**Quality maternity care for every woman, everywhere: A call to action**

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**Authors’ contributions**

MK conceptualized the paper and worked closely with CAM, SH, AL, AF, LH, NK, ACM, CC and OMRC on the first draft. CAM provided valuable editorial and technical inputs; LM helped with conceptualization of the priorities and editorial support; and OMRC and CC provided continuous support, both editorial and technical. All authors (MK, CAM, CC, JC, OMRC, ABF, WJG, LH, SH, ZM, LM, ACM, AKN, and AL) contributed draft sections of the paper, provided input to its overall direction and content, and reviewed each draft of the paper.

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**Abstract:** (391 words)

Millennium Development Goal (MDG) 5, with its target of reducing maternal mortality by 75%, was not achieved. High numbers of maternal and newborn deaths and morbidities persist in spite of progress in the utilization of maternity services. This mismatch between burden and coverage exposes a crucial gap in quality of care. In parallel, there are millions of pregnant women and adolescents who are outside the health system – *left behind* from the progress in coverage. This vulnerable population faces multiple challenges arising from their individual circumstances. To improve maternal health requires action on two parallel streams: ensuring the quality of maternal health care for all women and girls, and secondly, guaranteeing access to care for those left behind—the most vulnerable. Poor quality care and inaccessible care exist everywhere, affecting women in all countries, whether, middle or high-income.

As the final article in a series of six papers focused on maternal health, this paper highlights some of the most pressing issues in maternal health and asks the following questions: What steps can we take in the next five years to catalyze action toward achieving the Sustainable Development Goal target of less than 70 maternal deaths per 100,000 live births by 2030, with no single country exceeding 140? What steps can we take to ensure that high quality maternal health care is prioritized for every woman and girl everywhere, supporting the vision of the *Global Strategy for Women’s, Children’s and Adolescent Health*?

This paper calls on all stakeholders to work together in securing a healthy, prosperous future for every woman, everywhere. National and local governments must be supported by development partners, civil society and the private sector in leading efforts to improve maternal-perinatal health. This means dedicating needed policies and resources, and sustaining implementation to address the many factors influencing maternal healthcare provision and use. Drawing on the findings of this series, the following priority actions emerge for all partners:

**Priority 1:** Prioritie quality maternal health services that respond to the local specificities of need, and meet emerging challenges

**Priority 2:** Promote equity through universal coverage of quality maternal health services, including for the most vulnerable women

**Priority 3:** Increase the resilience and strength of health systems by optimizing the health workforce and improving facility capability

**Priority 4:** Guarantee sustainable financing for maternal-perinatal health

**Priority 5:** Accelerate progress through evidence, advocacy, and accountability.

**Introduction** (6182 words)

# Globally, the maternal mortality ratio (MMR) nearly halved between 1990 and 2015. Progress, however, was patchy, with only nine countries with an initial MMR greater than 100 achieving Millennium Development Goal 5a target of 75% reduction.1 Twenty-six countries made “no progress”, and in 12 countries – including the United States –MMRs increased.1 A woman’s lifetime risk of dying as a result of pregnancy and childbirth remains more than 100 times higher in sub-Saharan Africa than in high-income countries (HICs).1 Newborn deaths have also declined at a slower rate than those of older infants and children, and stillbirths remain high.2-4

Yet maternity service utilization has increased significantly in the 10 years since the 2006 Lancet Maternal Health Series: globally, three-quarters of women now deliver with a skilled birth attendant (SBA) and two-thirds receive at least four antenatal care (ANC) visits.5, 6 This mismatch between burden and coverage exposes a crucial gap in quality of care. Millions of women receive services that are delayed, inadequate, unnecessary or harmful,7-9 minimizing the opportunity for health gains for both mothers and babies.

In parallel to the women accessing services but receiving poor quality care, millions of women and adolescents who undertake their journey through pregnancy and childbirth outside the health systemare *left behind* from the progress in coverage. They represent a vulnerable population facing multiple challenges arising from their individual circumstances. Statistics show a growing divergence within and between countries in coverage of maternity services for women , mirrored by a doubling of the gap in levels of maternal mortality between the best and worst performing countries in the past 20 years.10

The dual streams of poor quality or inaccessible care co-exist everywhere – a universality that spans low-, middle- and high-income countries, including fragile and conflict-affected nations, and those considered economically and politically stable. Every woman, everywhere, has a right to access quality maternity services, and the benefits of such access extend to the fetus, newborns, children and adolescents. Effectively addressing maternal health requires integrated programming that appreciates these inextricable linkages, and connections with the broader social and political context in which women live (See Supplemental Figure 1). The breadth and complexity of such linkages are reflected across the Lancet or other series on stillbirths, newborns, midwifery, and adolescent health, among others.

As the final article in a series of six papers focused on maternal health, this paper highlights the most pressing issues in maternal health and asks two questions: In the next five years, how can we catalyze action to achieve the Sustainable Development Goal (SDG) target of a global MMR below 70 maternal deaths per 100,000 live births by 2030, with no single country having an MMR greater than 140? What steps can we take to ensure that high quality maternal health care is prioritized for every woman (including adolescents) and baby everywhere, supporting the vision of the *Global Strategy for Women’s, Children’s and Adolescent Health*?

We consulted experts, reviewed the literature, and carefully analyzed the five papers of this Series; our overall themes are that to improve maternal health we must ensure the quality of maternal health care for all women and adolescents, and guarantee access to care for those left behind, the most vulnerable. These two themes underlie the priority areas for action in Box 1:

# Priority 1: Prioritise quality maternal health services that respond to the local specificities of need, and meet emerging challenges

## Priority Action 1.1: Ensure timely, equitable, respectful, evidence-based and safe maternal-perinatal health care, delivered through context-appropriate implementation strategies

Prevention of unwanted or poorly timed pregnancy is the first step: ensuring access to modern contraceptives for all women and adolescents, everywhere, could reduce maternal deaths by an estimated 29%.11 In 2015, 12% of women had unmet need for contraceptives,12 and approximately 7.9% of maternal deaths were attributed to unsafe abortion.13 Safe abortion services are also important.

For pregnant women continuing to term, Souza’s obstetric transition14 extends the concept of the demographic and epidemiological transitions to maternal health, and helps stage appropriate intervention priorities. Table 1 presents settings in five phases from high fertility and maternal mortality, to low fertility and mortality. Across settings corresponding to stages I-III (MMR>70), gaps in access remain, and direct causes of maternal death predominate although indirect causes, particularly infections, may be present. In stages IV and V with MMRs<70, nearly all women access services, and indirect causes of death are substantial. In all stages, “effective quality coverage” is the goal: the right care, tailored to the local burden of illness, received by the right women at the right time, in a respectful manner.8, 10

Where women reach maternity care services, timeliness, quality and over-intervention need to be addressed.7, 9 High effective coverage of known interventions, particularly for vulnerable populations (Figure 1) e.g. use of appropriate uterotonic drugs for prevention of postpartum hemorrhage,15 antibiotics for sepsis, and preventive interventions for anemia16), could dramatically decrease maternal deaths17, 18,19 and improve perinatal outcomes .20 In later stages of the obstetric transition, routine labor augmentation21 and excessive caesarean delivery22-25 emerge as negative unintended consequences of wide access to facility delivery.7, 9 An effective national strategy should also attend to iatrogenic outcomes arising from poor quality care and over-intervention.7, 9

There are sound recommendations on the content of care and guidelines for implementation throughout the pregnancy-post-partum continuum.7-9, 26, 27 Adherence to high-quality clinical practice guidelines, when combined with simulation-based training, can improve providers’ knowledge, clinical skills, attitudes28 and women-centered approaches.29,30

While global recommendations for the content of care are valuable, it is inappropriate to make standardized global prescriptions for implementation strategies.8 Both health systems and maternity care models vary within and between countries, so there is no simple “one-size-fits-all” solution. Providing maternity care in a given setting is, in part, a function of available resources and existing infrastructure, including the private sector, human resources, financing, and factors such as geography, population density, facility density and capability, and distance between peripheral and referral centers.8 Even so, we know that countries with the best outcomes, lowest clinical intervention rates, and lowest costs have integrated midwifery-led care through different models including: team-based care in maternity wards, alongside midwifery-led units (low risk units alongside full-scope maternity hospitals), freestanding midwifery-led units, and home-based midwifery.9

Despite the diversity in models of providing care, the starting point is the same for all countries: ensuring that every woman, everywhere, delivers in a safe environment. We believe each country needs a clear national statement of what care needs to be provided to pregnant women, what constitutes routine care for uncomplicated deliveries, what mechanisms are required to respond on a timely basis to complicated deliveries, including referral linkages. Countries then need to critically compare this with their present situation using tools such as facility and population-based surveys, or routine information systems. See Supplementary Figure 2 for priority actions to improve facility capabilities.

## Priority Action 1.2: Build linkages within and between maternal-perinatal and other health care services to address the increasing diversity of the burden of poor maternal health

Effective clinical interventions for direct causes of maternal death are well-known (Figure 1), but achieving better outcomes globally also requires addressing the increasing burden of indirect causes of maternal morbidity and mortality.10 This involves clarity on interventions, and integration with other facets of the health system, from prevention, to primary care, to tertiary-facility networks.

In sub-Saharan Africa, infectious diseases, such as malaria and HIV, take their toll on maternal health, and contribute to the burden of perinatal deaths.18, 31-33 In settings with fewer of these infectious diseases, or fewer deaths due to traditional direct causes, non-communicable diseases (NCDs) and mental health become more prominent, often related to older-age mothers and obesity.9, 10, 34

In such contexts, if prevention is unsuccessful, effectiveness of maternity services will increasingly require integration across health care services, and linkages between levels of care. What this approach looks like will vary by context. In low-income, high-burden settings, some of these services are unavailable, and funding and programming silos fragment others: HIV/AIDS, tuberculosis and malaria resources should be required to effectively link with maternity services.35

A substantial patient-safety literature identifies movement between services as a critical point when care breaks down. For example, anti-retroviral therapy protocols for HIV+ women identified via ANC screening were adapted to require fewer visits to ensure high coverage of prevention of mother-to-child transmission in the limited time-window before delivery.36 Reducing maternal and perinatal deaths attributable to eclampsia/ pre-eclampsia requires functional linkages between antenatal care and hospital-based services.37 The call-to-action for the Lancet Stillbirth series, echoes the importance of coherent integrated action across services to improve maternal, newborn and stillbirth outcomes.4 Innovative interventions (e.g. new screening tests, high-tech medicine and telemedicine) can provide solutions but also pose challenges for maintaining equity, particularly when costly.

Local empirical studies are needed to collect basic descriptive data on approaches for integrating maternal health care and services for NCDs, infectious diseases, malnutrition and mental health. Implications on staff workload, skill mix and service quality of midwives but also of laboratory technicians, anesthetists, community health workers and supply chain managers, among others, also need assessing to understand the implications for woman-centred care. Pre-service training curricula need to be strengthened to ensure health workers’ skills in managing women with co-morbidities, and that clinical practice guidelines are available and followed.2 Essential drug lists will need to be expanded to include those for indirect morbidities.

# Priority 2: Promote equity through universal coverage of quality maternal health services, including for the most vulnerable women

Women everywhere fail to seek care for numerous reasons, including socio-cultural factors such as gender inequality, location due to remoteness or conflict, and financial constraints.38-44 These three major access barriers require immediate priority attention.

Gender inequality reflects power imbalances between men and women both within the household and in the wider societal context45 and is both defined and perpetuated by socio-cultural norms.

Documented to varying degrees in every country around the world,46 gender disparities affect women and maternal health through pathways directly47 (early marriage and childbearing, decision making about care seeking, costs of care, types of care sought) and indirectly48,49 (e.g., education, availability of food). Gender-based violence, one of the most extreme forms of discrimination against women, increases during pregnancy and directly affects maternal and perinatal health.48 Gender inequality can also affect health-care providers, many of whom are women.50

Solutions to gender inequality include access to basic information about maternal, perinatal and reproductive health and care seeking targeted at women, families, communities and providers and a commitment to humanized services.51 The roles of men and influential family members, such as mothers-in-law, are key and need to be addressed, to enable women to make informed care choices. On a limited scale, appropriate mes­sages shared through mass media, interpersonal counseling, and women’s groups have improved use of facilities for birth, referral for complications, and reduced maternal morbidities, stillbirths and perinatal mortality.52-56 Messages are more effective when involving problem solving57, 58 and participatory community engagement.59,57, 60 Some programs focused on education, employment, and autonomy for women and girls have also shown effectiveness in improving utilization of maternal health services.45

Women living in remote areas or in areas of humanitarian crises face other challenges.38 Rural residence brings the obvious barrier of greater distance to hospitals. Solutions to improve access may include linking women to delivery services during antenatal care, providing maternity waiting homes to bring women closer to services before labour begins, and improved, subsidized transport, including for emergencies.3

Women in areas of humanitarian crises are among the super-vulnerable populations of fragile states.Sixteen47 countries are in the high alert category of the Fragile States Index, and in nine, over a third of women reside in conflict areas. Many have high MMRs: 60% were either seriously or moderately off target for MDG5.61 High fertility and unwanted pregnancies are typically common, particularly among adolescents, often caused by sexual violence inflicted as a weapon of war.62

In spite of increased need, maternal and reproductive health resources for even basic services such as family planning, obstetric emergencies, and comprehensive abortion care are limited or nonexistent during humanitarian crises, especially in countries with pre-existing weak health systems.63 For example, in the Ebola epidemic, maternal and infant mortality, already high before the outbreak, increased significantly during the crisis.64 Ensuring access and availability of these basic services is necessary everywhere, including in areas with humanitarian crises..

Financial constraints underlie much of the poor access to maternal health services in all settings. 42-44 Poor sub-populations in LMICs still face catastrophic expenditures due to emergency obstetric care. In parts of Mali, for example, more than 50% of households needing emergency obstetric care incurred catastrophic expenditures.65 Establishing large pre-payment and risk-pooling mechanisms, that reduce reliance on out-of-pocket spending, curb catastrophic health expenditures in the near- and long-term. A recent systematic review showed health insurance is positively correlated with the use of maternal health services, although the effects on quality-of-care and health outcomes remains inconclusive.66 Other financing instruments can also be deployed to promote access: cash transfers, microcredit, vouchers, and user fee removal.67-69 To support free healthcare policies, however, additional investment in pay and recruitment, commodities, and infrastructure may be needed, including staff pay increases for more demanding workloads.87,98,122

“Leaving no one behind” is a key slogan in the well-emphasized SDG goals of greater equity, but will such promise reach these populations left behind and experiencing a disproportionate burden of poor maternal health? Universal health coverage (UHC) is the core mechanism for achieving SDG 3, with linked objectives around quality and availability of care, matching uptake with need, and improving cost-effectiveness and financial protection.70 Every UHC initiative should include a strong maternal health service core and ensure that it reaches every woman, everywhere with quality care, and without causing financial hardship and pushing families into poverty. Progressive universalism is presented as the pathway to achieving UHC, defined as a determination to include people who are poor from the beginning, as elaborated by Kruk and colleagues.71

# Priority 3: Increase the resilience and strength of health systems by optimizing the health workforce and improving facility capability

## Given unserved populations and changing and diverging maternal health needs, it is urgent to increase the strength and resilience of national health systems to respond at scale with quality care, and in a sustainable manner. Resilience demands mechanisms to ensure essential health services are delivered, regardless of the stress on the system, and must include the capacity to address the special needs of women, adolescents and newborns,72,67 even as those needs change with outbreaks such as Ebola or Zika or with conflicts. This is a challenge for countries with over-stretched staff and weak governance. At a minimum, building resilient and strong health systems requires an emphasis on increasing and optimizing the health workforce and improving facility capability.

## Human resources are a glaring challenge to health systems in all countries, especially LMICs. The numbers of skilled health professionals (i.e. midwives and physicians, and others such as anesthetists), their composition, deployment, retention and productivity are dynamic yet crucial variables in ensuring universal access to sexual, reproductive, maternal, newborn health.73

Modeled estimates point to the need for over 18 million additional health workers by 2030 required to meet the SDGs and UHC targets with gaps concentrated in the LMIC.74 Even in countries with improving provider-to-population ratios the geographical distribution of providers remains a challenge, with several countries reporting densities in the most under-served areas that are a small fraction of those in urban areas.75

Figure 276 compares the ratios of practicing midwives / auxiliary midwives / nurse-midwives and obstetrician/ gynaecologists to the number of pregnancies in African countries. It illustrates that countries with the largest numbers of births (e.g. Democratic Republic of Congo, Tanzania, Kenya and Ethiopia) have some of the lowest densities of midwives and obstetricians (<2 per 1000 pregnancies).

Addressing complex and multi-faceted health workforce challenges that hinder the provision of maternal-perinatal care requires an integrated approach to better balance health workforce needs, demand and supply, and to provide health workers with an enabling work environment. Some of the required interventions may be specific to the staff most directly involved in providing maternity care. For instance, the policy and regulatory environment for midwifery care should be realigned with midwives’ pre-service education and accreditation requirements. Despite having the potential to address the vast majority of maternal and newborn health needs, in many countries midwives are not authorized to perform within the full scope of their profession, and lack the authorization to deliver the signal functions of basic EmONC. Also there is evidence that, beyond skilled health workers, task-shifting to other cadres, such as community-based health workers, can play a substantial role – in certain contexts and under certain circumstances – in expanding access to select health services, particularly family planning and medication abortion services, among others.77.78

Addressing health workforce bottlenecks effectively requires an integrated and comprehensive approach. Countries – and, where relevant, development partners - need to invest in training, deploying, and retaining health workers, by expanding the fiscal space and allocating resources more equitably and efficiently across levels of the health systems; by strengthening pre-service education to ensure a quantitative scale-up, a rural pipeline for health workforce production and deployment, and improvement in the quality of their competencies; by ensuring a gender-balanced approach to health workforce education, deployment and management; by adopting a range of financial and non-financial incentives to improve management systems and the work environment in which they operate, so as to maximize worker motivation and performance,74 and minimize risks of attrition and out-migration.

The necessary expansion of the health workforce should lead to cost-effective resource allocation, prioritizing a skills mix harnessing inter-professional primary care teams of health workers, avoiding the pitfalls and cost-escalation of overreliance on specialist and tertiary care. A WHO framework (Supplemental Figure 3) illustrates the supply, demand and contextual factors for human resources, which has been adapted for the specific needs of maternity services in a UNFPA Handbook.79

An inadequate workforce is not the only challenge: Campbell and colleagues elaborate on the extent to which countries have inadequate numbers of functional facilities. We have stated that the starting point needs to be a clear national statement of what should constitute primary care for uncomplicated deliveries, and what mechanisms, including referral need to be in place for complicated deliveries. Above, we suggest facility capability can be critically compared with the present situation measured using facility surveys (i.e. quantifying the “aspiration gap”), and reviews of bed capacity, stock-outs and supply chains, maintenance and infrastructure. Planning means such as the One Health tool can also help assess needs. Subsequently, budgeted plans with target dates need to be put in place to address the aspiration gap.

# Priority 4: Guarantee sustainable financing for maternal -perinatal health

The investment case for health financing, and in particular for investing in the health and education of women, has been clearly made by a Lancet Commission, WHO, and others.80-83 Additional investments in high maternal and child mortality countries would yield high rates of return, producing up to ‘nine times the economic and social benefit by 2035’.83 Yet a very real resource gap remains.84 Over the 2013-2035 time-frame, Stenberg and colleagues project that an additional investment of US$ 72.1 billion is needed to achieve high coverage of an essential package of maternal and newborn health services.83 These services can be expected to yield a triple benefit of reduced maternal deaths, stillbirths and newborn deaths, and gains for child health and development. How then can the global community translate potential long-term investment returns into concrete next steps that will improve maternal health over the next five years?

#### Capture expanded domestic fiscal space for maternal health

In this series, Kruk and colleagues71 highlight that the economic transition in LMICs can increase the domestic fiscal space for health. However, 10 years after a Lancet Series paper on financing for maternal health,85 concern remains as to whether the maternal health financing gaps can be filled with domestic resources. Nandakumar et al86 show that between 1995 and 2011, as countries transitioned from low to lower middle-income status and donor spending declined, governments did not step in to fill the gap. Indeed, the authors identified an increase in the share of out-of-pocket spending and other private sources of financing for health. Another analysis finds that while government spending on health in HICs rises commensurate with GDP growth, each percentage point increase in economic growth in LICs is associated with only half a percentage point growth in government spending on health.87 A recent analysis echoed these concerns, projecting that between 2013 to 2040, only 3% of LICs and 37% of MICs are likely to reach the goal of 5% of GDP spent by the government on health. 88

For these reasons, greater coordination and investment in national advocacy is needed to support governments to build and sustain health investments. Advocates should leverage the consensus statement on domestic resource mobilization that emerged from the 2015 Conference on Financing for Development in Addis Ababa to campaign for improving countries’ tax policy and tax administration. Options to explore include sales taxes on alcohol and tobacco, tourist taxes, and redirecting fossil fuel subsidies to health.

#### Deploy coordinated, targeted donor assistance for vulnerable populations

Continued donor support for maternal health interventions is most critical where need cannot be met via domestic resources, such as in super-vulnerable populations where location and individual’s characteristics stack against sub-groups of women.10 Development aid for maternal health has increased annually since 2003,89, 90, 88which is reassuring in the face of the decline in overall development assistance.

As Kruk and colleagues note,71 new initiatives are proliferating to maintain momentum for Reproductive, Maternal, Newborn, Child, and Adolescent Health (RMNCAH) in the SDG era. For example, the Global Financing Facility (GFF) was launched in July 2015 to increase, coordinate, and better target donor and domestic funding for women’s, children’s and adolescents’ health in support of the 2030 SDGs.84 Still, some development players remain skeptical, citing concerns that the GFF will further fragment the global system and undermine the position of UN agencies.91 Moreover, it is unclear whether and how such mechanisms will reach the super-vulnerable within countries. The next five years will be critical for the GFF to demonstrate its capacity to raise national health resources and effectively improve RMNCAH.

#### Effectively employ strategic purchasing and performance-based incentives

Equally important to mobilizing adequate financial resources for maternal-newborn health care is the optimal allocation and efficient use of those resources. As domestic resources increasingly fund such programming, the importance of supporting governments and private financiers to implement strategic purchasing will also grow. Strategic purchasing can be defined as proactively identifying *which* models of care and interventions to invest in (taking into account cost-effectiveness, burden of disease, and population preferences); determining *how* they should be purchased (including contractual mechanisms, pricing, and payment systems); *for* *whom* they should be purchased (which groups might benefit from subsidies, for instance); and selecting *which health care providers* to purchase services from – ideally those who can provide the highest quality of care most efficiently, whether public or private sector.92, 93 Not only can this active purchasing approach ensure that scarce resources are allocated appropriately, but – if designed well – the mechanisms for paying providers can incentivize improvements in performance and quality of care.

Reviews of the effects of financial incentive programs, including performance- or results-based financing (RBF) and vouchers, on improving the quality and quantity of maternal health service provision suggest these can be successful, especially when users have choice among providers.94, 95 However, RBF schemes that reward providers for better outcomes must be thoughtfully designed to avoid unintended consequences, such as only serving the lowest-risk women. In addition, rigorously monitoring for accountability in RBF programs is key to its impacts, and as yet such measurement remains challenging in many LMIC settings, particularly regarding equity. Nonetheless, in the next five years, particular attention should be paid to intelligently incorporating performance elements to provider payment systems to improve the efficiency and effectiveness of resource use for maternal health services.

Private-sector providers form a significant part of health systems in many countries, and are currently responsible for one of every five deliveries across 57 LMICs,96 and a majority of care in some settings. Leveraging the power of the private health sector to deliver maternal health services efficiently and effectively is not easy,97 through approaches such as contracting and social franchising can be another critical component of strategic purchasing. Contracts set clear expectations for providers and tie payments to achievement of predefined objectives.98 If utilization of private providers for maternal health services grows,99 contracts between government payment agencies (such as national health insurance schemes) and private providers will be an important component of the toolkit for promoting quality and access.100 Franchising also has the potential to improve quality and maternal health outcomes in the private sector, but the evidence base is weak.99, 101

# Priority 5: Accelerate progress through evidence, advocacy, and accountability

## Priority Action 5.1: Develop better metrics and support implementation research to promote accountable, evidence-based maternal health care

Research is an essential component of the post-2015 maternal health agenda. Yet research funding is not commensurate with need: only 35% of published research in 2011-4 addresses problems in high burden countries. Even so, the number of research papers on maternal health in high burden countries doubled in 2011-2014 compared with the preceding 5 years102.

Based on recent literature reviews,103, 104 the five papers in this series, and discussions with the series’ authors, we identify two types of research specifically needed to scale up and accelerate progress in maternal health. The first is on measurement of the morbidity and mortality burden and causes, vulnerable groups, and on indicators to measure progress of policies and promote accountability, health system capability, content of intrapartum care, and women’s satisfaction. Secondly, there is an urgent need for research on models for implementing care at all stages of the obstetric transition (Table 1) and on methods for scaling up pre-service training of skilled birth attendants.

### Measurement: redefining maternal health metrics

Improving measurement and coding of maternal mortality and morbidity, including direct and indirect causes and risk factors, is essential to guide intervention research, set implementation priorities, and improve quality of care, particularly for women and babies most at risk. Better measurement will require standardizing definitions and methods of determining and recording direct, indirect, and contributing causes of death, as well as categories of illness and illness severity.10 More importantly, better civil vital registration systems that accurately and comprehensively document pregnancy outcomes – births, stillbirths, neonatal deaths, and maternal deaths105 – are needed in many LMICs. The Maternal Death Surveillance and Response (MDSR), a global strategy that aims to identify and respond to maternal deaths, is a useful start.106

In addition, research that aims to better understand the changing patterns of socio-demographic, obstetric and medical risk factors is needed. What are the best mechanisms for real-time tracking of pregnancies and their outcomes, and how can such mechanisms capture those women who either do not obtain care, or seek care outside the formal healthcare system? Addressing such issues will be pivotal in effectively and equitably improving maternal health and the quality of care in the coming years—leaving no one behind.

To measure the burden and the ability of health systems to provide quality maternal health care for all, Table 2 provides examples of indictors that cover a number of domains. Some are already widely used (e.g. caesarean section rate by wealth quintile); others require development (e.g. percentage of women delivering without obstetric intervention), standardization (e.g. percentage with a length-of-stay after a singleton vaginal delivery in a facility of 12 or 24 hours), and validation. This list is not exhaustive, and has yet to include indicators related to such important issues as delays in treatment, timely referrals, use of financial incentives, women’s satisfaction and specific provider skills. Yet a sub-set of these indicators could be used depending on context. For example, in areas with very low coverage of facility delivery (Table 1, Stages I and II with MMR>420), managers could focus on barriers to service use (e.g. social, geographical and financial) along with the content of the care delivered, while in areas with low maternal mortality (Table 1, Stages IV and V, MMR <70) and high coverage of contacts with ANC and facility delivery, morbidity-related metrics, content of care (under and over intervention) and women’s satisfaction take precedence.

### Implementation research: maternal health priorities

Implementation research aims to understand what, why, and how interventions work (and can be improved) in real-world settings, and requires working with populations affected by the interventions, and with those involved in directing, managing and providing the services.107 Supplemental Table 1 illustrates our assessment of high-priority research areas, categorized by the priority areas identified in this paper.

Bridging the gap between priority identification and the implementation of research projects to address persisting or new maternal health needs requires sustained commitment on the part of national governments, donors, and researchers. National governments – especially in LMICs – need to allocate resources to support locally-driven research, and to build capacity among in-country researchers, including health system experts, epidemiologists, and social scientists. Only when in-country researchers have the training to compete for funding successfully, and countries allocate resources to support such efforts, will research truly reflect the needs of programs in LMICs. At the same time, donors must see the value in – and provide funding for – evidence generation and long-term, data-driven programming that targets vulnerable populations.

## Priority Action 5.2: Translate evidence into action through effective advocacy and accountability for maternal health

Investing in effective, joint platforms for action by all stakeholders – governments, donors, multilateral partners, civil society and the private sector – can mobilize resources, strengthen laws and policies, and promote mutual accountability.

The *Global Strategy’s* “Every Woman Every Child” advocacy platform supports the delivery of the SDGs, by encouraging partners to act together to leverage financial, policy and service delivery commitments for maternal health and related issues.108 Since its launch in 2015, the *Global Strategy* has attracted more than 150 commitments from governments and other partners towards its implementation.109 Partners are further guided by evidence presented in this and other related Lancet series (stillbirth, adolescent, newborn, midwifery), and through related action plans such as the 2015 *Ending Preventable Maternal Mortality* (EPMM) plan110 and the *Every Newborn Action Plan*111, which have converging priorities.3 All these documents highlight the need for effective maternal and newborn advocacy within the wider RMNCAH continuum of care.

Regional advocacy can also play a vital role in reducing inequities and improving quality of care for women and newborns. An example is The Campaign for the Accelerated Reduction of Maternal Mortality in Africa which assists partners to use data and evidence for advocacy through its African Health Stats platform. Country scorecards and other data products can also help parliamentarians, media, and civil society track national performance on regional commitments such as the 2001 Abuja Declaration, committing countries to spending 15% of government budgets on health.112 The Global Health Observatory estimates that on average in 2013, these countries allocated 11.4% to health, a significant improvement over an average of 3.1% in 1995.113 Whether this has translated into improved maternal health-specific funding remains unclear.

The voice of parents and families is another key force to be tapped to bring about better maternal and newborn outcomes, as reflected in the Lancet Newborn Health series.20

In the transition to the new SDG era, robust national, regional and global advocacy and accountability efforts are needed to ensure women’s and children’s health not only retain their prominence, but that they are seen as corner-stones for achieving other goals, including several that reach beyond health. In the MDG era, the *Global Strategy’s* independent Expert Review Group (iERG)114 and the *Countdown to 2015115* initiative provided periodic, scientifically credible, feedback on what needed to improve and where.115 To support the SDGs, successor groups, the Independent Accountability Panel (IAP), and the Countdown to 2030 will provide evidence on needs and gaps that can be converted into actionable messages by advocacy actors such as the Partnership for Maternal, Newborn & Child Health, Women Deliver, White Ribbon Alliance, and others.

## Moving forward

Building on the priorities identified in this series (Box 1), the interventions known to reduce maternal death (Figure 1), and potential implementation priorities by stage of MMR reduction (Table 1), Figure 3 schematically represents an action plan for local, national, regional, and global stakeholders to accelerate progress toward improving maternal health. It emphasizes that sustained efforts must be defined and initiated at local and national levels, and complemented and supported by efforts at the regional and global levels. This complements existing action plans, such as the Global Strategy for Women and Children108 EPMM,95 and ENAP,111 by emphasizing the need to contextualize local and national-level action, including a careful assessment of the local context, locally-driven action plans, and implementation plans that are tied to local and national budgets. It also emphasizes the critical interplay between local and global stakeholders, and the relative strengths of each.

National and local stakeholders are best positioned to identify and address key elements of the national and local context needed to ensure effective maternal healthcare provision for all women, including adolescents. This includes assessing the local burden of disease; current models of care; the private sector’s role; provider numbers, skills and working conditions; financial initiatives available and their impact on maternal and newborn care; and the cultural, financial and geographical factors impacting illness, care-seeking, access, and women’s perspectives and satisfaction. It also involves setting measurable, costed, time-anchored goals for: human resources and their support; facility capabilities; content, quality and integration of care provision; and health information systems and data needed. National and local stakeholders will be instrumental in ensuring that such goals are supported by corresponding national and local budgetary allocations and through collaboration between various levels and sections of government, civil society, private sector, and with other relevant ministries.

At global and regional level, stakeholders will need to advocate for increased attention to maternal-perinatal health, and ensure women’s rights and agency are acknowledged, including by involving women in their own healthcare. Global stakeholders should encourage a fundamental paradigm shift toward more woman- and family-centred care, including more functional linkages between maternal healthcare services and other aspects of healthcare, such as combining family planning and newborn care provision during postpartum care visits, or integrating HIV and nutrition services.116 While such linkages are not easy to implement and sustain, and while funding silos are often difficult to bridge, this is precisely what is needed to realize the maximum possible gains for maternal-perinatal health globally.

Global stakeholders can also help by supporting continued efforts to provide evidence-based clinical practice guidelines, as well as case studies of programme implementation. Finally, global partners can fund research on measuring maternal and newborn outcomes, implementation facilitators for known interventions, and test integration and linkages with others services, all the while being aware that different contexts are likely to require different implementation strategies.

**Conclusion**

This Series, following up on the 2006 Maternal Survival Series and building on recent related series and commissions, including those on Midwifery, Newborns, Stillbirths, and Adolescents), suggests two fundamental issues that need to be addressed to improve maternal health: ensuring the quality of maternal health care for all women, and guaranteeing access to care for those left behind, or the most vulnerable. In addition, it describes, organizes and analyzes a large body of information that, if applied, could improve the health and pregnancy experience of millions of women and save thousands of lives around the world. Based on the hard-fought experience working for improvements in maternal health during the MDG era, it provides a crucial knowledge base to inform actions under the new SDGs over the next five years. The priority actions presented here provide a timely update of the evidence under similar themes as the EPMM / ENAP strategic directions3 and are a supportive and more elaborated evidence base to inform the development of plans and priority actions.

Maternal health strategies need to respond to the specific and often rapidly changing population needs as demographics, epidemiology and economies evolve, and preferences shift and diversify. This will require unprecedented collaboration with a wide array of partners to improve equitable access to efficient, high-quality, and respectful maternal health care with functioning referral systems. It will require a fundamental paradigm shift toward woman- and family-centred care, with better linkages across RMNCAH and more, as NCDs and other maternal illnesses become apparent.

Crucial to achieving equity in maternal health will be the growing pressure on national and regional governments in even the poorest countries to provide UHC, i.e. high quality services available for every woman, everywhere, with financial protection. Maternal health improvements will influence, and be influenced by, achievements within the wider continuum of care, those working on NCDs, infectious diseases, nutrition, and mental health, and in relation to other SDG targets, from those aimed at ending poverty, to those building resilient infrastructure. Finally, as these efforts yield independent, rigorous data, such results can guide national and local governments and global partners in working together to focus on what is needed to reach the SDG target for MMR <70 by 2030 and to attain equitable and accelerated improvement in maternal health.

**Box 1: Priorities and priority actions for accelerated progress toward improved maternal health**

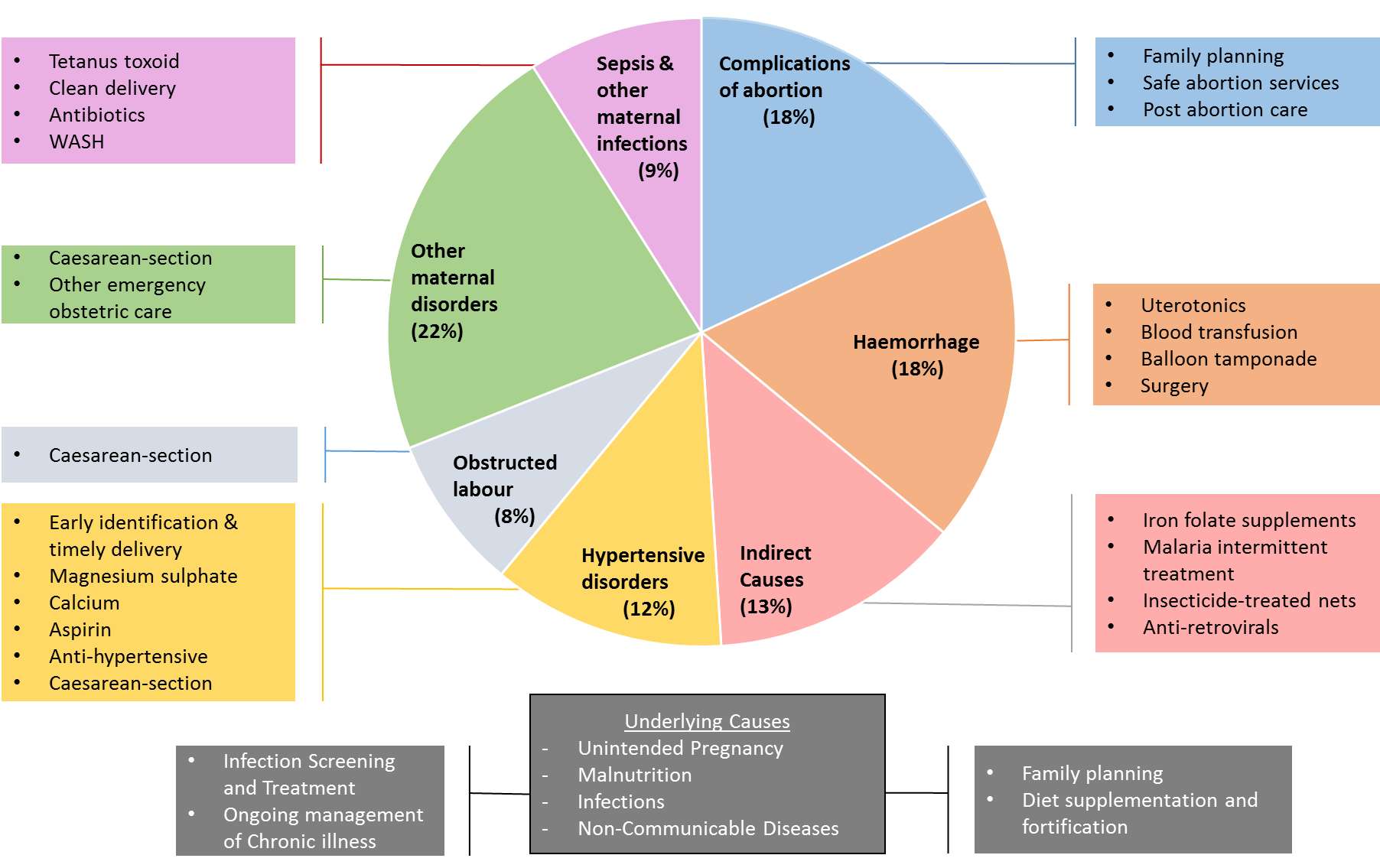
|  |
| --- |
| Priority 1: Prioritise quality maternal health services that respond to the local specificities of need, and meet emerging challenges1.1: Ensure timely, equitable, respectful, evidence-based and safe maternal-perinatal health care, delivered through context-appropriate implementation strategies1.2: Build linkages within and between maternal-perinatal and other health care services to address the increasing diversity of the burden of poor maternal health  Priority 2: Promote equity through universal coverage of quality maternal health services, including for the most vulnerable women **Priority 3: Increase the resilience and strength of health systems by optimizing the health workforce and improving facility capability**  **Priority 4: Guarantee sustainable financing for maternal-perinatal health**  **Priority 5: Accelerate progress through evidence, advocacy, and accountability** 5.1: Develop better metrics and support implementation research to promote accountable, evidence-based maternal health care5.2: Translate evidence into action through effective advocacy and accountability for maternal health |

**Table 1: Stages in the Obstetric Transition and Corresponding Priority Actions**

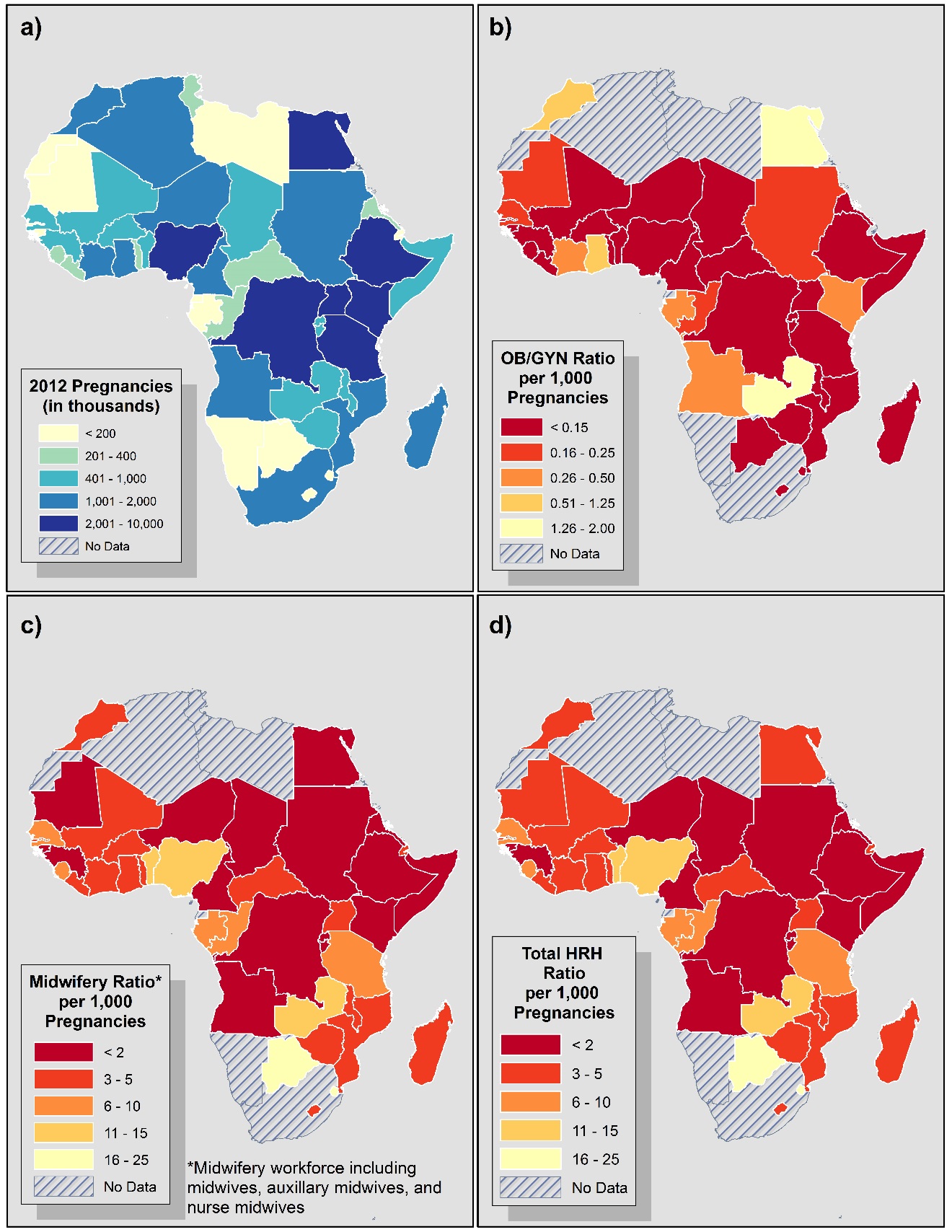
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| --- | --- | --- |
| **Stages I and II:** MMR > 420  Prioritize:   * Develop and support frontline infrastructure and human resources, * Provide simple preventive interventions, including family planning, bed nets, iron supplementation, and safe abortion * Provide routine maternal health care components (e.g., ANC, uterotonics post-delivery) and emergency response for urgent problems (eg. Hemorrhage and newborn resuscitation) to reduce major direct causes of mortality * Improve service quality with provider training, including respectful treatment of women, ready access to basic equipment and supplies, supportive supervision, and other key supports * Focus on equitable demand creation (UHC) | **Stage III:** MMR 70-420  Assume actions for stages I and II are met, and prioritize:   * Improve management of routine delivery and of complications, including a timely referral process * Improve service quality through appropriate integration, especially for infections, malnutrition and mental health, triage and referral * Employ quality of care improvement methods (including clinical practice guidelines), timely data collection and use for decision making and programme improvements * Increase demand for services, with specific focus on the vulnerable, through:   --respectful satisfactory care provision based on women’s needs and perspectives,  --- address transport/location needs, and  --effective use of financial initiatives (UHC), | **Stages IV and V:** MMR <70  Assume actions for stages I – III are met, and prioritize:   * Improve integration/ linkages with health care for infections, malnutrition, NCDs and mental health * Address between and within-facility delays * Improve quality of care and decrease over-medicalization * Increase satisfaction with care and sense of wellbeing |

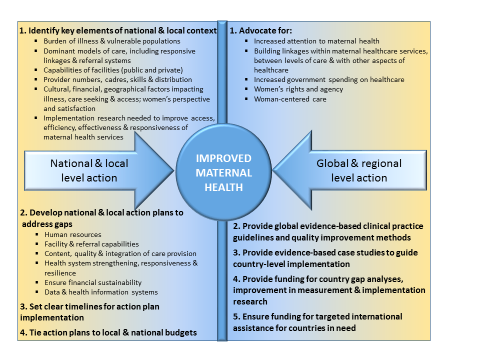
**Table 2: Example of indicators for measuring burden and the ability of health systems to provide quality maternal health care**

|  |  |  |  |
| --- | --- | --- | --- |
| **Domain** | **Proposed Indicator** | **Widespread existing experience** (Example of existing data source) | **Issues** |
| **Impact** | Pregnancy-related mortality ratio, preferably cause-specific | **Yes** (Vital Registration, US, Mexico117, 118) | * Captures deaths; need timely, empirically based estimates * Using pregnancy-related definition avoids erratic approach to coincidental deaths |
| Risk of severe maternal morbidity | **Yes** (Facility-based (UK)119 or survey (multi120)) | * Captures morbidity, broadens focus from mortality |
| Percentage of women delivering without obstetric intervention (e.g. caesarean, induction) | **No** (DHS, Brazil & Denmark medical records121, 122) | * Captures desire to avoiding over-intervention * Multiple versions of indicator exists; needs global consensus on definition |
| **Coverage** | Skilled attendant at birth by place of birth (level & sector; and type of provider-midwife, doctor, obstetrician*)* | **Yes** (Ghana DHS123) | * Captures contact with person theoretically providing routine care, identification of complications and at least some BEmOC * Need to ascertain what various cadres are trained to do vis-à-vis routine and EmOC |
| Uterotonics immediately after birth for prevention of postpartum haemorrhage (among facility births) | **No** (Facility based, Ecuador124) | * Captures care at the individual level; measures content of routine care of an effective intervention, which has a benchmark of 100% * Very challenging to measure in the absence of good medical records (women’s self-report via survey unreliable) |
| Percentage with ANC with all essential elements of care | **Yes** (Ghana DHS, Ethiopia, India, Nigeria123, 125) | * Captures care at the individual-level; moves beyond number/ timing of ANC contacts to assess receipt of effective care * Data to calculate indicator are widely available; essential elements need to be agreed and possibly expanded |
| Caesarean section rate, by wealth quintile and/or urban/rural | **Yes** (DHS, multi126) | * Captures a life-saving intervention for mothers & newborns but since not all women require caesarean, also reflects “too little, too late” & “too much, too soon”, and highlights inequitable access |
| Met need for family planning | **Yes** (DHS127, 128) | * Important preventative measure and recognises important of links with other reproductive health services |
| Post-natal care visit within 24 hours of delivery (home births) or length of stay for 24 hours with check (facility births) | **Yes** (Countdown, multi127) | * Captures contact in the immediate postpartum period; for facility delivery, assesses if length of stay sufficient for postnatal checks. For home-births without SBA, assesses coverage of postnatal home visit * Need to standardise the adequate period (12 or 24 hours postnatally); data could be used to calculate total length of stay after vaginal singleton delivery after facility birth |
| Percentage of HIV positive pregnant and postpartum women receiving ART | **Yes** (Countdown, multi127) | * Captures integration of maternal health services with general health services, in this case HIV * Most existing indicators focus on PMTCT, whereas ours emphasises women’s own need for access to general health services that continue care beyond pregnancy * Operationalising this indicator, would need decision whether to measure any ARV, or movement long-term treatment for a certain length of time |
| **Systems outputs** | “Readiness” of facility with respect to:   * Infrastructure (water, electricity, 24/7 opening) * Routine delivery (infection prevention, AMSTL, partograph) * Basic emergency care (antibiotics, uterotonics, MgSO4, manual extraction of placenta, removal of retained products, assisted vaginal delivery) * Comprehensive care (C-section, blood transfusion) * Staffing | **Yes** (Service provision assessment data8, 129, 130) | * Captures the facility capability to provide routine and emergency care, and is required for the two subsequent indicators * Operationalization requires standardisation across a variety of instruments, including consensus on whether a signal function was performed within a 3 month interval |
| Availability of EmONC facilities within two hours | **No** (Ethiopia, Zambia131, 132) | * Captures geographic access to functional emergency care & bolsters desirability of geo-located facility data, & assessment of facility capability * Experience is growing; best with facility censuses, including private-sector |
| Availability of routine delivery facilities within two hours | **No** (Zambia131) | * Captures routine provision & complements previous indicator at little marginal cost. Has advantage of emphasising access to decent care for all deliveries not just complicated ones |
| (Full time equivalence of) Midwives (SBAs) per 100 births | **No** (Sri Lanka133) | * Captures human resources available; provides a clear understanding of numbers with skills to do effective delivery in relation to numbers of births * Need to develop appropriate benchmarks & expected tasks of SBA |



**Figure 1: Main causes of maternal death and key interventions (2013)134 (adapted from Lassi et al, The Interconnections between maternal and newborn health – evidence and implications for policy The journal of maternal-fetal & neonatal medicine 2013; 26 Suppl 1: 3-53**)

**Figure 2: Human Resource Ratios per 1000 Pregnancies, 2012**

**Figure 3: Maternal Action Plan: Accelerating Progress Toward Improved Maternal Health**

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