Maternal and Under-five Mortality in Zimbabwe

Multiple Indicators Cluster Survey 2014

Key Findings
Maternal Mortality

Maternal mortality, 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, is hard to measure in the absence of a complete registration of deaths with accurate attribution of cause of death. Included in the ICD-10 is a concept of ‘death during pregnancy, childbirth and the puerperium’ defined as any death temporal to pregnancy, childbirth or the postpartum period, even if it is due to accidental or incidental causes which allows measurement of deaths that are related to pregnancy, even though they do not strictly conform to the standard ‘maternal death’ concept. This concept is useful in settings where accurate information about causes of death based on medical certificates is unavailable. In the absence of a complete vital registration system, national estimates of maternal mortality are commonly obtained through modelling or household surveys such as the Demographic Health Survey (DHS), the Multiple Indicator Cluster Survey (MICS) and censuses. These alternative methods are not without challenges, Table 1 summarizes the methods and their pros and cons.

Table 1: Approaches to measuring maternal mortality

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<th>Census</th>
<th>Household Surveys (DHS &amp; MICS)</th>
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<td>With additional limited number of questions censuses can obtain estimates of maternal mortality. This approach eliminates sampling errors (because all women are covered) and hence allows a more detailed breakdown of the results, including trend analysis, geographic sub-divisions and social strata. Characteristics and limitations of a census are:</td>
<td>DHS and MICS employ the direct ‘sisterhood’ method using household survey data. This method obtains information by interviewing a representative sample of respondents about the survival of all their siblings. This approach has the following limitations:</td>
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<td>o Allows identification of deaths in the household in a relatively short reference period (1–2 years);</td>
<td>o Identifies pregnancy-related deaths (including AIDS and accidents), rather than maternal deaths;</td>
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<td>o Long intervals (i.e. 10 years) limits monitoring of maternal mortality;</td>
<td>o Produces estimates with wide confidence intervals, thereby diminishing opportunities for trend analysis;</td>
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<td>o Identifies pregnancy-related deaths (excluding accidents) unless when combined with verbal autopsy;</td>
<td>o Provides a retrospective rather than a current maternal mortality estimate (referring to a period approximately 5 or 7 years prior to the survey.</td>
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<td>o Training of enumerators is crucial, since census activities collect information on a range of other topics unrelated to maternal deaths;</td>
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<td>o Results must be adjusted for characteristics such as completeness of death and birth statistics and population structures, in order to arrive at reliable estimates.</td>
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Zimbabwe is classified in group B for countries with incomplete civil registration and/or other types of data for the 2013 estimates. For group B countries, a two-part multi-level regression model was developed to estimate MMRs for all target years. The first part is a multi-level linear regression model that predicts the proportion of deaths among women of reproductive age that are due to maternal causes (PM) (i.e direct obstetric causes or to indirect causes (other than AIDS) for which pregnancy was a substantial aggravating factor); the second part estimates the proportion of AIDS deaths that qualify as indirect maternal deaths out of the total number of AIDS deaths among women aged 15–49 years. The three selected predictor variables in the regression model are: GDP, the general fertility rate (GFR) and presence of a skilled attendant at birth as a proportion of live births (SAB).

Estimates computed to ensure comparability across countries; thus they are not necessarily the same as official statistics of the countries, which may use alternative rigorous methods.

Source: Adapted from WHO (2011)

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4. Ibid
Recent Maternal Mortality Estimates Explained

Figure 1 presents Maternal Mortality Ratio (MMR) estimates for Zimbabwe from various sources. Maternal mortality figures vary enormously by source.

**Figure 1: Maternal Mortality Ratio per 100,000 live births**

Let’s try to make sense out of these figures. The first key to understanding MMR figures from surveys and modelling is to think in ranges, in ‘bands’ instead of focusing on that one illusive number. The ZDHS estimate for 2010 has an uncertainty range of 778-1142 deaths per 100,000 live births, meaning the actual figure lies between 778 and 1142 deaths per 100,000 live births with an expected average of 960 deaths per 100,000 live births for the seven years preceding the survey. The interagency model estimate for 2013 has an uncertainty range of 270-790 deaths per 100,000 live births for five years preceding the survey (depicted by the error bars in the graph). The MICS 2014 estimate is also associated with an uncertainty range which will be available with the main report. Given these, already we can tell that the Census 2012 and MICS 2014 MMR estimates are within the interagency estimate band.

**Maternal Mortality Estimates Trend Explained**

A number of factors are at play for comparability and trends, key to programming and monitoring progress in maternal mortality. Key in understanding the current estimates is the method used, reference period and definition of maternal deaths. Table 1 above gives a shot at the measures/definition used, census, DHS and MICS estimates measure maternal related deaths while modelling results attempts to remove the effect of accidental and AIDS deaths. By that, survey data and modelling estimates are not directly comparable as such. The DHS and MICS number is a number for five to seven year time period and not for a year (depicted by lines in Figure 1: DHS 1999 refer to five years preceding survey while DHS 2005/06, DHS 2010/11 and MICS 2014 refer to seven years preceding survey). Only census can give estimates for a relatively short period i.e one year. Again census and DHS/MICS figures are not directly comparable. Both the DHS and MICS use the direct sisterhood method for fairly similar reference periods. With all these figures, can we say anything about the trend?

Looking at the comparable figures we can be able to tell the direction of movement of the maternal mortality estimates. Interagency estimates to an increase in maternal mortality from 520 deaths per 100,000 live births in 1990 to a peak of 740 deaths
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per 100,000 live births in 2005. Around the same time, in 2002, census also records a high maternal mortality figure of 1,068 deaths per 100,000 live births. Looking at the movement of averages from the DHS and MICS suggest a similar trend, increasing to a high of 960 deaths per 100,000 live births for the period covering 2004 to 2010. Recent estimates from MICS for the period covering 2008 to 2014 shows a decline to 614 deaths per 100,000 live births, for the seven years preceding the survey. The periods of estimation between DHS 2010/11 and MICS 2014 overlaps suggesting the decline registered in 2014 figure of MMR has happened in the later years, and most likely due to the multiple interventions in maternal and child health care under the Health Transition Fund (HTF). An estimate for a shorter reference period, 5 years preceding survey (2010-2014), suggest even a stronger decline in MMR at about 581 deaths per 100,000 live births. Estimates from the 2012 census also suggest a strong decline in MMR from a high of 1,068 deaths per 100,000 live births in 2002 to 525 deaths per 100,000 live births in 2012.

**Under-five Mortality Estimates Explained**

Under-five mortality rate is defined as the probability of dying between birth and exactly five years of age expressed per 1,000 live births. Under-five mortality estimates from surveys should also be seen as averages usually over a five year period thus also has a range of uncertainty. Figure 2 below gives recent estimates of under-five mortality. The trend from these estimate suggest that under-five mortality rose from 55 deaths per 1,000 live births in the early 1990s to a high of 94 deaths per 1,000 live births in 2009 recorded by MIMS 2009. DHS records as estimate of 84 deaths per 1,000 live births in 2010 which also corroborated by the census figure in 2012. Recent estimates from MICS 2014 are similar to estimates from DHS and census for the periods prior but suggest a strong downward trend between 2010 and 2014 which is attributable to resuscitation of the health system through the HTF. The 2014 estimate of under-five mortality stands at 75 deaths per 1,000 live births.

**Figure 2: Child Mortality estimates in Zimbabwe: 1990-2014**

![Figure 2: Child Mortality estimates in Zimbabwe: 1990-2014](image-url)
Evidence

We should focus on the context and the determinant variables as well to get “evidence based mortality estimates”. The pregnancy-related or maternal mortality ratios alone are insufficient for understanding the levels of, and trends in, maternal mortality. Decision-makers need to interpret the numbers in the light of other information. Thus, the apparent increases in maternal mortality (child mortality) in Zimbabwe in the 1990-2010 period likely reflect both rising levels of HIV during the 1990s and problems with access to care during pregnancy and childbirth. The recent context is also clear: the AIDS crisis is abating and after the horror years 2008-2009 the health indicators are improving very fast due to massive investments as confirmed by MICS 2014.

Results from MICS do show that antenatal care coverage for at least four times increased from about 57% in 2009 and to about 70% in 2014 while skilled birth attendance increased from about 60% in 2009 to 80% in 2014. Large gains were also recorded in post natal care coverage, percentage of women age 15-49 years who received a health check while in facility or at home following delivery, or a post-natal care visit within 2 days after delivery of their most recent live birth in the last 2 years. DHS 2010/11 recorded a postnatal coverage rate of about 27% compared to the 2014 figure of about 78% (Figure 3).

Figure 3: Maternal health process indicators, MIMS 2009 and MICS 2014
Modeling using process indicators towards a (middle of a band) MMR of 400 in 1990, 1000 in 2000, 800 in the 2000-2008 period, 1200 in 2008 and 550 in 2011 (see Figure 4)\(^5\).

**Figure 4: MMR estimates from modelling, 1990-2014**

While child mortality is not as difficult to measure as maternal mortality, process indicators also provides the evidence to the trends. Figure 5 five summarises some of the key process indicators for child health. Results also show large gains in post natal care coverage, percentage of last live births in the last 2 years who received a health check while in a facility or at home following delivery, or a post-natal are visit within 2 days after delivery. Post natal care coverage for the newborn increased from only 11.7% recorded by DHS 2010/11 to 85% in 2014. Full immunization almost doubled from 2009 to 2014 while marginal gains were also recorded in child nutrition. Exclusive breast feeding jumped from about 26% in 2009 to about 41% in 2009. Such gains could be responsible for the abating child mortality.

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\(^6\) Ibid
Conclusion

In principle, a census allows the identification of deaths in a household in a relatively short reference period (1 year), and thereby provides estimates of recent pregnancy related mortality. However, the results must be adjusted for the completeness of births and deaths declared in the census, and for distortions in age structures, to produce reliable estimates\(^7\). Because of these limitations, WHO advises that a census should be viewed as a source of additional comparative data, rather than a primary data source, for estimates of maternal mortality. However, experts\(^8\) who have reviewed census data suggest that estimates from census in 2012 give a more accurate figure. Looking at the various sources on both maternal and under-five mortality, the evidence strongly suggest mortality in Zimbabwe has turned the corner. We do know that Maternal Health as well as child health are reflective of the status of the overall Health System. The better and more effective the Health System, the better the mortality indicators. The improvements in the Health System, critical element that is driven by the programmatic national scale activities of the HTF and further complemented by related programmes, have started to pay off. Needless to say these need to be sustained for a complete reversal of the worsening maternal and child survival prospects recorded between 2000 and 2009.

\(^7\) WHO. 2011. International statistical classification of diseases and related health problems, 10th revision (ICD-10) (9), WHO, Geneva

\(^8\) Dr Kenneth Hill
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