

Ending Preventable Maternal and Newborn Mortality and Stillbirths Effective interventions and strategies¹

Technical paper to inform an updated Global Strategy for Women and Children's Health

ABSTRACT

Each day 800 women and 7,700 newborns die from complications during pregnancy, childbirth and other neonatal causes. In addition, 7,300 women experience a stillbirth. Evidence-based solutions exist to prevent these deaths. The Millennium Development Goals (MDGs), which called for a 75% reduction in maternal mortality and a two-third reduction in under-5 mortality, demonstrated that ambitious targets can focus attention, funding, and multi-sectoral engagement to accelerated progress towards achieving those targets. At the close of the MDGs and on the cusp of the Sustainable Development Goals (SDGs), “a grand convergence” is within our reach. Through concerted efforts we can eliminate wide disparities in current maternal and neonatal mortality and reduce the highest levels of these deaths worldwide. In particular, investing in improved access and quality of care around childbirth can generate a triple return on investment by saving maternal and newborn lives and preventing stillbirths and disability. This paper draws upon the Every Newborn Action Plan (ENAP) and Ending Preventable Maternal Mortality (EPMM) plans, which aim to catalyze the necessary actions to address the unfinished MDG agenda by ending preventable mortality within a generation. The EPMM and ENAP targets are: an average global target of Maternal Mortality Ratio (MMR) of less than 70 maternal deaths per 100,000 live births by 2030; a national target for Neonatal Mortality Rate of 12 per 1000 live births and stillbirth rate of 12 per 1000 total births by 2030. Here, we present the principles and strategic objectives which support the UN Secretary General's effort to develop a new Global Strategy for Women's Children's and Adolescent's Health.

I. INTRODUCTION

Despite remarkable achievements towards the Millennium Development Goals (MDGs) for maternal and child survival, *each day* 800 women and 7,700 newborns still die from complications occurring during pregnancy, childbirth, postpartum and the neonatal periods. In addition, 7,300 women experience a stillbirth. Feasible, evidence-based solutions exist to prevent these deaths¹.

This paper considers essential interventions and current strategic priorities to prevent maternal and newborn deaths and stillbirths, and promote their health and well-being. It supports the UN Secretary General's effort to develop a new Global Strategy for Women's, Children's and Adolescents' Health that will fit the Sustainable Development Goals (SDGs) and provides strategic directions.

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II. PROBLEM STATEMENT

As the MDG era ends, maternal mortality has seen a 45% decline, from an estimated 523 000 in 1990 to 289 000 in 2013. While this is noteworthy, it falls well short of the MDG target of 75% reduction. Obstetric causes, notably, hemorrhage (27%), hypertensive diseases of pregnancy (14%), and sepsis (11%), continue to account for a large proportion of maternal deaths.ⁱⁱ Increasingly, however, maternal deaths are attributed to other medical conditions that can be worsened by pregnancy, such as diabetes, HIV, malaria, cardiac conditions and obesity (Figure 1).

Since 1990, there has been slower progress in reducing newborn mortality compared with overall under-5 mortality. As a result, the proportion of newborn mortality now accounts for 44% of all under-5 child deaths globally, up from 37% in 1990. In 2013, about 2.8 million newborns died, a decline of 39% since 1990. Almost 80% of mortality occurs among low birth weight babies (weighing less than 2500 grams at birth), two-thirds due to preterm birth.ⁱⁱⁱ Preterm birth, intrapartum-related causes and severe infections are the leading direct causes of neonatal deaths (Figure 1).

Stillbirths have received the least attention and rates have only declined 15% since 1995 with an estimated 2.64 million stillbirths globally.^{iv} Tragically, 40% of stillbirths – 1.2 million a year- occur intrapartum, among babies who were alive at the onset of labour but died as a consequence of inappropriate care.^v In addition to prolonged and obstructed labor, untreated infections such as syphilis are an important cause of stillbirths in low-resource settings.^{vi}

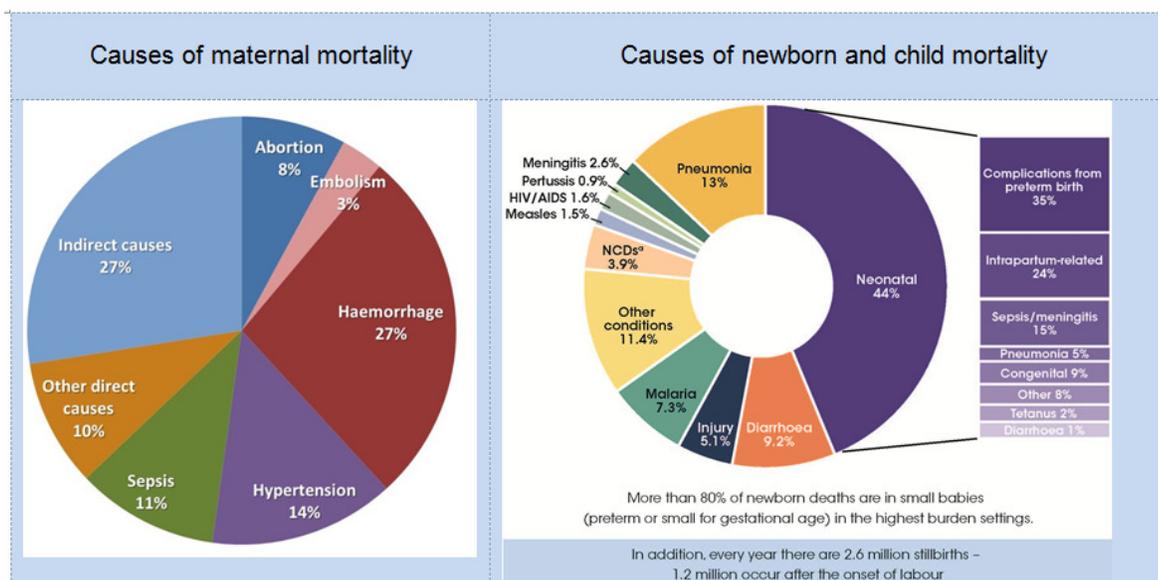


Figure 1: Causes of maternal^{vii}, newborn and child^{viii} mortality

Morbidities also deserve attention as they represent a big burden and can largely be prevented by adequate care. At least four million term or near-term neonates each year are estimated to have life-threatening conditions, including intrapartum-related brain injury, severe bacterial infection and pathological jaundice, which result in life-long impairments and 15 million babies born too soon (preterm) account for more disability adjusted life years (DALYs) than HIV/AIDS.^{ix} For women, morbidities and disabilities can result from complications or aggravation of disease during pregnancy and childbirth. While the true burden is poorly understood, with declining maternal deaths, the proportion of severe “near-miss” cases and other morbidities can only be expected to rise.^{xxi} Continued attention to prevention and management of chronic conditions is needed to improve the lives of affected women and children, challenging health systems accustomed to providing emergency, acute care.

The health of childbearing women and newborns is inextricably linked and calls for integrated care during pregnancy, childbirth and in the postnatal period. Essential interventions are available and feasible for scale-up, including in settings that are resource constrained. The MDGs demonstrated that the global community can set ambitious targets and work together over a sustained period of time to accelerate progress towards those targets. Analyses suggest that “a grand convergence” is within our reach, when through concerted efforts we can eliminate wide disparities in current maternal and neonatal mortality and reduce the highest levels of these deaths worldwide - both within and between countries - to the rates now observed in the best-performing middle-income countries.^{xii}

III. RESPONSE AND PRIORITY INTERVENTIONS

This paper draws upon the Every Newborn Action Plan (ENAP)^{xiii} and the Ending Preventable Maternal Mortality (EPMM) plan,^{xiv} which aim to catalyze the necessary actions to address the unfinished agenda of ending preventable mortality within a generation. The aim of this paper is to bring together ENAP and EPMM targets, their guiding principles and strategic objectives.

Methodology

Both plans are based on scientific and empirical evidence and have been endorsed by Members States including at the 67th World Health Assembly in 2014.^{xv} The ENAP content was based on *The Lancet* Every Newborn Series^{xvi} with data and evidence shaped by systematic reviews. Both ENAP and EPMM underwent wide expert consultation with inputs from national, regional and global meetings as well as an official online consultation. Details of these consultation processes are available in these strategies.^{xvii xviii} A complete review and mapping of EPMM and ENAP was undertaken to identify the overlapping elements as well as distinctions to unite these strategies for integrated action in countries.

Targets

The EPMM and ENAP set targets to end preventable maternal and newborn mortality and stillbirths to be achieved by 2030, i.e., within a generation.

EPMM and ENAP country targets:

- By 2030, every country should reduce its maternal mortality ratio (MMR) (number of deaths per 100,000 live births) by at least 2/3 from 2010 baseline level, and no country should have an MMR greater than 140 deaths per 100,000 live births, a number twice the global target
- By 2030, every country should have a national neonatal mortality rate of 12 or less per 1000 live births and a stillbirths rate of 12 or less per 1000 total births

EPMM and ENAP global averages as result of national reduction:

- Average global target of MMR of less than 70 maternal deaths per 100,000 live births by 2030.
- Average global Neonatal Mortality Rate of 9 per 1000 live births and stillbirth rate of 9 per 1000 total births by 2030.

A key requirement to reach these targets is the focus needed by all countries on addressing inequalities and continue to close equity gaps within their populations.

Priority interventions

In order to achieve these targets, essential interventions as presented in Figure 3 have to be implemented at scale, to reach every woman and every newborn. The list is not exhaustive but it does prioritize interventions that will have a significant impact on maternal and newborn survival by addressing the main causes of mortality, and that can be delivered through the health sector, from the community up to the referral level of service provision^{xxi}. They have been identified based on evidence of their effectiveness^{xx} and packaged according to feasible levels of delivery in the health system^{xxi}. Investing in the implementation of these interventions gives triple return; care around the time of birth saves mothers, their newborn babies and prevents stillbirths and disability. Interventions delivered around the time of birth have the greatest potential (41% of deaths averted), followed by care of small and ill newborn babies (30%). Meeting unmet need for family planning with modern contraceptives could halve the numbers of neonatal deaths and stillbirths.^{xxii}

First and secondary health facilities	Family planning/contraception Prevention/management of STIs, HIV and malaria Tetanus immunization Nutritional counseling/Supplementation FGR management Chronic disease management	Management of preterm labour including antenatal steroids, antibiotics for pPROM Skilled birth attendance and basic obstetric care Clean birth practices Emergency obstetric care if needed Induction of Labour >41 weeks	Immediate newborn care (stimulation, warmth, breastfeeding) Neonatal Resuscitation Extra care of sick/preterm newborn - warmth, KMC, feeding/fluids, oxygen, management of neonatal jaundice Emergency care - CPAP/IPPV and surfactant for RDS Management of severe neonatal infections	Hospital care of childhood illness including HIV
	Family planning /contraception ANC Visits Prevention and management of STIs, HIV and malaria Tetanus Immunization Nutritional counseling/Supplementation Diagnosis and treatment of maternal chronic conditions	Skilled birth attendance and basic obstetric care Clean birth practices Emergency obstetric care if needed Referral and transport	Promotion of healthy behaviours e.g. hygiene, breastfeeding, warmth Neonatal Resuscitation Extra care of at risk babies - KMC, warmth, feeding support/ IV fluids, oxygen provision Management of neonatal jaundice Infection prevention/management Early detection & referral for severe illness	Immunizations, Nutrition Malaria (IPTi and bednets) Care of children with HIV First level care of childhood illness (IMCI) Diagnosis and treatment of disability Infection prevention/management Early detection & referral for severe illness
Community	Adolescent and pre-pregnancy health and nutrition Community-based distribution of contraceptives Prevention of STIs and HIV Prevention of FGM and gender violence Nutritional counseling/Supplementation	Counseling & preparation for safe birth and newborn care Emergency preparedness including transport Skilled birth attendance Where skilled care is not available, consider clean birth practices	Healthy home care including: Promoting preventive newborn care (hygiene, warmth), Early initiation and exclusive breastfeeding Seeking curative services for infections and other illnesses Referrals where required	Seeking curative services for children including oral rehydration solution for diarrhoea, case management for pneumonia, malaria and other illnesses Referrals where required
INTERSECTORAL Improved living and working conditions including housing, water and sanitation, and nutrition; Education and empowerment especially of girls; folic acid fortification; safe and healthy work environments for women and pregnant women				
	Pre-pregnancy/pregnancy	Labour and childbirth	Newborn	Child

Figure 2: Essential Interventions - from before conception through the postnatal period, and by level of care setting^{xxiii}

Strategic objectives for effective implementation

Maternal deaths and morbidities impact newborn and child survival, growth, and development. Likewise, improved child survival in countries is closely linked to declining fertility and thus, reduced complications of frequent pregnancies. Therefore, an integral part of any reproductive, maternal and newborn health strategy must be to protect and support the mother-baby health together and to encourage the integration of strategies and service delivery for both. Country planning for maternal and newborn health and survival and stillbirths in the post-2015 agenda must rest on a strong foundation of implementation effectiveness, which marries a well-considered strategic policy framework with a ground-up focus on implementation performance. Contextual factors, health system dynamics, and social determinants of health must also be considered. It is within this remit that the guiding principles and strategic objectives from the ENAP and EPMM action plans have been merged and condensed below, with reference to each full plan.

STRATEGIC OBJECTIVE 1: Engage in data-driven country analysis to effectively address all causes of death, morbidities, disability and foster country leadership

Changing population demographics and burden of disease impact the epidemiology of risk in countries and influence the strategies they implement to end preventable maternal and newborn deaths and stillbirths. The “obstetric transition” concept was adapted from classic models of epidemiologic transition and shows the evolution of causes of maternal death experienced as countries progress along a trajectory toward development. For newborn health, epidemiological analysis of causes of deaths in countries at various levels of mortality has shown that, across lowering rates, the relative contributions of prematurity and congenital conditions increased while the contribution of newborn infections and intrapartum complications (birth asphyxia) reduced.^{xxiv} There is a need for country-led, context specific planning that accounts for both immediate priorities and projects future needs as countries move toward ending preventable mortality, and also consider outcomes beyond mortality, including child development.

STRATEGIC OBJECTIVE 2: Strengthen and invest in care during pregnancy, labour, birth and the first day and week of life, ensuring full integration of maternal and newborn care

The greatest risk of death for mothers and their babies is during labour, childbirth and the first week following birth. Therefore, investing in improved access and quality of care around this time is a smart strategy that can generate a triple return on investment by saving maternal and newborn lives and preventing stillbirths and disability. Of the 3 million lives of women, newborns and stillbirths that could be saved each year with universal coverage of high impact interventions, almost 2 million are around the time of birth (Figure 3). Although globally the proportion of women giving birth with a skilled attendant (physician, nurse or midwife) has increased to 70%, great disparities in coverage and quality of care exist between and within countries. Highlighting the importance of care around the time of birth and in the first week of life does not imply that care across the reproductive health and childbearing continuum is not important. Access to high-quality contraception, family planning, postpartum and post-abortion care is critical. Family planning can prevent closely spaced and ill-timed pregnancies and births, which contribute to infant mortality and by reducing rates of unintended pregnancy, the need for unsafe abortion is also reduced, as these also contribute significantly to the reduction of maternal deaths and reaching the highest attainable level of health.^{xxv}

STRATEGIC OBJECTIVE 3: Focus on improving quality of care

In spite of progress to increase the coverage of births with a skilled attendant, declines in maternal and newborn mortality associated with skilled birth attendance alone have been modest, and for stillbirths they have been virtually non-existent^{xxvi xxvii xxviii}. Quality care during childbirth, focusing on monitoring labor and managing complications, dramatically reduces the chance of stillbirth or death or disability for both the mother and newborn. Quality improvement efforts to achieve optimal outcomes should aim for health care that is safe, effective, timely, efficient, equitable, people-centered^{xxix} and respectful. In addition to ensuring the provision of appropriate care, the women’s experience is crucial.

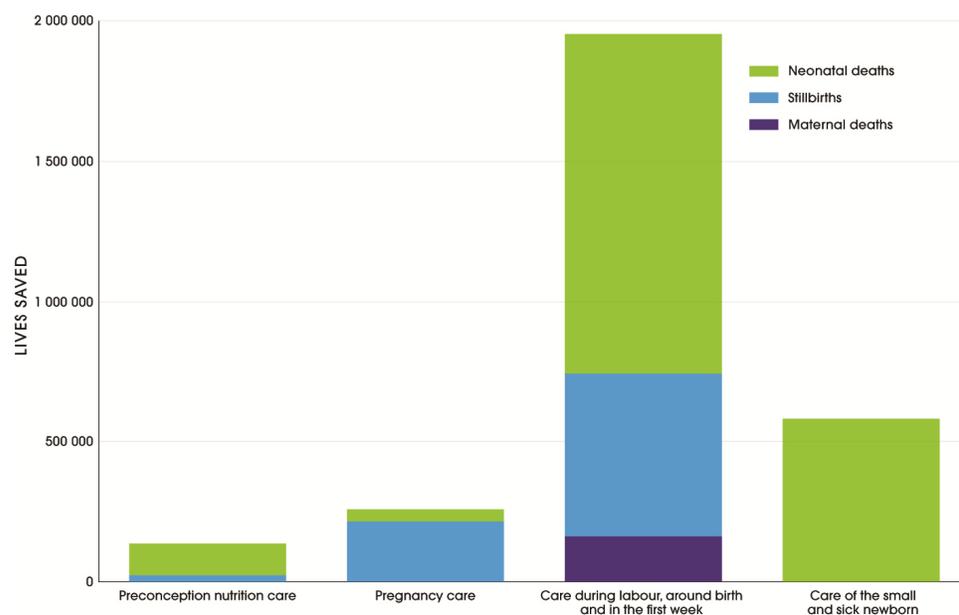


Figure 3: Impact of intervention packages by time period^{xxx}

STRATEGIC OBJECTIVE 4: Strengthen health systems — health work force, commodities, innovation

Health system strengthening for maternal and newborn survival must include both the hardware - such as ensuring the availability of essential health infrastructure, amenities, and commodities - and the software, including attention to organizational development and management, improving health information and transparency and countering corruption, supporting innovation and private-public partnerships, ensuring mechanisms for participation and community engagement, and prioritizing respectful care norms and values.^{xxxi}

Among the high burden countries, 38 face critical imbalances and acute shortages in health provider availability. Evidence suggests that 87% of essential maternal and newborn health care services can be provided by midwives, yielding a 16-fold return on investment.^{xxxii} Similarly, availability of life-saving commodities can be a major bottleneck to provision of quality of care calling for investment in supply and demand side strategies.

A myriad of challenges constrain equitable health system delivery of essential, quality interventions to populations in need. In response, innovations such as digital health systems (including mHealth) can provide solutions to strengthen health systems, increase the quality and coverage of essential health interventions, reduce barriers to

health access and enhance the potential for universal health coverage, while collecting data to improve monitoring and evaluation. While these “hi-tech” solutions have emerged, products under design and testing such as the Odon Device and re-packaging/alternative routes of oxytocin drug delivery, or simplified resuscitation devices offer innovative thinking to solve age-old problems, addressing bottlenecks in health care provision.

STRATEGIC OBJECTIVE 5: Reach every woman and every newborn and address inequities in the context of a human rights approach

Ensuring equity is a fundamental human rights-based priority. Programme planners need to better understand barriers to access – financial, legal, gender, age, cultural, geographic, or based on fear of disrespectful care – and factors, including values and preferences, that make care acceptable to all who need it and encourage sustained demand at scale. Recognizing that inequity in maternal and newborn health includes systematically uneven quality and not just access, efforts must also ensure that the care that all populations receive high quality care, not just urban or richer families.

Costs of health services can present an important barrier to families seeking care during pregnancy, childbirth and in the postnatal period. Up to 11% of the population in some countries incur high costs in paying for health care, with as many as 5% forced into poverty because of health care-related expenditure, including costs associated with essential maternal and newborn care.^{xxxiii} Universal health coverage for maternal and newborn healthcare encompasses two equally important dimensions: reaching all people in the population with essential services, and protecting them from financial hardship due to the cost of these services. Performance-based financial incentives have the potential to improve quality of services while conditional cash transfers have been shown to increase demand. To achieve universal coverage implies an imperative to prioritize adequate and sustainable resources for maternal and newborn health, by political leaders and financial decision makers in countries and development partners and donors in the global community.

Because motherhood is specific to women, issues of gender equality and empowerment of women and girls are central to a rights-based approach to maternal and newborn health and survival. Gender-based violence is widespread and its adverse consequences include unwanted pregnancies, pregnancy complications including low birth weight and miscarriage, injury and maternal death, and sexually transmitted infections, such as HIV/AIDS.^{xxxiv} Strategies for empowering women in the context of their reproductive and maternal healthcare must ensure they not only have the power of decision making including in deciding whether or not and when to get pregnant and the number of children she wishes to have, and also the availability of options that allow them to exercise their choices.

STRATEGIC OBJECTIVE 6: Harness power of parents, families and communities and engage with civil society

Families are at the forefront of providing care for women and newborns, and men also play an important role in safe-guarding family health. Parents are important voices for change and shifting social norms. Evidence shows that implementation of community mobilization through facilitated participatory learning and action cycles with women’s groups is beneficial to improve maternal and newborn health, in particular in rural settings with low access to health services.^{xxxv} Community health workers, if trained to proficiency, can assist families in strengthening caregiving practices and facilitate appropriate care seeking. Within the remit of community engagement, civil society organizations can contribute significantly to social mobilization and hold governments and health services to account. Participatory mechanisms at every level of the health system can help ensure that services are responsive to community needs and demands, and are transparent and inclusive.

STRATEGIC OBJECTIVE 7: Count every woman, newborn and stillbirth: strengthen measurement capacity and improve data quality to drive improvement and accountability

The establishment of effective national registration and vital statistics systems in every country is essential for counting births and deaths and tracking progress^{xxxvi}. Vital statistics provide indispensable information for policy-making and planning and fulfill the right of every woman and child to be counted. In 2012, about one third of 137 million births globally and nearly all neonatal deaths and stillbirths went unregistered, while an estimated one third of countries have high quality registration of maternal or neonatal deaths or stillbirths. Accurate documentation of the *cause* of death through registration or special review/surveillance mechanisms is critical to address preventable causes of mortality.^{xxxvii} Many countries are currently strengthening maternal death surveillance and response as a foundation for improving quality of care and measurement. Today, estimation is necessary to infer maternal mortality ratios in many countries where little or no data are available; unfortunately, these countries are the very ones where mortality and severe morbidity are often highest due to weak health infrastructure.

Indicators need to be developed to assess coverage and quality of essential interventions including for management of life-threatening maternal and newborn complications. Countries and development partners need to invest more in measurement of population coverage as well as quality of care and equity. In addition to standardized data sources, indicators, and intervals for data collection to allow for better global comparisons, the local use of data for ensuring quality of care in clinical programmes is an important component of program effectiveness. New technologies for data collection (e.g., mapping, mobile phones) could speed up data collection to allow effective, real-time use.

IV. CONCLUSION

As the post-2015 sustainable development agenda emerges, it is vital that the vision of healthy societies, in which childbirth is celebrated and women and adolescent girls, newborns and children all thrive, is at the heart of that ambition. The transformation towards the “grand convergence” between the world’s poorest and richest countries in terms of mortality and morbidity levels depends heavily on accelerated progress towards ending maternal and newborn deaths and stillbirths. The SDGs provide a holistic framework for advancing the health of women and children. However, because of their comprehensiveness, it also remains essential to focus. The detailed strategic guidance that EPMM and ENAP provide, including specific targets and milestones, should have a critical place in the formulation of national health plans and their funding. Now is the time for the global health community to prioritize this unfinished agenda for women’s and children’s health and stand firm in the unacceptability of these daily losses to families, communities, economies and nations.

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