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Happy Mother's Day? Maternal and neonatal mortality and morbidity in low- and middle-income countries

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At least 800 women die each day during pregnancy or birth and more than 15 000 babies each day are stillborn or die in the first month of life. Almost all of these deaths occur in low- and middle-income countries. Many more women and babies are known to suffer morbidity as a result of pregnancy and childbirth. However, reliable estimates of the burden of physical, psychological and social morbidity and comorbidity during and after pregnancy are not available. Although there is no single intervention or 'magic bullet' that would reduce mortality and improve health, there are evidence-based care packages which are defined and agreed internationally. A functioning health system with care available and accessible for everyone at all times is required to ensure women and babies survive and thrive.

Keywords: Low- and middle-income countries, maternal morbidity, maternal mortality, neonatal morbidity, neonatal mortality

Maternal and perinatal mortality

'No woman should die while giving life.' (United Nations Secretary-General Ban Ki-moon, 2014.)

An estimated 303 000 women die each year because of complications during or after pregnancy and childbirth. In addition, an estimated 2.6 million stillbirths occur.[1]

The neonatal period includes the first 28 d after birth. Globally, an estimated 2.7 million newborn babies die every year. Up to 75% of these occur on the day of birth or within the first week of life. Neonatal deaths account for half of all deaths in children aged under 5 y. For these families there is no Happy Mother's (or Father's) Day.

At least 100 countries do not yet have complete civil and vital registration systems in place.[2] Thus, even in 2019, we still do not have accurate data regarding how many deaths occur exactly; countries rely on modelling or on methods which may provide estimates of deaths that occurred in the past such as the 'sisterhood method'.[3] Burials take place every day but many deaths are not 'counted'. This is referred to as the 'scandal of invisibility'.[4] However, it is clear that almost all of these deaths occur in low- and middle-income countries (LMICs) and/or among those who are poor. Between 1990 and 2015, the global maternal mortality ratio (MMR, the number of deaths per 100 000 live births) decreased by 44%. Despite this progress, the world still fell far short of the Millennium Development Goals (MDGs) target of a 75% reduction in global MMR by 2015. Moreover, there are large geographic inequalities between and within countries. In the USA, for example, a rise in MMR was noted between 1990 and 2015 among poor and ethnic minorities.

There is ample evidence documenting that the vast majority of these deaths could have been prevented if care had been available, accessible and of good quality. The three-delay model has for decades been used to try and explain why mothers and babies die.[5] Much emphasis has been placed on the first delay, namely the failure of women to recognize the need for and then decide to access care; followed by the second delay, delayed arrival at a health facility. New data show that almost one in six households spend on average 10% of their total household budget on health. It is the third delay that we should now be worried about, namely a delay in receiving the right care when women and their babies do attend for care at a healthcare facility.[6,7]

Maternal and neonatal morbidity

The new global strategy for women's, children's and adolescents' health has as a subtitle 'survive, thrive, transform'. This asks for a continued international effort to ensure survival as well as highlighting the need for a refocus on the right to the highest attainable standard of health.[8]

For every maternal death, an estimated 20–30 women experience significant morbidity requiring healthcare. Until now

the focus has been on assessing severe morbidity or life-threatening complications of pregnancy and childbirth.[9]

Health is a state of complete (physical, psychological and social) well-being and not merely the absence of disease or infirmity.[10] A new definition for maternal morbidity is 'any health condition attributed to and/or complicating pregnancy, and childbirth that has a negative impact on the woman's well-being'.[11] Currently, there is a lack of understanding of what type and extent of ill health women suffer during and after pregnancy and to date the burden of maternal morbidity is largely unknown.

A recent study comprehensively measured the burden of maternal morbidity during and after pregnancy in over 11 000 women across four countries (Kenya, Malawi, Pakistan and India) using a standardized approach to assess the physical, psychological and social components of ill health in combination with objective clinical and laboratory measurements, and almost three out of four women had more than one symptom (73.5%), abnormalities on clinical examination (71.3%) or laboratory investigation (73.5%).[12] In total, 9.0% of women had an identified infectious disease (HIV, malaria, syphilis, chest infection or TB), 32.5% had signs of early infection, 47.9% of women were anaemic, 11.5% were diagnosed with other medical or obstetric morbidities, 25.1% of women reported psychological morbidity and 36.6% reported social morbidity (domestic violence and/or substance misuse). Maternal morbidity was not limited to a core 'at-risk' group; only 1.2% of women had a combination of all four morbidities. This study for the first time highlighted a significant burden of ill health during and after pregnancy that has, until now, largely been 'hidden' and/or underestimated.

A continuum of care for mothers and babies

There is plentiful and robust evidence for what type and content of healthcare is needed and how this should be organized. To detect, prevent and manage ill health or complications during pregnancy and childbirth there are well-defined single interventions, which are often combined into care packages (or 'care bundles') that are known to be effective. If in place, these significantly reduce both maternal and perinatal mortality and morbidity. This is called the 'continuum of care' and includes antenatal care, skilled birth attendance, emergency obstetric care, early newborn care and postnatal care.

Good care during and after pregnancy is important for the health of both the mother and the baby. Antenatal care links the woman and her family with the formal health system, has the potential to improve health during pregnancy for both the mother and her unborn baby and increases the probability of the mother receiving skilled birth attendance, essential newborn and postnatal care.

Of 50 interventions identified to be essential for reproductive, maternal, newborn and child health and for which there is evidence of effectiveness, 16 (including the specific components of the antenatal care package) are expected to be implemented as part of antenatal care and 12 are intended to be provided as part of postnatal care.[13]

Antenatal care is considered to be a major success story. More than 80% of women attend for antenatal care on at least one occasion during pregnancy and 64% attend four times or more.[1] However, in reality, in many cases this constitutes a series of 'missed opportunities'.

New guidelines recommend a minimum of eight antenatal care visits or 'contacts', double the four recommended following meta-analysis of seven randomized controlled trials.[14,15] This new recommendation is largely based on an observed association of increased perinatal mortality with fewer visits in a secondary data analysis of one trial.[16] Increasing the frequency of visits without improving the content is, however, unlikely to lead to a 'positive pregnancy experience', and will not result in the identification and management of the health needs of women and their babies and/or in a reduction in perinatal mortality.[17] Antenatal care should include screening for and management of infections such as malaria, HIV, TB and syphilis, screening for and management of pregnancy complications such as pre-eclampsia, anaemia and gestational diabetes as well as assessment of mental and social health. Traditionally, a strong emphasis has been placed on nutritional advice; perhaps more importantly, women should be aware of the signs and symptoms of potentially life-threatening complications and know when and where to seek care for these, as well as where to seek professional care at the time of birth.

Currently, only 48% of women and babies globally receive postnatal care.[18] Care in the period following birth is critical not only for survival but also for the future health and development of both the mother and her baby. An important challenge in the postpartum period is providing support for family planning to address a largely unmet need for contraception that can prevent millions of unintended, untimely and unwanted pregnancies.

Antenatal and postnatal care are important opportunities to provide integrated care, i.e. inclusive of the recognition and management of malaria, HIV/AIDS and TB and the provision of 'routine' obstetric care.[12,17,19] This should be provided all together at each healthcare facility visit rather than a woman having to attend different clinics at different times for each one of these conditions (the vertical approach). Often an antenatal care visit is a woman's (and her family's) first encounter with the formal health system. By providing a comprehensive disease prevention approach, integrated antenatal and postnatal care platforms can help accelerate progress towards reduction of the global burden of disease attributed to malaria, HIV/AIDS, TB and syphilis. This will require researchers, programmers and certainly also funders to move away from 'single disease' programmes and approaches. Increasingly, it is being acknowledged that antenatal and postnatal care should be differentiated, i.e. meeting the specific health needs of mothers and their unborn babies, with rapid point-of-care tests available; syndromic approaches to detect morbidity—as is still the approach in many settings, including for syphilis and other sexually transmitted infections and for anaemia—should be abolished. A 'blanket' approach is no longer needed and does not work. New tools and approaches are available and we can do a better job.

Care at birth—the 'triple return'

'A skilled birth attendant is an accredited health professional—such as a midwife, doctor or nurse—who has been educated

and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns.'[20]

Skilled attendance at birth is the first of three coverage indicators used to assess progress against the Sustainable Development Goals targets for maternal and newborn health. Skilled birth attendance has two key components, a skilled attendant and an enabling environment. The enabling environment includes equipment, supplies, drugs, transport, referral, regulatory frameworks and policies cited as components.[21]

Latest estimates show that globally 78% of births are attended by skilled health personnel; this ranges from 54% in the African region to 99% in the European region.[1] Despite the heavy reliance on the proportion of births attended by a skilled attendant as the key indicator for measuring progress towards the achievement of MDG 5, there was little consistency in how this was monitored and evaluated in the various country settings. A variety of cadres of staff in LMICs are expected to provide skilled attendance at birth.[22,23]

The *State of the World's Midwifery 2014* defines midwifery as 'the health services and health workforce needed to support and care for women and babies, including sexual and reproductive health and especially pregnancy, labour and postnatal care. This includes a full package of sexual and reproductive health services, including preventing mother-to-child transmission of HIV, preventing and treating sexually transmitted infections and HIV, preventing unwanted pregnancy, dealing with the consequences of unsafe abortion and providing safe abortion in circumstances where it is not against the law.'[24] This definition is wider than, for example, the Medical Subject Headings definition, introduced in 1966, which simplifies midwifery to 'the practice of assisting women in childbirth' (https://www.ncbi.nlm.nih.gov/mesh). The majority of LMICs are endeavouring to expand and deliver equitable midwifery services.

Internationally, there has been a lot of debate regarding the terminology used and scope of practice of a 'skilled birth attendant'. This has often been based largely on models of care in high income settings and the debate surrounding the terminology to be used has not always been helpful.

A care package required to treat complications that arise from pregnancy and childbirth is collectively known as emergency obstetric care (EmOC). Basic EmOC includes administration of parenteral antibiotics, uterotonic drugs and parenteral anticonvulsants, manual removal of placenta, removal of retained products, performance of assisted vaginal delivery and neonatal resuscitation. At a higher level of care, comprehensive EmOC includes all basic EmOC interventions plus blood transfusion and caesarean section services.[25]

EmOC is an evidence-based care package designed to save lives and reduce preventable maternal and neonatal mortality and morbidity and stillbirths. It should be in place everywhere and for everyone; minimum coverage rates have long been agreed.

However, studies show that in many LMICs EmOC is not available, or is only available in parts. Distribution of healthcare facilities able to provide EmOC is geographically inequitable and the quality of EmOC is often substandard.[26–28]

Quality of care—a renewed focus

'The question should not be why do women not accept the service we offer, but, why do we not offer a service that women will accept.' (Professor Mahmoud Fathalla, 1998.)

Quality of care is defined as the extent to which health services provided to individuals and populations improve desired health outcomes. In order to achieve this, healthcare needs to be safe, effective, timely, efficient, equitable and people-centred.[29]

Although progress has been made with regard to increasing the coverage of maternal and newborn health interventions over the past two decades, there is increasing recognition that further improvement in maternal and newborn health outcomes will depend on the ability to address the gap between coverage and quality. Poor quality care is now a bigger barrier to reducing mortality and morbidity than insufficient access.[30] A woman's relationship with her healthcare provider during and after pregnancy and childbirth are very important, not only with regard to meeting her and her baby's health needs, but also with regard to ensuring this is a positive and empowering experience for both the woman and her healthcare provider.[31–34] The maternity charter developed by the White Ribbon Alliance sets out the rights of childbearing women and discusses how these can and must be addressed.[35] Many LMICs have signed up to the network to improve quality of care for maternal, newborn and child health, calling for leadership, action learning and accountability.[36,37]

There are a variety of methods to improve quality of care that are already accepted and used in maternal and newborn health. These include conducting maternal mortality and perinatal death audit or review, 'near-miss' and standards-based audit. All three types of audit essentially ask the questions of what was done well, what was not done well and how can care be improved in future.[38,39]

Maternal and perinatal surveillance and review is ongoing in many LMICs and requires support for continued and improved implementation.[40] Generic standards for the benchmarking of quality of maternal newborn and child healthcare were developed by a multidisciplinary group of stakeholders.[41] These can be adopted and adapted by countries and can be used as the basis for standards-based audit, a participatory learning cycle where action is taken to improve compliance with agreed standards of care.

Improving the quality of facility-based healthcare services and making quality an integral component of the scaling up of interventions that are known to be effective is crucial if health outcomes for mothers and babies are to improve. This requires a renewed global focus and action.

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