



Maternal Mortality and the Importance of comprehensive civil registration and vital statistics (CRVS) systems

This Stats Brief traces the progress in Asia and the Pacific with reducing maternal mortality since 1990. It outlines the approaches used for estimating maternal mortality and highlights related challenges and limitations. It explains the value of comprehensive civil registration and vital statistics (CRVS) systems as a sustainable data source for calculation of accurate maternal mortality indicators.

The maternal mortality ratio (MMR) has long been recognized as one of the key indicators of population health and development. Accordingly, in the last few decades, there have been concerted efforts and actions towards improving maternal health and reducing maternal mortality. This continued interest has been paralleled by a strong demand for accurate and reliable estimates of maternal mortality.

Reducing maternal mortality and improving maternal health are global health priorities. Several of the global agreements including the Millennium Declaration, the International Conference on Population and Development (ICPD), the Beijing Platform for Action and the new global Sustainable Development Goals (SDGs) include commitments to improve maternal health and reduce maternal mortality. Goal 5 of the Millennium Development Goals (MDGs) called for a reduction of maternal mortality ratio by three quarters.

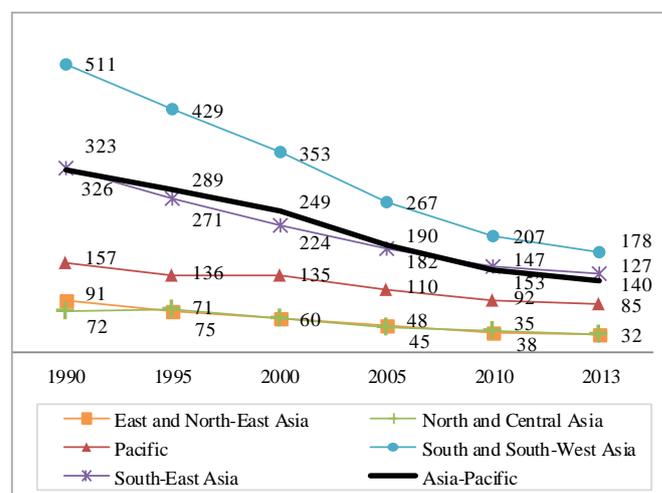
According to the International Classification of Diseases (ICD), Revision 10, a maternal death is the “death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes”. The most commonly used measure for assessing and analyzing the magnitude of maternal deaths in a country is the maternal mortality ratio (MMR). MMR is defined as the number of maternal deaths occurring during a given time period per 100,000 live births during that same period.

Status of maternal mortality

The 2013 global estimates developed by the Maternal Mortality Estimation Inter-Agency Group (MMEIG) indicate that MMR dropped by 45 per cent between 1990 and 2013, which equates to a decline from an estimated 380 to 210 maternal deaths per 100,000 live births. While this downward trend is encouraging, the rate of decline is far slower than needed to achieve the MDG target by the end of 2015. Furthermore, of all the goals, MDG 5 remains the goal that lags farthest behind. As a result, the declaration on the new Sustainable Development Goals commits countries to ‘accelerating the progress made to date in reducing newborn, child and maternal mortality by ending all such preventable deaths before 2030’.¹

In Asia and the Pacific as a whole, maternal mortality fell as by 61% between 1990 and 2013 (from 326 to 126 per 100,000 live births).² This reduction was one of the highest absolute rates of progress observed for any of the MDG indicators. As shown in Figure 1, there has also been notable progress in decreasing material mortality levels in several of the sub-regions in Asia and the Pacific. The 2013 estimates indicate that South-and South-West Asia has achieved the greatest reduction, with the MMR dropping by 65 per cent (from 511 to 178 deaths, per 100,000 live births). A steady decline of 57 per cent was recorded in South-East Asia; equating to a reduction from 326 to 140 deaths per 100,000 live births.³

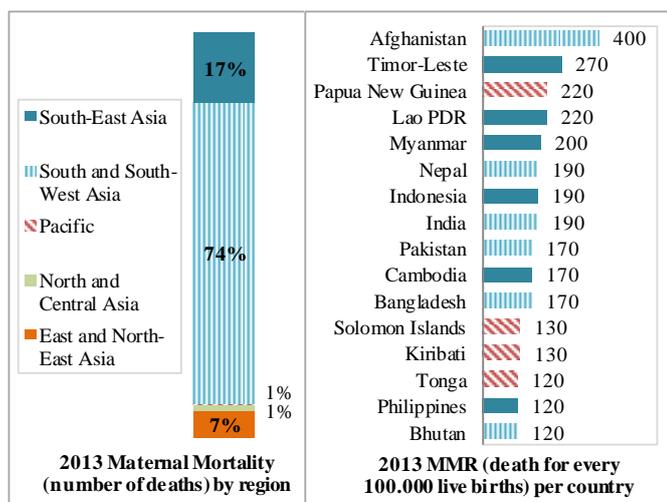
Figure 1: Maternal deaths per 100,000 live births, among women aged 15–49 years (1990, 2000 and 2013)



Source: Data from ESCAP Statistical Database on 29-Sep-2015: <http://www.unescap.org/stat/data/statdb/DataExplorer.aspx>

Despite these significant reductions, the number of maternal deaths in the region remains high. South and South-West Asia, which is home to 1.6 billion people, have the largest population affected by maternal mortality in the ESCAP region (Figure 2). Out of a total of 91,728 maternal deaths, South and South-West Asia accounts for 74 per cent, while 17 per cent of maternal deaths occur in South-East Asia. Further, of the top 16 countries in Asia-Pacific affected by high MMR, six are in South and South-West Asia, six in South-East Asia and four in the Pacific (Figure 2).³

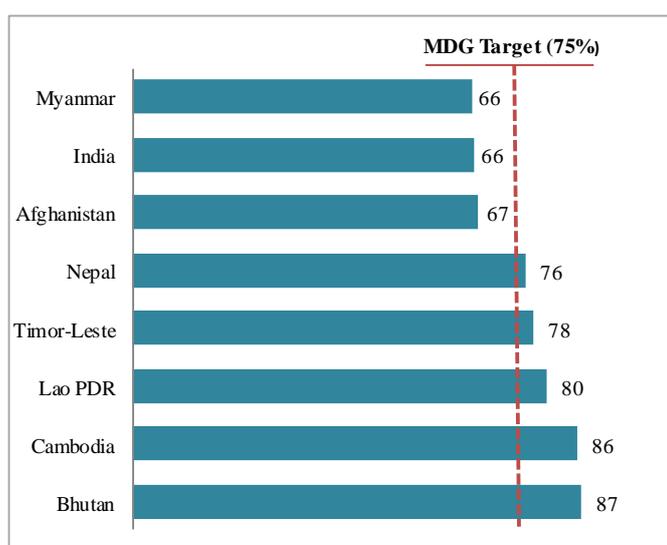
Figure 2: Distribution of Maternal mortality within sub-regions and countries in Asia-Pacific by number of deaths (left) and deaths per 100,000 live births (right), 2013



Source: Data from ESCAP Statistical Database on 29-Sep-2015: <http://www.unescap.org/stat/data/statdb/DataExplorer.aspx> (ESCAP, 2015)

Of the eight countries in Asia-Pacific with the highest MMR in 1990, five achieved the MDG target by 2013 (Bhutan Cambodia, Lao PDR, Nepal and Timor-Leste). The three other countries - Afghanistan, India and Myanmar - came close, with reductions of over 65 per cent (Figure 3). Nepal, for example, reduced its MMR due to a national effort comprised of several maternal and child health interventions including, increased prioritization of maternal health by successive Nepali governments, improvements in access to affordable health services for women and behavioural changes among women as a result of their increased awareness of pregnancy-related risks.⁴

Figure 3: Percent reductions in MMR in relation to the MDG targets, 1990 – 2013



Source: Data from ESCAP Statistical Database on 29-Sep-2015: <http://www.unescap.org/stat/data/statdb/DataExplorer.aspx>.

Why is maternal mortality important?

Maternal mortality is impacted by a wide range of determinants which lie within and outside the health sector. In addition to factors within the health system related to access, quality and affordability to reproductive health services, a range of issues including gender equality, education and cultural factors have a direct impact on maternal mortality. Reducing maternal mortality therefore requires a sound understanding of the causes of maternal deaths – including why, where, when and how they occur. Accurate data on both the numbers of maternal deaths and their causes are critical for reducing the number of women who die.

Reliable data on maternal mortality, specifically the levels and causes of maternal deaths, are necessary for informing policy making, planning of sexual and reproductive health programmes, priority setting and advocacy purposes. Accurate data are also critical for monitoring and evaluating the outcomes and impacts of programmes and interventions for improving maternal health. Within the context of the MDGs, timely and accurate estimates of maternal mortality were indispensable for monitoring progress towards the achievement of the target set under goal 5 (Improving maternal health). Beyond the MDGs, the need for high-quality data on maternal mortality continues with respect to the 2030 Agenda for Sustainable Development.

Calculation challenges

Calculation of MMR requires information about deaths among women of reproductive age (15 – 49 years), their pregnancy status at or near the time of death, the medical cause of death as well as the number of live births.⁵ Ideally, such information should be derived from national civil registration systems that regularly record births and deaths and generate vital statistics. However, this is seldom the case. In developing countries, systemic deficiencies in the civil registration and vital statistics systems, coupled with incomplete or non-registration of vital events and lack of proper medical certification of cause of death, make it difficult to accurately measure maternal mortality (Figure 4).

Figure 4: Civil Registration coverage of cause-of-death in per cent 2004-2012⁶



Source: World Health Organization: Civil Registration coverage of cause-of-death (%), 2004-2012, available from http://www.who.int/gho/mortality_burden_disease/registered_deaths/mbd_018.jpg

Data from the United Nations Statistics Division on the coverage and completeness of vital events registration indicates that death registration coverage in the Asia-Pacific region ranges from a low of 9 per cent in Tuvalu to 100 per cent in a few developed countries.⁷ Even in developed countries with complete registration of deaths, the measurement of maternal mortality is challenged by issues related to the classification of the causes of death.

There are also limitations in the quality and reliability of the information on causes of death. An estimated one third of countries in the world have the capacity to count or register maternal deaths⁸ and less than two fifths have a complete civil registration system with accurate attribution of the cause of death, necessary for the measurement of maternal mortality.⁹

How does estimation work?

A complete and well-functioning system of civil registration and vital statistics is deemed the gold standard for maternal mortality data¹⁰, as it is the only source of continuous nationally representative information on cause-specific mortality. With few developing countries achieving full registration of vital events, however, many countries are unable to produce reliable mortality estimates on the basis of vital statistics. Consequently, countries rely on data from alternative sources to derive MMR estimates.

In the absence of complete registration, sample registrations with verbal autopsy have been identified and used in a few countries to document maternal deaths.¹¹ The method is a community-based demographic and mortality surveillance system involving randomly selected cluster samples. Through the use of verbal autopsies, interviewers are able to determine the probable underlying cause of death on the basis of information provided by family members about the signs and symptoms of the deceased prior to her death. Sample registration systems with verbal autopsy are used in countries such as China and India.

Estimates of maternal mortality can also be generated from population-based household surveys and censuses. With this approach, information on recent deaths in the household are obtained from the head of the household or other household members. Additional questions are posed to respondents when deaths are identified in women of reproductive age. One other common survey-based method is the sisterhood method that relies on information provided by survey respondents (sisters of the deceased) on their sibling's histories. This is the method most commonly used in the Demographic Health Surveys (DHS) surveys and is deemed better than the direct household deaths because it effectively identifies more events and thus generates a more stable estimate.¹²

When household surveys / censuses are used as a source of mortality data, estimates on maternal deaths can only be derived if appropriate questions on mortality and fertility are included in the questionnaire.¹³ Unless the household survey or census is followed by a verbal autopsy, however, the resulting estimates tend to be limited and usually identify pregnancy-related deaths, not maternal deaths.¹⁴ The International Classification of Diseases (ICD), Revision 10, defines a pregnancy related death as “the death of a woman

while pregnant or within 42 days of termination of pregnancy, irrespective of cause”. Unlike maternal deaths, pregnancy-related deaths are identified solely based on their timing relative to the pregnancy, delivery and postpartum period. As a result, deaths recorded on the basis of surveys or censuses sometimes overestimate maternal deaths because, in theory, pregnancy-related include deaths from incidental causes. Accurate classification of a maternal death requires specific information on the cause of death.

Given the constraints and limitations of the data sources and the variability that arises from using data from different sources, a number of other estimation techniques have been used to produce country and regional comparable estimates. The Maternal Mortality Estimation Inter-Agency Group, for instance, produces regular MMR estimates, primarily for purposes of international comparison. Their estimation techniques entail applying varied statistical models to maternal mortality data from a range of sources, including national-level data from civil registration, surveys, surveillance systems, censuses, reproductive age mortality studies (RAMOS) and sample registration systems, to derive comparable MMR estimates. Due to the variety of data sources and estimation methods used, national estimates may, at times, diverge from estimates produced by international entities. Where there are variations between MMR estimates developed by the inter-agency group and national estimates, it is essential to work closely with countries to address gaps in data and methodologies to ensure that international and national estimates are compatible.

Limitations of estimation

While the aforementioned methods are widely used for deriving estimates of maternal mortality, they have several limitations. First, measurements that are not based on civil registration and vital statistics systems generally indicate pregnancy related mortality ratio, not maternal mortality. Secondly, dependent on the methods used for data collection, there are potential pitfalls with under or over reporting, timeliness of the information received and general recall issues; errors caused by differences in the accuracy or completeness of the sibling histories recalled by survey respondents. Thirdly, sample design is an issue and subnational or subgroup estimates from samples are almost impossible. Keeping in mind the importance of disaggregated data for informing health interventions, and for tracking progress in realizing the new global SDGs, this should be taken into account when deciding on data sources for estimating maternal mortality.

Making a case for improving CRVS systems

The newly adopted sustainable development goals (SDGs) includes a target of a global MMR of less than 70 deaths per 100000 live births by 2030. To achieve this target, governments will require accurate and timely data to track and measure progress on ending preventable maternal mortality (EPMM). The ability to count every maternal death is essential not only for monitoring purposes, but also for understanding changing patterns in underlying causes of deaths and developing evidence-informed, context-specific programme interventions that prevent women from dying prematurely.¹⁵

In order to improve data availability, timeliness and quality with respect to cause of death, national civil registration and vital statistics systems need to be strengthened.⁸ Improving civil registration and vital statistics will have multiple gains. On the one hand, civil registration and vital statistics systems provide timely and reliable data for informing policymaking, planning and programme development and implementation, as well as monitoring of development goals. On the other hand, the registration process can ensure that all individuals have the legal documentation to establish their civil status and ensuing rights. Compared to surveys, CRVS systems are cheaper to maintain in the long run and also enable the production of the disaggregated data demanded by the SDGs.

Securing strong political commitment and investment in strengthening and developing universal and responsive civil registration and vital statistics systems as a continuous source of data for producing vital statistics is a critical first step. It is against this backdrop that countries are encouraged to redouble their efforts and strengthen their CRVS systems. In the Asia-Pacific region, the initiative to “Get Every One in the Picture” seeks to accelerate efforts to improve civil registration and vital statistics systems towards the shared vision that, by 2024, all people in Asia and the Pacific benefit from universal and responsive CRVS systems that facilitate their rights and support good governance, health and development.

There is a growing global momentum around improving civil registration and vital statistics systems and a number of regional initiatives are underway in Africa, Latin America and the Eastern Mediterranean.

CONCLUSION

Significant accomplishments have been made with respect to reducing MMRs in Asia and the Pacific, but more improvements are needed. Getting to know the number of women who die every year during pregnancy or childbirth as well as the underlying cause of death is essential to develop targeted programmes to prevent women from dying of preventable causes. This information is currently lacking in many countries.

The most suitable source of information on cause of death is a well-functioning civil registration and vital statistics system that include accurate cause of death identified by physicians working in health facilities.

It is thus advantageous for countries in Asia and the Pacific to improve their CRVS systems in order to protect the health and wellbeing of women and of their families. In addition, well-functioning CRVS systems are the cornerstone for good governance and evidence based policy making as recognize in the newly adopted 2030 sustainable development agenda.

It is time that every maternal death is counted. It is time to ‘Get Every One in the Picture’. Countries in the region have committed to improving their CRVS systems during the CRVS Decade (2015-2024). If they succeed, a reduction in the number of maternal deaths will be part of the results of their efforts.

For more information regarding ESCAP’s work in statistics development please visit:

<http://www.unescap.org/our-work/statistics>

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Endnotes

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