



MATERNAL AND NEWBORN CARE

# Universal reporting of maternal mortality: An achievable goal?

W.J. Graham<sup>\*</sup>, J. Hussein<sup>1</sup>

Department of Obstetrics and Gynaecology, and IMMPACT, University of Aberdeen, Foresterhill Campus, Aberdeen, Scotland, UK

## KEYWORDS

Maternal mortality;  
Maternal death;  
Reporting;  
Measurement;  
Trends

**Abstract** This paper aims to highlight the importance of aspiring to achieve universal reporting of maternal deaths as a part of taking responsibility for these avoidable tragedies. The paper first discusses the reasons for reporting maternal deaths, distinguishing between individual case notification and aggregate statistics. This is followed by a summary of the status of reporting at national and international levels, as well as major barriers and facilitators to this process. A new framework is then proposed – the *REPORT* framework, designed to highlight six factors essential to universal reporting. Malaysia is used to illustrate the relevance of these factors. Finally, the paper makes a Call to Action by FIGO to promote *REPORT* and to encourage health professionals to play their part in improving the quality of reporting on all maternal deaths – not just those directly in their care.

© 2006 International Federation of Gynecology and Obstetrics. Published by Elsevier Ireland Ltd.

## 1. Introduction

Each year the survival status of an estimated 36 million women [1] who give birth is officially unknown. These are the women who deliver the next generation in parts of the world where births and deaths are still unrecorded. This statistic speaks volumes on societal values in the 21st

century – when an unknown number of women continue to die in “service” to society. The Millennium Declaration brings renewed attention to maternal deaths by proposing that the goal of “improved maternal health” be judged on the basis of a 75% reduction by 2015 in the maternal mortality ratio (MMR). The MMR is a measure only of obstetric risk, calculated as the number of maternal deaths divided by the number of live births and expressed per 100,000.

The assumed equivalence of the health of women with their death related to pregnancy again speaks volumes about values and assumptions – this time among the “society” of international and

<sup>\*</sup> Corresponding author. Tel.: +44 1224 553924/555850; fax: +44 1224 555704.

E-mail addresses: [w.graham@abdn.ac.uk](mailto:w.graham@abdn.ac.uk) (W.J. Graham), [j.hussein@abdn.ac.uk](mailto:j.hussein@abdn.ac.uk) (J. Hussein).

<sup>1</sup> Tel.: +44 1224 554474/559958; fax: +44 1224 555704.

national policy makers. It is thus perhaps not surprising that two of the eight Millennium Development Goals (MDGs) thought to show significant lack of progress in 2005 are those on maternal health (MDG 5) and gender equality (MDG 3). The dialogue of disappointment used in the numerous analyses of “progress” or lack thereof is telling – these are “off track” and “hard to reach” MDGs. Such claims coincide with clear recognition of the weakness of the data, especially on maternal mortality. The “falling behind” of MDG 5 is argued to be due to policy neglect [2], and yet an MDG that cannot be monitored cannot be met or missed [3]. This apparent lack of progress, policy neglect and poor data is not a coincidence, but rather a reflection of a measurement trap [4] in which inaction and inadequate information are self-reinforcing. The state of maternal mortality in the world today – mostly underestimated and mostly avoidable – is clear evidence that “*what you count is what you do*” [5]. The primary aim of this paper is to highlight the importance of aspiring to achieve universal reporting of maternal deaths. The paper draws upon published literature and unpublished reports identified by a structured search of relevant major reference databases, including Ovid Medline, Embase, CINAHL and Popline, as well as the websites of relevant United Nations agencies and international organizations, such as the UN Millennium Project and the World Health Organization.

## 2. Why should all maternal deaths be reported?

The reporting of all vital events requires effort and thus takes resources – be this the time taken by a relative to travel to the birth registry office or the costs of data processing to produce annual death statistics. Questioning the purpose and value of reporting is thus perfectly legitimate. In the case of maternal deaths, different purposes have specific implications for the universality of reporting, and can usefully be discussed at the level of individuals and of populations.

At the individual level, there are two main reasons for reporting maternal deaths – one is related to case management and the other to legal or human rights. Each and every maternal death is a tragedy from which lessons can be learnt. This is the *raison d’être* for the confidential inquiry systems which have long been implemented in several developed and transitional countries [6]. Reporting of individual deaths – “telling the story”

– seeks to identify and understand circumstances and contributory factors, primarily with a view to improving future case management. As such, case reporting may be seen as part of quality assurance within health services, and death audits are now widely practiced across developed and developing countries [7]. The focus is thus on events primarily occurring within health facilities and managed by health professionals, and often only on the maternity wards. This clearly means that lessons specifically from deaths in the community or in non-maternity units may be unintentionally neglected or regarded as beyond the area of responsibility for midwives or obstetricians. Although there are undoubtedly lessons to learn from each individual death, be this in a facility or the community, it is not necessary that all deaths are reported in order to be able to identify common avoidable factors. However, when the purpose relates to laws, such as when all maternal deaths are legally notifiable events, or to human rights standards which uphold the right of everyone to be free from avoidable death [8], then universality of reporting is implied.

At the aggregate level of entire populations, the purpose of reporting maternal deaths is to demonstrate magnitude, trends, patterns and differentials. These insights in turn are used to prioritize, plan, implement, monitor and evaluate major policy and programmatic activities to reduce maternal mortality, and may be complemented by individual level information. There is also a broader purpose to tracking maternal deaths overall, namely as a proxy or barometer of the functioning and quality of the entire health system [9] and, in the case of MDG 5, as a marker of overall development. Responsibility for these aggregate data is often assumed to lie with national statistics offices and the overall health information system rather than with health professionals. However as the term “aggregate” implies, the quality of these data, in terms of their reliability or accuracy and their coverage, can only be as good as the quality of the individual case reports from which they are compiled. Thus, responsibility for the reporting of maternal deaths is a continuum from the providers of care close to the time of death through to records officers at health facilities and districts administrations, and onto regional and national statisticians. For aggregate level purposes, not all maternal deaths need to be included. A sample of all maternal deaths may be adequate if the selection biases are limited, the size is sufficient to produce reliable trends and differentials, and the accuracy of the sample data is acceptable.

### 3. What is the quality of reporting on maternal mortality?

No country in the world today can be completely confident of the reliability and validity of its national estimates of maternal mortality [1]. The degree of confidence, however, will vary enormously and lies in close association with the reported or projected magnitude of maternal mortality. In low mortality settings, with MMRs of less than 50 per 100,000 live births, misclassification errors and small numbers of events can lead to wide fluctuations in annual estimates, undermining the validity of comparisons over time and between countries [10]. At the other end of the continuum – with MMRs above 500, the problem of misclassification remains but this is accompanied by many deaths being completely missed from any reporting mechanism. Such problems are partly symptomatic of dysfunctional health information systems, and as a consequence these countries can often only provide guesstimates of maternal mortality. In some intermediate settings – where the MMR lies between 50 and 500 deaths per 100,000 live births, the sheer size of the population means that uncertainty regarding the true MMR has enormous implications for the absolute numbers of maternal deaths. Thus for example in 2000, only 13 countries contributed 67% of the estimated 529,000 maternal deaths, with India alone accounting for 26% [11].

Much has been written about the challenges of reporting maternal deaths, both at the individual and the population level, and in terms of historical as well as contemporary settings. Historical series show how wider and longer term improvements in birth and death registration were crucial to sustainable maternal death reporting, and how responsibility for this progress involved civil society as well as a range of professionals – not all health-related [12]. With increased registration of deaths overall, the dominant remaining obstacle in these now developed and transitional countries was and remains misclassification of the causes of maternal death, leading to alarming levels of underreporting, ranging from a third to a half [10]. This problem existed over a century ago, as so-called “hidden deaths” [12]. It seems that misclassification is unlikely ever to be fully eliminated, owing to the nature of maternal deaths – with multiple pathologies and causation, restricted diagnostic and autopsy facilities in some settings, and intentional distortion of details in cases, for example, of induced abortion or violent causes.

In developed and transitional countries, the fact that underreporting is primarily due to misclassification is a marker of the state of routine information systems, as frank omission of deaths is extremely limited. This, in turn, reflects the functionality of the wider health system, which manages to avert many deaths and to audit those that are not prevented. Similarly, in developing countries the absence or poor quality of health information and vital registration reflects the weak state of the health system itself. In many resource-poor settings, an unknown proportion of maternal deaths occurs in the community without any reporting and even those reaching health facilities may be omitted or misreported. Here survey-based methods may be the only alternative for generating primary data on maternal mortality. Such approaches have major resource implications where the existing statistical infrastructure and capacity is poor, and where significant cultural barriers to reporting may be encountered. Where primary data are lacking, modeling techniques are often used to derive estimates, and there remains a pressing need to improve these analytical approaches as well as empirical methods [13].

The tracking of progress towards the target for MDG 5 is clearly problematic. As of September 2005, only 3 of the 10 world regions are expected to achieve a 75% reduction in maternal mortality by 2015. Five regions are categorized as not expected to reach the target, and the remaining 2 regions (Sub-Saharan Africa and Southern Asia) fall into the heading of “no progress, or a deterioration or reversal” [14]. Interestingly, this UN source also notes that “the available data for maternal mortality do not allow a trend analysis”. The perversity of this state of affairs is clear – a target has been agreed without the means for monitoring [15]. The position is confirmed in Table 1, which shows that the figures for maternal mortality for the year 2000 were modeled or adjusted for almost three-quarters of the 173 countries [11]. Under these circumstances, differentiating a failure of the data from a failure of policy and program action will not be easy for MDG 5. In a historical series, there are numerous illustrations of the interplay between improved reporting and reduced maternal mortality [16]. In more recent years, providing access to reliable information has been argued to be the single most cost-effective strategy for achieving health gain [17]. For safe motherhood, the calls for improved information have long been made in unison with the calls for action [18], and the 2005 World Health Day frontline message

**Table 1** National estimates of maternal mortality for the year 2000, by source

Source of estimates	Number of countries	% of countries in reporting category	% of global births	Estimated number of maternal deaths	% of global maternal deaths	Range of maternal mortality ratios <sup>a</sup>
Vital registration <sup>b</sup>	66	38	14	8165	1.54	2 to 170
Surveys <sup>c</sup>	32	27	58	322,220	60.96	20 to 1800
Modeling <sup>d</sup>	62	36	27	198,214	37.50	24 to 2000
	173	101	99	528,599	100	2 to 2000

Source: adapted from reference [11].

<sup>a</sup> Expressed per 100,000 live births.

<sup>b</sup> Adjusted to arrive at MMR.

<sup>c</sup> Including RAMOS, surveys using direct sisterhood method, or direct estimation from surveys or censuses.

<sup>d</sup> Regression model with independent variables reflecting demographic, economic, social, health system and regional characteristics for each country. Model is used to predict proportion of deaths to women of reproductive age due to maternal causes (PMDF), which is then applied to estimates of the number of reproductive age deaths in each country for 2000, in order to derive the number of maternal deaths.

echoes this – “Make every mother and child count” [1].

#### 4. REPORT — a new framework for promoting responsibility for reporting maternal deaths

The values of our society are clearly reflected in what we choose to measure, monitor and count [20]. Thus quality of reporting maternal deaths is a barometer of commitment to and responsibility for action in terms of the health of women. Having said this, reporting is not a simple matter, as it must be fit-for-purpose and consistent with the wider agenda for improving maternal health through equitable health systems [19]. What follows is a new framework which we propose to promote universal, high quality, reporting of maternal deaths, both as an aspiration and as a professional responsibility. *REPORT* is a mnemonic which flags six key issues in maternal death reporting: R stands for rights, E for Equity, P for Professionals, O for Organization, R for Resources, and T for Trends. These individual elements are first explained in some detail and then illustrated with a case study of Malaysia.

##### 4.1. Rights

In recent years, a rights-based approach has been advocated for reducing maternal mortality. This vehicle for change recognizes that technical action is not enough and challenges the political and social status quo [8]. The rights-based approach is used in combination with traditional public health and with health systems perspectives to achieving equitable health gain and universal access. It raises the level of debate around women’s rights to survival and

health, as core values enshrined in numerous human rights charters. This rights-based perspective may be supported by legal obligations, which have implications for the status of reporting of vital events – births and deaths – in other words, for the right to be counted in life and in death [15]. Such a right thus implies universal reporting, with omission constituting a violation of rights. Clearly, coercive reporting could also be regarded as a violation and highlights the need for mechanisms to guard against this. The rights-based approach also flags sensitive issues of the privacy and confidentiality of information which designates as “maternal” certain causes of deaths, such as suicide, violence or abortion. Civil society can play a pivotal role in a rights-based approach, lobbying for access to information and for improvements to reporting by addressing community and health professional barriers. Several examples of political commitment to safe motherhood being strengthened through combinations of local lobbying and activities to spur change can be cited, many associated with promising progress. In Honduras, for example, the MMR is reported to have fallen from 182 to 108 maternal deaths per 100,000 live births between 1992 and 1997 [1] – a period when political commitment to safe motherhood was high.

##### 4.2. Equity

The equity dimension of the *REPORT* framework encompasses three distinct elements – gender equity, poverty and social exclusion. Together these bases for discrimination within a population mean that national estimates of maternal mortality often disguise enormous internal differences in risk. These differences are matched and aggravated by inequities in reporting, with data for the most disadvantaged groups also being the most inadequate. Disaggregated data are thus essential for monitoring

equitable progress. As noted earlier, MDG 3 seeks to promote gender equality and to empower women, and its target indicators are also “off track”. The magnitude of avoidable maternal deaths and the state of reporting can be correlated with indicators both of inequities between women and men and of women’s social status. Gender dynamics make adverse events among women prone to non-disclosure and also explain differentials in service statistics. Several studies have shown a gender gap in terms of place of death, with a notable under-representation, even after adjustment, of the proportion of women dying in hospital, as seen, for instance, in recent work in Ethiopia [21].

Turning to equity in economic terms, there is widespread acceptance of the two-way relationship between poverty and health. In terms of maternal health, there is evidence of major differentials in access to and uptake of maternity services across a wide variety of developing countries, and recently a technique has been developed to expose similar discrepancies in the risk of maternal mortality [22]. These risks are a culmination of disparities in underlying health status, differential lifetime exposure to pregnancy, different access to the means to avoid unwanted pregnancy, unequal physical, economic and social access to preventive services for normal pregnancy and delivery, and major discrepancies in utilization of quality emergency obstetric care. Table 2 illustrates some of these maternal differentials for one country, Indonesia, and contrasted with indicators for children. This table makes it clear that the standard measure of maternal mortality – the MMR – masks the inequity

between the richest and poorest groups, since frequency of exposure to obstetric risk is not captured. This is, however, encompassed in the measure of lifetime risk, which reveals over a four-fold difference between the poorest and richest groups, a differential greater than that for both under-five and infant mortality.

Finally, inequities may have ethnic, religious or cultural bases, and these are particularly difficult to measure and to constructively understand. Many advanced routine information systems in developed countries do not capture such sensitive data, and may require special inquiries. For example, the UK CEMD in 1997–1999 found a three-fold difference in the risk of maternal mortality between the white population and women of south-east Asian origin, and a four-fold so-called “black–white gap” has been reported in the USA [23].

### 4.3. Professionals

A core purpose of the *REPORT* framework is to heighten the role and responsibility of health professionals for reporting maternal deaths. This is relevant not only to the quality of data at the level of individual cases, but also for compiled or aggregate statistics. The major unspoken issue, however, is the scope of professionals’ responsibility in terms of the desire to capture all deaths. Clearly, for those events happening directly in the care of a professional, there is a duty and obligation to comply with notification requirements. This not only provides an opportunity to learn lessons for the future, but also raises

**Table 2** Poverty differentials for selected maternal and child health indicators, Indonesia 1997

	Poverty quintiles					Poor–rich gap <sup>a</sup>
	1	2	3	4	5	
	Poorest				Richest	
Maternal mortality ratio (maternal deaths per 100,000 live births) <sup>b</sup>	592	389	403	386	221	2.7
Lifetime risk of maternal death <sup>b</sup>	1 in 51	1 in 89	1 in 96	1 in 104	1 in 226	4.4
Total fertility rate	3.3	2.9	2.6	2.5	2.0	1.7
% women attending antenatal care <sup>c</sup>	76.6	89.9	94.3	97.0	99.3	1.3
% women delivering with health professional <sup>d</sup>	21.3	34.8	48.1	64.4	89.2	4.2
Under 5 mortality rate (per 1000) <sup>e</sup>	109.0	76.5	69.5	51.6	29.2	3.7
Infant mortality rate (per 1000) <sup>e</sup>	78.1	57.3	51.4	39.4	23.3	3.4

Data source: Indonesia 1997 Demographic and Health Survey; [www.worldbank.org/poverty/health/data/indonesia/indonesia.pdf](http://www.worldbank.org/poverty/health/data/indonesia/indonesia.pdf). Accessed: 10 October 2005.

<sup>a</sup> The poor–rich gap is the value of the indicator in poorest quintile relative to the value in the richest quintile, calculated to reflect the gradient of disadvantage. For example, the difference in the Total Fertility Rate is 1.7 times – being highest in the poorest quintile (3.3 versus 2.0), whereas for % antenatal care the difference is 1.3 times, with uptake being lowest in the poorest quintile.

<sup>b</sup> Calculated using the familial technique (see Ref. [22]).

<sup>c</sup> Refers to antenatal care for most recent pregnancy.

<sup>d</sup> Deliveries to births in 5 years preceding survey.

<sup>e</sup> Children born in 5 years preceding survey.

responsibilities for action when substandard care is identified. In developing countries, however, many circumstances arise when the onus of responsibility is much less clear, especially for the professionals providing maternity care – midwives, obstetricians, nurses, and general physicians. These ambiguities relate to deaths that occur in health facilities but not in the maternity unit, to indirect or so-called incidental deaths, to cases referred between health facilities, to women brought in dead or dying shortly after admission, to deaths in private facilities, and to deaths in the community – particularly among women who have had recent contact with health professionals. In many countries, such circumstances represent the majority of cases, and thus uncertainty about responsibility for reporting has serious implications. Where HIV and AIDS are highly prevalent, for example, the majority of maternal deaths may be indirect, as in South Africa, and the potential for underreporting is considerable, especially where women go home to die or where late maternal deaths are not captured.

Recently, there has been international and national advocacy for a continuum of care, linking mother, baby and child, and ensuring universal access to care [1]. This also implies a continuum of reporting. The lead health professionals providing care during pregnancy and childbirth have a responsibility for the continuum, regardless of final circumstances in the event of death. Evidence indicates that many maternal deaths occur among women with recent prior contact with health professionals. In Egypt, for example, this was true of 93% of maternal deaths in the 2000 national study [24]. With the prioritization of skilled attendance at delivery as a strategy to reduce maternal mortality, the proportion of women in contact with health professionals can be expected to increase. This activity could logically lead to improved reporting of deaths if appropriate mechanisms for constructive accountability are also put in place. Such accountability is not about blame and punishment when things go wrong, but rather about developing an effective dynamic of obligation and entitlement between providers and clients [1]. In the final analysis professional duty of care for all women should extend beyond single contact episodes and be part of the continuum of care.

#### 4.4. Organization

Reporting of maternal deaths must be seen as part of the wider health information system and thus the entire health system. It would be inefficient and inappropriate to advocate separate or unique

reporting structures, although special methods of inquiry and analytical approaches will still be needed for some years to come in many developing countries. Studies that have provided high quality information, as in the two Egyptian national studies, recognize the long-term need for institutionalizing reporting [24]. Vital registration in particular requires strengthening, including considering adding a pregnancy check-box to death certificates [25]. Making maternal death a notifiable event by law may improve reporting if backed-up by supportive mechanisms. Active surveillance systems in which multiple sources of data are utilized have been established in a wide variety of countries. Where access and uptake of maternity services is low, a high proportion of maternal deaths occurs in the community. This does not mean that facility-based data are worthless, but rather their interpretation requires care. Close partnerships are needed to ensure that health professionals and statistical agencies work in unison to improve both the quality of reporting and of data interpretation and use.

#### 4.5. Resources

The reporting of maternal deaths, be this at individual or aggregate levels, is ultimately to inform action. An argument has often been made about the balance between resources for measurement and resources for action. This argument is not helpful, however, because action needs to be informed by measurement, and measurement needs to be endorsed by action. Maternal mortality poses significant measurement challenges, and must be accompanied by valid and reliable information on process indicators of the quality of care. The overall health system, however, will be judged in terms of markers of equitable health gain, such as disaggregated maternal mortality. These data are essential to resource allocation decisions, and their quality matters. Resources are wasted if measurement is flawed, data are not used, and appropriate action not taken. A virtuous circle is needed that enables positive feedback on progress to stimulate continuing efforts and sustained resource input – which bring us to the last element in the *REPORT* framework.

#### 4.6. Trends

The importance of being able to “tell the story” of success at a population level is apparent from both historical and contemporary experience. Showing trends in maternal mortality is not straight forward, particularly where differences in diagnostic

skills, definitions and data sources have occurred over time. Improved ascertainment can lead to spurious reversal of downward trends. Showing change over time is also politically sensitive, and worsening mortality is unpopular but not improbable, as witnessed recently in Malawi and Zimbabwe as a result of the AIDS epidemic [26]. In many developed countries, however, trend analysis now reveals stagnation, and debate ensues about whether an irreducible biological minimum has been reached. Both lack of progress and reliable evidence of improvement can stimulate action. Ideally, such trends should be evaluated independently of those groups with any conflict of interest in the findings. This reiterates the earlier point about the importance of partnership between responsible agencies, including building capacity to interpret trends data and to effectively communicate findings to decision-makers. Thus the potential for reporting to act itself as an intervention to reduce maternal mortality may be realized, as illustrated in the following country case study of Malaysia.

#### 4.7. Reporting maternal deaths in Malaysia

The Malaysian experience is frequently cited as a success in global efforts to reduce maternal mortality. Between 1933 and 1976, the MMR fell from 1085 to 78 maternal deaths per 100,000 live births. The factors related to this decrease are believed to be improvements in health systems, provision of skilled maternity care and better registration of deaths [27]. Since the decline of maternal mortality to an MMR of 19 in 1990, Malaysia has witnessed a plateau in progress [28], and is clearly at a “crossroads of change”, which not only requires a fresh approach, [29] but which also

builds upon the lessons from the past. The *REPORT* framework can be used to highlight the successes of maternal death reporting in Malaysia, and these are shown diagrammatically in Fig. 1.

The right of a maternal death to count [15] is a concept consistent with the history of the Malaysian registration system. Birth and death reporting became established in the 1950s, and today local police stations continue to act as peripheral sources of data for the Registrar General. The commitment to ensure all maternal deaths are counted is exemplified through the integration of the Registrar General’s maternal death records with Ministry of Health information systems [27] and the commencement in 1991 of routine confidential inquiries into maternal deaths with active case detection [30]. These improvements in data capture have highlighted the fact that the vital registration system underestimates maternal deaths and adjustments are being made to correct this, including misclassification biases [28].

Equity matters, and is reflected in the under-reporting of deaths in groups hardest to reach. These concerns are well acknowledged in Malaysia, and information is available at a disaggregated level. Data on the three main ethnic groups – Chinese, Malays and Indians – show that five-fold disparities in the level of the MMR were observed in the 1970s. These disparities started to narrow in the 1990s, but some differences remain and may be related to poverty, rural–urban distinctions, and cultural preferences [28]. Data on rural compared to urban states suggest as much as a 2-fold difference in maternal mortality, despite policy initiatives implemented since the 1970s [27]. There remain significant areas of uncertainty, such as the two Malaysian states on the island of Borneo (Sabah and Sarawak). Moreover, with economic prosperity

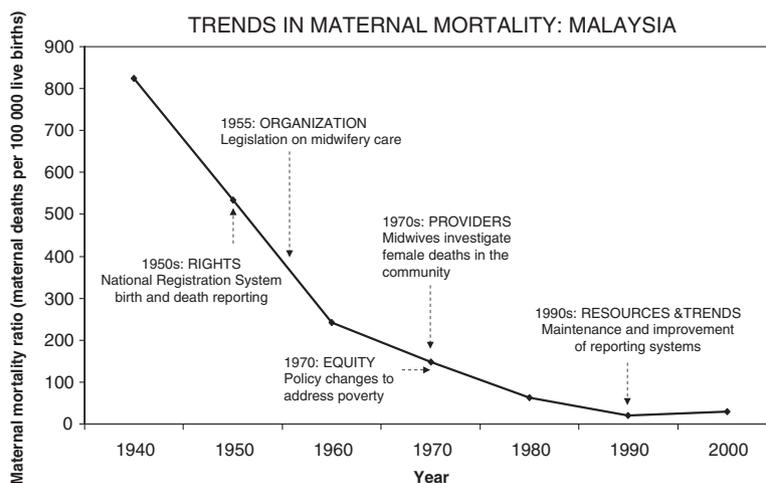


Figure 1 Trends in maternal mortality: Malaysia.

over the last two decades, 42% of maternal deaths are now found in immigrant and non-Malaysian women [28]. The aboriginal communities in Malaysia are also likely to have remained marginalized, and there is evidence of an overrepresentation of deaths in these people [31].

Professionals providing maternity care in Malaysia have historically had a formal duty of care which extends beyond health facilities, and includes fully investigating any maternal death reported in the community. Midwives began to obtain information on maternal deaths from local police stations around the 1950s. In the 1970s, it became a formal requirement for local midwives to visit families reporting female deaths, in order to determine if these were maternal, and if so, assess the contributory factors [27]. The confidential inquiries into maternal death have allowed identification of key deficiencies in the training and capacity of midwives and doctors [30]. Future priorities include the quality of private practice, continuing medical education – especially of non-obstetrician doctors [28,30] and improved support for and retention of practitioners in rural locations [32].

Organization of the health system in Malaysia, including reporting mechanisms, has long contributed to the decline in maternal mortality. Linked with the legislation of midwifery care in 1955 and the subsequent requirement for midwives to visit homes in the community where female deaths have taken place, the Ministry of Health now captures twice as many maternal deaths as the vital registration system. The Registrar General's system was revised in the 1990s to enable it to also capture deaths known to the Ministry of Health, emphasizing the importance of using more than one source for data capture. A new requirement to enter pregnancy status (pregnant, postpartum) in death certificates was also established at around the same time [27].

Resource requirements for the development of Malaysia's comprehensive and publicly funded health system have been reported to comprise less than 1.8% of GDP since the 1950s [27]. Only a fraction of these costs have been used to maintain the reporting system.

Trend data are powerful, and in Malaysia these have been used to tell the story of change and progress through persistent and continuous monitoring. Trends in maternal mortality have been linked with the evolutionary changes in health policy and service provision. Malaysia has approached the problem of maternal deaths and reporting using the dual concepts of causation – ensuring that the impact of interventions to reduce mortality are well recorded – and reverse causa-

tion, such that the comprehensive reporting systems may in themselves, have influenced improvements in mortality figures. The apparent stagnation currently observed in Malaysia marks a watershed in its history of maternal death reporting. Universal reporting remains an aspiration, with increasing attention being paid to identifying misclassifications and hard to reach groups.

## 5. Call to action

This paper was given a title which posed a question – is universal reporting of maternal mortality an achievable goal? There exist clear and significant technical challenges to achieving this goal, but it must remain the aspiration. Striving for the highest quality reporting, in terms of universal coverage and reliability, is essential both to inform action to prevent maternal deaths, and to support the human right to be acknowledged in life and in death. The key issue then becomes one of constructive accountability among those individuals and agencies that have the power and responsibility to bring about change. FIGO is in a unique position to facilitate progress in the reporting of maternal deaths and this paper calls for action on this to be endorsed at the XVIII World Congress. The *REPORT* framework may be used to raise awareness of the key influences on quality reporting, and examples of progress reported back by FIGO members at the 2009 Congress. This action is consistent with the Joint Statement of 12th September 2005 from health professional groups who are key to reaching MDGs 4 and 5, which was provided in support of the new Partnership for Maternal, Newborn and Child Health. The statement recognizes that strengthened health systems imply strengthened monitoring mechanisms to ensure health gain occurs and is equitable. Strengthened reporting of maternal mortality can be both a marker and a stimulus of such progress.

## Acknowledgments

This invited paper was prepared under the auspices of the international research program IMMPACT (Initiative for Maternal Mortality Programme Assessment. See <http://www.abdn.ac.uk/impact>), funded by the Bill and Melinda Gates Foundation, the Department for International Development, the European Commission, and USAID. The funders have no responsibility for the information provided or views expressed in this paper. The views expressed

herein are solely those of the authors'. WG is funded by the University of Aberdeen and IMMFACT, and JH is funded by IMMFACT.

## References

- [1] World Health Organization. The world health report 2005 Make every mother and child count. Geneva: WHO; 2005. p. 11.
- [2] Sachs JD, McArthur JW. The Millennium Project: a plan for meeting the Millennium Development Goals. *Lancet* 2005;365:347-53.
- [3] Johansson C, Stewart D. The Millennium Development Goals: commitments and prospects. Human Development Report Office Working Papers and Notes: Working Paper No 1. New York: UNDP; 2002.
- [4] Graham W, Campbell O. The measurement trap. *Soc Sci Med* 1992;35:967-76.
- [5] Freedman LP, Wirth M, Waldman R, Chowdhury MR, Rosenfield A. Background paper of the Task Force on Child Health and Maternal Health. Millennium Project; 2003, April 18. Accessed at: <http://www.unmillenniumproject.org/documents/tf04apr18.pdf>. October 10 2005.
- [6] Lewis G. Confidential enquiries into maternal deaths. World Health Organization. Beyond the numbers: reviewing maternal deaths and complications to make pregnancy safer. Geneva: WHO; 2004. p. 77-102.
- [7] Bullough C, Graham WJ. Facility-based maternal deaths review: learning from deaths occurring in health facilities. World Health Organization. Beyond the numbers: reviewing maternal deaths and complications to make pregnancy safer. Geneva: WHO; 2004. p. 57-76.
- [8] Department for International Development. How to reduce maternal deaths: rights and responsibilities. London: DFID; 2005 [February].
- [9] Parkhurst JO, Penn-Kekana L, Blaauw D, Balabanova D, Danishevski K, Rahman SA, et al. Health systems factors influencing maternal health services: a four-country comparison. *Health Policy* 2005;73:127-38.
- [10] Alexander S, Wildman K, Zhang W, Langer M, Vutuc C, Lindmark G. Maternal health outcomes in Europe. *Eur J Obstet Gynaecol Reprod Biol* 2003;111:578-87.
- [11] [http://www.who.int/reproductive-health/publications/maternal\\_mortality\\_2000/](http://www.who.int/reproductive-health/publications/maternal_mortality_2000/). Accessed: 10 October 2005.
- [12] Loudon I. Death in childbirth. An international study of maternal care and maternal mortality 1800-1950. Oxford: OUP; 1992.
- [13] Graham WJ. Now or never: the case for measuring maternal mortality. *Lancet* 2002;359:701-4.
- [14] <http://www.unstats.un.org/unsd/mi/pdf/MDG%20Chart%20Sept.pdf>. Accessed: 10 October 2005.
- [15] Graham WJ, Hussein J. The right to count. *Lancet* 2004;363:67-8.
- [16] Van Lerberghe W, De Brouwere V. Of blind alleys and things that have worked: history's lessons on reducing maternal mortality. In: De Brouwere D, Van Lerberghe W, editors. *Safe motherhood strategies: a review of the evidence*. Studies in Health Service Organisation and Policy; 2001. vol. 17, p. 7-34.
- [17] Pakenham-Walsh N, Priestly C, Smith R. Meeting the information needs of health workers in developing countries. *BMJ* 1997;314:90.
- [18] AbouZahr C, Wardlaw T. Maternal mortality at the end of a decade: signs of progress? *Bull World Health Organ* 2001;79.
- [19] Freedman L, Waldman R, de Pinho H, Wirth ME, Chowdhury A, Rosenfield A. Who's got the power? Transforming health systems for women and children. UN Millennium Project. Task force on child health and maternal health. New York: Millennium Project; 2005.
- [20] Berg CJ, Bruce FC, Callaghan WM. From mortality to morbidity: the challenge of the twenty-first century. *JAMA* 2002;287:173-4.
- [21] Reniers G, Araya T, Schaap A, Kumie A, Kebede D, Nagelkerke N, et al. Monitoring cause-specific adult mortality in developing countries: a comparison of data sources for Addis Ababa and its implications for policy and research. *Soc Sci Med* 2005;61:1952-7.
- [22] Graham W, Fitzmaurice AE, Bell JS, Cairns JA. The familial technique for linking maternal death and poverty. *Lancet* 2004;363:23-7.
- [23] Graham W. The global problem of maternal mortality: inequalities and inequities. In: MacLean AB, Neilson JP, editors. *Maternal morbidity and mortality*. London: RCOG; 2002.
- [24] Ministry of Health and Population, Egypt JP. National maternal mortality study 2000, vol. 2. Cairo: MHP; 2001.
- [25] MacKay AP, Rochat R, Smith SC, Berg CJ. The check box Determining pregnancy status to improve maternal mortality surveillance. *Am J Prev Med* 2000;19:35-9.
- [26] Bicego G, Boerma JT, Ronsmans C. The effect of AIDS on maternal mortality in Malawi and Zimbabwe. *AIDS* 2002;16:1078-81.
- [27] Pathmanathan I, Liljestrand J, Martins JM, Rajapaksa LC, Lissner C, de Silva A, et al. Investing in maternal health learning from Malaysia and Sri Lanka. Washington, DC: The World Bank Washington; 2003.
- [28] UNDP. Malaysia - achieving the Millennium Development Goals successes and challenges. Kuala Lumpur: United Nations Country Team; 2005.
- [29] Sivalingam N. Maternal health care at the crossroads. *Med J Malaysia* 2003;58(1):1-4.
- [30] Suleiman AB, Mathews A, Jegasothy R, Ali R, Kandiah N. A strategy for reducing maternal mortality. *Bull World Health Organ* 1999;77:190-3.
- [31] Jegasothy R. Sudden maternal deaths in Malaysia: a case report. *J Obstet Gynaecol Res* 2002;28(4):186-93.
- [32] Ariff KM, Teng CL. Rural health care in Malaysia. *Aust J Rural Health* 2002;10:99-103.