



## DHS Survey Design: Maternal Mortality



A maternal death is defined as a death that occurred during pregnancy or delivery, or in the 42 days following childbirth or the termination of a pregnancy, excluding deaths due to accident or violence. Although maternal mortality-related indicators are not generated as part of a standard DHS survey, they can be produced by including the Adult and Maternal Mortality Module in the Woman's Questionnaire.

### Is a DHS the best way to measure maternal mortality?

Household surveys such as the DHS are not the ideal tool to collect information on maternal mortality, but in the absence of comprehensive and reliable vital statistics systems and other cost-efficient ways to collect information on maternal deaths, many countries rely on DHS maternal mortality estimates obtained using the sisterhood method. DHS uses information on respondents' siblings to measure both adult and maternal mortality. Respondents are asked to list their siblings and the vital status of each sibling. In the case of sisters who have died at age 12 or older, the interviewer asks whether or not the sister died during pregnancy, childbirth, or within the 2 months following childbirth or the end of a pregnancy. For those sisters in the latter category, the interviewer asks how many days after the end of pregnancy or childbirth the sister died.

But relying on a respondent's report of a sister's death has limitations. Respondents may not know whether their sister was pregnant or had recently been pregnant when she died, or they may not accurately recall the exact timing of a sister's death. Additionally, respondents may be reluctant to report a sister's death, particularly if the death was abortion-related. These issues can make it hard to collect accurate information about maternal mortality in the survey context.

### Should we include the Adult or Maternal Mortality Module in our survey?

A maternal death is a statistically rare event. The two most important maternal mortality-related indicators are the maternal mortality rate (reported per 1,000 women age 15-49) and the maternal mortality ratio (MMR, reported as the number of maternal deaths among women age 15-49 per 100,000 live births). In order to have a sufficient number of maternal deaths to calculate meaningful

### Considerations for Inclusion

#### Timing:

The Adult and Maternal Mortality Module should not be repeated more than once every 10 years because the reference period for consecutive surveys will overlap.

#### Validity:

Estimates based on the sibling method depend on respondent recall. Despite this concern, in the absence of vital registration data, DHS maternal mortality estimates may be the only reliable sources of these data.

#### Effect on sample size:

Estimating MMR at the national level requires a sample size of at least 10,000 households in high fertility countries, and an even larger sample size in low fertility countries.

#### Impact on cost:

Because of the large sample size required and the additional time needed for training, fieldwork, data processing, and data dissemination, adding the Adult and Maternal Mortality Module to a DHS has significant cost implications.

#### Impact on quality:

Addition of the Adult and Maternal Mortality Module greatly increases the interviewer's workload, which can have a negative impact on the quality of the interviewer's work and ultimately the quality of data collected.

indicators, both indicators use a 7-year reference period. This reference period is much longer than most other indicators in DHS surveys, including those related to childhood mortality. Because of the long reference period, The DHS Program recommends that countries only collect data on maternal mortality every 10 years. When these data are collected more frequently than 10 years, the reference periods for consecutive surveys can overlap, complicating the ability to observe changes in indicator estimates.

## **What sample size is required to estimate MMR?**

In general, a sample size of 10,000 women is the minimum needed to produce a national MMR estimate in high fertility level countries. Confidence intervals for MMR estimates are wider than confidence intervals around estimates for most other indicators in a DHS survey. One reason why the amount of uncertainty around MMR estimates is relatively large is that a maternal death is such a statistically rare event that the MMR is measured in the scale of one maternal death per 100,000 live births. This means that many women need to be interviewed in order to identify even a small number of deaths and produce reliable MMR estimates. For example, during the 2016 Nepal DHS, nearly 13,000 women were interviewed with the Adult and Maternal Mortality Module. In total, they reported having about 29,000 sisters, yet among these sisters, only 107 maternal deaths were reported for the prior 7 years. A small increase or decrease in the number of maternal deaths would have a large effect on the MMR.

## **Can we measure maternal mortality at the regional level?**

The DHS Program is often asked to analyze variations in maternal mortality indicators across subnational administrative units or other subpopulations within a country. There are two main reasons why we discourage such disaggregation:

- The information from the sibling history is limited to respondents in the survey within the ages of 15-49. We know where the respondent lives but we do not know where the siblings she reports on live now or where they died. The respondent and her sisters may not live in the same region reported in the survey; they may not share the same background characteristics such as education level. Therefore, estimates of maternal mortality at the regional level or for certain educational levels can be misleading because the region or education level is that of the respondent and not of the sister who has died.
- Relative to estimates of maternal mortality at the national level, estimates at the subnational level will be highly imprecise due to smaller sample sizes and the comparative rarity of the maternal deaths. Any inferences about differences or trends at subnational level can be misleading if statistical tests are not conducted to detect significant change. To get precise results for a subnational unit would require very large sample sizes, which would be enormously expensive and could jeopardize the data quality of the entire survey.

## **Resources and References:**

PRMR/MMR videos: [https://www.youtube.com/watch?v=Z\\_VraFDfGxQ](https://www.youtube.com/watch?v=Z_VraFDfGxQ)

An Assessment of DHS Maternal Mortality Data and Estimates:

<https://dhsprogram.com/pubs/pdf/MR13/MR13.pdf>