

# Are we there yet? Challenges in measuring MDG5 achievements

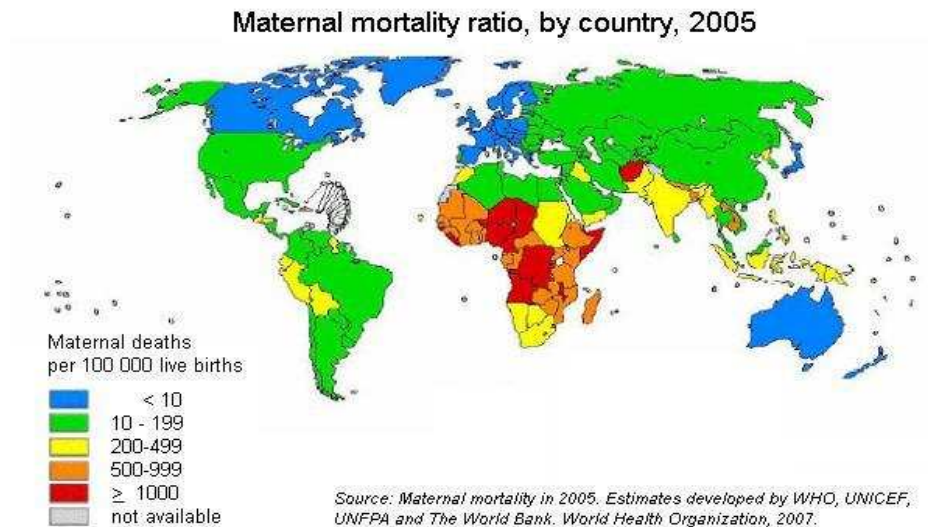
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**Abstract** The last few years have seen an increasing demand for more accurate estimates to mark progress in development. In particular the widely acknowledged lack of progress in MDG 5 – improving maternal and reproductive health – has highlighted the importance of providing good and accurate estimates. As a result countries feel the pressure to improve their statistical systems and donors to increase their support to statistical offices. However estimation of the maternal mortality ratio, the key target for MDG5, is far from being accurate and in most developing countries we still rely on large confidence intervals while vital registration systems are far from being adequate.

The paper will discuss the major shortcomings of the key target indicators: skilled birth attendance at delivery, maternal mortality ratio, antenatal care coverage and unmet need for family planning. In this paper I review key issues related to the availability, quality of data and their comparability, as well as new ways to estimate maternal mortality and the debate surrounding the suitability of unmet need as an indicator of reproductive health programme success. The paper also highlights the challenges ahead when monitoring progress in terms of improvements in data collection and reporting to the key agencies.

## 1 Introduction

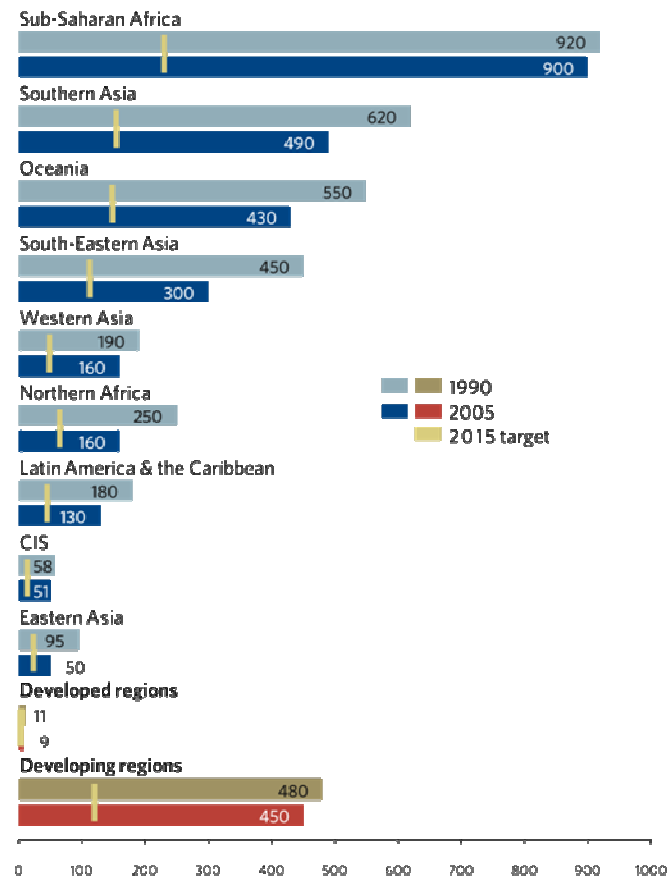
Maternal mortality levels in developing, especially Sub-Saharan Africa, countries remain dramatic with more than half a million women dying worldwide each year, more than half of these in Africa (Figure 1). Although the latest publication on the subject shows a decline to around 350,000 deaths (Hogan, Foreman et al. 2010) the figure still remains dramatic.

**Figure 1:** Maternal mortality ratios by country, 2005

The most dramatic figure is the extent of the gap still remaining between the 2015 target and the current figures (Figure 2) in particular in Sub-Saharan Africa and Southern Asia.

The plan of action agreed at the International Conference on Population and Development follow up conference (ICPD+5) in 1999 emphasised the importance of reliably estimating levels of maternal health in countries using a variety of data sources including censuses<sup>1</sup>. The additional emphasis on Millennium Development Goal (MDG) number five which urges the reduction in maternal mortality has highlighted the importance of providing good and accurate estimates of mortality that would enable developing countries to keep track of their achievements in the area of maternal mortality. Thus reliable data on maternal mortality is fundamental in order to enable policy makers to make informed decisions. While the MDGs have been accused of minimising the issue to only a few indicators which do not represent the complexity of the problem, they do have in my opinion the merit of having highlighted the need to push for stronger statistical systems and investments in the data collection and compilation area.

<sup>1</sup> <http://www.unfpa.org/intercenter/advocating/icpd+5.htm>

**Figure 2:** Distributions of maternal deaths 1990-2005 by target to reach

Source: United Nations, 2009. Millennium Development Goals Report 2009.

## 2 A controversial issue

Maternal mortality ratios are a strong point of contention, at least in developing countries, both for measurement and source of data. On the 14th of April the key headline on the development news was the decline in the number of maternal deaths worldwide as reported in the Lancet paper on the review of the progress towards MDG 5 (Hogan, Foreman et al. 2010). It stated that since 1990 the maternal mortality had declined by 30% whereas the previous WHO figure had stated that the MMR globally

had only declined by 5% between 1980 and 2008. The paper goes on at length to explain the regional variations. However the paper has so far received mixed reactions with a few researchers calling for caution as the data are weak and the statistical modelling might just be an artefact. This is due to two main reasons being the wide range of confidence intervals for the main estimates and the reliance on heavy modelling of weak data often obtained from modelling of proxies as we will discuss later on. The study also neglects to address unsafe abortion, which accounts for 13 per cent of maternal mortality globally (IPPF, 2010), and occurs more in some countries than others, according to research conducted by the World Health Organization.

Collecting and analysing data about maternal health can be very difficult, particularly unsafe abortion which is the most misclassified and under-reported maternal health complication (especially where it is restricted by law). The issue of the estimation of maternal mortality is so sensitive that it has been suggested that attempts were made to prevent publication of the data as it undermined the case for greater investment in maternal and reproductive health. This is only the latest example of publication of maternal mortality ratios being a controversial issue. In this paper I will attempt to give an overview of the key issues linked to the estimation of MDG5 and why we need to be cautious when new estimates hit the news.

I'll explore here briefly how the key targets of MDG5 are used and the major merits and shortcomings.

## **2.1 *Targets and indicators***

Let's have a look in detail at the targets and indicators used in MDG 5:

Target 5.A. Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio

5.1 Maternal mortality ratio

5.2 Proportion of births attended by skilled health personnel

Target 5.B. Achieve, by 2015, universal access to reproductive health

5.3: Contraceptive prevalence rate

5.4: Adolescent birth rate

5.5: Antenatal care coverage

5.6: Unmet need for family planning

Undoubtedly target 5A has received most of the attention in the last decade as it was implemented earlier on but also as it is a more sensitive issue which can overcome cultural and religious issues such as family planning generally the centre of contention at key international meetings. A quick Google scholar search shows for example that there are 9210 articles which include both the words MDG5 and maternal mortality, 3110 with contraception and of which 2200 are of maternal mortality, 6180 of which 3980 are of maternal mortality.

A general unbalance which is both reflected in peer reviewed papers and in funding.

*Target 5A*

Maternal mortality is challenging to measure for both conceptual and practical reasons. Maternal mortality is difficult to identify as it requires information about deaths among women of reproductive age, pregnancy status or near the time of death, and the medical cause of death. All these components are difficult to measure in itself in settings where reporting is poor and where there is no medical certification (WHO, UNICEF et al. 2007). Information may be missing, misclassified or under-reported even in industrialized countries with fully functioning vital registration systems, as well as in developing countries facing high burdens of maternal mortality. There are several reasons for this: first, many deliveries take place at home, particularly in the least developed countries and in rural areas, complicating efforts to establish cause of death. Second, civil registration systems may be incomplete or, even if deemed complete, attribution of causes of death may be inadequate. Third, modern medicine may delay a women's death beyond the 42-day post-partum period. Forth, as previously mentioned, maternal deaths due to unsafe abortions go often unreported due to the sensitivity of the issue but also to the possible lack of knowledge that the woman was pregnant.

For this reason one of the major problems in estimation of mortality in less developed countries is that conventional estimation methods are not feasible due to the incomplete and dubious quality data. Key data-sources include the sisterhood method in sample surveys vital registration data and census data. Demographers have developed a range of demographic indirect methods in order to estimate mortality from incomplete or misreported data (United Nations 1983). One of the methods involves collecting information on cause of death from relatives (e.g. verbal autopsy) (Hill and Trussell 1977; United Nations 1983; Brass 1985; Trussell and Rodriguez 1990; Hill 2000; Timæus, Zaba et al. 2001; Graham, Fitzmaurice et al. 2004). This information can be collected through sample surveys such as the Demographic and Health Surveys (DHS), longitudinal studies such as the Demographic Surveillance Systems (DSS), ad hoc surveys, or through censuses. In particular, some census questionnaires ask about any deaths in the household in the 12 months preceding the census date.

The United Nations recommends that, in countries lacking accurate registration of deaths, censuses should include questions on deaths in each household (United Nations Statistics Division 1997).

The main issue with the estimation of maternal mortality from surveys is that due to the small resulting sample numbers of maternal deaths, it is generally not feasible to analyse maternal mortality trends or differentials due to lack of statistical significance. For this reason the use of census data has been recommended in order to gather estimates of maternal mortality especially for population sub-groups, although census information has so far been rarely used for analysis of adult mortality in general and even less for maternal mortality (Hill, Stanton et al. 2001; Stanton, Hobcraft et al. 2001). In addition because of the difficulty in differentiating between maternal and other pregnancy-related deaths in the household, measurement methods used in developing countries often focus on the calculation of Pregnancy Related Mortality Rates (PRMR) rather than Maternal Mortality Rates (MMR). Where none of these data sources are available WHO-UNICEF estimate the MMR with a weights model which includes skilled attendance at delivery, completeness of vital registration system and GDP among others (WHO, UNICEF et al. 2007). Currently most developing countries rely either on the WHO estimates or on survey data to estimate maternal mortality

which is affected by huge confidence intervals. With declining fertility this indicator becomes more and more obsolete and capturing maternal deaths more cumbersome. The challenge of measuring the achievements of the MDGs is further exacerbated by the lack or poor quality of data.

The detractors of the emphasis on the MMR often claim that the key information needed to understand how to tackle maternal mortality are the causes of death and more investment should be made into improving detailed information rather than focusing on a one number.

I would argue that given the struggle to collect basic causes of death in many developing countries, there is a need to prioritise and the costs involved in those kind of data collection are unsustainable. The emphasis and funding put on maternal mortality targets should be exploited and the momentum taken to the advantage of the wider reproductive health cause. After all maternal mortality is possibly the only credible cause of death which is possible to collect through means other than medical assessment as it relies on timing of death.

To summarise there are three key issues to consider when analysing the figure reported by the MDG5 datasets: most figures come with a wide confidence interval, they might refer to pregnancy related deaths and therefore not directly attributable to maternal causes, they might come from the WHO-UNICEF model which does not use any information on maternal deaths.

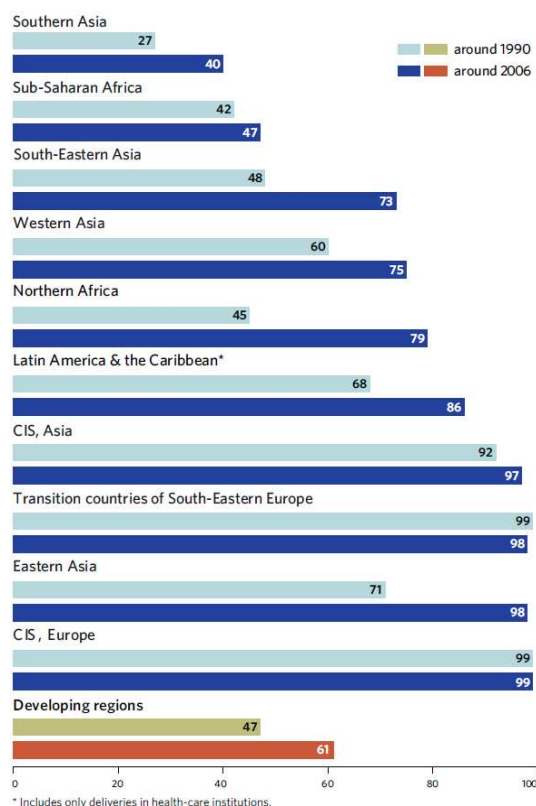
Skilled attendance at delivery is the second indicator of target 5a. It is hailed in particular by WHO as one of the key targets to achieve safer pregnancies and deliveries. The progress is possibly more advanced than other indicators (Figure 4). However the key issue is in the definition of skilled attendant which vary hugely across countries (WHO, UNICEF et al. 2007). In addition, availability of skilled attendance does not mean the service will be used and mainly it does not give a rating on the level of skills of the person delivering the service. The quality of this information is dubious for two reasons: it often relies on self-reported data where the woman does not necessarily know the level of skills of the health worker and it relies on loose definitions which vary from country to country. Finally, the quality of this indicator affects indirectly the quality of the modelled maternal mortality ratios mentioned previously as it is used as one of the key variable in the WHO-UNICEF model.

Furthermore the research on the link between skilled attendance at delivery and consideration needs to be given to the place of delivery and infrastructure as well as personnel's training. Although key for programme implementation maternal health programmes, the skilled attendance at delivery only tell us a small slice of the story

**Figure 3:** Skilled attendance at delivery progress by region, 1990-2005

### Skilled health workers at delivery are key to improving outcomes

Proportion of deliveries attended by skilled health care personnel, around 1990 and around 2006 (Percentage)



#### Target 5B

Target 5B was introduced in 2007 as a response to the continuous requests to push for reproductive health improvements as maternal mortality reduction cannot be reached without developing an effective family planning programme. The initial reticence to include RH in the key list was due to a general fear that abortion would be part of it and religious groups were not too keen on the idea of promoting contraceptive methods to non-married couples. Maternal mortality was often seen as token effort to account for RH in general.

In addition the long debate on which indicators to include in the target delayed the final inclusion. The indicators are possibly as controversial as the maternal mortality ratio and have generated a heated debate in particular on the measure of

unmet need. For the sake of brevity I will only concentrate on antenatal care and unmet need in this section, briefly mentioning adolescent fertility.

Antenatal care is defined as the percentage of women who used antenatal care provided by skilled health personnel for reasons related to pregnancy at least once during pregnancy, as a percentage of live births in a given time period.

The key limitations of this definition are the lack of control over the quality of the visit and the number of visits which could prove crucial. In addition the definition of skilled attendant suffers of the same problems as target 5A. Levels have gone considerably up in the last 15 years (figure 4) but progress has been slow in SSA in particular.

**Figure 4:** Proportion women who used antenatal care, 1990-2005

Proportion of women (15-49 years old) attended at least once during pregnancy by skilled health personnel, around 1990 and around 2005 (Percentage)



Source: Millennium Development Goals 2008

WHO sets the minimum number of antenatal visits to 4 and a deviation from this number could be affected by a variety of factors such as distance to the nearer centre, health systems protocols, risks during pregnancy. A minimum number of antenatal over 10 antenatal visits could, for example, indicate excessive resort to services and over-medicalisation. On the other hand, frequent use of antenatal services could pick up visits for monitoring potential high-risk pregnancies and related complications. The

number of visits is linked to the protocol of the country or institution on antenatal care contacts (Leone, Padmadas et al. 2008), it would be a shortcoming not to account for national policies in an analysis of this indicator. In general, there is a lack of strong evidence that the content, frequency and timing of visits in currently recommended prenatal programs are effective.

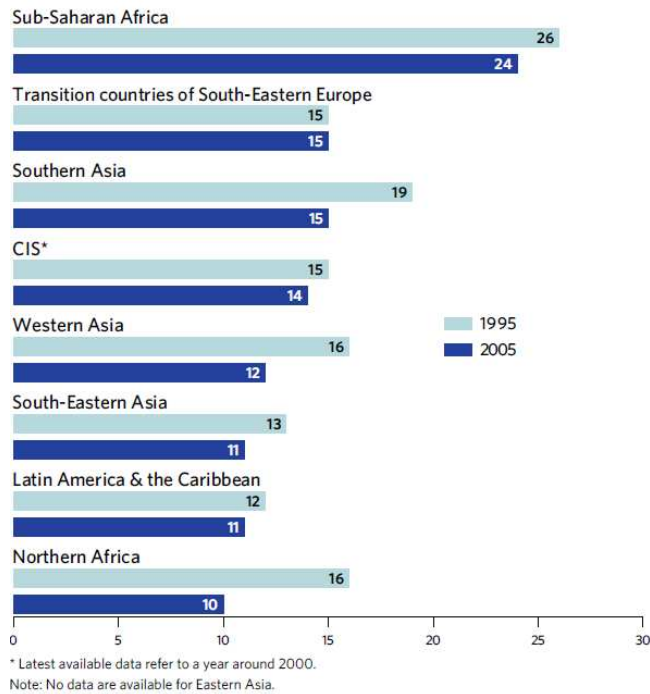
In addition to antenatal care there is a need to put more emphasis on postpartum care both from the data collection and analysis point of view. In many developing countries postpartum care is neglected and stands out as a gap along the continuum of care (Koblinsky 2005; Graham 2006). Even where the proportion of institutional deliveries is already quite high or is increasing, women are often discharged less than 24 hours after a birth, but more than half of maternal deaths occur after this period, as do many newborn deaths. Despite the burden of morbidity during this period, uptake of postpartum care in developing countries is usually extremely low, typically less than half the level of uptake for antenatal or delivery care. Fewer than a third of women in developing countries are estimated to receive any postpartum care at all and yet to ensure good health following birth, health behaviours need to be initiated around this time (Graham 2006).

Unmet need is measured as the gap between the actual contraceptive use and the actual need. More explicitly it's calculated as the number of couples/women who do not want anymore children but are not using any contraceptive methods despite being fecund. This measure is often criticised as it neglects some of the aspects of spacing (Timæus and Moultrie 2008) as well as the unmet need of unmarried women (Figure 5).

Limitations of the indicator as a sign of FP success: Unmet need is typically indicated by married couples, satisfaction of unmet need at one point in time doesn't mean that they might change later on (Jain 1999). Lastly and this is also a shortcoming of the contraceptive prevalence indicator, often traditional contraceptive methods are not accounted for in the measure of the indicator. Given the strong influence of traditional methods both in 19th century Europe and in many developing countries, this could be a significant short sight.

Finally, it is worth mentioning that adolescent fertility is declining slowly however in many African and Latin American countries it does show signs of going against the flow and it is increasing despite a general decline of fertility at national levels (United Nations 2008). This trend is particularly worrying in Latin America where the funds dedicated to family planning have been slowly cut in the last decade given an overall level of fertility. The inclusion of this indicator in MDG5 is drawing further needed attention on the subject.

**Figure 5:** Proportion married women with unmet need by region, 1990-2005  
Proportion of married women aged 15-49 years with unmet need for family planning, 1995 and 2005 (Percentage)



### 3 The way forward?

Despite the criticisms to the limitations of the indicator in MDG5, I believe that the solution would be to improve the current indicators rather than to include more. As it stands those 6 are more than enough. What is needed is more methodological work into the use of the current indicators.

Solutions could include:

- Inclusion of data quality ratings  
This would need to take into account the type of data (eg; survey vs vital statistics) as well as the reliability of the data (e.g.: level of coverage of VT or adjustment factor of census data)
- Integration of datasources

- Use of multilevel modelling to account of national policies variations
- Weighting to account of data quality ratings
- Revision of the concept of unmet need
- More emphasis needs to be given to:
- Differential analysis
- Variations in geographic access
- Quality of care
- More stress on post-partum care and abortion

## 4 Discussion and conclusions

Maternal mortality estimation or more in general reproductive health research are often accused of having 'stolen the thunder' of key major demographic issues such as the wider adult mortality estimation in sub-Saharan Africa or the stalling of fertility (possibly as consequence of declining contraceptive supplies) which in the bigger scheme of things could be considered as . Key critics of Cairo state ICPD's emphasis on women's health and status is laudable, the shift of focus away from population control per se will have detrimental effects on the funding and prioritizing of family planning programs where they are most needed, such as in Sub-Saharan Africa and some Asian countries (Caldwell 1997; AbouZahr 1999). However, I believe that although it's true that funding and human resources have shifted from demography, there is a window of opportunity with the estimation of key MDG indicators which should be exploited further. One example is the estimation of adult mortality which could gain momentum from the attention that maternal mortality is receiving.

Stronger statistical systems: The 2004 Marrakech Action Plan for Statistics, adopted by aid recipients and donor stakeholders at the Second International Roundtable on Managing for Development Results, was a major step towards assisting developing countries in strengthening their statistical capacity. This key international push needs to be channelled toward the creation of national priorities needed to build sustainable statistical systems.

Finally more methodological work should be dedicated to the analysis of incomplete or poor quality data. There is a lack of scientists dedicated to the improvement of data in resource poor countries. The MDGs are a key opportunity to get more statisticians on board.

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