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Global Perinatal Health: Accelerating Progress Through Innovations, Interactions, and Interconnections

In this issue of *Seminars in Perinatology* we examine global perinatal health, a timely topic in light of the unprecedented, high-level attention that has been given this past year to maternal, newborn, and child health (MNCH; Table 1). Global economic powers, including governments and other donor agencies; the private sector, including multinational and national companies with a stake in MNCH; policy makers across high-, middle-, and low-income countries; academics; international and national civil society organizations, and program managers from governmental and nongovernmental organizations have met together at these various fora to assess progress, revise existing strategies, and launch new, innovative approaches to achieving a common vision for fulfillment of the Millennium Development Goals (MDGs), particularly MDG 4 for child survival and MDG 5 for maternal health.

Perinatal health is a cornerstone of MNCH, and addressing the health of mothers and newborns is fundamental to the achievement of not only MDGs 4 and 5 but also several other MDGs, most notably MDGs 1 (eradicate extreme poverty and hunger), 2 (achieve universal primary education), 3 (promote gender equality and empower women), and 6 (combat HIV/AIDS, malaria and other diseases). In this context, this series of articles aims to measure our progress toward improving global perinatal health and calls for a redoubling of our efforts to implement what is working and to innovate to address what is not.

Although a focus on "perinatal health" is potentially confusing—because the term tends to be used imprecisely to refer to several different times during pregnancy and the neonatal period—this focus does help to galvanize attention on the need to develop more integrated approaches to addressing maternal and newborn health. In this series, we use the term "perinatal" to refer to the period from 28 completed weeks of gestation through childbirth and the first week of life. Thus, interventions in the perinatal period, by definition, encompass maternal antenatal and intrapartum care as well as early postnatal care for newborns and are aimed at reducing stillbirths as well as neonatal deaths. Although we (the authors of this series) collectively support integrated programs to address maternal, neonatal, and child health; in this series, we focus on stillbirths and neonatal mortality (particularly early neonatal mortality) as the outcomes of primary interest.

In this series of articles, we first consider the epidemiologic underpinnings of perinatal health as a first-order guide to what to intervene against (ie, the major causes of death, including stillbirth, intrapartum-related neonatal deaths or "birth asphyxia," complications of preterm birth and infections), where to focus intervention efforts (low- and middle income countries where the vast majority of stillbirths and neonatal deaths occur), what to intervene with (ie, cost-effective interventions and strategies during pregnancy, childbirth and in the first days of life), and where major gaps in knowledge lie.[1] The subsequent chapters examine in further detail each of the major causes of perinatal death (stillbirths,[2] intrapartum-related neonatal deaths,[3] preterm birth,[4] infections[5]); hypothermia as an underappreciated contributor to neonatal morbidity and mortality[6]; interconnections between maternal, perinatal and reproductive health[7]; behavior change as fundamental to improvements in perinatal health[8]; the evidence for community-based strategies[9]; and linkages between community and facility-based care that are critical to achieving substantial reductions in perinatal mortality and reaching MDG 4.[10]

Several key principles emerge in this series:

- Neonatal mortality reduction slowed in the 1990s, and in the past decade it has decreased at a slower pace than postneonatal and child mortality rates; thus, the proportion of under-five mortality that occurs in the first month of life (now 41%) is increasing, which calls for increased attention and innovations in intervention strategies to avert perinatal deaths, particularly during childbirth when nearly 2 million stillbirths and intrapartum-related neona-

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Table 1 Key Recent High-Level Events That Have Focused on, and Helped to Create, Unprecedented Global Momentum in Maternal, Neonatal, and Child Health

Dates	Event	Participants	Importance
Announced in May 2009	United States GHI	U.S. government commitment to partner countries	The GHI is proposed as a 6-year, US$63 billion commitment by the U.S. government to improve maternal, neonatal and child health, and family planning. Announcing this initiative after only 4 months in office, President Obama solidified the government's commitment to MNCH, family planning and nutrition.
April 14-15, 2010	United Nations Secretary General Retreat	UN Secretary-General, government leaders, World Bank, World Health Organization, donor organizations	Secretary-general Ban Ki-Moon officially launched a global effort to improve women and children's health, a movement which will be formalized in a Global Strategy for Women's and children's health (formally referred to as the joint action Plan) to be presented at the UN MDG Summit in September 2010 in New York. The Global Strategy emphasizes renewed and expanded global commitment to improving the health of women, newborns, and children.
June 7-8, 2010	Women Deliver Conference	Policymakers, donor organizations, global health and development leaders, media	This broad-reaching conference intensified the call to integrated action on maternal, newborn, child, and reproductive health, emphasizing political, social/cultural, economic, and technological solutions.
June 22-24, 2010	Pacific health Summit	Policymakers, donor organizations, leaders in public health, science, and industry	The Summit's theme for 2010 was maternal and newborn health. The event was unique in its focus on increased dialogue and relationship building for private sector involvement in life-saving maternal and newborn health interventions.
June 25-27, 2010	G8 Summit	Top government leaders	For the first time in history, the Summit focused on maternal, neonatal, and child health. The Muskoka initiative emerged from the Summit, a declaration to increase donor accountability, funding, and accelerate progress in achieving MDGs 4 and 5. The Initiative commits the G8 to raising US$5 billion during the next 5 years, with the explicit goal of catalyzing a donor movement to donate more than US$10 billion by 2015.
July 19-27, 2010	African Union, Summit	Heads of state from African Union member countries	The African Summit continued the year's momentum in MNCH, with a defined theme of maternal, infant and child health and development in Africa. This topic was a momentous first for the Summit. The event culminated in the African Union's adoption of "Actions for Accelerated Achievement of Maternal, Newborn and Child Health and Development in Africa," a clear demonstration of political will across the continent to address and improve MNCH.

Abbreviations: GHI, Global Health Initiative; MDG, Millennium Development Goals; MNCH, maternal, newborn, and child health.

tal deaths occur, and in the first week of life, when three-quarters of all neonatal deaths occur.

- Increased focus on equity could substantially reduce stillbirths and neonatal mortality; 300,000 newborn deaths a year could be averted if the equity gap was closed in India alone.
- Relatively little progress has been made in addressing intrapartum-related neonatal deaths ("birth asphyxia") or preterm birth. Advances in these areas hinge on providing quality intrapartum care, particularly skilled attendance at birth, access to emergency obstetrical care, neonatal resuscitation, and early postnatal care within 48 hours.
- Documentation of acute and chronic neonatal morbidity is particularly poor, and the burden of disabilities and impairments is likely to be substantial and, with adequate attention, avertable to a large (but currently undefined) degree.
- The global annual number of stillbirths (estimated at 3.2 million) is nearly equal to the number of neonatal deaths (estimated at 3.6 million), yet stillbirths are virtually absent from global policy dialogue and program action. An estimated one-third of stillbirths occur acutely during childbirth. The authors of recent reviews have identified several effective interventions in the antenatal and intrapartum periods, most importantly, provision of skilled care at birth and emergency obstetrical care, and identification and treatment of maternal syphilis and malaria.
- A number of antenatal and intrapartum interventions are available to avert intrapartum-related neonatal deaths (ie, deaths caused by "birth asphyxia"), yet coverage of effective interventions is low. Only 15% of maternity hospitals surveyed in sub-Saharan Africa have the skilled staff and equipment needed to perform neonatal resuscitation, despite the finding that training in neonatal resuscitation in health facilities could avert 30% of intrapartum-related neonatal deaths. This could be achieved at an estimated cost of US$208 per life saved, making this a highly cost-effective intervention. This is a major missed opportunity, which new initiatives, such as Helping Babies Breathe, are beginning to address.
- Preterm birth is the leading cause of neonatal death worldwide, yet few interventions are available to prevent preterm birth, and the vast majority of preterm births cannot be prevented with current interventions. Thus, advances are needed in understanding the origins of preterm birth and in identifying new targets for preventive interventions. Most neonatal deaths attributed to complications of preterm birth, however, could be averted with currently available interventions. Low coverage of administration of maternal corticosteroids for preterm labor and of skin-to-skin care are particularly important missed opportunities.
- Neonatal infections, including tetanus, sepsis, pneumonia and diarrhea, together comprise approximately one-third of neonatal deaths globally; in very high-mortality settings, infections causes approximately one-half of all neonatal deaths. Most neonatal deaths attributable to infections are avertable with currently available interventions. However, population-based surveillance data on etiology of perinatal infections are almost nonexistent and are critically important to guide the development of new preventive and therapeutic interventions and to keep pace with emergence of antimicrobial resistance. Improved early diagnostic capabilities could also revolutionize treatment strategies.
- Recent data have shown a clear link between hypothermia and risk of neonatal mortality, yet little population-based data are available on the burden of hypothermia, its health consequences, and the impact of specific thermal care interventions in the home and community on the risk of hypothermia and associated mortality.
- Increased attention is needed in policies and programs that improve interconnections between maternal health, neonatal health, family planning, and child health. New approaches, described by Bhutta et al,[7] are emerging to identify collateral benefits of interventions across this continuum, and are likely to lead to innovations in implementation strategies.
- Behavior change is fundamental to achieving an impact in therapeutic, preventive, and promotive neonatal health interventions. Advances in the science of behavior change are emerging. Kumar et al present a new Intervention-Causation pathway and a Behavior Change Management framework to guide the design and implementation of behavior change interventions, with a focus on interpersonal communications at household and community levels. Effectively scaling-up behavior change remains a critical challenge.
- Significant reductions in perinatal mortality can be achieved by community-based interventions, typically involving home visits and some form of community mobilization for increased care seeking. Linkages between communities and facilities are critical for expanding the potential for impact of perinatal care programs but have received little attention in research and programs to date. Data are almost nonexistent on models of urban perinatal health care, an urgent need considering global trends toward urbanization.
- An effective overarching framework for improving perinatal health is to innovate to bring care closer to families and communities (eg, task shifting, skilled birth attendants in the community, community health worker training and supervision) and to bring families closer to care (eg, community mobilization, financial incentives, maternity waiting homes, communications technology, referral and emergency transport systems).
- Full advantage must be taken to provide cost-effective interventions during every interaction of a mother or newborn with the health system, particularly during interactions with frontline workers. More interactions that are high in quality, efficient in use of human and financial resources, and equitable must be ensured.
- Development and adaptation of new technologies, tools, and treatments can play an important role in advancing

coverage of currently available interventions and in increasing the proportion of the burden of perinatal mortality that is avertable. Equally important is innovation in implementation and in behavior change at scale, as well as in dissemination of innovations.

- Better use of data, including tracking of all pregnancies, coverage data on key interventions, and use of local data to drive program improvement are urgently needed, particularly at district level.

In summary, substantial improvements in perinatal health are possible now through (1) *innovations* in tools, technologies and treatments, and in strategies to deliver effective interventions at scale; (2) enhanced *interactions* between frontline workers and families, including advances in precision, predictability and pace of behavior change, resulting in increases in uptake of key interventions; and (3) increased *interconnections* across the continuum of care for women and children, including policy and programmatic linkages between maternal, newborn and child health, as well as across community and facility-based care.

I would like to thank my colleagues who responded with great enthusiasm to the opportunity to synthesize and share collective global knowledge and recent progress in addressing perinatal health, and to highlight for further attention remaining gaps in knowledge, which we have noted, are many. For our readers, we hope this collection inspires you to redouble efforts and to bring fresh thinking, energy and commitment to solve the remaining challenges and to ensure that the many solutions currently in hand reach those who need them most in poor communities throughout the world.

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