**	29	30	**22**	21	22	**15**	12	19	10	**2.7**	1.7	3.7
Viet Nam	**51**	47	55	**34**	31	37	**22**	21	23	17	**3.4**	3.1	3.8
Yemen	**126**	119	134	**95**	88	103	**42**	32	54	42	**4.4**	3.4	5.5
Zambia	**191**	179	202	**163**	152	175	**64**	49	81	64	**4.4**	3.4	5.4
Zimbabwe	**76**	70	82	**106**	96	116	**71**	51	98	25	**0.3**	-1.0	1.6

Estimates of under-five, infant and neonatal mortality by Millennium Development Goal region[a]

Developed regions	**15**	14	15	**10**	10	10	**6**	6	6	5	**3.7**	3.3	3.9
Developing regions	**100**	99	102	**83**	82	85	**47**	45	50	33	**3.1**	2.8	3.2
Northern Africa	**73**	71	75	**44**	43	46	**24**	21	28	24	**4.4**	3.8	5.0
Sub-Saharan Africa	**180**	177	184	**154**	151	158	**83**	78	93	60	**3.1**	2.6	3.4
Latin America & Caribbean	**54**	52	56	**32**	31	33	**18**	17	19	18	**4.4**	4.1	4.6
Caucasus & Central Asia	**73**	69	77	**63**	59	68	**32**	25	47	24	**3.3**	1.7	4.4
Eastern Asia	**53**	49	58	**37**	35	39	**11**	9	13	18	**6.3**	5.6	7.1
Excluding China	**27**	24	32	**30**	25	37	**14**	12	17	9	**2.7**	2.5	3.0
Southern Asia	**126**	123	129	**92**	89	94	**51**	47	56	42	**3.6**	3.2	4.0
Excluding India	**126**	123	128	**93**	90	95	**59**	51	69	42	**3.0**	2.4	3.6
South-eastern Asia	**72**	70	74	**49**	47	50	**27**	25	31	24	**3.9**	3.4	4.3
Western Asia	**66**	63	69	**43**	41	45	**22**	20	26	22	**4.3**	3.7	4.8
Oceania	**74**	68	82	**67**	59	77	**51**	33	81	25	**1.5**	-0.3	3.2
World	**91**	89	92	**76**	75	77	**43**	41	46	30	**3.0**	2.7	3.2

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

Country	Number of under-five deaths with 90 percent uncertainty interval (thousands)						Sex-specific under-five mortality rate (deaths per 1,000 live births)				Infant mortality rate (deaths per 1,000 live births)		Number of infant deaths (thousands)		Neonatal mortality rate (deaths per 1,000 live births)		Number of neonatal deaths (thousands)	
	1990			2015			1990		2015									
	Under-five deaths	Lower bound	Upper bound	Under-five deaths	Lower bound	Upper bound	Male	Female	Male	Female	1990	2015	1990	2015	1990	2015	1990	2015
Tajikistan	**24**	21	26	**12**	8	19	117	99	50	40	85	39	19	10	32	21	7	5
Thailand	**40**	37	43	**9**	6	15	42	32	14	11	30	11	33	8	20	7	22	5
The former Yugoslav Republic of Macedonia	**1**	1	1	**0**	0	0	38	35	6	5	33	5	1	0	17	4	1	0
Timor-Leste	**5**	4	5	**3**	2	4	183	168	57	48	132	45	4	2	56	22	2	1
Togo	**23**	21	25	**20**	16	24	155	137	84	72	90	52	14	13	43	27	7	7
Tonga	**0**	0	0	**0**	0	0	20	24	15	18	19	14	0	0	10	7	0	0
Trinidad and Tobago	**1**	1	1	**0**	0	1	33	28	22	18	27	18	1	0	20	13	0	0
Tunisia	**13**	11	14	**3**	2	4	61	53	15	13	44	12	10	3	28	8	6	2
Turkey	**104**	97	112	**19**	18	20	78	71	15	12	56	12	77	16	33	7	45	10
Turkmenistan	**12**	10	14	**6**	3	11	102	79	59	44	73	44	10	5	30	23	4	3
Tuvalu	**0**	0	0	**0**	0	0	60	54	30	25	44	23	0	0	30	18	0	0
Uganda	**151**	142	162	**85**	63	117	200	174	60	49	111	38	92	60	39	19	32	30
Ukraine	**12**	11	14	**4**	4	4	22	17	10	8	17	8	10	3	12	6	7	2
United Arab Emirates	**1**	1	1	**1**	1	1	18	15	8	6	14	6	1	1	8	4	0	0
United Kingdom	**7**	7	7	**3**	3	4	11	8	5	4	8	4	6	3	5	2	3	2
United Republic of Tanzania	**178**	166	189	**98**	68	143	172	158	52	45	100	35	109	72	40	19	43	39
United States	**43**	43	44	**25**	21	30	13	10	7	6	9	6	36	21	6	4	22	14
Uruguay	**1**	1	1	**0**	0	1	26	21	11	9	20	9	1	0	12	5	1	0
Uzbekistan	**52**	45	59	**26**	13	55	80	63	44	34	59	34	43	23	31	20	22	14
Vanuatu	**0**	0	0	**0**	0	0	39	33	30	25	29	23	0	0	16	12	0	0
Venezuela (Bolivarian Republic of)	**17**	17	18	**9**	7	12	33	26	17	13	25	13	15	8	13	9	8	5
Viet Nam	**99**	91	107	**34**	33	36	57	45	25	19	37	17	71	27	24	11	46	18
Yemen	**75**	70	80	**34**	26	45	132	121	46	38	89	34	54	28	44	22	27	18
Zambia	**70**	65	75	**39**	30	50	199	182	69	59	113	43	42	27	36	21	13	13
Zimbabwe	**29**	26	31	**38**	27	53	82	69	76	65	51	47	19	25	22	24	8	13

Estimates of under-five, infant and neonatal mortality by Millennium Development Goal region[a] (continued)

Developed regions	**223**	221	225	**80**	75	86	16	13	6	5	12	5	186	67	8	3	116	44
Developing regions	**12,526**	12,331	12,761	**5,865**	5,626	6,315	102	98	49	44	69	35	8,738	4,383	40	21	4,990	2,639
Northern Africa	**280**	270	290	**114**	100	133	75	71	26	22	56	21	214	99	31	14	117	66
Sub-Saharan Africa	**3,871**	3,789	3,966	**2,947**	2,740	3,314	189	171	89	77	108	56	2,343	2,018	46	29	994	1,027
Latin America & Caribbean	**632**	612	654	**196**	187	211	58	49	20	16	43	15	500	167	22	9	255	102
Caucasus & Central Asia	**145**	138	154	**62**	47	93	80	65	36	28	59	28	120	54	29	16	57	31
Eastern Asia	**1,662**	1,531	1,817	**194**	164	229	55	51	12	10	42	9	1,339	167	29	6	939	100
Excluding China	**28**	24	33	**12**	10	15	29	25	15	12	21	11	21	10	12	7	11	7
Southern Asia	**4,796**	4,673	4,926	**1,891**	1,726	2,087	124	128	51	51	89	41	3,390	1,499	57	29	2,179	1,078
Excluding India	**1,439**	1,408	1,475	**690**	596	816	128	123	62	55	92	47	1,052	553	56	32	642	382
South-eastern Asia	**856**	832	883	**331**	298	373	77	65	30	24	52	22	617	272	28	13	326	165
Western Asia	**270**	260	282	**117**	104	136	69	62	24	20	50	19	204	98	29	12	117	64
Oceania	**14**	13	16	**13**	9	22	79	70	55	46	55	40	11	11	28	22	5	6
World	**12749**	12554	12984	**5945**	5707	6395	93	88	44	41	63	32	8924	4450	36	19	5106	2682

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

Estimates of under-five, infant and neonatal mortality by UNICEF region[a]

	Under-five mortality rate (U5MR) with 90 percent uncertainty interval (deaths per 1,000 live births)									Annual rate of reduction (ARR) (percent) 1990-2015		
	1990			2000			2015			Millennium Development Goal target for 2015			
Region	U5MR	Lower bound	Upper bound	U5MR	Lower bound	Upper bound	U5MR	Lower bound	Upper bound		ARR	Lower bound	Upper bound
Africa	**164**	161	168	**142**	140	146	**76**	71	85	55	**3.1**	2.6	3.3
Sub-Saharan Africa	**180**	177	184	**154**	151	158	**83**	78	93	60	**3.1**	2.6	3.4
Eastern and Southern Africa	**167**	162	171	**140**	136	144	**67**	60	78	56	**3.7**	3.0	4.1
West and Central Africa	**198**	193	205	**172**	167	178	**99**	88	114	66	**2.8**	2.2	3.2
Middle East and North Africa	**71**	69	73	**50**	49	52	**29**	27	32	24	**3.6**	3.2	4.0
Asia	**90**	88	93	**71**	69	72	**36**	34	40	30	**3.6**	3.3	3.9
South Asia	**129**	126	133	**94**	91	96	**53**	48	58	43	**3.6**	3.2	4.0
East Asia and Pacific	**58**	55	62	**42**	40	43	**18**	16	20	19	**4.7**	4.3	5.2
Latin America and Caribbean	**54**	52	56	**32**	31	33	**18**	17	19	18	**4.4**	4.1	4.6
Central and Eastern Europe/Commonwealth of Independent States	**48**	46	49	**37**	36	39	**17**	15	22	16	**4.1**	3.1	4.7
World	**91**	89	92	**76**	75	77	**43**	41	46	30	**3.0**	2.7	3.2

Estimates of under-five, infant and neonatal mortality by World Health Organization region[a]

	Under-five mortality rate (U5MR) with 90 percent uncertainty interval (deaths per 1,000 live births)									Annual rate of reduction (ARR) (percent) 1990-2015		
	1990			2000			2015			Millennium Development Goal target for 2015			
Region	U5MR	Lower bound	Upper bound	U5MR	Lower bound	Upper bound	U5MR	Lower bound	Upper bound		ARR	Lower bound	Upper bound
Africa	**177**	174	181	**153**	150	157	**81**	76	91	59	**3.1**	2.7	3.4
Americas	**43**	41	44	**26**	25	27	**15**	14	16	14	**4.2**	3.9	4.5
Eastern Mediterranean	**100**	98	103	**80**	77	82	**52**	47	61	33	**2.6**	2.0	3.1
Europe	**32**	31	33	**22**	22	23	**11**	10	14	11	**4.2**	3.3	4.6
South-East Asia	**118**	115	121	**84**	81	86	**43**	39	47	39	**4.1**	3.7	4.5
Western Pacific	**52**	49	56	**35**	34	37	**14**	12	15	17	**5.4**	4.8	5.9
World	**91**	89	92	**76**	75	77	**43**	41	46	30	**3.0**	2.7	3.2

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

Estimates of under-five, infant and neonatal mortality by UNICEF region[a] (continued)

Region	Number of under-five deaths with 90 percent uncertainty interval (thousands)						Sex-specific under-five mortality rate (deaths per 1,000 live births)				Infant mortality rate (deaths per 1,000 live births)		Number of infant deaths (thousands)		Neonatal mortality rate (deaths per 1,000 live births)		Number of neonatal deaths (thousands)	
	1990			2015			1990		2015									
	Under-five deaths	Lower bound	Upper bound	Under-five deaths	Lower bound	Upper bound	Male	Female	Male	Female	1990	2015	1990	2015	1990	2015	1990	2015
Africa	**4,150**	4,068	4,247	**3,062**	2,853	3,428	172	156	81	71	101	52	2,557	2,117	44	27	1,111	1,093
Sub-Saharan Africa	**3,871**	3,789	3,966	**2,947**	2,740	3,314	189	171	89	77	108	56	2,343	2,018	46	29	994	1,027
Eastern and Southern Africa	**1,736**	1,690	1,793	**1,068**	967	1,260	175	157	72	62	103	46	1,082	740	43	25	458	402
West and Central Africa	**2,031**	1,964	2,106	**1,789**	1,589	2,078	208	189	105	92	116	66	1,195	1,216	49	32	502	586
Middle East and North Africa	**659**	643	678	**324**	299	361	74	68	31	27	53	23	491	261	30	15	273	172
Asia	**7,219**	7,039	7,422	**2,408**	2,241	2,615	91	90	37	36	65	29	5,274	1,930	42	20	3,400	1,336
South Asia	**4,687**	4,564	4,815	**1,870**	1,704	2,066	127	132	52	53	92	42	3,306	1,481	58	30	2,129	1,065
East Asia and Pacific	**2,532**	2,400	2,690	**538**	495	597	61	55	19	16	44	15	1,967	449	29	9	1,271	270
Latin America and Caribbean	**632**	612	654	**196**	187	211	58	49	20	16	43	15	500	167	22	9	255	102
Central and Eastern Europe/Commonwealth of Independent States	**354**	343	366	**108**	94	140	52	43	19	15	39	15	284	94	21	9	156	57
World	**12,749**	12,554	12,984	**5,945**	5,707	6,395	93	88	44	41	63	32	8,924	4,450	36	19	5,106	2,682

Estimates of under-five, infant and neonatal mortality by World Health Organization region[a] (continued)

Region	Number of under-five deaths with 90 percent uncertainty interval (thousands)						Sex-specific under-five mortality rate (deaths per 1,000 live births)				Infant mortality rate (deaths per 1,000 live births)		Number of infant deaths (thousands)		Neonatal mortality rate (deaths per 1,000 live births)		Number of neonatal deaths (thousands)	
	1990			2015			1990		2015									
	Under-five deaths	Lower bound	Upper bound	Under-five deaths	Lower bound	Upper bound	Male	Female	Male	Female	1990	2015	1990	2015	1990	2015	1990	2015
Africa	**3,755**	3,674	3,851	**2,820**	2,611	3,172	186	168	87	76	107	55	2,278	1,939	45	28	966	985
Americas	**678**	658	700	**223**	213	239	46	39	16	13	34	13	539	190	18	8	279	117
Eastern Mediterranean	**1,360**	1,331	1,397	**883**	788	1,035	103	98	55	49	74	41	1,014	693	43	27	576	454
Europe	**414**	404	426	**129**	115	161	35	29	13	10	26	10	335	111	15	6	190	68
South-East Asia	**4,570**	4,447	4,700	**1,558**	1,418	1,713	117	120	43	42	84	34	3,196	1,242	53	24	2,037	894
Western Pacific	**1,966**	1,835	2,122	**328**	295	372	55	49	15	12	40	11	1,558	273	27	7	1,056	163
World	**12,749**	12,554	12,984	**5,945**	5,707	6,395	93	88	44	41	63	32	8,924	4,450	36	19	5,106	2,682

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

Estimates of under-five, infant and neonatal mortality by World Bank region[a]

	Under-five mortality rate (U5MR) with 90 percent uncertainty interval (deaths per 1,000 live births)									Annual rate of reduction (ARR) (percent) 1990-2015		
	1990			2000			2015			Millennium Development Goal target for 2015			
Region	**U5MR**	Lower bound	Upper bound	**U5MR**	Lower bound	Upper bound	**U5MR**	Lower bound	Upper bound		**ARR**	Lower bound	Upper bound
Low income	**187**	184	192	**150**	147	154	**76**	71	85	62	**3.6**	3.2	3.9
Middle income	**90**	89	92	**73**	72	75	**41**	39	45	30	**3.2**	2.8	3.4
Lower middle income	**120**	117	122	**93**	91	95	**53**	49	58	40	**3.3**	2.9	3.6
Upper middle income	**55**	53	58	**40**	38	41	**19**	17	23	18	**4.3**	3.5	4.8
Low and middle income	**102**	100	104	**85**	84	87	**47**	45	51	34	**3.1**	2.8	3.2
East Asia and Pacific	**59**	56	63	**42**	41	44	**18**	17	20	20	**4.8**	4.3	5.2
Europe and Central Asia	**58**	56	60	**42**	40	45	**21**	17	28	19	**4.1**	3.0	4.8
Latin America and the Caribbean	**58**	57	61	**34**	33	35	**19**	18	20	19	**4.5**	4.2	4.8
Middle East and North Africa	**68**	67	70	**45**	44	47	**25**	23	28	23	**4.1**	3.6	4.4
South Asia	**129**	126	133	**94**	91	96	**53**	48	58	43	**3.6**	3.2	4.0
Sub-Saharan Africa	**180**	177	184	**154**	151	158	**83**	78	93	60	**3.1**	2.7	3.4
High income	**16**	15	16	**11**	11	11	**7**	6	8	5	**3.3**	2.9	3.6
World	**91**	89	92	**76**	75	77	**43**	41	46	30	**3.0**	2.7	3.2

Estimates of under-five, infant and neonatal mortality by United Nations Population Division region[a]

	Under-five mortality rate (U5MR) with 90 percent uncertainty interval (deaths per 1,000 live births)									Annual rate of reduction (ARR) (percent) 1990-2015		
	1990			2000			2015			Millennium Development Goal target for 2015			
Region	**U5MR**	Lower bound	Upper bound	**U5MR**	Lower bound	Upper bound	**U5MR**	Lower bound	Upper bound		**ARR**	Lower bound	Upper bound
More developed regions	**15**	14	15	**10**	10	10	**6**	6	6	5	**3.6**	3.3	3.9
Less developed regions	**100**	99	102	**83**	82	85	**46**	45	50	33	**3.1**	2.8	3.2
Least developed countries	**175**	173	178	**138**	135	141	**73**	69	81	58	**3.5**	3.1	3.8
Excluding least developed countries	**85**	84	87	**69**	68	70	**38**	36	42	28	**3.2**	2.8	3.5
Excluding China	**114**	113	116	**91**	90	92	**52**	50	56	38	**3.1**	2.8	3.3
Sub-Saharan Africa	**182**	179	186	**156**	153	160	**84**	78	94	61	**3.1**	2.7	3.4
Africa	**164**	161	168	**142**	140	146	**76**	71	85	55	**3.1**	2.6	3.3
Asia	**87**	85	89	**67**	66	69	**34**	32	37	29	**3.7**	3.4	4.0
Europe	**17**	17	18	**12**	12	12	**6**	6	7	6	**4.2**	3.9	4.4
Latin America & Caribbean	**54**	52	56	**32**	31	33	**18**	17	19	18	**4.4**	4.1	4.6
Northern America	**11**	11	11	**8**	8	8	**6**	5	8	4	**2.1**	1.5	2.8
Oceania	**35**	32	37	**33**	30	38	**24**	16	37	12	**1.5**	-0.3	3.0
World	**91**	89	92	**76**	75	77	**43**	41	46	30	**3.0**	2.7	3.2

Definitions

Under-five mortality rate: Probability of dying between birth and exactly five years of age, expressed per 1,000 live births.
Infant mortality rate: Probability of dying between birth and exactly one year of age, expressed per 1,000 live births.
Neonatal mortality rate: Probability of dying in the first 28 days of life, expressed per 1,000 live births.

Note: Upper and lower bounds refer to the 90 percent uncertainty intervals for the estimates. Estimates are generated by the United Nations Inter-agency Group for Child Mortality Estimation to ensure comparability; they are not necessarily the official statistics of UN Member States, which may use alternative rigorous methods.

a The sum of the number of deaths by region may differ from the world total because of rounding.

Estimates of under-five, infant and neonatal mortality by World Bank region[a] (continued)

Region	Number of under-five deaths with 90 percent uncertainty interval (thousands)						Sex-specific under-five mortality rate (deaths per 1,000 live births)				Infant mortality rate (deaths per 1,000 live births)		Number of infant deaths (thousands)		Neonatal mortality rate (deaths per 1,000 live births)		Number of neonatal deaths (thousands)	
	1990			2015			1990		2015									
	Under-five deaths	Lower bound	Upper bound	Under-five deaths	Lower bound	Upper bound	Male	Female	Male	Female	1990	2015	1990	2015	1990	2015	1990	2015
Low income	**2,555**	2,499	2,622	**1,667**	1,554	1,875	196	178	81	71	113	53	1,555	1,173	49	27	669	596
Middle income	**9,933**	9,744	10,150	**4,170**	3,927	4,545	92	88	42	39	64	31	7,151	3,186	39	20	4,303	2,028
Lower middle income	**7,188**	7,050	7,336	**3,492**	3,254	3,826	121	118	55	51	83	40	4,973	2,647	48	26	2,919	1,713
Upper middle income	**2,745**	2,612	2,904	**678**	602	811	58	52	20	18	43	15	2,178	539	28	9	1,384	316
Low and middle income	**12,488**	12,293	12,721	**5,837**	5,597	6,285	104	99	49	45	70	35	8,707	4,359	40	21	4,972	2,625
East Asia and Pacific	**2,528**	2,396	2,685	**537**	493	595	62	56	20	16	45	15	1,963	448	29	9	1,269	270
Europe and Central Asia	**294**	284	306	**90**	75	121	62	53	23	18	46	18	235	78	25	11	124	47
Latin America and the Caribbean	**586**	566	608	**175**	166	189	63	54	21	17	46	16	461	148	23	10	232	90
Middle East and North Africa	**529**	515	545	**223**	204	250	71	66	26	23	52	21	404	189	29	14	226	128
South Asia	**4,687**	4,564	4,815	**1,870**	1,704	2,066	127	132	52	53	92	42	3,306	1,481	58	30	2,129	1,065
Sub-Saharan Africa	**3,864**	3,782	3,960	**2,943**	2,736	3,310	189	171	89	77	108	56	2,338	2,015	46	29	992	1,025
High income	**261**	256	267	**108**	101	118	17	14	8	6	13	6	217	91	8	4	134	58
World	**12,749**	12,554	12,984	**5,945**	5,707	6,395	93	88	44	41	63	32	8,924	4,450	36	19	5,106	2,682

Estimates of under-five, infant and neonatal mortality by United Nations Population Division region[a] (continued)

Region	Number of under-five deaths with 90 percent uncertainty interval (thousands)						Sex-specific under-five mortality rate (deaths per 1,000 live births)				Infant mortality rate (deaths per 1,000 live births)		Number of infant deaths (thousands)		Neonatal mortality rate (deaths per 1,000 live births)		Number of neonatal deaths (thousands)	
	1990			2015			1990		2015									
	Under-five deaths	Lower bound	Upper bound	Under-five deaths	Lower bound	Upper bound	Male	Female	Male	Female	1990	2015	1990	2015	1990	2015	1990	2015
More developed regions	**221**	219	224	**79**	74	85	16	13	6	5	12	5	184	66	8	3	115	43
Less developed regions	**12,528**	12,333	12,762	**5,866**	5,627	6,316	102	98	48	44	69	35	8,739	4,384	40	21	4,991	2,639
Least developed countries	**3,628**	3,568	3,702	**2,181**	2,049	2,437	183	168	78	68	109	51	2,268	1,546	52	27	1,076	828
Excluding least developed countries	**8,899**	8,711	9,115	**3,685**	3,451	4,022	87	84	40	37	61	29	6,472	2,838	37	19	3,915	1,811
Excluding China	**10,894**	10,749	11,067	**5,684**	5,445	6,138	117	111	54	49	78	39	7,421	4,227	43	23	4,063	2,546
Sub-Saharan Africa	**3,770**	3,689	3,866	**2,858**	2,650	3,224	191	173	89	78	109	57	2,279	1,957	46	29	962	988
Africa	**4,150**	4,068	4,247	**3,062**	2,853	3,428	172	156	81	71	101	52	2,557	2,117	44	27	1,111	1,093
Asia	**7,739**	7,559	7,945	**2,597**	2,433	2,814	88	86	35	34	63	28	5,677	2,092	40	19	3,623	1,440
Europe	**164**	162	167	**48**	45	51	19	15	7	5	15	5	138	40	9	3	87	27
Latin America & Caribbean	**632**	612	654	**196**	187	211	58	49	20	16	43	15	500	167	22	9	255	102
Northern America	**46**	46	47	**27**	23	32	12	10	7	6	9	6	39	23	6	4	24	15
Oceania	**17**	16	19	**15**	10	23	37	32	26	22	26	19	13	12	14	11	7	7
World	**12,749**	12,554	12,984	**5,945**	5,707	6,395	93	88	44	41	63	32	8,924	4,450	36	19	5,106	2,682

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.

Developed regions

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

Developing regions

Caucasus and Central Asia

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

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, Dominica, 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, Libya, 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, Cabo Verde, Cameroon, 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, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Swaziland, Togo, Uganda, United Republic of Tanzania, Zambia, Zimbabwe

Western Asia

Bahrain, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, State of Palestine, Syrian Arab Republic, Turkey, United Arab Emirates, Yemen

unicef World Health Organization WORLD BANK GROUP United Nations

The UN Inter-agency Group for Child Mortality Estimation

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

UN 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.

UN IGME updates its child mortality estimates annually after reviewing newly available data and assessing data quality. This report contains the latest UN 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>.

For more information on child mortality estimates and the work of UN IGME, contact <childmortality@unicef.org>.