

# Challenges in measuring maternal deaths

Maternal mortality is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, regardless of the site or duration of pregnancy, from any cause related to or aggravated by the pregnancy or its management. Causes of deaths can be divided into direct causes that are related to obstetric complications during pregnancy, labour or the post-partum period, and indirect causes. There are five direct causes: haemorrhage (usually occurring post-partum), sepsis, eclampsia, obstructed labour and complications of abortion. Indirect obstetric deaths occur from either previously existing conditions or from conditions arising in pregnancy which are not related to direct obstetric causes but may be aggravated by the physiological effects of pregnancy. These include such conditions as HIV and AIDS, malaria, anaemia and cardiovascular diseases. Simply because a woman develops a complication does not mean that death is inevitable; inappropriate or incorrect treatment or lack of appropriate, timely interventions underlie most maternal deaths.

Accurate classification of the causes of maternal death, whether direct or indirect, accidental or incidental, is challenging. To accurately categorize a death as maternal, information is needed on the cause of death as well as pregnancy status, or the time of death in relation to the pregnancy. This information may be missing, misclassified or under-reported even in industrialized countries with fully functioning vital registration systems, as well as in developing countries facing high burdens of maternal mortality. There are several reasons for this: First, many deliveries take place at home, particularly in the least developed countries and in rural areas, complicating efforts to establish cause of death. Second, civil registration systems may be incomplete or, even if deemed complete, attribution of causes of death may be inadequate. Third, modern medicine may delay a women's death beyond the 42-day post-partum period. For these reasons, in some cases alternative definitions of maternal mortality are used. One concept refers to any cause of death during pregnancy or the post-partum period. Another concept takes into account deaths from direct or indirect causes that occur after the post-partum period up to one year following pregnancy.

The main measure of mortality risk is the *maternal mortality ratio*, which is identified as the number of maternal deaths during a given period of time per 100,000 live births during the same period, which is generally a year. Another key measure is the *lifetime risk of maternal death*, which reflects the probability of becoming pregnant and the probability of dying from a maternal cause during a women's reproductive lifespan. In other words, the risk of maternal death is related to two main factors: mortality risk associated with a single pregnancy or live birth; and the number of pregnancies that women have during their reproductive years.

## Working together to improve estimations of maternal deaths

Several agencies are collaborating to establish more accurate measurements of maternal mortality rates and levels worldwide, and assess progress towards Target A of Millennium Development Goal 5, which seeks to reduce the maternal

mortality rate by three quarters between 1990 and 2015. The Maternal Mortality Working Group, which originally comprised the World Health Organization, UNICEF and the United Nations Population Fund, developed internationally comparable global estimates of maternal mortality for 1990, 1995 and 2000.

In 2006, the World Bank, United Nations Population Division and several outside technical experts joined the group, which subsequently developed a new set of globally comparable maternal mortality estimates for 2005, building on previous methodology and new data. The process generated estimates for countries with no national data, and adjusted available country data to correct for under-reporting and misclassification. Of the 171 countries reviewed by the Maternal Mortality Working Group for the 2005 estimations, appropriate national-level data were unavailable for 61 countries, representing one quarter of global births. For these countries, models were used to estimate maternal mortality.

For the 2005 estimates, data were drawn from eight categories of sources: complete civil registration systems with good attribution of data, complete civil registration systems with uncertain or poor attribution of data, direct sisterhood methods, reproductive-age mortality studies, disease surveillance or sample registration, census, special studies and no national data. Estimates for each source were calculated according to a different formula, taking into account factors such as correcting for known bias and determining realistic uncertainty bounds.

Measures of maternal mortality are prepared with a margin of uncertainty, highlighting the fact that while they are the best estimates available, the actual rate may be higher or lower than the average. Although this is true of any statistic, the high degree of uncertainty for maternal mortality ratios indicates that all data points should be interpreted cautiously.

Notwithstanding the challenges of data collection and measurement, the 2005 inter-agency estimates for maternal mortality were sufficiently rigorous to produce trend analysis, assessing progress from the 1990 baseline date of MDG 5 to 2005. The lack of improvement in reducing maternal mortality identified in many developing countries has helped bring greater attention to achieving MDG 5.

The 2005 maternal mortality estimates are far from perfect, and much work is still required to refine the processes of data collection and estimation. But they reflect a strong commitment on the part of the international community to continually strive for greater accuracy and precision. These ongoing efforts will support and guide actions to improve maternal health and ensure that women count.

*See References, page 107.*