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Full length article

European Board and College of Obstetrics and Gynaecology position statement on maternal mortality surveillance in Europe

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ABSTRACT

Maternal mortality data and review are important indicators of the effectiveness of maternity healthcare systems and an impetus for action. Recently, a rising incidence of maternal mortality in high income countries has been reported. Various publications have raised concern about data collection methods at country level, as this usually relies mainly on national vital statistics. It is therefore essential that the collected data are complete and accurate and conform to international definitions and disease classification. Accurate data and review can only be truly available when an Enhanced Obstetric Surveillance System is in place. EBCOG calls for action by national societies to work closely with their respective ministries of health to ensure that high quality surveillance systems are in place.

Introduction

The death of a woman during pregnancy, childbirth or postpartum is a devastating outcome for any pregnancy and the maternal mortality rate serves as an important reflection of the maternity healthcare standards provided. In most high-income countries, the maternal mortality ratio (MMR) has become very low and appears to have remained stable for many years. The MMR in low-income regions has also gradually come down over the last two decades but remains persistently high [Fig. 1] [1]. On a global level, the highest burden of maternal mortality lies in lower and lower-middle income countries, where almost 95 % of all maternal deaths occur [2]. Even in some high-income countries, an apparent rise has become a matter of concern. In the United States, maternal mortality rates have been reported to have nearly doubled from 17.4 per 100,000 live births [LB] in 2018 to 32.9 in 2020 [3]. Europe has contrastingly seen a gradual fall in MMR from 26 per 100,000 LB in 2000 to 13 in 2020 [Fig. 1] [1]. Continuing MMR surveillance remains an valuable obstetric performance parameter. The importance of maternal healthcare and the efforts to reduce maternal mortality rates worldwide are reflected in the multiple statements and goals set by UN network agencies: “Millenium Development Goals”, “Sustainable Development Goals”, or the “Strategies toward ending preventable maternal mortality” [4,5].

While Europe shows overall low MMR, there is nevertheless a marked variability between the various countries with 2020 rates of 2 per 100,000 LB being reported for Norway and Poland, and 68 per 100,000 LB for Cyprus (Fig. 2) [1]. Continuing national surveillance thus remains important. However, it is important to keep in mind, that when there there is no system of enhanced identification data are less reliable.

Reliability of published statistics

Maternal mortality surveillance data are published by organisations

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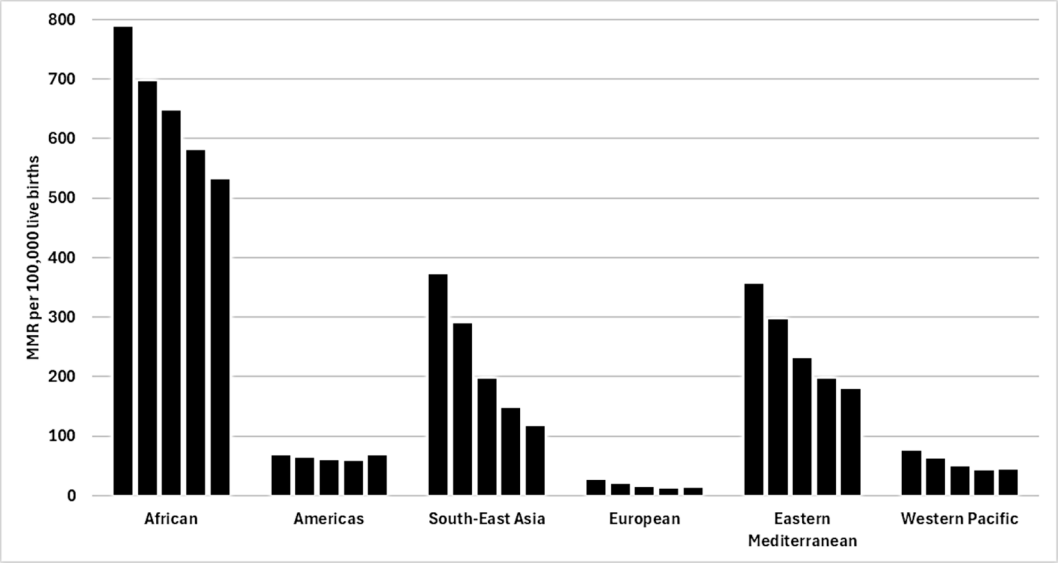

Fig. 1. Trends in Maternal Mortality Rate – WHO Regions, 5-yearly MMR point estimates between 2000–2020 [1].

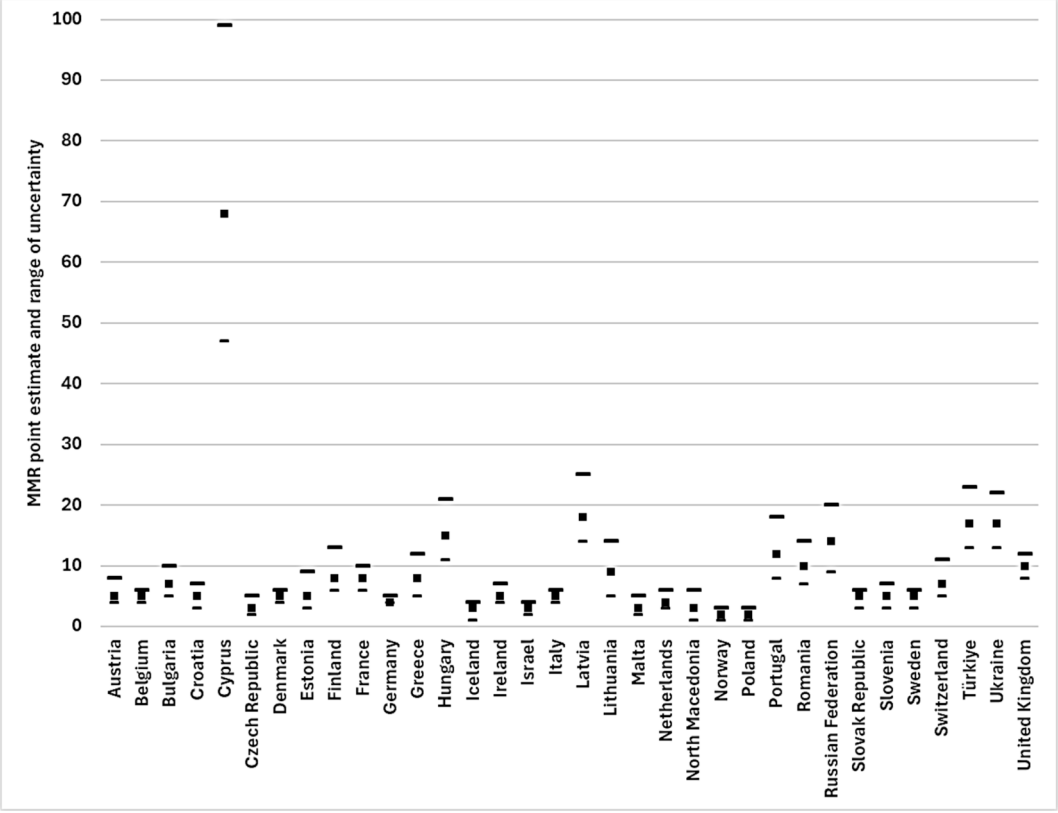

Fig. 2. MMR point estimate and uncertainty range – European Region [1].

and institutes such as the WHO or UNICEF. Many of these data are dependent on national vital statistics data. Even for countries with high quality vital statistics, measuring maternal mortality based solely on the available vital statistics has been shown to be associated with substantial underreporting [6–8]. A recent study comparing maternal mortality ratios between eight European countries with an enhanced obstetric surveillance system (EOSS), showed that vital statistics led to an underreporting of up to 62 % [9].

A full procedure has been in place in the UK since the early 1950s, under the denomination "Confidential Enquiry into Maternal Deaths (**CEMD**)" [10,11]. Other EU countries have followed and have a similar on-going sustainable complete system. From the mid 1990's on, the WHO has developed specific tools for monitoring and action, at present available under the denomination "Maternal Death Surveillance and Response (**MDSR**) [12]" Though the aims of these two approaches are obviously identical, the contents differ in some more technical aspects. In this context, for this paper, we will use solely the term Enhanced Obstetric Surveillance System (EOSS).

It is of utmost importance that each country has a robust system for maternal mortality and ideally also morbidity surveillance, to timely identify changes in trends and to learn from every case of maternal loss and thus prevent future deaths, and in effect, many countries have already installed an enhanced obstetric surveillance system. The present statement will address the quality standards for managing an effective EOSS and provide recommendations for future action.

Enhanced Obstetric Surveillance System (EOSS)

An effective EOSS aims to identify, ascertain, and clinically review all the maternal death cases that have occurred, in a given geographic area, in general a country, be it in a healthcare facility or not. It must also include a system whereby the information collected and reviewed at regional level are brought together and collated on a national level. It is composed of consecutive activities, which will be presented here in three steps.

Step 1. Case ascertainment

To assess the true magnitude of maternal mortality collecting reliable numbers and overcoming underreporting is the first step. An effective EOSS data collection must be based on a cross-linking of multiple data sources that include birth registers, hospital discharge databases, death registers and other relevant sources. Additional cross-checking with national vital statistics should also be performed. Some countries include a pregnancy specific checkbox in the statutory death certificates to easily identify women who during pregnancy, delivery or the puerperium and postnatal period. Clinicians should also be encouraged to actively report every maternal death.

General pitfalls in case ascertainment are related to deaths occurring during the first trimester of pregnancy including those following an early miscarriage, a termination of pregnancy or ectopic pregnancy. Another pitfall influencing national maternal death statistics relates to the definition of what constitutes a maternal death. The WHO defines a "maternal death" as one that arises 'from any cause related to (direct) or aggravated (indirect) by pregnancy or its management (excluding accidental or incidental causes), during pregnancy, childbirth and within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy". However, in high income countries it is desirable that all deaths are collected and analysed, to include two more groups: "coincidental" (not due to or aggravated by pregnancy) and "late" (more than 42 days but less than one year after termination of pregnancy" [13]. These deaths are not always included in maternal mortality surveillance reports. They are however equally important since some diseases may aggravate and lead to death even beyond the arbitrary interval of 42 days postpartum. This becomes even more so in the light of increasing availability of modern life-sustaining procedures and technologies that may enable women to survive adverse outcomes of pregnancy and delivery beyond the arbitrary 42 days postpartum period.

Step 2. Maternal death review

All reported maternal deaths should undergo internal department auditing and for a system to be in place it needs to be followed by an external audit. Every clinician should carry out a review of any cases of maternal deaths with his clinical team so that the adverse episode may serve as a learning experience. The auditors or reviewing committee need full access to anonymized medical reports, and other relevant data such as X-rays or post-mortem reports. Most countries with an effective EOSS have installed a permanent "*maternal mortality audit committee*" consisting of specialist obstetricians and midwifes, as well as other relevant medical specialists such as anaesthesiologists, internal medicine specialist or representative of other specialities whenever needed. Auditing can be considered on a case-base level or be thematic where several maternal deaths caused by a specific complication are reviewed jointly [14,15]. During the auditing process the chain of events is reconstructed and particular attention is given towards the primary cause of death and the standard of quality of care provided.

1. Identification of the primary cause of death: according to the ICD-MM, the underlying cause of death is defined as "the disease or condition that initiated the morbid chain of events leading to death or the circumstances of the accident or violence that produced a fatal injury" [13]. The causes should then be further subdivided into direct, indirect or not-pregnancy related as defined by WHO [13]. Direct maternal deaths are defined as those "resulting from obstetric complications of the pregnant state (pregnancy, labour and puerperium), and from interventions, omissions, incorrect treatment, or from a chain of events resulting from any of the above". Indirect maternal deaths include those maternal deaths "resulting from previous existing disease or disease that developed during pregnancy and not due to direct obstetric causes but were aggravated by the physiologic effects of pregnancy". Non-pregnancy related [or incidental or accidental] deaths should not be included in MMR calculations. The classification of direct and indirect causes of death might seem straight forward, however previous reports have shown that there are differences in the approach used by different data providers to classify maternal deaths [16]. Maternal deaths and late maternal deaths are combined in the 11th revision of the ICD under the new grouping of "comprehensive maternal deaths" [17]. Adherence to this standard classification coding is highly recommended to facilitate intercountry analysis and interpretation.
2. Assessment of the appropriateness of care: the care received by the woman is compared to national guidelines; if no guidelines are available, compared to the best available evidence at the time of death. The quality of care is then represented as "substandard care", "improvable factors in care" or the level of preventability of the death. Utilisation of the WHO classification coding for quality of obstetric care may provide useful insights, to facilitate intercountry analysis and interpretation [18]. Most European countries have national guidelines for obstetrical life-threatening conditions. The European Board and College of Obstetrics and Gynaecology (EBCOG) has also published its recommendations for standards of care for Women's health in Europe that includes useful identifiable pointers of auditable indicators [19].

Step 3. Analysis, interpretation, dissemination, recommendations

Following a systematic auditing of all maternal deaths, usually after collecting a sufficient and representative amount of data, national or regional trends in maternal mortality can become noticeable. Every EOSS and maternal mortality committee should invest sufficient effort and resources towards assessing the MMR, identifying the relevant risk factors and formulating lessons learned from the adverse outcomes. These lessons lead to new recommendations for maternal healthcare, improvement of existing national guidelines and initiate new research. The results of all the above should be collated and published, and thus made available to clinicians, researchers, and policy makers in an effort to ameliorate the maternity healthcare services on offer.

Barriers to reporting

Although an increasing number of European countries have currently installed an Enhanced Obstetric Surveillance System, several factors contribute to the stagnation of effectiveness and development of these systems and thus reduce the potential effectiveness of the EOSS. These factors include underfunding, mainly due to underprioritizing of maternal mortality and morbidity surveillance, and to misunderstanding of the time and resources necessary to implement an efficient EOSS. In addition, given the small absolute numbers of maternal deaths and

Table 1
Further questions before starting on an EOSS.

1	**Systematic process** > sustainability? funding? partnership with government?
2	**Multi-disciplinary** > which professionals? Include lay people?
3	**Anonymous review of all cases in a defined time period and geographical area** > no one feels threatened? count of deaths complete, enhanced? quality of documentation of cases? data on ethnicity and social circumstances?
4	**Identification of the primary cause of death** > consistency? example of suicide could be direct (peripartum psychosis), indirect (postpartum depression in depressed woman), or coincidental?
5	**Appropriateness of care** > reviewers? paired? panel? mixed? electronic? assessment of care against guidelines; which guidelines? if no existing guidelines?
6	**Dissemination and recommendations** > how? priorities? implementation?
7	**Consider possible new epidemiological situations** like the covid epidemic, and how to be able to offer rapid reaction

morbidity or mortality due to rare obstetric diseases, collaboration across borders is of paramount importance to truly assess the import of these conditions on maternal health and wellbeing. The International Network of Obstetric Survey Systems (INOSS) is a collaborative network of many national EOSS. However, international data sharing of anonymous data even in aggregated form is hampered by the different and strict interpretation of the General Data Protection Regulations. Finally, because of the fear that the results of maternal mortality reviewing can form the basis of litigation, there appears to be a defensibly growing reluctance to report maternal deaths. It is therefore important to remember that all activity around maternal death surveillance needs to be performed on a "NO BLAME NO SHAME" basis.

Other challenges to case ascertainment and accurate reporting can arise in circumstances of national emergencies. For example, the COVID-19 pandemic introduced an increase in maternal mortality most obvious in high-income countries and related to the virus and to inadequate availability and preparedness of healthcare professionals [20]. Regional armed conflicts also contribute to a breakdown in obstetric statistics collection systems. [21].

One more issue relates to the increased burden of maternal mortality in women from ethnic minorities and deprived areas. This is consistently observed where such data are available [22,23]. The EOSS therefore needs to collect relevant socio-economic data which will allow to identify the problem and tackle it.

Conclusion

Enhanced obstetric surveillance systems are an indispensable component of quality assessment of maternal health care including in high income countries. High standards of case ascertainment and the reviewing and formulation of lessons learned lead to a better understanding of the events behind every maternal death and thus providing tools to improvements for future healthcare (Table 1). Involvement in the obstetric surveillance process should not only involve healthcare providers, but also the political/governmental authorities who should embrace and support the surveillance system by providing financial support and introducing legislation to protect anonymity and data. Systems must also be in place whereby fear of disciplinary or medico-legal procedures is reduced thus encouraging the healthcare providers to voluntarily come forward to report such cases. Only by ensuring that an effective Enhanced Obstetric Surveillance System is in place, can we ensure an improvement of maternal mortality death mortality numbers.

EBCOG calls for action by all national obstetrical societies within Europe to engage with their own ministries of health to review the current process of collection of data in their countries and put mechanisms in place to enhance the quality of data collection.

EBCOG Council also recommends to the health care planners in the EU to implement a unified system of surveillance to allow comparable data to be collected.

This paper has been endorsed by the European Association of Perinatal Medicine. This paper was approved by the council of EBCOG in May 2024.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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