Measuring Maternal Mortality

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Background

Since the creation of Millennium Development Goals MDGs, the need for reliable information on the estimate of maternal death has been growing at national and international levels.

Despite the significant progress, reliable data on maternal deaths are still scarce and the policies are developed despite of the lack of data.

Reliable data are needed to help policy makers to set priorities and appropriately allocate resources.

- The MDG5: Improve Maternal Health
- Target 5.A. Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio
- Target 5.B. Achieve, by 2015, universal access to reproductive health

Why measure maternal mortality?

Reliable data on causes of maternal death can be used for:
- Planning
- Monitoring and Evaluation
- Help in priority setting and advocacy

Definition of maternal death:

The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.

Causes of Maternal Death

-direct causes as result of obstetric complications of pregnant state, such as hemorrhage, eclampsia /pre-eclampsia, complication of anesthesia, caesarean section, incorrect treatment.

-indirect causes as consequence of previous existing diseases, diseases developed during pregnancy or aggravated by pregnancy, such as cardiac or renal diseases.

Alternative Definitions

Pregnancy-related Death:

The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of death.

Late maternal death:
The death of a woman from direct or indirect obstetric causes, more than 42 days but less than one year after termination of pregnancy
(**WHO, International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, 1992 (ICD-10))**

The first alternative definition allows to measure maternal death, where accurate information, based on medical certificate in not available.

The second definition allows to identify deaths that occur between six weeks and one year postpartum. This method is used in countries with developed registration system.

Statistical measures of maternal mortality

<u>Maternal Mortality Ratio</u>

Number of maternal death during a given time-period per 100 000 live birth during the same time-period.

<u>Maternal Mortality Rate:</u>

Number of maternal death in a given period per 100 000 women of reproductive age during the same time-period.

<u>Adult Lifetime risk of maternal death:</u>

The probability of dying from a maternal cause during a woman's reproductive lifespan

Difficulties in accurate measurement of maternal mortality:

-in most developing countries the death certificate indicating the cause of death does not exist and attribution of death as maternal death is very difficult.

-to identify maternal death precisely especially in setting, without complete recording of deaths in civil registration.

-even if the civil registration exist, the pregnancy status may not have been known and the death not have been reported as maternal death, even if the women were pregnant.

Approaches to measuring maternal mortality

Civil Registration System:
It is a routine, permanent, national and legal source of data and information on vital life events, such as live births, deaths, fetal deaths, marriages and divorces).

 Advantages:
-representative of entire population
-does not require special data collection
-provide annual statistics on maternal death at national and regional levels
-provide cause-specific estimate of maternal mortality
-provide data on birth
-ideal for monitoring & evaluation

Limitation
-poor quality, under-estimation of maternal deaths, attribution of incorrect cause of death
-it exists only in 78 countries covering only 35% of world population

Household Survey

It is an appropriate important data collection platforms for
maternal deaths in settings where routine information collection
systems are weak or does not exist.
Advantages:
 -sampling ensures that the target populations are representative.
-household surveys can also collect information on causes
time, place, health care seeking behavior prior to death
Limitation:
-survey identifies pregnancy-related death, not maternal death
-in epidemiologic terms, maternal deaths are rare events, survey
to measure their magnitude requires a large sample size.
-even with large sample size, the obtained results could be uncertain
because of wide confidence interval

Sisterhood methods

This method consists of obtaining information by interviewing a representative sample or respondents about the survival of all their adult sister in order to determine: the number of ever-married sisters, how many are alive, how many are dead and how many died during pregnancy, delivery or within six weeks of pregnancy.

Limitations

-it identifies pregnancy-related deaths, rather than maternal deaths.
-it provides retrospective rather than actual maternal mortality
estimate (over 10 years prior to survey)
-it is less appropriate in settings with significant migration and population movement.
-it is difficult to get additional information about deaths (causes, risk factors, timing, etc as sibling may not have such details)

Reproductive-age mortality studies (RAMOS)

It includes identifying and investigating the causes of all deaths of women of reproductive age in a defined geographical area /population. It requires the use of multiple sources of data, such as family members interview, vital registration, health facility records, death records, traditional birth attendants.

Advantages:
-in the absence of reliable data collection of registration system, this method is more reliable and can provide sub-national Maternal mortality ratios.

Limitations
-it could be long, complicated and expensive, especially if it is implemented on a large scale.
The number of live birth used in computation and calculation of MMR may not be accurate, especially in places, where women deliver at home.

Verbal Autopsy

This method consists of interviewing family members, community members to assign the cause of death. It is used in settings where medical certification of cause of death is not available. It aims to identify maternal death that occur in community and the cause of maternal death.

Advantages:
-it is the only way to ascertain the cause of death, where the deaths happen outside of health facility.
-it can also capture information on social and community factors associated with a maternal death for example barriers to accessing obstetric care

Limitations:
-limited reliability of causes of death when reported by a lay-persons, which can be subjective
-there is a risk of under or over-reporting of cause of death
-quality of data collection depends on the quality of training provided to field workers and interviewers and quality of the questionnaire

Census

<u>Advantage:</u>

-no sampling errors
-ability to estimate differentials by socioeconomic, geographic variables
-well-developed formal evaluation methods
-it allows identification of death in relatively short reference period
(1-2 years)

<u>Limitations</u>

-generally only held every 10 years, which limit the monitoring of maternal mortality
-the basic data always need evaluation, and frequently need adjustment
--the estimates (after adjustment) are for the intercensal period (long reference period

Reference Document

Trends in Maternal Mortality: 1990 to 2008

Estimates developed by:

WHO, UNICEF, UNFPA and the World Bank

Link:

http://whqlibdoc.who.int/publications/2010/9789241500265_eng.pdf