

Neonatal and Perinatal Mortality

Country, Regional and Global Estimates



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Executive summary

All over the world, major changes are taking place in the area of maternal and child health to achieve the goals set out in international declarations and country commitments. The need for evaluation and information has, therefore, become increasingly apparent. Governments and professional organizations have to monitor the overall impact of the changes that are set in motion and compare them internationally. As under-five mortality is decreasing in almost all countries, except in those affected by the HIV/AIDS epidemic (1), neonatal mortality emerges as an increasingly prominent component of overall under-five mortality and is thus receiving additional attention. Consequently, information on perinatal and neonatal mortality at international level is in great demand.

The report provides neonatal and perinatal mortality estimates by country, regional groupings and globally. For countries that do not have data, models were developed to estimate mortality. Since data on deaths come from a number of different sources, the methods used to obtain the estimates are also described. Country-specific estimates of stillbirth and early neonatal deaths are published here for the first time. Estimates of stillbirth deaths that occur during delivery (intrapartum) by regional groupings, as well as estimates of sex ratio in neonatal, early neonatal and stillbirth mortality for the developing world are other recent contributions to the understanding of early mortality that are presented in this document.

The results show that every year over 4 million babies die in the first four weeks of life; 3 million of these deaths occur in the early neonatal period. Moreover, it is estimated that more than 3.3 million babies are stillborn every year; one in three of these deaths occurs during delivery and could largely be prevented. Ninety-eight per cent of the deaths take place in the developing world.

In developing countries, the risk of death in the neonatal period is six times greater than in developed countries; in the least developed countries it is over eight times higher. With 41 neonatal deaths per 1000 live births, the risk of neonatal death is highest in Africa; the sub-Saharan regions of Eastern, Western and Central Africa have between 42 and 49 neonatal deaths per 1000 live births. South-central Asia, with 43 neonatal deaths per 1000 live births, shows rates close to those registered in sub-Saharan Africa, while the neonatal mortality rate for Latin America and the Caribbean is 15 per 1000 live births. Most neonatal deaths occur in Asia, which is where most children are born. Given the high mortality rate in the South-central Asia subregion, over 40% of global neonatal deaths take place here, which presents a formidable challenge.

Early neonatal deaths occur during the perinatal period, and have obstetric origins, similar to those leading to stillbirths. Worldwide, there are over 6.3 million perinatal deaths a year, almost all of which occur in developing countries, and 27% of them in the least developed countries alone. Stillbirths account for over half of all perinatal deaths. One third of stillbirths take place during delivery, and are largely avoidable. Intrapartum deaths (i.e. those occurring during delivery) are closely linked to place of, and care at, delivery. In developing countries, just over 40% of deliveries occur in health facilities and little more than one in two takes place with the assistance of a doctor, midwife or qualified nurse (2).

Compared with earlier estimates, global and regional neonatal and perinatal mortality rates have slowly declined. Improvements appear to have been more noticeable in South America than in other regions of the world.

Thanks to public health interventions, under-five and infant mortality rates are decreasing at a faster pace than neonatal mortality; consequently, neonatal deaths will represent an increasing proportion of child deaths. This document will allow countries to review their achievements in the area of maternal and neonatal health and compare their results with those obtained by other countries. Problems related to early mortality data will, it is hoped, stimulate further research and collection

of population-based data, which will help to improve mortality monitoring and provide health managers with comparative information about the nature and extent of the problem in their country.

This is the second comprehensive report on this topic by the World Health Organization (WHO) and presents country, regional and global estimates of perinatal, neonatal, early neonatal and stillbirth mortality for the year 2000. The first report was published in 1996 (3) and presented perinatal and neonatal mortality rates around the year 1995. However, since different methodologies were used, the estimates are not directly comparable, but must be seen as discrete evaluations^a (4,5).

Government, parliament and society at large in every country need reliable information, analysis and advice to improve decision-making, stimulate research and inform debate. This document constitutes a small contribution to such a debate.

^a Information on other pregnancy outcomes is available from other WHO sources: Low birthweight: Country, regional and global estimates (4) and the Skilled attendant at birth estimates (5) provide information for the same period and regions.

1. Introduction

Over 130 million babies are born every year, and more than 10 million infants die before their fifth birthday (6), almost 8 million before their first.

Many countries have set under-five and maternal mortality reduction as their key development goal, as suggested by international conferences such as the World Summit for Children in 1990, the United Nations Millennium Declaration (7) and the United Nations Special Session on Children in 2002 (8). In preparing child-mortality-reduction strategies it is important for countries to know the magnitude of perinatal and neonatal mortality in order to assess needs and develop programmes that will reduce avoidable child deaths more quickly. However, national indicators of the health of mothers and newborn infants are often not readily available, especially in countries that lack vital registration systems.

This document focuses on **neonatal mortality**, i.e. deaths occurring during the first four weeks after birth. It also addresses **perinatal mortality**, which includes both deaths in the first week of life and fetal deaths (stillbirths). Countries will have to ensure a noticeable reduction in the number of deaths during the relatively brief neonatal period, when more than one in three deaths in children under five occur. Reducing neonatal deaths is, therefore, an essential step towards reducing under-five mortality.

Country neonatal and perinatal mortality rates cover a wide range with obvious differences and similarities. However, analysing and comparing mortality rates between countries is also fraught with pitfalls, as minor differences or similarities may be the result of real distinctions in mortality levels, or may be due to diverging definitions and reporting systems, sources of data, or levels of accuracy and completeness.

This report has several aims:

- to bring together epidemiological data on neonatal and perinatal mortality, describing how data/statistics were collected and analysed, and how the estimates were produced, in order to help readers interpret them alongside other reports related to pregnancy, childbirth and newborn infants
- to present neonatal and perinatal estimates and their components by country, region and globally for the year 2000, in order to guide efforts to reduce the number of deaths
- to stimulate interest in this type of data and assist health professionals and decision-makers in producing better statistics relevant to their work.

This document begins with a description of neonatal and perinatal mortality and ways of measuring it, especially those used to assess progress in preventing deaths. It provides definitions, followed by the most common sources of data, and describes the methods used to obtain the estimated rates and numbers. It shows the estimates by country and region for the year 2000, followed by an analysis and interpretation of the results. The report also provides tables, showing the rate and numbers of stillbirths and early neonatal, neonatal and perinatal deaths by United Nations and WHO region, and by country. In addition, it presents regional estimates of intrapartum deaths and sex ratios in developing regions for stillbirths, early neonatal and neonatal deaths.

As in the previous report (3), the main sources of data used are demographic and health surveys and vital registration data. While the focus is on the magnitude of neonatal and perinatal mortality, the accuracy and completeness of the data sources are discussed, and strengths and weaknesses of country and global estimates are emphasized.

The current estimates cannot be directly compared with earlier ones, since the methodology used to obtain them has been modified and improved. One of the major changes is the calculation of

current estimates within the under-five mortality envelope estimated by WHO for each country and for the year 2000. Within this envelope, data were adjusted proportionately to arrive at the current estimates.

We hope that this second edition of neonatal and perinatal estimates will stimulate interest in routine data collection and stress the need for better data to inform and monitor change.

This document is also available on the WHO web site (www.who.int/making_pregnancy_safer/en/)^b.

2 Neonatal and perinatal mortality

Although being newborn is not a disease, large numbers of children die soon after birth: many of them in the first four weeks of life (**neonatal deaths**), and most of those during the first week (**early neonatal deaths**). For every baby who dies in the first week after birth, another is born dead (**fetal deaths or stillbirths**). Causes and determinants of neonatal deaths and stillbirths differ from those causing and contributing to postneonatal and child deaths.

Neonatal deaths and stillbirths stem from poor maternal health, inadequate care during pregnancy, inappropriate management of complications during pregnancy and delivery, poor hygiene during delivery and the first critical hours after birth, and lack of newborn care. Several factors such as women's status in society, their nutritional status at the time of conception, early childbearing, too many closely spaced pregnancies and harmful practices, such as inadequate cord care, letting the baby stay wet and cold, discarding colostrum and feeding other food, are deeply rooted in the cultural fabric of societies and interact in ways that are not always clearly understood.

In many societies, neonatal deaths and stillbirths are not perceived as a problem, largely because they are very common. Many communities have adapted to this situation by not recognizing the birth as complete, and by not naming the child, until the newborn infant has survived the initial period. Health workers at primary and secondary level of care often lack the skills to meet the needs of newborn infants, since the recognition of opportunity is only just emerging in countries, and their experience in this area is therefore limited.

2.1 Neonatal deaths

Babies die after birth because they are severely malformed, are born very prematurely, suffer from obstetric complications before or during birth, have difficulty adapting to extrauterine life, or because of harmful practices after birth that lead to infections.

Around 1% of infants have a major congenital anomaly. These anomalies are more common in developing than in developed countries, especially those caused by diseases such as syphilis, or by nutrient deficiency, which leads to neural tube defects and proteinuria.

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