<http://www.devinfo.info/mdginfo2011/>

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| .01 Maternal mortality ratio (MMR)  |
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| **Element** | **Value** |
| **Definition** |

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| The maternal mortality ratio (MMR) is the ratio of the number of maternal deaths during a given time period per 100,000 live births during the same time-period. A maternal death refers to a female death from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy and childbirth or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy.  |

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| **Method of Computation** |

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| The maternal mortality ratio can be calculated by dividing recorded (or estimated) number of maternal deaths by total recorded (or estimated) number of live births in the same period and multiplying by 100,000. Measurement requires information on pregnancy status, timing of death (during pregnancy, childbirth, or within 42 days of termination of pregnancy), and cause of death. It is important to note that not all deaths which occur temporally to pregnancy are considered "maternal deaths". Maternal deaths are a specific subset of deaths which occur during pregnancy, childbirth and the puerperium and can be further divided into two groups, namely direct and indirect obstetric deaths. Direct obstetric deaths result from obstetric complications of the pregnant state (pregnancy, labour and puerperium); from interventions, omissions or direct treatment; or from a chain of events resulting in any of these. Indirect deaths result from previously existing disease or disease that developed during pregnancy and was not directly due to obstetric causes but was aggravated by the physiologic effects of pregnancy. Deaths which do not meet these criteria, such as those which occur as a result of accidents, are defined by the more general term, "death occurring in pregnancy, childbirth or the puerperium" (previously referred to as "pregnancy related deaths"). The maternal mortality ratio can be calculated directly from data collected through vital registration systems, household surveys or other sources. However, maternal mortality data from all sources have limitations, particularly related to the underreporting and misclassification of maternal deaths (see "comments and limitations" section). The World Health Organization (WHO), United Nation's Children's Fund (UNICEF), United Nations Population Fund (UNFPA), The World Bank (WB), and United Nations Population Division (UNPD) have developed a method to adjust existing data in order to take into account these data quality issues. This method involves adjusting existing data for underreporting and misclassification of deaths and model-based estimates are made for countries with incomplete or no reliable national level data.  |

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| **Comments and Limitations** |

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| Maternal mortality is difficult to measure. Vital registration and health information systems in most developing countries are weak, and thus, cannot provide an accurate assessment of maternal mortality. Even estimates derived from complete vital registration systems, such as those in developed countries, suffer from misclassification and underreporting of maternal deaths. Because maternal mortality is a relatively rare event, large sample sizes are needed if household surveys are used. This is very costly and may still result in estimates with large confidence intervals. To reduce sample size requirements, the sisterhood method measures maternal mortality by asking respondents about the survivorship of sisters. While this method reduces sample size requirements, it produces estimates covering some 7-12 years before the survey, which renders data problematic for monitoring progress or observing the impact of interventions. The direct sisterhood method asks respondents to provide date of death, which permits the calculation of more recent estimates, but even then the reference period tends to refer to 0-6 years before the survey. The ability to generate country, regional, and global estimates with higher precision and accuracy would be greatly facilitated if country civil registration systems were further improved. This improvement would reduce the need to conduct special maternal mortality studies (which are time-consuming, expensive, and of limited use in monitoring trends). In addition, owing to the very large confidence limits around maternal mortality estimates, trends in maternal mortality should be interpreted with caution. It is recommended that process indicators, such as attendance by skilled health personnel at delivery and use of health facilities for delivery, be considered in assessing progress towards the reduction in maternal mortality. The maternal mortality ratio should not be confused with the maternal mortality rate (the number of maternal deaths in a population divided by the number of women of reproductive age). The maternal mortality rate captures the likelihood of both becoming pregnant and dying during pregnancy or the puerperium (six weeks after delivery).  |

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| **Sources of Discrepancies between Global and National Figures** |

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| As detailed above, WHO, UNICEF, UNFPA, and The WB, have developed a method to adjust existing data in order to produce better quality estimates, accounting for some of the limitations mentioned above. Thus, if a national figure is derived directly from the civil registration system or from survey data, global and national estimates may differ. Depending on the type of the data source used, primary data for individual countries may be adjusted for specific characteristics. To obtain MMR estimates that are comparable across study designs, data may be adjusted for the extent of potential underreporting of maternal deaths according to the data source (which is an issue even in highly developed civil registration systems), and/or for the definition of deaths captured by the source (maternal or death occurring during pregnancy, childbirth or the puerperium (see "method of computation"). Such adjustments allow the calculation of comparable country estimates as well as regional and global aggregates. For this reason, global estimates might differ from the country-reported figures.  |

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| **Process of Obtaining Data** |

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| Data on maternal mortality and other relevant variables are obtained through databases maintained by WHO, UNPD, UNICEF, and The WB. Data available from countries varies in terms of the source and methods. Primary sources of data include vital registration systems, household surveys (direct methods), reproductive age mortality studies, disease surveillance or sample registration systems, special studies on maternal mortality, and national population censuses. Given the variability of sources, all data are reviewed and different methods are used for each data source in order to arrive at country estimates that are comparable and permit regional and global aggregation. For a detailed description of the methodology please refer to the publication ( <http://www.who.int/reproductivehealth/publications/monitoring/9789241500265/en/index.html>) Maternal mortality estimates for 63 countries with complete civil registration systems and good attribution of cause of death are presented after the adjustment for underreporting. For countries with other types of data, these data are adjusted to account for definition, and a statistical model is employed to estimate maternal mortality levels. For countries/territories with no appropriate maternal mortality data--the statistical model is employed to predict maternal mortality levels. Despite being based on established demographic techniques and empirical data from other countries, there is no guarantee that the country specific point estimates obtained through the statistical model represent the true levels of maternal mortality. Estimated uncertainty margins are not confidence intervals in the epidemiological and statistical sense. Because these margins are extremely wide, one must be wary of interpreting small numerical differences in countries as representing real differences in maternal mortality levels. The wide lower and upper margins around the estimated figures reflect such uncertainty.  |

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| **Treatment of missing values** |

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| For information on methods see: Trends in maternal mortality: 1990 to 2008. Estimates developed by WHO, UNICEF, UNFPA and The World Bank. Available at :([http://www.who.int/reproductivehealth/publications/monitoring/9789241500265/en/index.html)and](http://www.who.int/reproductivehealth/publications/monitoring/9789241500265/en/index.html%29and) the accompanying technical report(<http://www.who.int/reproductivehealth/publications/monitoring/MMR_technical_report.pdf>)  |

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| **Data Availability** |

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| Data meeting inclusion criteria for the estimation process are available for 148 of the 172 countries and territories included in the estimation process. There are 24 countries which did not meet the national representative data inclusion criteria. . The estimates did not include countries and territories with populations under 250,000. Adjusted estimates of MMR are calculated for 5 yearly intervals. The complete data files and the statistical programmes used to generate the estimates are available online at: (<http://www.who.int/reproductivehealth/publications/monitoring/9789241500265/en/index.html>). The estimates are published as Trends in maternal mortality: 1990 to 2008. Estimates developed by WHO, UNICEF, UNFPA and The World Bank and annually by UNICEF in The State of the World's Children report and the WHO in World Health Statistics.  |

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| **Regional and Global Estimates** |

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| Regional and global estimates are based on population-weighted averages weighted by the total number of live births. These estimates are presented only if available data cover at least 50% of total births in the regional or global groupings.  |

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| **Expected Time of Release** |

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| Global estimates are produced approximately every two to five years and the latest update Trends in maternal mortality: 1990 to 2008. Estimates developed by WHO, UNICEF, UNFPA and The World Bank is available at :(<http://www.who.int/reproductivehealth/publications/monitoring/9789241500265/en/index.html>) and annually by UNICEF in The State of the World's Children report and the WHO in World Health Statistics.  |

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