Innovative Approaches to Maternal and Newborn Health

Compendium of Case Studies

Keywords: innovative approaches, maternal health, newborn health
Special Thanks
This compendium has been made possible through funding from the Canadian International Development Agency (CIDA) as part of the H4+ Global Initiative to Accelerate Support for Maternal and Newborn Health.

Contributors
Afghanistan: Nasreen Khan (UNICEF Afghanistan), Malalai Naziri (UNICEF Afghanistan), Nuzhat Rafique (UNICEF Regional Office South Asia); Bangladesh: Riaz Mahmud (UNICEF Bangladesh), Nuzhat Rafique (UNICEF Regional Office South Asia); Cambodia: Malalay Ahmadzai (UNICEF Cambodia), Dr. Viorica Berdaga (UNICEF Cambodia), Thomas Jensen (UNICEF Cambodia), Vanny Ung (UNICEF Cambodia), Tan Try (UNICEF Cambodia), Tung Rathavy (National Maternal and Child Health Center, Cambodia), Tasnim Partapuri (UNICEF Cambodia Consultant), Nabila Zaka (UNICEF East Asia and Pacific Regional Office); China: Robert Scherprieb (UNICEF China), Sufang Guo (UNICEF China), China Health Development Research Centre, National Centre for Women and Children’s Health, Nabila Zaka (UNICEF East Asia and Pacific Regional Office); Ethiopia: Luwei Pearson (UNICEF Ethiopia), Asheber Gaym (UNICEF Ethiopia), Janet Kayita (UNICEF East and South Africa Regional Office); India: Gagan Gupta (UNICEF India), Jayashree Chandra (State Government of Madhya Pradesh), Tania Goldner (UNICEF India), Henri Van Den Hombergh (UNICEF India), Rahul Bhadoria (Divisional Coordinator Gwalior), Nuzhat Rafique (UNICEF Regional Office for South Asia); Mongolia: Surenchimeg Vanchinkhuu (UNICEF Mongolia), Aira Toivgoo (Well Spring), Dr Bu cyanjargal (Ministry of Health, Mongolia), Khishigee Seded (National Maternal and Child Health, former Vice President of Mongolian Federation of Obstetricians and Gynaecologists), WHO, UNFPA, Nabila Zaka (UNICEF East Asia and Pacific Regional Office); Nepal: Asha Pun (UNICEF Nepal), Hendrikus Raaijmakers (FHD, Department of Health Services, Ministry of Health and Population), Senendra Upreti (FHD, Department of Health Services, Ministry of Health and Population), Nuzhat Rafique (UNICEF Regional Office for South Asia); Pakistan: Tahir Manzoor (UNICEF Pakistan), Nuzhat Rafique (UNICEF Regional Office for South Asia); Philippines: Willibald Zeck (UNICEF Philippines), Soe Nyunt-U (WHO), Mariella Castillo (UNICEF Philippines), Anthony Calibo (Department of Health, Philippines), Juanita Basilio (Department of Health, Philippines), Martha Cayad-an (UNICEF Philippines), Nabila Zaka (UNICEF East Asia and Pacific Regional Office); Rwanda: Friday Nwaigwe (UNICEF Rwanda), Janet Kayita (UNICEF East and Southern Africa Regional Office); Sierra Leone: Kennedy Ongwae (UNICEF Sierra Leone), Yaron Wolman (UNICEF Sierra Leone), Mariame Sylla (UNICEF West and Central Africa Regional Office); Timor Leste: Aderto Gregorio do Carmo (UNICEF Timor Leste), Carla Jesuina Quintao (UNICEF Timor Leste), Sherin Varkey (UNICEF Timor Leste), Monjur Hossain (UNICEF Timor Leste)

Reviewers
Kim E. Dickson (UNICEF NYHQ), Rene Ekpini (UNICEF NYHQ), Ariel Higgins-Steele (UNICEF NYHQ/Concern Worldwide U.S.), Nuzhat Rafique (UNICEF ROSA), Aline Simen Kapeu (UNICEF NYHQ), Kristen Wenz (UNICEF NYHQ), Nabila Zaka (UNICEF EAPRO)

For further information please contact:
Maternal and Newborn Health Unit
Health Section, Programme Division
United Nations Children’s Fund
3 United Nations Plaza, New York, NY 10017, USA
Telephone: +1-212-326-7000
Contents

1. Introduction .................................................................................................................. 1
   Purpose of compendium ................................................................................................. 2
   Target audiences ........................................................................................................... 2
   Methods ......................................................................................................................... 2
   Key dimensions of maternal and newborn health programming .................................. 2
   Structure of compendium .............................................................................................. 3

2. Case studies: Innovative approaches to maternal and newborn health ...................... 6
   AFGHANISTAN: Maternity Waiting Homes: Reducing geographic access barriers .... 6
   BANGLADESH: Maternal and Perinatal Death Review for evidence-based prevention ... 9
   CAMBODIA: Communication for Behavioural Impact to promote early antenatal care 12
   CAMBODIA: Community care of mothers and newborns ........................................ 15
   CHINA: Promoting safe motherhood through facility-based births .......................... 20
   CHINA: Ensuring every newborn’s financial access to health services ...................... 22
   CHINA: Introducing and sustaining Maternity Waiting Homes .................................. 24
   ETHIOPIA: Introduction of magnesium sulphate to manage pre-eclampsia and eclampsia 27
   INDIA: Tracking newborns treated in Special Newborn Care Units .......................... 30
   MONGOLIA: Evidence-based approaches to improving newborn care .................... 33
   NEPAL: Establishing and sustaining birthing centres closer to communities ............ 36
   PAKISTAN: Chief Minister’s Initiative for the Attainment and Realization of the MDGs 41
   PHILIPPINES: Essential intrapartum and newborn care protocol ............................ 44
   RWANDA: SMS alert system to monitor pregnancy and reduce maternal and child deaths 48
   SIERRA LEONE: Capacity development of human resources for maternal and newborn health.... 52
   TIMOR-LESTE: Involving communities in addressing maternal health inequalities ....... 56

3. Implications for public health programming ................................................................ 59

4. Conclusion .................................................................................................................... 61
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANC</td>
<td>Antenatal care</td>
</tr>
<tr>
<td>ANM</td>
<td>Auxiliary nursing midwife</td>
</tr>
<tr>
<td>ASHA</td>
<td>Accredited Social Health Activist</td>
</tr>
<tr>
<td>BCC</td>
<td>Behaviour Change Communication</td>
</tr>
<tr>
<td>BEmONC</td>
<td>Basic Emergency Obstetric and Newborn Care</td>
</tr>
<tr>
<td>C4D</td>
<td>Communication for Development</td>
</tr>
<tr>
<td>CCMN</td>
<td>Community Care of Mothers and Newborns</td>
</tr>
<tr>
<td>CEmOC</td>
<td>Comprehensive Emergency Obstetric Care</td>
</tr>
<tr>
<td>CHARM</td>
<td>Chief Minister’s Initiative for Attainment and Realization of MDGs</td>
</tr>
<tr>
<td>CHC</td>
<td>Community Health Center</td>
</tr>
<tr>
<td>CHW</td>
<td>Community Health Worker</td>
</tr>
<tr>
<td>COMBI</td>
<td>Communication for Behavioural Impact</td>
</tr>
<tr>
<td>eHealth</td>
<td>Electronic Health</td>
</tr>
<tr>
<td>EmONC</td>
<td>Emergency Obstetric and Newborn Care</td>
</tr>
<tr>
<td>FHD</td>
<td>Family Health Division</td>
</tr>
<tr>
<td>IEC</td>
<td>Information, Education, Communication</td>
</tr>
<tr>
<td>MCH</td>
<td>Maternal and child health</td>
</tr>
<tr>
<td>MDGs</td>
<td>Millennium Development Goals</td>
</tr>
<tr>
<td>mHealth</td>
<td>Mobile health</td>
</tr>
<tr>
<td>MMR</td>
<td>Maternal Mortality Ratio</td>
</tr>
<tr>
<td>MNCH</td>
<td>Maternal, newborn and child health</td>
</tr>
<tr>
<td>MPDR</td>
<td>Maternal and Perinatal Death Review</td>
</tr>
<tr>
<td>MWH</td>
<td>Maternity Waiting Home</td>
</tr>
<tr>
<td>NCMS</td>
<td>New Cooperative Medical Scheme</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-governmental organization</td>
</tr>
<tr>
<td>NRHM</td>
<td>National Rural Health Mission</td>
</tr>
<tr>
<td>PNC</td>
<td>Postnatal Care</td>
</tr>
<tr>
<td>SBA</td>
<td>Skilled Birth Attendant</td>
</tr>
<tr>
<td>SIM</td>
<td>Subscriber Identity Module</td>
</tr>
<tr>
<td>SMS</td>
<td>Short Message Service</td>
</tr>
<tr>
<td>SNCU</td>
<td>Special Newborn Care Unit</td>
</tr>
<tr>
<td>UNAIDS</td>
<td>Joint United Nations Programme on HIV/AIDS</td>
</tr>
<tr>
<td>UNFPA</td>
<td>United Nations Population Fund</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
</tbody>
</table>
1. Introduction

The Millennium Development Goal targets to reduce child mortality (MDG 4) and maternal mortality (MDG 5) have seen some gains around the world. However, many countries are not on track to meet their targets by 2015.1 Overall, improvements in maternal mortality have been less impressive than those in child mortality.2 In addition, an increasing share of child deaths occurs in the neonatal period of the first 28 days of life, the most recent estimate being 40.3 per cent or 3.027 million deaths.3 Improving maternal and newborn health is therefore still a critical priority, though important inroads have been made in improved access and quality of care through local and global initiatives.

High-level political leadership and support to accelerate progress have increased in recent years. Major global initiatives continue to push towards ambitious, yet achievable goals of ending preventable deaths for mothers and children, including in the crucial first 28 days of life. The United Nations Secretary-General’s initiative ‘Every Woman Every Child’ mobilized financial, policy and service delivery commitments in 2010 to improve the health of women and children. Part of this initiative is H4+, a joint effort by the United Nations and related agencies and programmes: UNAIDS (the Joint United Nations Programme on HIV/AIDS), United Nations Population Fund (UNFPA), UNICEF (United Nations Children’s Fund), UN Women, the World Health Organization (WHO) and the World Bank. Harnessing the collective power of each partner’s strengths and capacities, H4+ works to improve the health of women and children and accelerate progress towards achieving MDGs 4 and 5.

In 2012, the Governments of Ethiopia, India and the United States together with UNICEF convened countries under ‘A Promise Renewed,’ a call to action around three main goals: to mobilize political leadership to end preventable child deaths, to achieve consensus on a global road map highlighting innovative and proven strategies to accelerate reductions in child mortality, and to drive sustained collective action and mutual accountability.

Empirical evidence demonstrates that a set of low-cost essential interventions can prevent the majority of maternal and newborn deaths, from routine antenatal care (ANC) and clean delivery to exclusive breastfeeding. But these interventions still do not have the necessary reach and quality, especially in resource-constrained settings. A common goal among global initiatives is to successfully deliver these interventions at scale through continued global and local engagement, especially through innovative approaches that hold great potential for accelerating progress.

The global momentum for the reduction of maternal and neonatal deaths provides a strategic opportunity for H4+ agencies and partners to pursue its goal of equitable development for all children. UNICEF’s investment in maternal and newborn health aims to fulfill the rights of mothers and newborns to survival, growth and development, and to attain the highest standards of health, with a particular focus on the most disadvantaged populations and groups. UNICEF’s maternal and newborn health programming prioritizes working with various stakeholders and partners in countries to implement and

---

scale-up innovative strategies to expand facility- and community-based care, especially among marginalized and deprived groups.

Whereas some innovative approaches may be quite novel in most countries, others are new to a specific country or context and are showing results. These experiences must be shared broadly among maternal and newborn health groups to encourage evidence-based programming and cross-country learning. This compendium has been created because it can be hard to find documentation of these maternal and newborn health strategies summarized in a practical way.

**Purpose of compendium**

The aim of this compendium is to provide a resource for innovative approaches that have shown promising results for improved health outcomes. It describes policies, strategies and interventions that were newly introduced or implemented, some even scaled-up, to increase maternal and newborn survival.

**Target audiences**

This compendium is intended for individuals and agencies working in maternal and newborn health globally. It is for implementers, policy makers and academics interested in a range of UNICEF and partner experiences in countries that are demonstrating results for mothers and infants.

**Methods**

Case studies for innovative strategies and approaches to maternal and newborn health supported by UNICEF were collected from UNICEF Country Offices, in collaboration with Regional Offices, from July through October 2012. A standardized template – including justification of innovation, background, strategy, results, scale and evidence (lessons learned), potential for wider application, and next steps – was used to collect information on individual case studies. The template included open-ended narrative sections followed by closed responses, to capture specific information. A group of UNICEF Regional and Headquarters colleagues reviewed all case studies for completeness and to ensure they fit the criteria for inclusion in the compendium.

**Key dimensions of maternal and newborn health programming**

Several frameworks were used to describe and categorize each case study in an effort to systematically document innovative approaches to delivering maternal and newborn health interventions.

- **Supply, demand, quality and enabling environment**
  Identifies what aspects of health system performance the innovative approach seeks to improve. These have been characterized in the Tanahashi model as supply (or access), demand (or use), quality and aspects of the enabling environment as part of health system coverage. This model is useful in describing health system performance and is being applied to results-based planning and monitoring.

- **Continuum of care**
  Indicates at which points along the continuum of care an innovative approach intervenes. The continuum of care acknowledges that mothers and newborns are inseparably linked in life and

---

In health care needs. In the past, maternal, newborn and child health (MNCH) policy and programmes tended to address the mother and child separately, resulting in gaps in care which especially affect newborn babies. The continuum of care can be achieved through a combination of well-defined reproductive, maternal, newborn and child health policies and intervention packages to improve home care practices and health care services throughout the life cycle building on existing initiatives. Interventions, both preventive and curative, should prioritize the most critical time (birth and the first few days of life) and the place where care is most needed (at home or close to home) with strong links to facility-based care.

- **Scale**
  Characterizes the reach of strategies across populations and geography. It is important in describing whether an approach is being piloted or scaled up, either sub-nationally or nationally.

Taken together, these elements can provide a useful and concise description of innovative approaches to maternal and newborn health. See table 1 on the following page for an overview of case studies included in this compendium.

**Structure of compendium**

**Section 1**: Provides a background to the compendium and highlights the purpose and target audience.

**Section 2**: Contains the actual country case studies; each case study includes the background, strategy, implementation considerations, lessons learned, next steps and potential application, as well as a short description of why it is considered innovative.

**Section 3**: Looks across case studies, summarizing implications for public health programming in low-resource contexts.

**Section 4**: Concludes the compendium.
Table 1. Key characteristics of UNICEF maternal and newborn health case studies

<table>
<thead>
<tr>
<th>Country</th>
<th>Key issues/bottlenecks to address</th>
<th>Innovation</th>
<th>Health systems areas</th>
<th>Continuum of care</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>Poor geographic access for pregnant women living in remote areas</td>
<td>Maternity waiting homes</td>
<td>Supply</td>
<td>Pregnancy, Childbirth, Post-natal: mother &amp; newborn</td>
<td>Scaling up subnationally</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>Low quality of care associated with inconsistent understanding of the causes of deaths</td>
<td>Maternal and perinatal death reviews</td>
<td>Supply</td>
<td>Childbirth</td>
<td>Scaling up subnationally</td>
</tr>
<tr>
<td>Cambodia</td>
<td>Late uptake of ANC</td>
<td>ANC behaviour change communication campaign to encourage early uptake</td>
<td>Demand</td>
<td>Pregnancy</td>
<td>Sustaining activities</td>
</tr>
<tr>
<td>Cambodia</td>
<td>Low rate of skilled delivery</td>
<td>Integrated community care for mothers and newborns with targeted home visits during pregnancy and post-partum periods and referral to facility</td>
<td>Supply, Demand, Enabling environment</td>
<td>Pregnancy, Childbirth, Post-natal: mother &amp; newborn</td>
<td>Scaling up subnationally</td>
</tr>
<tr>
<td>China</td>
<td>Low rate of skilled delivery</td>
<td>Standard subsidies for normal and operative hospital delivery</td>
<td>Enabling environment, Supply, Demand, Quality</td>
<td>Childbirth</td>
<td>Scaled up nationally</td>
</tr>
<tr>
<td>China</td>
<td>Financial barriers to accessing health services for newborns in rural areas</td>
<td>Evidence-driven assessment and advocacy to inform policy makers and new policy development to ensure insurance for newborns</td>
<td>Enabling environment, Supply, Demand</td>
<td>Post-natal: newborn</td>
<td>Scaling up nationally</td>
</tr>
<tr>
<td>China</td>
<td>Low rate of skilled delivery in remote areas</td>
<td>Maternity waiting room and subsidies to mothers</td>
<td>Supply, Demand, Enabling environment</td>
<td>Childbirth</td>
<td>Scaling up sub-nationally; replicating in other locations</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>Low quality of maternal care, especially the management of pre-eclampsia and eclampsia</td>
<td>Introduction of magnesium sulfate in public and private hospitals leading to task shifting of drug provision to nurses and midwives</td>
<td>Enabling environment, Supply, Quality</td>
<td>Pregnancy, Childbirth</td>
<td>Scaling up nationally</td>
</tr>
<tr>
<td>India</td>
<td>High newborn mortality rate after hospital discharge</td>
<td>SMS system for tracking newborns after hospital discharge and timely home visits by community health workers</td>
<td>Supply, Quality</td>
<td>Postnatal: newborn</td>
<td>Scaling up within a state</td>
</tr>
<tr>
<td>Country</td>
<td>Key issues/bottlenecks to address</td>
<td>Innovation</td>
<td>Health systems areas</td>
<td>Continuum of care</td>
<td>Scale</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>------------------------------------------------------------</td>
<td>--------------------------------------------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>Mongolia</td>
<td>Lack of BEmONC services including insufficient human resources and stock-out of commodities</td>
<td>Integration of newborn care within maternal health services and supplies (midwifery kits)</td>
<td>Enabling environment Supply Quality</td>
<td>Childbirth Postnatal: mother &amp; newborn</td>
<td>Gradual national scale-up following policy adoption</td>
</tr>
<tr>
<td>Nepal</td>
<td>Low access to skilled birth attendants and basic emergency obstetric and newborn care (BEmONC) services</td>
<td>Upgrade of primary health facilities to birthing centres in remote areas through a comprehensive approach including creating an enabling environment, facilitating access to care and increasing demand for services</td>
<td>Supply Demand Enabling environment Quality</td>
<td>Pregnancy/antenatal Childbirth</td>
<td>Scaling up subnationally</td>
</tr>
<tr>
<td>Pakistan</td>
<td>High maternal and neonatal mortality and morbidity in flood-affected areas</td>
<td>Upgrading BEmONC services by implementing a comprehensive package: 24/7 service delivery, incentives, performance-based financing, eHealth monitoring and communication for development (C4D)</td>
<td>Supply Demand</td>
<td>Childbirth</td>
<td>Scaling up subnationally</td>
</tr>
<tr>
<td>Philippines</td>
<td>High maternal and neonatal mortality rates</td>
<td>Implementation of quality Essential Intrapartum and Newborn Care (strategy to strengthen the health system)</td>
<td>Supply Demand Quality</td>
<td>Childbirth Postnatal: mother &amp; newborn</td>
<td>Scaling up subnationally</td>
</tr>
<tr>
<td>Rwanda</td>
<td>Slow progress in reduction of maternal deaths</td>
<td>Rapid SMS-MCH using mobile phones for monitoring throughout pregnancy and post-partum and strengthen referral systems</td>
<td>Supply Quality</td>
<td>Pregnancy Childbirth Postnatal</td>
<td>Scaling up nationally</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>Shortage of health personnel providing emergency obstetric and newborn care (EmONC) services in underserved rural areas</td>
<td>Training of health workers using mannequins</td>
<td>Supply Quality</td>
<td>Childbirth</td>
<td>Scaling up subnationally</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>Inequities in utilization of maternal health services</td>
<td>C4D model for community action / community empowerment</td>
<td>Demand</td>
<td>Pregnancy Childbirth</td>
<td>Scaling up subnationally</td>
</tr>
</tbody>
</table>

6 Communication for development (C4D) is an approach promoted by UNICEF that uses a two-way process for sharing ideas and knowledge using a range of communication tools and approaches that empower individuals and communities to take actions to improve their lives.
2. Case studies: Innovative approaches to maternal and newborn health

AFGHANISTAN: Maternity Waiting Homes: Reducing geographic access barriers

Background
Decision-making on health care is seen to be influenced by perceptions of accessibility. A study supported by UNICEF in 2002 found that maternal mortality in Afghanistan was high, and increased with the remoteness of the location where a woman lived. A more recent UNICEF study found that distance similarly impacted health care knowledge among women, as well as decisions to seek care. Only 30 per cent of families in Ragh, in rural Afghanistan, sought care, whereas 72 per cent did so in the capital city Kabul.

In all locations, families reported lack of transport, distance to services, insecure travelling conditions, and the inability to afford transport or care as obstacles. Of families trying to obtain care, three quarters identified distance, availability of transport, and cost of transport and services as the most significant obstacles to access. Almost 70 per cent reported that they did not receive quality and timely care after reaching a facility or provider. Cost was also a constraint, since many families had to buy blood and medications. Overall, 78 per cent of maternal deaths reviewed were believed preventable. Deaths could be averted if complications were prevented through optimization of general health status and if complications that occurred were treated to reduce their severity.

Strategy
As a response to evidence on low care-seeking in rural areas especially for childbirth, the Ministry of Public Health developed a national strategy to increase the number of skilled birth attendants (SBA) and emergency obstetric care facilities, as well as to link the health system with rural communities through community health workers (CHWs).

Maternity waiting homes (MWHs) were introduced as a key strategy to bridge the geographic gap in obstetric care for people living in rural areas. Integrated as part of the health system, these homes admit pregnant women from remote rural areas and provide them a comprehensive package of clinical service for skilled delivery and postnatal care (PNC), referrals in case of complications, counselling for maternal and newborn care including nutrition and early initiation of breastfeeding, family planning and social services including community awareness of existing MWHs, income generation activities, gender awareness and support for domestic and gender-based violence.

Implementation
Six MWHs were built by UNICEF and the Ministry of Public Health in rural areas of Afghanistan in six locations – Kandahar, Badakhshan, Laghman, Kunar Herat, and Bamyan – and they began functioning in 2009. Each MWH has six staff members: one matron, two midwives, one cleaner and two guards. Each

Why is this innovative?
Maternity Waiting Homes are an equity-based strategy implemented for the first time in Afghanistan to increase access to maternal and newborn services among women from remote areas. It is a low-cost solution to skilled birth attendance, aiming to bridge the geographic gap in obstetric care in inaccessible areas and reduce inequities. Maternity Waiting Homes increase institutional deliveries and consequently decrease maternal mortality caused by the delay in reaching obstetric care.
MWH can accommodate 10 women with their newborns at any given time. Extensive community dialogues were held during the feasibility study of the MWHs; as a result, land for the MWH in Bamyan was donated by the community.

The MWHs do not have any specific catchment population. The entire province may be the catchment area for a MWH, and in some locations, patients from neighbouring provinces may come; for example, in the MWH in Kandahar, women are admitted from Zabul, Uruzgan and other provinces as well.

Operational guidelines for MWHs cover objectives, service provision, overall management and oversight, community mobilization and referral support, and financial and technical reporting, thus encouraging financial sustainability of MWHs.

Provincial health departments are responsible for staff recruitment, reporting and recording, facilitation of trainings and provision of professional assistance as required. Administration and supervision of the MWH operations are managed by a committee. Protection and efficient usage of MWH properties is ensured and all broken and stolen property issues are solved by the department.

Results
MWHs were constructed and operationalized in phases; the first facility (Kandahar) was established in April 2009, and between 2009 and 2012, a total of 2,434 women and newborns benefitted from MWH services; and 5,925 women and 5,100 newborns had access to skilled and quality emergency obstetric care during pregnancy, birth and post-partum period.

An evaluation of the MWH in Kandahar indicated that no maternal death occurred among clients admitted there. For the fetal outcomes, 93 per cent were live births, 6 per cent still births and 1 per cent neonatal deaths.

Travelling distance and road security are major barriers for clients to come from other provinces: 79 per cent of MWH clients reported longer travelling distance as the main reason for utilising the facility while 21 per cent of clients were admitted for other reasons such as obstetric complications.

Most of the clients were facility referrals and the numbers of community referrals are likely to increase with the increase in female community health workers in the region. A total of 118 patients refused admission to the MWH as their family did not allow them to stay.

In terms of where MWH clients resided, 87 per cent of all clients belonged to Kandahar province and a small fraction belonged to other south region provinces (Helmand 6 per cent, Uruzgan 5 per cent and Zabul 2 per cent). A few cases were also received from neighbouring regions and provinces of Daikundi, Ghazni and Farah.

The number of women using the MWH in Kandahar is an indication that this approach is accepted by the community and the facility is considered a credible provider of health services to women with high-risk pregnancies.
Lessons learned

- MWHs are decreasing the patient load at maternity hospitals and are providing quality care.
- Women admitted in MWH are receiving new knowledge about health and nutrition issues.
- MWHs provide a safe and peaceful environment for social interactions among women.
- Clients are becoming repeat clients: families who used a MWH once are coming for the next pregnancy, indicating satisfaction with the services.
- The MWH concept was used to create maternity waiting rooms at the district hospital level, at a lower cost than establishing more MWHs.
- MWHs provide good learning environment for newly graduated midwives.

One woman’s story: Zareen Gul, mother-in-law of Gul Bakht, a woman who used the MWH, reported: “We are from Kuchi population and it is my second time that I am bringing a daughter-in-law to the Kandahar Maternity Waiting Home. Based on my experience with my first daughter-in-law, I encouraged Gul Bakht to deliver at health facility because this is her first child. She started having labour pains at midnight and is also suffering from a urinary infection, so I was worried. When we reached the hospital, the staff referred us to the MWH and it is really like home. We are feeling safe and secure here.”

Next steps

- Future scale-up of MWHs in focus districts in underserved areas, including Diakundai, Badghis, Ghor, Kandahar and Hilamnd provinces. An estimated population of around 10,000 pregnant women are being targeted.
- Advocacy is being planned to mainstream MWH into hospital management contracts.
- Public information and communication through the community development councils will promote the use of MWHs among the catchment population. CHWs will be made more aware of these facilities in their communities.
- The possible use of mobile health units to transport clients to MWHs will be explored.

Potential application

MWHs play a role in promoting facility-based deliveries and reducing maternal mortality. Introducing incentives for women to use the service by subsidizing or eliminating transport costs could influence uptake, as would sensitization by community development councils and CHWs.

Acknowledgements: Nasreen Khan (UNICEF Afghanistan), Malalai Naziri (UNICEF Afghanistan), Nuzhat Rafique (UNICEF Regional Office South Asia)
BANGLADESH: Maternal and Perinatal Death Review for evidence-based prevention

Background
Bangladesh has experienced a steady decline in maternal, neonatal, infant and under-five mortality in recent decades; however, the rate of decline is insufficient to achieve MDG 4 and 5 targets set for Bangladesh. Independent evaluations of the Bangladesh national health sector and maternal and newborn health programmes reported problems related to the quality of care that had to be addressed for improvement to be seen. The Maternal and Perinatal Death Review (MPDR) is a mechanism to understand medical or social causes of death and to put in place preventive measures to avoid future maternal and neonatal deaths. These mechanisms were found necessary at facility and community levels.

Strategy
UNICEF and two directorates of the Government of Bangladesh – the Directorate General of Health Services and the Directorate General of Family Planning – initiated the MPDR with the Centre for Injury Prevention and Research. An MPDR system and associated tools were developed in collaboration with WHO, UNFPA, professional organizations and other experts. After approval of the directorates, this system and tools were first implemented in one district, Thakurgaon, in 2010. Based on this experience, the Government of Bangladesh scaled up implementation of the MPDR programme to three additional districts (Jamalpur, Moulvibazar and Narail) to cover a population of approximately 5.8 million people. The system gathers actionable data related to maternal and newborn deaths. Data collection instruments developed include the notification of maternal and neonatal deaths and still births at both facility and community levels, verbal autopsy in community deaths and facility death reviews.

Implementation
The two directorates are implementing the MPDR through the existing health system infrastructure, utilizing grassroots-level health care providers. Over 5,700 health and family planning staff at the field level were trained to perform death notifications of maternal and neonatal deaths and still births at community and facility levels, perform verbal autopsies and social autopsies, and organize quarterly review meetings at the subdistrict (upazila) and district level to analyse findings and plan remedial actions. The analysis of data and the preparation of follow-up actions for implementation and improvement at the local level. The process is also monitored and evaluated through two-way feedback from communities to the providers as well as to the policy makers. Implementation at the district level is coordinated through the District MPDR Coordination Committee and the Upazila MPDR Coordination Committees. Both directorates were represented during the formation of these committees to agree on roles and responsibilities during implementation. The committees provided all guidance and support for implementation under the policy guidance of the National MPDR Coordination Committee where both directors serve as co-chairs. The MPDR Technical Committee is composed of technical experts, professionals and programme experts of the two directorates and provides technical inputs when necessary.

Field-level implementation is conducted by field and facility staff of both directorates. Field-level health staff record maternal, neonatal deaths and still births at the community level, and nurses in health facilities do so using death notification slips. After a death is reported, either a health inspector or a

Why is this innovative?
Bangladesh newly introduced the Maternal and Perinatal Death Review to improve the quality of services provided to women in order to reduce maternal and neonatal deaths. Impressive results from the first year’s implementation demonstrate that these innovative solutions can translate into life-saving actions.
family welfare inspector conducts verbal autopsies in the community using a field-tested form while trained nurses and doctors do the facility death reviews.

All data are analysed and reviewed at periodic review meetings at *upazila* and district MPDR review meetings. Data are also utilized for mapping deaths, which is the process of identifying the location of deaths by geographic and administrative areas. Follow-up actions are planned through participatory discussions during the review. MPDR committees at the local level support and supervise implementation of the MPDR and remedial actions. A central purpose of the MPDR is to continue to integrate data into government planning and decision-making.

**Results**

**Capacity-building:** The programme began with the orientation of the health and family planning managers at the district and *upazila* levels. It was followed by the training of the health care providers and field staff under the two directorates, on the MPDR mechanism and associated tools. A total of 3,440 health assistants, family welfare assistants and equivalent non-governmental organization (NGO) field workers were trained on death notification; 409 health inspectors and family planning inspectors and paramedics on verbal autopsy and 363 doctors and nurses on facility death review.

**Deaths notified:** A total of 306 maternal deaths, 3,371 neonatal deaths and 3,056 still births were reported in 2011 in four districts (see figure 2). Verbal autopsies were conducted in all cases of maternal and one third of other deaths. The analysis of verbal autopsies and facility death reviews revealed critical details for programme managers, making it possible to identify actions to improve care.

**Table 2. Community death notification in four districts (Jan–Dec 2011)**

<table>
<thead>
<tr>
<th>District</th>
<th>Population</th>
<th>Maternal deaths</th>
<th>Neonatal deaths</th>
<th>Still births</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jamalpur</td>
<td>2,089,366</td>
<td>100</td>
<td>1,321</td>
<td>1,214</td>
</tr>
<tr>
<td>Moulvibazar</td>
<td>1,604,028</td>
<td>110</td>
<td>865</td>
<td>829</td>
</tr>
<tr>
<td>Narail</td>
<td>689,021</td>
<td>36</td>
<td>314</td>
<td>280</td>
</tr>
<tr>
<td>Thakurgaon</td>
<td>1,400,000</td>
<td>60</td>
<td>871</td>
<td>733</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>5,782,415</td>
<td>306</td>
<td><strong>3,371</strong></td>
<td><strong>3,056</strong></td>
</tr>
</tbody>
</table>

Verbal and social autopsies from the MPDR mechanism prompted the district committee to investigate the Kashipur union based on deaths reported there. The MPDR system reported 4 maternal deaths, 21 neonatal deaths and 15 still births that occurred during 2010 in Kashipur (a population of approximately 22,000 people) in Ranishankoil *upazila* in the Thakurgaon district. This is a remote area with illiteracy and poverty rates higher than the national average. The investigation identified one community clinic that was not functioning due to insufficient human resources and logistics issues, and was most likely the reason for the high death rate.

Local health authorities took action, deploying members of the Community of Skilled Birth Attendants to work in this health facility and provide needed logistical support, besides launching awareness activities. The community clinic started operations again. Coverage with ANC, safe delivery and PNC including newborn care increased, as did referrals to the health facility. These actions resulted in positive results within a quick period: 2011 data showed a remarkable reduction in deaths in this catchment area: there were no maternal deaths, while eight neonatal deaths and five still births were reported. An analysis of maternal referrals showed that the community referred at least a few potentially serious cases immediately to the district hospital.
The three delays were analysed using the verbal autopsy data in 252 of the 206 maternal deaths in 2011. In a majority of the deaths, decisions were taken to go to facilities or for treatment within two hours (41 per cent), and within six hours of the appearance of danger signs or complications (75 per cent). Sixty-one per cent of deaths were among mothers who managed to reach the facilities within two hours of decisions taken while 78 per cent of women who reached the facilities received some form of treatment.

One woman’s story: Thakurgaon District Hospital examined the facility death review findings of the 12 maternal deaths that occurred in 2010. Trained nurses collected data from records and witness providers, using the facility death review form. Trained doctors also reviewed death cases using the Agreed Standard Procedure checklist. The causes of deaths were analysed and shared in the MPDR death review meeting in June 2011 and it was found that the majority of the 12 deaths could have been averted by the availability of blood. Health authorities then established a blood bank, storing blood bags and establishing a network of volunteer-donors to meet future emergencies. Among the women who benefited from this change was a 19-year old from Bongoan who was referred to Thakurgaon Sadar hospital on 13 August 2011 for profuse bleeding after delivery. She was saved by a blood transfusion, provisions for which had not existed before.

Lessons learned
Evidence from 2011 tells a compelling story of improvements made possible in health outcomes through effective implementation of the MPDR. A cornerstone to effective implementation is ownership from the community level up to the national level, which inspires action-oriented responses to challenges identified through data on maternal and newborn deaths.

User acceptability and user friendliness were documented in the qualitative evaluation at the end of the first phase. Death mapping and the resultant findings created an awareness and enthusiasm among local managers to plan and implement follow-up actions. A number of essential health care interventions were improved in communities and facilities. Results have since been visible and appreciated at the national level.

Next steps
The MPDR will continue to be implemented, with an updated model in 2013 incorporating feedback from health managers, providers and staff who did the implementation and also taking into account lessons learned and good practices. All government, civil society and United Nations stakeholders will also be consulted before updating the model. Data will be aligned with the existing health information system so that it reflects at national level for use in programme planning and reporting for MDG 4 and 5. Scale-up of the MPDR is being discussed in sub-committees that are now working on updating the National Maternal Health Strategy and standard operating procedures.

Potential application
Countries can make sustained improvements in maternal and newborn health outcomes using the MPDR approach. But the MPDR needs to be adapted to the country context and its policies. Once implemented, results can lead to quick ownership and a willingness to bring it to scale.

Acknowledgements: Riad Mahmud (UNICEF Bangladesh), Nuzhat Rafique (UNICEF Regional Office South Asia)
Further reading: Centre for Injury Prevention and Research, Bangladesh (www.ciprb.org)
CAMBODIA: Communication for Behavioural Impact to promote early antenatal care

Background
In 2005, Cambodia’s maternal mortality was estimated at 472 deaths per 100,000 live births and there was no recorded reduction in maternal deaths since 2000. Only 44 per cent of births were taking place with a skilled attendant present, while 55 per cent of women were giving birth with a traditional birth attendant or by themselves. Only 22 per cent of all births were taking place in health facilities, either at health centres or referral hospitals; the other 78 per cent were home births.

A baseline assessment undertaken by the National Centre for Health Promotion and the Provincial Health Promotion Units in seven demonstration provinces in 2008 estimated that only 5.6 per cent of women attended their first ANC visit within the first month of having missed their period.

Strategy
With support from the European Union and UNICEF, the National Maternal and Child Health Centre and the National Centre for Health Promotion of the Ministry of Health jointly launched the Behaviour Change Communication (BCC) campaign ‘Antenatal Care within the First Month of Missing a Period’ in January 2009. The media component was national in scope, while interpersonal communication, social mobilization and outdoor promotion focused on the seven ‘good BCC practice’ provinces.

The overall goal of the ANC campaign was to contribute to improvements in child and maternal survival in Cambodia by providing proper and early ANC to pregnant women. The BCC campaign was developed using the Communication for Behavioural Impact (COMBI) approach. Its methodology integrates health education, information, education, communication (IEC), community mobilization, consumer communication techniques and community-based maternal and newborn health programmes. These are all directed to specific behavioural outcomes to improve ANC seeking, especially among women living in remote areas.

In order to achieve desired behavioural changes, the COMBI plan for ANC employed a blend of five communications strategies including administrative and community mobilization, public relations and advertising, personal selling, interpersonal communications, and point-of-service promotion.

Implementation
The media component of the campaign was national in scope while the interpersonal communication component was implemented in seven provinces (Kampong Speu, Prey Veng, Sway Rieng, Kampong Thom, Odar Mean Chey, Stung Treng and Mondulkiri). In these provinces, the National Center for Health Promotion and the Provincial Health Promotion Units trained health centre staff and thousands of Village Health Support Group volunteers called Maternal Child Health Missionary to promote ANC.

Why is this innovative
The new ‘Communication for Behavioural Impact’ or COMBI approach for ANC in Cambodia integrates health education, IEC, community mobilization, consumer communication techniques and community-based maternal and newborn health programmes. These are all directed to specific behavioural outcomes to improve ANC seeking, especially among women living in remote areas.

---

7 Bangladesh Demographic and Health Survey, 2004.
The national advertising consisted of eight 3-week flights\textsuperscript{8} during the course of a one-year period through various channels including television, radio, newspapers, and magazines. The advertisements, reinforcing each other, were intended to keep the theme of early ANC within one month of missing a period on the public agenda, and reinforce support for its practice, as well as to lend support for the door-to-door work of community volunteers.

At the health centre level, midwives were retrained in providers’ rights and clients’ rights. As part of the exchange between midwife and client, an additional incentive in the form of a pregnancy welcome kit was given to women to encourage other women to adopt the recommended behaviour, i.e., attending early ANC. This kit included a cloth bag with the campaign logo and branding in which there was a bar of soap along with a booklet on pregnancy.

Flags and banners with the campaign logo were posted at each targeted health centre in the seven provinces, where a woman who might be pregnant could go for care. They were a visual reminder to women passing by that this is where they could come in for their ANC visit within one month of having missed their period. In the waiting area of each health centre three large posters were prominently displayed with messages similar to those of TV and radio spots. Additionally, in midwife examination rooms, the same three posters were displayed as a reminder to the midwife and the woman.

**Results**

An external evaluation of the BCC project and the ANC campaign in 2011 documented that the national health promotion capacity had been strengthened as planned. Within the first 12 month of the ANC campaign, 36 per cent of potentially pregnant women came in for their first ANC visit within the first eight weeks, in the seven provinces. After the campaign, the proportion of pregnant women completing all four recommended ANC visits almost doubled, while the proportion of pregnant women receiving 90 iron folate tablets also increased significantly. Data collected from 2008 to 2011 shows that these trends are sustained and that the number of pregnant women receiving two tetanus toxoid vaccinations increased significantly, almost doubling in four of the seven provinces.

Between 2005 and 2010, ANC visits increased from 69 to 89 per cent, delivery by SBAs from 44 to 71 per cent and delivery in health facilities from 22 to 53 per cent. The proportion of women delivering with the support of traditional birth attendants decreased from 55 per cent in 2005 to 28 per cent in 2010.\textsuperscript{9} It appears that efforts in improving ANC coverage through the ANC campaign, midwifery incentives, improved referral systems and availability of SBAs at the health facilities all contributed to these improvements.

Noting the positive result of the ANC campaign, the Ministry of Health encouraged the National Maternal and Child Health Centre and UNICEF to expand the campaign to other provinces. From 2010 to 2011, the campaign covered nine additional provinces, bringing its total coverage to 16 out of 24 provinces nationwide.

\textsuperscript{8} A flight is defined as that period of time during which the advertisements take off or are run (three weeks), followed by a pause of several weeks (about 2-6 weeks), and then followed by another flight of another three weeks, another pause, and so on. Strategic and constant repetition is key in advertising.

\textsuperscript{9} Cambodia Demographic and Health Surveys, 2005 and 2010.
Lessons learned
The evaluation of the campaign noted that distances to the health centres remained a barrier for some women in completing the recommended number of ANC visits. In addition, it was recommended that sustained coordination among various Ministry of Health departments was essential for successful implementation of the campaign activities.

Next steps
The ANC campaign activities are being sustained and integrated with community-based programmes for mothers and newborns in selected operational districts characterized by their distance from health centres and having the largest number of poor and ethnic minorities. In addition, the media component is also continuing to ensure that gains are sustained.

Given the positive results of the campaign in improving ANC coverage in Cambodia, the COMBI approach is now being used to implement a communication campaign for appropriate care-seeking for pneumonia and improving complementary feeding practices in Cambodia.

Potential application
With appropriate adaptations to local contexts, in the channels used and the message, this targeted approach to behavioural change can be used to increase demand for a number of essential maternal and newborn health interventions.

Acknowledgements: Malalay Ahmadzai (UNICEF Cambodia), Thomas Jensen (UNICEF Cambodia), Vanny Ung (UNICEF Cambodia), Tan Try (UNICEF Cambodia), Nabila Zaka (UNICEF East Asia and Pacific Regional Office)
CAMBODIA: Community care of mothers and newborns

Background
In 2008, Cambodia had one of the highest maternal mortality ratios (MMR) in the region, with 472 deaths per 100,000 live births and there was no recorded reduction in maternal deaths since 2000.\(^{10}\) Cambodia was not on track for meeting its 2010 MDG target set at 243 deaths per 100,000 live births. The main causes of maternal deaths included bleeding during or immediately after delivery, eclampsia, obstructed labour and sepsis.\(^{11}\)

Despite decreases in child mortality in Cambodia, the decline in neonatal mortality had been slower than in post-neonatal mortality (24 per cent and 36 per cent between 2000 and 2005, respectively). Newborn deaths, or death in the first month of life, represented 42 per cent of infant mortality and 34 per cent of under-five mortality. And while Cambodia was on track for meeting its MDG targets for infant and under-five mortality, future progress depended on neonatal mortality reduction.

In 2005, only 44 per cent of births in Cambodia were taking place with a skilled attendant present, while 55 per cent of women were giving birth with a traditional birth attendant or by themselves. Only 22 per cent of all births were taking place in health facilities; the other 78 per cent were home births. Key factors impeding deliveries with skilled attendants included the unavailability of midwives, limited working hours of health centres (many are closed at night), high costs of care and transportation, long distances, unavailability of transport, and traditional beliefs. The widespread tradition for delivering at home with a traditional birth attendant was posing serious risks to maternal and newborn health. Major risks included poor hygiene (mainly a lack of hand washing) and traditional cord care practices which expose the baby and the mother to high risks of infection including tetanus. Another traditional practice after delivery translated as ‘roasting’\(^{12}\) restricts a mother’s ability to leave her house and seek health services for a routine postpartum or newborn check-up.

While many births were taking place at home with traditional birth attendants, their cooperation with the health sector was not clearly defined, resulting in poor linkages and referrals from communities to health facilities. ANC, care during delivery, and PNC provided at health centres was of poor quality due to the limited knowledge and skills of midwives and a shortage of drugs and supplies. Some health centres lacked electricity, had problems with water supply and measures to prevent infections, and lacked or had inadequate space for delivery and postpartum stays for the mother and newborn.

Simple, low-cost interventions in newborn care received little attention in Cambodia and were either not available or accessible to many Cambodian families. Also, the ability of Cambodian families and communities to recognize and access care quickly in an emergency, which is critical for the survival of

---

\(^{10}\) Cambodia Demographic and Health Survey, 2005.
\(^{12}\) Roasting is a traditional post-partum practice locally known as *ang pleung* that is based on the Khmer concept of balancing the body between hot and cold after a traumatic experience such as childbirth. Women stay on a mat bed over coals for three to seven days and are not permitted to leave the bed.
the baby, was very weak. This was causing harmful delays in seeking immediate or emergency health care. Two major sets of causes determined poor maternal and newborn health outcomes:

- Factors related to health services provision, and more specifically, limited availability and poor quality of essential health services including inadequate responsiveness to patients’ needs;
- Factors related to demand and utilization of essential health services, which depend on the knowledge and ability of families to access services (cost and transport), as well as traditional practices and beliefs dominant in society.

**Strategy**

In light of Cambodia’s high maternal and neonatal mortality, the Ministry of Health, with support from UNICEF Cambodia, piloted the ‘Community Care of Mothers and Newborns’ (CCMN) package. In 2008 and 2009, the package was adapted from the global WHO Newborn Health Care Package, and tested with UNICEF support in 200 villages in Kampong Thom and Steung Treng provinces in 2009 and 2010.13

CCMN promotes an integrated approach to the mother and newborn. It aims to complement the care provided by health staff and uses mostly female CHWs or Village Health Support Volunteers to conduct targeted home visits during pregnancy, and the post-partum period. The main objectives of this pilot package were to assess:

- Relevance, quality and effectiveness of training, monitoring and supervision;
- Feasibility of the pilot implementation by volunteers and acceptability of volunteers’ work by health centre staff and families;
- Effectiveness of the pilot on family and community practices, including the uptake of ANC, delivery and PNC at health facilities, and on referrals when signs of danger are seen in pregnancies;
- Feasibility and sustainability for replication and expansion.

It was also planned as part of the pilot experience to identify and document lessons learned and good practices that could inform the scale-up of the community care of mothers and newborns.

**Implementation**

During the home visits, trained community volunteers provide health education, advise families on care during pregnancy and post-partum periods, refer to health facilities for ANC, delivery and PNC services, assist pregnant women prepare a birth plan, advise and check for danger signs for both mothers and newborns — referring them to a health clinic if necessary — and promote and support breastfeeding practices.

**Materials:** The CCMN package consists of training materials, supervision and monitoring tools, counselling cards for community volunteers and IEC materials for families. To ensure the continuity of care, the CCMN package was implemented in areas where previous training, equipment and supervision investments had already been made in the health system.

**Training:** Prior to training community volunteers, a national and provincial level training-of-trainers was held for the provincial and operational district maternal and child health managers, who in turn trained health centre staff on supervisory and training skills. The advantage of this cascade training model is that it does not require an outlay of significant resources (i.e., human, material and financial). More

---

13 The package was tested in five other provinces, supported by USAID-funded NGOs, GIZ and Save the Children.
specifically, the programme does not have to hire and support a separate team to do the training, but uses existing staff as trainers. Costs are generally low and decentralized by using existing staff and having the training take place near or in the trainer and trainee work site (e.g., a health centre). The process empowers health staff at all levels to plan and conduct trainings.

The community volunteers’ CCMN package has 24 lessons, with three extra lessons that cover all possible activities of community volunteers in the field. The ANC portion of the training took four days, with a one-month gap to ensure the community volunteers got exposure to field work, followed by three days of PNC training. The trainings were provided to community volunteers by the district health managers and health centre staff covering the catchment area where community volunteers operated. The community volunteers were provided with a register to facilitate adequate monitoring of their activities including documenting the number of pregnant and post-partum women visited and referred.

Results
The CCMN package pilot was evaluated in 2011 to assess its relevance, quality and effectiveness, efficiency, scalability and sustainability and to inform national expansion plans. CCMN was piloted in two provinces, Kampong Thom which is semi-rural and Stung Treng which is very rural and has a large number of ethnic minority groups. By the end of 2010, CCMN intervention had reached 6,375 pregnant and post-partum women and newborns, which was about 27 per cent of the target group, with one community volunteer per 15 beneficiary women and newborn per year.

Relevance: The pilot was shown to be in line with Cambodia’s health policies and plans. Training modules proved to be relevant to the context and effective. Priority was given to the health centres with weaker coverage indicators to improve those that had lower performance, and staff from these health centres were trained on integrated post-partum care. The assessment indicated that staff appeared motivated and reported training time was adequate. Implementation guidelines were followed for the selection of the trainers and community volunteer; communities were involved in the selection of community volunteers.

Efficiency and sustainability: A total of 6,375 pregnant and post-partum women participated in the CCMN pilot, at a cost of $7.12 per woman. The highest of these costs were supply-related, accounting for 39 per cent of the programme’s total costs. Other than referral slips and registers, which needed to be periodically replenished, supply was largely a non-recurrent cost, i.e., of procurement of thermometers, timers and weighing scales for community volunteers. Training the community volunteers was the second highest costing activity, accounting for 32 per cent of total costs. Since the programme relies on existing health workers and community volunteers, it has no additional costs and can piggyback on existing training and supervision mechanisms.
Quality and effectiveness: Four hundred and fifty women (300 in intervention villages and 150 in non-intervention villages) who had delivered in the previous four months were selected to participate in the quantitative assessment, which focused on assessing their knowledge and care-seeking behaviours. The overwhelming majority of respondents in both groups were homemakers (94 per cent and 99 per cent). Across all knowledge-related indicators such as knowledge of care for a pregnant woman, birth preparedness, danger signs and newborn care, there were considerable differences, most of which were statistically significant, with higher levels of knowledge between intervention and non-intervention responses.

Women in intervention areas were far more likely to cite midwives and community volunteers as providers of ANC, at 72 per cent and 52 per cent respectively. The corresponding figures in the non-intervention group were only 21 per cent and 12 per cent respectively. Community volunteers were cited as providers of ANC services possibly due to their presence in outreach ANC sessions as well as their pregnancy visits. The few respondents in the non-intervention areas who did not use ANC services cited reasons such as distance, lack of an accompanying person, and lack of knowledge about the place where ANC services were provided.

CCMN aims to vastly increase the proportion of deliveries taking place in institutions. There is a statistically significant difference between CCMN intervention and non-intervention communities in terms of delivery practices for the most recent baby, with approximately two thirds of women delivering in institutions (61 per cent) and about 70 per cent receiving skilled birth attendance, in contrast with lower figures for non-intervention sites.

The most marked differences were seen in postnatal practices of skin-to-skin contact and immediate breastfeeding. Significant differences were also seen in feeding of colostrum and immediate drying and wrapping.

Timely home visits by community volunteers, particularly in the post-partum period, are a critical part of the CCMN strategy. These visits allow community volunteers to reinforce behavioural change messages, provide counselling, identify and help women and children at risk, assist women with breastfeeding and make referrals to the health centre, if necessary. Increasing the frequency of PNC visits by having community volunteers in the villages is the most significant accomplishment of the CCMN. In non-intervention communities, only 32 per cent of mothers stated they had received a home visit by a community volunteer or health worker in the last delivery, whereas in the intervention villages, 93 per cent had received home visits.

The timing of these visits was crucial. Community volunteers were encouraged to make home visits on the first, second and sixth or seventh day after delivery. For those women who could recall the date of the postnatal visits, half in intervention villages received a postnatal visit on the first day after delivery,
as compared to 24 per cent of women in non-intervention areas. Nearly all (97 per cent) of respondents in the intervention villages reported that a community volunteer had visited them during the last pregnancy, childbirth or after delivery.

These findings indicate that mothers are not being visited by community volunteers in the critical 24 hours after birth. In terms of services provided by community volunteers during postnatal visits, respondents listed taking the baby’s temperature and weighing (42 per cent), mother’s temperature (24 per cent), providing Vitamin A (11 per cent), IFA (9 per cent), advice on keeping the baby warm (15 per cent), breastfeeding (38 per cent), cord care (31 per cent), cleanliness for the baby (12 per cent) and examination of the baby (23 per cent).

**Lessons learned**

UNICEF and provincial health officers closely oversaw the training and implementation of CCMN in two pilot provinces. It is possible that the intensity and level of effort required to build community volunteers and the capacity of the health system could be unsustainable by the Ministry of Health; however, if this is built into the job descriptions and planning cycles of provincial health officers it could enhance sustainability.

**Next steps**

UNICEF’s future role with regard to scale-up would be technical assistance to the Ministry of Health in developing a scale-up plan, and ensuring that vulnerable communities are prioritized for the CCMN interventions. UNICEF also supports the Ministry of Health in drawing up guidelines for identification, support and monitoring of the NGOs involved.

The assessment report indicated considerable increases in desirable health and nutrition practices, as well as in service coverage. This can be attributed to increases in home contact and information or advice provided by community volunteers. There are strong associations between the processes meant to promote effective interventions (reported home visits and advice) and the reported practice of desirable health behaviours and service use.

As recommended by the assessment report, UNICEF supported a review of the training materials, development of the scale-up plan and implementation of initial scale-up in selected villages that are remote, have ethnic minorities, and low financial resources. By end of 2011, the pilot was scaled up in 36 per cent of the villages in 17 selected operational districts in Cambodia.

**Potential application**

The CCMN approach addresses both demand- and supply-side considerations for improved maternal and newborn health outcomes. While it requires commitment and technical and supply investments, it is relatively low-cost and can demonstrate considerable improvement in outcomes related to maternal and newborn health knowledge, attitudes and practices.

It should be emphasized that CCMN is not a stand-alone activity and is implemented as part of the continuum of care approach in all the selected operational districts in Cambodia. Thus, UNICEF also supported improvement of quality of care at the health centre levels, integrated outreach, emergency referral systems and strengthening of the supervision and on the job coaching for health staff.

**Acknowledgements:** Tung Rathavy (National Maternal and Child Health Center, Cambodia), Malalay Ahmadzai (UNICEF Cambodia), Tasnim Partapuri (UNICEF Cambodia Consultant), Nabila Zaka (UNICEF East Asia and Pacific Regional Office)
CHINA: Promoting safe motherhood through facility-based births

Background
China is unusual among most developing countries, with roughly similar rates of decline in both neonatal and post-neonatal child mortality since 1990. Historically, China’s focus on primary health care during the 1960s and 1970s contributed to lower child mortality rates than countries with similar economic development. Economic reforms in 1978 led to a decrease in community-financed, barefoot doctors and a shift toward privatized community health care that relied on user fees. Less than half of women were giving birth in facilities at this time with many home births occurring in rural areas. In 1995, China passed the Law on Maternal and Infant Health Care, which guarantees a woman’s right to institutional delivery.

Strategy
Building on recent policies to improve maternal and newborn health, in 1999, UNICEF, in cooperation with the Ministry of Health and the National Working Committee for Children and Women, launched a safe motherhood initiative. The aim was to encourage women to deliver their infants in a hospital instead of at home so mothers and their newborns could receive basic but potentially life-saving care. The approach employed three core strategies:

- Expanding the concept of safe motherhood beyond the health system by addressing three key, related factors: demand creation, community mobilization, and the affordability and quality of obstetric services;
- Establishing incentives not only to promote hospital delivery at the community level, but also to urge local health authorities to increase their commitment;
- Increasing transparency and programme evaluation to ensure proper use of funds and assist health managers to objectively assess achievements and constraints.

Most efforts seek to improve supply, demand and quality of facility-based care for mothers and newborns, as well as the enabling environment. Besides the strengthening of infrastructure, staff training and supervision in township and low-level hospitals, the approach also establishes referral channels to tertiary hospitals with the capacity to deal with comprehensive emergency obstetric and newborn care (CEmONC).

Implementation
Over 10 years, from its introduction in 1999 through 2009, coverage of the approach expanded from a pilot to all rural counties throughout the country. The initial pilot was implemented in 40 counties with low socio-economic characteristics. This was expanded to 378 counties with high maternal mortality in 2000. The scheme, which provided standard subsidies for normal and operative hospital delivery, trained Maternal and Child Health (MCH) workers on life-saving skills and mobilized communities to promote hospital delivery, was progressively expanded to 428 counties in 2002; 1,000 counties in 2005; and 1,200 counties in 2007, always focusing on those with the most maternal deaths and rural poverty. In 2008, the Government of the People’s Republic of China allocated 1.9 billion renminbi (approximately 305 million USD) for such subsidies in all central and western rural counties; since 2009, women in all

Why is this innovative?
China implemented the Safe Motherhood Initiative and expanded it beyond the health system to reduce inequities in the access to quality care. The new approach considered additional strategies including community mobilization to create demand, financial incentives to promote hospital deliveries, and transparency and accountability.
2,297 rural counties in China are eligible for subsidized hospital delivery, as one element of China’s health system reforms.

Results
Strategies employed by this initiative resulted in considerable increases in hospital delivery in rural China, documented by several large studies. In combination with separate initiatives to provide social insurance for all and medical financial assistance for the poor, China’s hospital delivery rate increased from 73 per cent in 2000 to 96 per cent in 2009. During the period 1988-2001, the average yearly increase in hospital births was 21 per cent.14

Most compelling, a statistically significant and causal association between the scheme’s support for hospital delivery and reduced maternal mortality has been found.15 To the extent that the scheme has also reduced newborn deaths, which account for over 50 per cent of under-five and almost 70 per cent of infant deaths in China – it has also reduced the rural/urban ratio of under-five mortality and infant mortality, particularly since 2002.

Lessons learned
Working closely with government, UNICEF supported the initial policy development, piloting and evaluation, helping to increase the practicability, success and sustainability of the scheme. Senior political leaders were involved extensively in the mobilization and planning in project counties along with the health bureau directors. In doing so, local funding and support extended beyond the health sector to the entire local government, and contributed to national health care reform initiatives.

Next steps
As China approaches universal hospital delivery, the quality of care in hospitals is a prime concern, with the need to ensure that mothers and infants receive high quality and accessible care during and after delivery. Many evidence-based, high impact interventions are not fully funded by the Government of the People’s Republic of China. A standard MNCH package is to be developed, a priority of which is improved quality of EmONC to further reduce maternal and newborn mortality in China.

Potential application
Other countries can learn from China’s substantial progress in reducing maternal and neonatal mortality. The major effect of China’s facility-based strategy combined with community mobilization and incentives, is estimated to be greater than that reported for community-based interventions only.16 China and other countries must ensure that family, community and hospital linkages are strengthened technically, administratively, and financially for the most vulnerable.

Acknowledgements: Robert Scherbier (UNICEF China), Sufang Guo (UNICEF China), Nabila Zaka (UNICEF East Asia and Pacific Regional Office)


CHINA: Ensuring every newborn’s financial access to health services

Background
China has made substantial progress on MDG 4 and MDG 5 targets, putting the country on track to meet both goals. Subsidies for facility births in rural areas have contributed considerably to reduce financial barriers to seeking care. In terms of children under-five dying, more than half are less than 28 days old (out of 18 of these deaths, 11 are in the newborn period).

The leading causes for neonatal mortality in China are birth asphyxia and pre-term births. The newborn mortality rate is more than double for rural areas as compared to urban areas. An analysis of place of neonatal deaths showed that 48.5 per cent of these deaths occurred at home (either the birth took place at home or mother had returned from the facility) or en route to or from health facilities. Transport and treatment costs are mentioned by 54 per cent of mothers as the major reason for not seeking care for newborn complications.

The New Cooperative Medical Scheme (NCMS), a kind of social health insurance scheme covering rural populations, was initiated in 2008 in China. In many counties, this scheme did not cover newborn illness. A review of all newborn deaths in a study of four counties in poor, rural areas revealed that 92.5 per cent of these newborns were not covered by insurance. The strategy for ‘ensuring every newborn’s financial access to health services’ was adopted to address this barrier to access for infant children.

Strategy
Starting in 2010, UNICEF began working with the Government of the People’s Republic of China to understand why children, including newborns, were not covered by insurance and why children died at home without seeking health services.

Implementation
After discussions, UNICEF China and the Ministry of Health jointly conducted a study and survey to gather evidence. A study on verbal autopsies and social autopsies was conducted to understand the main biological and social determinants of infant death. They conducted a review of national and provincial policy on NCMS and carried out a survey to understand NCMS coverage among newborns and assess the cost projections for the central government to cover NCMS for newborns.

Results of the study indicated that there are policy gaps in newborn enrolment in NCMS. For example, since revenue collection is once a year, infants born after the data of revenue collection can join NCMS only the following year. There was also a low NCMS enrolment rate among newborns; most newborns who died had no NCMS coverage.

Why is this innovative?
China implemented a New Cooperative Medical Scheme to reduce financial barriers for poor newborns. Due to low coverage of newborns in the scheme, China conducted evidence-driven assessment and strong advocacy initiatives to support policy revisions and new policy development to ensure that newborns were insured.

---

17 Unpublished results conducted by UNICEF and China’s National Center for Women and Children.
UNICEF then made projections to calculate the total funding needed for the central government to cover all newborns in rural areas in western China. UNICEF presented the evidence on gaps associated in coverage for newborns to the Ministry of Health.

**Results**
UNICEF suggested to the Ministry of Health that it issue a policy to automatically enrol a newborn into NCMS regardless of whether the mother joined NCMS or not. At present, the government has partly accepted UNICEF’s suggestion by issuing a formal document to all provinces and requesting all provinces enrol newborns into NCMS automatically if the newborn’s mother was enrolled in NCMS. This formal document has been issued by the Ministry of Health and this national policy has been implemented as a provincial policy. Now all local governments implement the NCMS according to the Ministry of Health’s request.

**Lessons learned**
To effectively advocate for policy change, a critical step is to gather robust evidence on gaps in current policy affecting health outcomes for newborns. By being able to indicate how a mother’s insurance coverage was not automatically connected to the insurance of newborns, and that this was associated with negative health outcomes, an important gap was identified.

**Next steps**
UNICEF is advocating for the central government to enrol newborns into NCMS automatically, regardless of the mother’s enrolment. Currently, China’s Ministry of Health is discussing with the Ministry of Finance the funding to support the automatic enrolment of all newborns.

**Potential application**
This approach is highly relevant to many countries seeking to lower out-of-pocket expenses for institutional deliveries without providing explicit coverage for treatment of sick newborns.

**Acknowledgements:** Robert Scherprier (UNICEF China), David Hipgrave (UNICEF China), Sufang Guo (UNICEF China), China Health Development Research Center, National Center for Women and Children’s Health, Nabila Zaka (UNICEF East Asia and Pacific Regional Office)
**CHINA: Introducing and sustaining Maternity Waiting Homes**

**Background**
Progress in reducing maternal mortality in China has been impressive, with the MMR dropping from 95 deaths per 100,000 live births in 1990 to 37 in 2010. However, regional disparities persist and the MMR in the western area is still about four times that of the eastern regions.

UNICEF and the Ningxia Hui Autonomous Region started a maternal and newborn health initiative with the purpose of improving facility-based deliveries. Ningxia Hui Autonomous Region is located in northwest China and includes 16 counties, over half of which are covered by mountainous terrain. The total population in Ningxia is 5,800,000, of which 33 per cent are the Hui ethnic minority whose socio-economic conditions tend to be lower than other population groups in this area.

**Strategy**
To increase facility-based deliveries, an integrated Maternity Waiting Home (MWH) approach was piloted to promote access to and uptake of institutional services in remote and mountainous areas in China. The four project counties – Xiji, Haiyuan, Jingyuan and Yuanzhou – are situated in the southern area of Ningxia, where maternal and child health indicators were worse than the national average even by the standards of rural areas. The per capita net income for rural farmers was $260 in 2005, about 35 per cent of the Ningxia average and half the national average. The area is drought prone and mountainous, and local communities have limited access to essential maternal and newborn services including obstetric care. In 2005, the hospital delivery rate in these counties averaged 45.8 per cent, which was 32.7 per cent lower than Ningxia’s average and 46 per cent lower than the national rural average. In the four counties, 18 townships chosen for the pilot covered a total population of 1.4 million (of which more than 60 per cent were ethnic minorities), including 343,901 women of child-bearing age and 116,110 children under 5 years.

Unlike in other MWH initiatives in which spaces are constructed, this approach uses existing rooms in the hospital, refurbishing these rooms into a maternity waiting room to avoid construction time and expenses. To ensure demand among pregnant women and support among family members, measures were also employed to inform pregnant women in remote villages about maternity waiting rooms and hospital delivery services. Pregnant women living in remote villages with a travel time of more than one hour by the quickest transport from the village to the townships were eligible to be admitted to the waiting rooms. The integrated strategy involved:

- Physical improvements to the available rooms, including providing living necessities such as cooking and hand washing facilities (allowing for cultural practices), heaters, bedding, storage services, basins, kettles, chairs;
- Offering a transport subsidy and living allowance for pregnant women of about $7.86 to help defray the cost of using the maternity waiting rooms;
- Providing free maternity waiting services including regular physician check-ups for pregnant women when admitted;

**Why is this innovative?**
China introduced a maternal and newborn health initiative, an integrated, low-cost Maternity Waiting Home approach, to address inequities in health care access and increase uptake of institutional deliveries in remote and mountainous areas. The approach effectively pairs community mobilization strategies and the provision of financial incentives to mothers.
• Mobilizing village doctors and township MNCH workers to conduct interpersonal health communication to promote the waiting rooms and encourage use among pregnant women.

Implementation
UNICEF, Ningxia Health Bureau and four county health bureaus developed the detailed plan, criteria for townships to install a waiting room, the eligibility of pregnant women to use the waiting rooms and the monitoring of their use. The Ningxia Health Bureau and four county bureaus identified the townships, based on the jointly developed criteria, and assisted in the management of the waiting rooms.

Results
In project counties, 18 townships were installed with waiting rooms and 2,631 pregnant women used the waiting room to be closer to a facility just before giving birth.

According to a preliminary analysis, the MWH-based initiatives have contributed to the improved access to and uptake of maternal and newborn health services since waiting rooms were initiated. Annual reporting data indicate that the hospital delivery rate in townships with waiting rooms increased from 54.6 per cent in 2006 to 86.2 per cent in 2008, with an increase of 57.9 per cent, much higher than in townships without a waiting room (32.2 per cent). The yearly increase in township hospitals with waiting rooms reached 25.6 per cent, also higher than that in non-waiting room townships (14.9 per cent), indicating that facility-based deliveries increased faster in townships implementing waiting room initiatives than in townships without piloting waiting room interventions.

One woman’s story: Li Wanqiao, a mother from Ligou Village in Tianping Township, delivered her baby in Tianping Township hospital, which is one of the seven facilities in Xiji County that installed a maternity waiting room. Ms. Li lives 20 kilometres from the township hospital. Her first baby was delivered at home due to the high transportation costs. In 2009, she became pregnant again and delivered her second baby in a hospital. Her experience, in her own words, reflected positive impressions of the waiting room initiative: “When I got pregnant, the village doctor came to my family and encouraged me to give birth in the hospital. She informed me about maternity waiting rooms, and said I could cook, eat and stay for free and more importantly, I could also get 30 yuan subsidy to cover my transportation cost. It proved to be true when I stayed there. The room was clean, cozy and friendly and the doctors checked me regularly free of charge. After my baby was delivered, the hospital even gave me a suit of baby clothes as a gift. I felt welcomed and cared for in the hospital and I will encourage my friends to come to this hospital.”

Lessons learned
A maternity waiting room approach should be an integrated strategy, which not only includes the physical improvements to the existing hospital rooms and provision of living necessities, but is successful when also including promotion of waiting room use within communities and transport subsidy and living allowance for pregnant women to help defray the cost of using the waiting rooms.
The success of waiting rooms is also contingent on existing capacities of health facilities. Capacity-building of health providers at hospitals and the availability of essential medical supplies are essential and should be addressed in this approach.

Next steps
The maternity waiting room approach is being scaled up to other places in Qinghai, Guizhou and replicated in a new location, Tibet. The Ministry of Health values the approach and sees the potential of applying it in hard to reach areas. In China, there are still approximately 30 counties with a hospital delivery rate of less than 50 per cent. The waiting room approach could influence the uptake of institutional delivery and reduce maternal mortality in these areas.

Potential application
MWHs play a role in promoting hospital delivery and reducing maternal mortality. The maternity waiting room approach of refurbishing existing rooms in health facilities means it is comparatively lower cost and can be set up more quickly with local ownership and adequate supply-side conditions. Introducing incentives for women to use the service by reducing transport costs, and sensitization by CHWs, can help improve immediate uptake.

Acknowledgements: Robert Scherpier (UNICEF China), Sufang Guo (UNICEF China), Nabila Zaka (UNICEF East Asia and Pacific Regional Office)
**ETHIOPIA: Introduction of magnesium sulphate to manage pre-eclampsia and eclampsia**

**Background**
Ethiopia has a high burden of maternal and neonatal mortality. The country in collaboration with development partners is making substantial efforts to reduce this mortality burden to make progress towards achieving MDGs 4 and 5. Rapid mortality reduction depends on the ability of the health system to provide quality care to mothers and neonates experiencing serious complications during pregnancy, labour and the immediate post-partum period. Low-cost but effective interventions to effectively manage most of the major complications of pregnancy exist and are already implemented in most of the world to save the lives of mothers and neonates. One of these proven high-impact interventions is the use of the safe and effective anticonvulsant agent, magnesium sulphate, for the management of severe pre-eclampsia and eclampsia.

Despite global recommendations adopted by most countries in the world over the last two decades, the Ethiopian health system had not yet made the transition to the management of eclampsia, a major cause of maternal death. Reasons included the unavailability of anticonvulsant agents and the inadequate number of trained human resources to administer and monitor drug administration in most facilities.

A national EmONC assessment conducted in 2008 revealed that parenteral administration of anticonvulsants (either MgSO4 or Diazepam) were the most frequent missing emergency obstetric signal functions at health facilities. Among the 72 health facilities missing only one signal function (out of a total 751 health facilities providing delivery service), about half were missing parenteral administration of anticonvulsants. Only a few teaching hospitals had used magnesium sulphate as an anticonvulsant. Reasons for the delay in introducing this essential intervention included the perceived risk of serious complications (i.e., drug side effects from this treatment), lack of highly trained human resources to manage complications if they arose, and unavailability of the drug and general resistance to change to a ‘new’ management in favour of established treatment modalities. Following the national EmONC assessment the Federal Ministry of Health agreed to introduce magnesium sulphate anticonvulsant management in all hospitals in 2010.

**Strategy**
The Federal Ministry of Health, in collaboration with the Ethiopian Society of Obstetricians and Gynaecologists with technical and financial support from UNICEF, implemented a one-year project to introduce this essential intervention into the national health system. Beginning with the training of non-specialist doctors and mid-level providers (i.e., health officers, midwives, nurses) on the safe administration of magnesium sulphate and its supply to health facilities, the project has successfully begun instituting this effective intervention in all public and most private hospitals in Ethiopia providing maternal and neonatal health services. Supportive supervision and mentoring seeks to ensure the quality of this intervention provided in the hospitals.

*Why is this innovative?* Ethiopia newly introduced this low-cost and highly effective intervention to address barriers to access essential medicines for mothers for the management of one of the major causes of maternal mortality. This initiative requires both involvement of public and private hospitals and shifting the duty of providing drugs to nurses and midwives.
Implementation
This project has successfully begun providing magnesium sulphate at all public and most private hospitals in Ethiopia providing care for severe pre-eclampsia and eclampsia through:

- Advocacy on the importance and feasibility of this globally-accepted, low-cost and high-impact intervention for a common pregnancy complication, at various levels of the health system including health management through health providers and their professional societies;
- Task-shifting of the administration of magnesium sulphate to non-specialist doctors and mid-level providers through advocacy and trainings that emphasize the real risk/benefit ratio of the intervention vis-à-vis perceived risks;
- Training providers in all public and most private hospitals providing maternal and newborn health services;
- Mentoring and providing supportive supervision to facilities on the successful initiation of the management, as well as auditing for negative outcomes;
- National oversight of the introduction of the intervention by a coordinating committee chaired by the Ministry of Health including the Ethiopian Society of Obstetricians and Gynaecologists and UNICEF.

Results
The project has successfully introduced the administration of magnesium sulphate for the management of severe pre-eclampsia and eclampsia in all public and most private hospitals providing maternal and newborn health services in the following way:

- An initial consignment of magnesium sulphate was delivered to these facilities through UNICEF support, and the management was initiated nationally in 113 public and 40 private facilities.
- A total of 446 providers from 113 public (all public hospitals providing maternal and newborn health services in the country) and 40 private hospitals across the country were trained on the correct management protocol of severe pre-eclampsia and eclampsia using magnesium sulphate. Eighty-four per cent of the trainees were non-specialist doctors, health officers, midwives and nurses, which emphasized the importance of task-shifting of the management of the drug in order to scale-up care to the national health service delivery system.
- Clinical mentoring was provided to all hospitals to support providers in the intervention at their work sites as well as to ensure quality care provision during the intervention.
- A clinical audit of outcome was collected from all facilities with emphasis on serious complications related to the intervention, including respiratory complications. During the one year of project implementation no serious side effects or mortality related to drug administration were recorded from any hospital.
- MgSO4 has been procured through government funding since 2010.

Lessons learned
Government leadership and oversight was critical in the magnesium sulphate roll-out and implementation, which increased its chances for sustainability. Task-shifting for magnesium sulphate provision is possible with appropriate support and oversight.
Next steps
Based on this initial experience at the hospital level, the health system is preparing to initiate magnesium sulphate administration at primary health care units across the country, with task-shifting of drug provision to midwives and nurses in these facilities.

The national scale-up of this essential intervention is occurring by expanding the provision of magnesium sulphate at 3,200 health centers across the country, through training of midwives and nurses and providing necessary supply through an enhanced partnership between the Ministry of Health, UNICEF and the Ethiopian Society of Obstetricians and Gynaecologists.

Potential application
This initiative demonstrates that with proper training and mentorship many effective interventions that were previously had to be administered at higher levels of care can effectively be provided at lower tiers of the health delivery system and does not necessarily require the presence of specialists or intensive care equipment and facilities. The project has successfully initiated this important, globally recognized, low-cost and highly effective intervention for the management of this serious pregnancy complication. The results have shown that the management is effective and the perceived serious side effects were not as common as previously thought.

Acknowledgements: Luwei Pearson (UNICEF Ethiopia), Asheber Gaym (UNICEF Ethiopia), Janet Kayita (UNICEF East and South Africa Regional Office)
INDIA: Tracking newborns treated in Special Newborn Care Units

Background
In the state of Madhya Pradesh, it was found that there was a high rate of infant death among preterm/infants small for gestational age after discharge from the health facility. A cohort analysis for survival at one year of age was done in pilot units in Guna and Shivpuri by UNICEF in 2008. Admissions showed at least 10 per cent of those discharged after successful completion of treatment died in their community before reaching one year of age. Outside of India, mortality rates after discharge for the same age range from 2.3 to 3.8 per cent, significantly smaller than the 10 per cent rate. Four years of data from 36 facilities showed that of infants treated in special newborn care units (SNCU), 12.7 per cent died after discharge. A follow-up study identified additional findings: more than half of deaths outside a facility take place in the first month after discharge, mortality was much higher in rural as compared to urban populations and more deaths occurred among scheduled castes and scheduled tribes.

Based on this data, the state of Madhya Pradesh, under India’s National Rural Health Mission (NRHM), working in close coordination with UNICEF, decided to make considerable investments in strengthening newborn follow-up care to improve survival.

Strategy
For the follow-up, a system was devised which involved six community visits in the first month of an infant’s life by trained CHWs called Accredited Social Health Activists (ASHAs), and five facility visits. These visits would be ensured through SMS technology, with timely reminders sent to frontline workers and family members for follow-up.

Implementation
Starting in 2010, the follow-up system was initiated in the pilot districts of Guna and Shivpuri using a customized software and automated SMS system for tracking newborns after discharge and to facilitate timely community and facility follow-up. The SMS system captured records of all patients admitted to an SNCU. After their discharge automated, periodic alerts were sent to the ASHA and family members for follow-up care and support. The system aimed to ensure that the babies received six visits by trained ASHAs during the first month of life, and made a total of five visits to a facility during the first year.

In each district, a data entry operator was responsible for entering patient information into the database using a computer with Internet connectivity. Customized software was developed to capture a wide range of information about the infants in SNCUs. Upon admission, the operator recorded necessary information including the mobile numbers of the family members or other persons in close contact with the family. At the time of discharge, the nurse counselled the family on the importance of follow-up care. Once the operator entered discharge information for a patient in the system, dates of follow-up

---

Why is this innovative?
A novel information and communications technology approach, a customized software and an automated SMS system is being used in the state of Madhya Pradesh to strengthen PNC services by tracking newborns after discharge and ensuring timely check-ups at home and in facilities during the first year of life.

18 Scheduled castes and scheduled tribes are two groups of historically-disadvantaged people recognised in the Constitution of India
were generated automatically and provided to the family along with a follow-up card. The family was also provided with contact details of the trained ASHAs in their village, as well as a list of danger signs, and other contact numbers in case of emergency.

Once the infant was discharged, the system automatically sent an SMS alert to the ASHA informing her that the patient was returning to the village. The schedule of follow-ups was also included in this message. On the day of follow-up, a reminder was sent to both the family and the responsible ASHA. At the end of that day, the data entry operator verified with the family whether the ASHA had visited their home and provided services.

In each case, a family was contacted 11 times through SMS from the day of discharge through the first one year of life while the ASHA was reached 12 times. The cost of installing the SMS software was 5,000 rupees (approximately 91 USD) for each district which included one year of maintenance. The cost of sending a total of 23 SMS messages in the first year of life for each child amounted to only 1 rupee (approximately 0.02 USD). The data operator was provided a salary of 7,000 rupees (approximately 127 USD) per month and was also involved in regular data analysis at the SNCU. Expenses were met through government funds under NRHM. UNICEF was involved in generating evidence related to the need for infant follow-up, conceptualizing the follow-up mechanism, developing the software and case record sheets for data recording and tracking, training of data entry operators, and monitoring the system and impact analysis.

Results
In 2010, a total of 22,667 SMS messages were delivered in the two districts, increasing to 43,024 in 2011. A total of 5,998 newborns were discharged during this period from units in Guna and Shivpuri between 2010 and 2011.

Results are available from Shivpuri district where the use of mobile SMS led to more than 63 per cent newborns receiving at least one community visit in 2010, which increased to 85 per cent in 2011. A similar increase was seen for multiple visits with 48 per cent of newborns receiving three community health visits in 2010, which increased to 67 per cent in 2011. In addition, more than 2,600 follow-up visits to the SNCU occurred in these two years.

The SMS system allowed the tracking of approximately 1,200 newborns. In 2010, an increased in newborn survival was recorded in Shivpuri compared to the 2008 cohort. Among infants successfully discharged from an SNCU, mortality reduced from 9.5 per cent to 5 per cent; for infants discharged against medical advice, reduction in mortality was from 29 per cent to 16 per cent for the same district.

The use of low-cost SMS technology has proved effective in ensuring follow-up of these newborns contributing to improved survival in a large remote district of Madhya Pradesh. The follow-up system was further strengthened in 2011 with considerable increases in both community health and facility follow-up; further gains are expected for the next birth cohort.

Lessons learned
- To maximize gains of facility-based newborn care, an effective follow-up system is strongly needed for all newborns after discharge, with well-defined protocols for follow-up, with both community and facility linkages.
- Tracking and follow-up through community and facility visits is feasible if key information about the infant is recorded. Customized software with periodic alerts based on admission and
discharge information can be developed to effectively use this information for targeted population groups.

- The use of SMS to send timely reminders to families and ASHAs is a low-cost, easy and effective method to encourage follow-up as was seen in the pilot districts.
- Improvement in survival rates at one year of age compared to a cohort two years prior indicates strong potential for continued use and replication in other areas where SNCUs exist.

Next steps
Data operators have been recruited for all units and are on board in nearly all 36 functional units in Madhya Pradesh. All the SNCUs have software for data recording and tracking installed in the system and operators have been trained. The system is being further scaled-up with necessary budgetary and human resource provision supported by the NRHM plan, with UNICEF as the technical partner. Monitoring of follow-up is being made possible online using web-based software developed by UNICEF for SNCU data management and tracking.

Potential application
With many states across India showing improved rates of institutional delivery, there is a need to invest in facility-based care for newborns and targeted follow-up. To fully optimize the effectiveness of newborn care units and improve survival rates of newborns even after discharge, a tracking system with community follow-up is needed especially in regions where health workers are trained in skills for community-based newborn care.

To effectively operate an SMS-based system, several aspects must be considered. High mobile connectivity is a precondition, which may not be possible in all rural areas. Internet connectivity is also required. Customized software storing data for each infant is necessary, as is a dedicated operator to input data and maintain records.

If the availability of a mobile network or Internet connectivity is a problem, alternative low-cost methods such as verbally informing the ASHA and families can replace the use of SMS. Having the customized software for storing information on infants discharged from SNCUs is still very useful even without SMS functionality to track patients.

There is the possibility of adapting the approach to track other populations such as pregnant women before delivery, and malnourished children and infants scheduled for receiving immunization.

Acknowledgements: Gagan Gupta (UNICEF India), Jayashree Chandra (State Government of Madhya Pradesh), Tania Goldner (UNICEF India), Henri Van Den Hombergh (UNICEF India), Rahul Bhadoria (Divisional Coordinator Gwalior), Nuzhat Rafique (UNICEF Regional Office for South Asia)
MONGOLIA: Evidence-based approaches to improving newborn care

Background
Mongolia has been reducing maternal and child mortality rates and making notable progress towards MDGs 4 and 5. A meta-analysis conducted by UNICEF on maternal and child mortality surveys in 2008 revealed stagnant levels of newborn mortality in recent decades. It also found lack of information on the current availability and quality of basic emergency obstetric and newborn care (BEmONC). UNICEF and the Ministry of Health jointly conducted three more assessments to reveal policy and service provision gaps associated with slow progress in reducing maternal and newborn deaths.

In 2008, UNICEF checked existing policy and service gaps against high-impact MNCH interventions, using the Marginal Budgeting for Bottleneck analysis. This analysis indicated that improvements were needed in the following interventions: hand washing by mothers, exclusive breastfeeding and community-based public health activities. Key bottlenecks of the health system were identified, including poor quality of available primary health care services (especially for remote and disadvantaged communities), limited skills among health practitioners, shortages of essential materials and poor implementation of health communications activities. It was also found that no unified policy integrated outreach services for mother and newborn, nor did clear guidance exist on what should be checked during maternal and newborn health visits.

An assessment of EmONC needs completed in 2010 found additional service delivery gaps. Findings included poor heating, water supply and sanitation infrastructure in hospitals (50–60 per cent of hospitals), doctors lacking skills to perform the manual removal of placenta (only 34 per cent knew how to), almost no use of partograph and vacuum extractors, very few staff properly managing delivery (13 per cent), poor newborn care particularly for the resuscitation of newborns with asphyxia in hospitals. County hospitals in particular lacked essential supplies such as blood pressure measurement apparatus and antibiotics and obstetric forceps were available at only 25 per cent of them. Interviews with clients revealed counselling of mothers was insufficient in urban hospitals: only 10 per cent of clients were prepared for possible complications during childbirth. Half of those interviewed felt it was not possible to communicate with doctors freely and 76 per cent indicating not expressing themselves freely. Observations of procedures confirmed non-readiness of EmONC services at county and general hospitals.

Strategy
Based on findings from several assessments, UNICEF first advocated for revision of the maternal mortality reduction strategy and a new plan to improve maternal and newborn health. This was approved in 2010 after the successful launch of a joint assessment with the Ministry of Health, UNICEF, UNFPA and WHO. The strategy included a monitoring and evaluation framework incorporating indicators for essential obstetric care and supplies.

Implementation
Advocacy: Advocacy on the needs of newborns was conducted among private sector representatives such as local suppliers of cashmere and wool processors, pharmaceutical and construction companies,
and most of them expressed their appreciation to the Ministry of Health and UNICEF for raising awareness about this issue. A draft memorandum of understanding was developed between Ministry of Health and the Employers Federation and Chamber of Commerce.

**Commodities**: Following results of the assessment, essential newborn commodities were provided to 80 county hospitals and UNICEF focus areas. Midwifery kits which contained essential newborn items and baby warmers were procured and distributed.

**Integration with maternal health service**: Training on essential newborn care and EmONC was conducted for 225 health workers. Work aids for health workers were distributed and IEC materials on newborn care for parents were developed and distributed. MWHs were equipped in select areas for mothers. Some MWHs were also established with a newborn corner for post-delivery care of newborns to stabilize them before going to remote herding areas.

**Results**
Overall, Mongolia saw a 10 per cent reduction in newborn mortality nationwide in 2011 according to national health statistics. There is improved awareness among government, health care providers, private sector and NGOs on newborn needs, particularly on EmONC. Budget allocation for newborn care increased in 2012 as compared to 2009 and planning for additional budget allocation for EmONC is ongoing with the Ministry of Health. Improved collaboration with UNFPA, WHO and other international and national organizations has resulted in improved division of labour and coordination of EmONC capacity-building in the country. The Maternal and Child Health Center and the Mongolian Federation of Obstetricians and Gynaecologists have improved their capacity to conduct EmONC needs assessments.

**Lessons learned**
Motivation and support for team work among maternal and child health workers must be encouraged. From Mongolia’s experience, delivery care and early newborn care need to be dealt with by the maternal health service providers in delivery homes, whereas late preventive newborn care and child care is better provided by family clinics. In areas where there is inadequate capacity of the local management team, this capacity must be built locally to improve EmONC systematically.

**Next steps**
- More resources are needed to meet needs revealed by the needs assessment, particularly for health infrastructure, human resource capacity and new technology.
- To scale-up these improvements, a role model facility with full EmONC capacities would be useful.
• Capacity-building is needed on the issue of newborn health for all health workers. The WHO needs to conduct a training-of-trainers on diagnosis, reporting of newborn cases and death audit.

• A kangaroo mother care project will be implemented for newborn warm chain improvement in selected focus areas. A C4D strategy will be developed and implemented for the empowerment of parents.

• It is essential to organize technical capacity-building of staff members and government partners on EmONC and sharing experience and learning among countries, and create a list of resources, particularly a roster of consultants on the use of new technologies, and integrated service delivery for maternal and newborn health.

Acknowledgements: Surenchimeg Vanchinkhuu (UNICEF Mongolia), Aira Toivgoo (Well Spring), Dr Buyanjargal (Ministry of Health, Mongolia), Khishige Seded (National Maternal and Child Health, former Vice President of Mongolian Federation of Obstetricians and Gynaecologists), WHO, UNFPA, Nabila Zaka (UNICEF East Asia and Pacific Regional Office)
NEPAL: Establishing and sustaining birthing centres closer to communities

Background
Although Nepal’s health system has experienced nearly 10 years of severe disruption caused by armed conflict, the country managed to almost halve its MMR from 539 deaths per 100,000 live births for 1989–1995 to 281 deaths per 100,000 live births for 1999–2005. Even with this progress, one woman was dying every four hours as a result of pregnancy and childbirth. Most maternal deaths were a direct consequence of under-utilization of appropriate health services and low quality of care, especially in rural areas. Other factors included traditional beliefs held by women, their families and communities and the lack of awareness of services and their utilization.

In 2005, 19 per cent of deliveries were conducted by SBAs. In the lowest wealth quintile, the figure was as low as 7 per cent. The Government of Nepal identified skilled birth attendance as the key strategy for reducing maternal mortality. However, skilled birth attendance and management of obstetric complications were mainly available only at hospitals and referral facilities. These facilities were not widely used by the poorer groups who tend to go to lower level facilities. It was therefore determined that delivery interventions were needed to build demand in the community as well as to increase access to quality emergency obstetric care services, specifically by developing birthing centres that would bring services closer to the community.

Strategy
The Government of Nepal determined that health facilities would be upgraded nationwide into birthing centres to fulfil criteria set by the Family Health Division (FHD). To overcome limited human resources, partnerships with local governance structures were envisioned. Strategies included creating an enabling environment through micro-planning workshops at the district and health facility level using an appreciative inquiry approach, increasing access to quality BEmONC, increasing access to skilled attendants at birth, and creating community awareness to increase demand for quality emergency obstetric services, especially among the poor and vulnerable.

Implementation
The working structure of the Ministry of Health and Population across Nepal’s 75 districts is made up of various village development committees per district. One health facility – whether a Primary Health Care Centre, Health Post or Sub-Health Post – is available in each village committee, staffed by one auxiliary nurse midwife, assistant health worker and village health worker. Each village committee has at least nine female community health volunteers (one in each ward), who provide counselling services for child

---

19 Nepal Demographic and Health Survey, 2006.
20 Appreciative Inquiry is a method for studying and changing social systems (groups, organizations, communities) that advocates collective inquiry into the best of what is in order to imagine what could be, followed by collective design of a desired future state that is compelling and thus, does not require the use of incentives, coercion or persuasion for planned change to occur. (Bushe, GR The Appreciative Inquiry Model. In Kessler, E. (ed.) The Encyclopedia of Management Theory. Sage Publications; 2013.)
and maternal health. Several strategies were developed and implemented to improve maternal and neonatal health status:

**Creating an enabling environment through micro-planning workshops:**

- **Needs assessment:** District health office supervisors in the 11 UNICEF focus districts conducted a needs assessment of the health facilities in their districts prior to establishing 24-hour, 7 day per week delivery service sites. This process helped in understanding the quality of the services at the time, the infrastructure, and human resources needed for better planning and budgeting.

- **Micro-planning workshop:** Conducted at the district level, hospitals and birthing centres, micro-planning workshops used an appreciative inquiry approach with technical support from UNICEF and the FHD, in order to ensure initiation of 24-hour delivery services at primary and subpost levels. Interactive workshops included a review and planning of the birthing centre where needs assessment findings and the maternal and neonatal health situation of the district was discussed in detail. These workshops also provided a platform for all stakeholders to discuss, share and learn about services provided by the facility, existing opportunities, issues and gaps, solutions to problems and an understanding of the responsibilities and accountabilities of different stakeholders. It created awareness among the community and helped participants to understand the importance of investing in mothers and children.

**Increasing access to quality emergency obstetric care services:**

- **Birthing centres:** To increase access to services, it was necessary to establish more birthing centres and BEmONC sites closer to the community. Birthing centres manage normal labour; BEmONC sites manage both normal labour and some complications seen during pregnancy, delivery and post-partum. Based on the needs assessment, health facilities needing to be upgraded into birthing centres were identified. The birthing centres criteria developed by FHD requires at least three SBAs, three rooms (delivery, antenatal and postnatal rooms) and equipment. UNICEF provided technical and financial support to strengthen or establish new birthing centres and BEmONC sites, by supplying equipment and instruments required for both maternal and neonatal service, minor renovation of birthing centres, continuous supervision and monitoring support, and recording and reporting of BEmONC and birthing centres.

- **Infection prevention:** To ensure and strengthen proper infection prevention practices, an important component in the quality of care, whole site infection prevention training was conducted for all birthing centres. Health workers and the support staff were taught different methods of sterilization, disposal of medical, non-medical and sharps waste, self-protection, etc. Technical support was provided to develop district level trainers for whole site infection prevention training at newly established birthing centres and for supervision and monitoring of infection prevention in these sites.
**Increasing access to SBAs at birth:**

- **SBA training:** To ensure the presence of SBAs at every delivery, UNICEF supported an eight-week SBA training for auxiliary nursing midwives and staff nurses working at birthing centres and BEmONC sites. The SBA training helped to develop competencies to provide quality ANC and PNC, and manage normal deliveries and some complications during delivery.

- **Maternal and newborn health update package:** Health authorities and partners developed a maternal and newborn update package, which emphasized prevention and management of the main three causes of maternal deaths: post-partum haemorrhage, preeclampsia/eclampsia and prolonged labour. While health workers waited to be trained as SBAs, they received the maternal and newborn health update package training as a short-term strategy to capacitate them with knowledge and skills for the correct management of normal labour and timely referral of complicated cases to CEmONC centres.

**Creating community awareness and increased demand for quality BEmONC services:**

- **Watch group:** UNICEF provided technical support to the Ministry for Local Development to develop watch group implementation guidelines, piloted by UNICEF in one district. The watch group’s main role is to identify pregnant women in their ward, counsel and encourage them to attend ANC and PNC clinics, help them understand the importance of maternal nutrition and institutional delivery with SBAs, and ensure the woman has received a tetanus toxoid injection,
iron and deworming during pregnancy. The watch group also establishes a BEmONC fund and ensures that the fund is well managed.

- **Transport:** The Aama programme – the Government of Nepal’s free delivery programme – provides transport incentives to women who come for institutional delivery. The woman receives this incentive only at the time of discharge from the health facility. The fund becomes useful especially when the family of the pregnant woman has difficulties finding money for the emergency. In these cases, families can borrow money from the fund without interest for a month.

UNICEF supported the FHD to implement the community-based prevention of post-partum haemorrhage using misoprostol in home births along with a birth preparedness package. Community health volunteers were trained on counselling the pregnant woman and her family on birth preparedness and readiness and on the importance of misoprostol to prevent post-partum haemorrhage, the timing of correct use, side effects and what to do if a woman bled even after taking misoprostol. This intervention has increased awareness among the family and communities on birth preparedness and complication readiness. Similarly, it has also increased the use of misoprostol for uterotonic coverage among women having home deliveries without an SBA.

**Results**

In 2008, there were only 16 health facilities in 5 UNICEF districts providing BEmONC services according to national standards. Today, there are 201 delivery sites in 11 UNICEF focus districts open all the time, of which 78 per cent are in the most disadvantaged village development committees. Access to delivery sites in these 11 districts has increased significantly from less than 10 per cent to 36 per cent. Out of the total institutional deliveries conducted in the 11 districts, 56 per cent took place in disadvantaged village development committees. The majority of the delivery sites in 11 districts (95 per cent) have at least one trained SBA. The micro-planning workshop helped the community stakeholders develop ownership and commitment.

Mobilization of female community health volunteers to increase awareness among the family and community on the importance of ANC, institutional delivery and PNC services, birth preparedness and complication readiness has proved to be very effective in encouraging the women to utilize services in a timely way. The watch group also played an important role in monitoring and encouraging the pregnant women and children to utilize available services. Institutional deliveries in some of the areas have increased dramatically from 7 per cent to 45 per cent. The fund associated with the watch group has helped women reach the facility for institutional delivery, especially women from disadvantaged groups. A recent fund utilization report showed that more women from the most disadvantaged group had used the fund compared to higher economic groups. Among women who had utilized the fund, 78 per cent were identified as being from a disadvantaged group.

**Lessons learned and potential application**

This comprehensive approach adopted by districts with UNICEF support has proven to be effective in making delivery sites functional full-time throughout the year. Micro-planning using the appreciative inquiry approach is an important process to encourage the community to appreciate available resources and fully utilize these resources, identify the gaps and issues and develop appropriate action plans to address these issues. The involvement of local stakeholders during the development of the local action plans and later in implementing the plans has shown to be more sustainable compared to the centrally
directed plans. This approach has also encouraged the community to better invest and utilize their local resources for women’s and children’s health.

Focusing on reaching the unreached population by establishing service sites in the most remote and disadvantaged areas has improved access to services even to the most deprived communities. Emphasizing the quality of care rather than concentrating on numbers has helped in strengthening the system. This approach has developed the capacity of personnel and created an enabling environment to provide quality services which has resulted in the increased trust of the community in the service providers and the services they provide.

Tapping into local resources has enabled the district health officers to establish many full-time birthing centres in their districts. The partnership between decentralized health authorities and community committees is well recognized and appreciated by the FHD and partners. UNICEF is planning to implement a similar intervention in 15 new districts between 2013 and 2017.

**Acknowledgements:** Asha Pun (UNICEF Nepal), Hendrikus Raaijmakers (FHD, Department of Health Services, Ministry of Health and Population), Senendra Upreti (FHD, Department of Health Services, Ministry of Health and Population), Nuzhat Rafique (UNICEF Regional Office for South Asia)
PAKISTAN: Chief Minister’s Initiative for the Attainment and Realization of the MDGs

Background
In 2010, severe floods affected millions of people in Pakistan, with approximately 4.5 million people affected in the Punjab province. Punjab’s total fertility rate is reported at 4.1, which is 30 per cent higher than that of neighbouring countries in South Asia. Both infant and under-five mortality rates have declined since 1990; however, the rate of decline over the last 15 years has been considerably slower than in other countries in the region and neonatal mortality rate has remained relatively stagnant.

In all the flood-affected districts, development indicators including MNCH were worse than the national average. With the flood causing increased risks to health conditions, there was an urgent need to implement a comprehensive strategy at community and health facility levels to prevent and reduce even higher maternal and neonatal mortality and morbidity.

Strategy
Punjab province health authorities, with financial and technical support from UNICEF and UNFPA, started providing 24/7 EmONC services at selected basic health units and rural health centres in the flood-affected districts, ensuring primary health care services with a focus on MNCH services. This programme was later named CHARM, short for the ‘Chief Minister’s Initiative for Attainment and Realization of MDGs’.

The programme was designed as a support and extension of the existing district health system so that it could be integrated into the district system. During the current phase, while the capacity of the district health systems evolves, the National Programme for Family Planning and Primary Health Care can continue to provide management and administrative support to the provincial and district management units in addition to its roles of policy formulation, monitoring and quality assurance of services provided.

Implementation
Several innovative components were developed and implemented including financial flexibility, robust monitoring and evaluation (that included altogether new e-monitoring, mechanism of accountability and rewards), pay-for-performance, reporting of results, and raising community involvement and awareness through mobile phone text messaging service.

Pay-for-performance: An incentive scheme was worked out according to a formula and initiated for staff working on the evening and night shifts. The incentive kicks in when a night delivery occurred, splitting the incentive by percentage among staff present, from medical officer to driver and security guard.
**Facility reward system:** Another incentive was provided to the health facility based on performance evaluation. The cash award was divided among the staff working at the best performing facilities.

**Real-time monitoring and reporting:** An innovative electronic or e-monitoring system was devised and is being piloted as part of the CHARM program. A central server was established at the provincial level and receives reports via SMS from various sources. Health workers – specifically ‘Lady Health Visitors’ – report directly to the central database in the province using an SMS-based reporting mechanism. Three types of reports can be created and sent through this system:

- **Daily SMS report:** One health worker from each facility is responsible for submitting a daily report by SMS to a number linked to the central database. All health workers were trained to submit the reports using a defined template.
- **Delivery report:** Every health worker who performs a delivery at any of these facilities submits a report on this event.
- **Referral report:** Every health worker who refers a case from any of these facilities submits the report by SMS using the referral template.

Monitoring reports are also sent by health worker supervisors and other monitors from the district. Their movement is monitored by satellite.

**SMS for community awareness and participation:** Mobile technology is also being used to increase community awareness around maternal and newborn health. After an infant is delivered, a report is sent by the health worker and a congratulatory message is generated from the central database and sent to the parents and family members asking them for feedback on the services provided at the health facility. After a few minutes, second and third messages are sent containing
messages about the early initiation of exclusive breastfeeding, postnatal checkups, immunization and family planning. SMS messages continue through immunization of the child.

**Results**
The CHARM programme, which was initiated as an emergency response, proved to be a cost-effective and sustainable model which produced evidence that the existing infrastructure of the Department of Health can deliver the required services for primary care, specifically maternal and newborn care.

Health facilities used to function for six hours a day before additional human resources were provided, which led to the operational timing of the health facilities increasing fourfold. This had a tremendous effect on the demand from communities for maternal and child health services.

The CHARM programme has shown promising results compared to the baseline data of the same health facilities before the intervention, as well as compared to the current data of other non-intervention health facilities.

**Lessons learned**
Factors for programme success include the commitment of the Department of Health, financial flexibility, an efficient programme management team, robust real-time monitoring and evaluation including e-monitoring, accountability mechanisms with zero level tolerance on false data, pay-for-performance, reporting of results, and community involvement and awareness through text messaging on mobile phones.

Special attention is being paid to the provision of postnatal and family planning services, which had not been as strong as facility-based care during and immediately after childbirth. Health workers are being involved in referral and follow-up of cases to ensure compliance.

**Next steps**
Observing these results, the Government of the Punjab has decided to extend similar services to 13 additional districts and sustain them in seven existing districts through its own resources in the coming years. New districts are being selected based on an analysis of health indicators.

**Potential application**
Post-emergency response can be a good time to introduce new interventions in maternal and child health that help the affected regions in terms of both immediate recovery and long-term development. This combination of supply-side inputs with maternity health components is effective in mHealth service delivery at a low cost.

**Acknowledgements:** Tahir Manzoor (UNICEF Pakistan), Nuzhat Rafique (UNICEF Regional Office for South Asia)
PHILIPPINES: Essential intrapartum and newborn care protocol

Background
In the Philippines, 40,000 newborns die each year from causes that are mostly preventable such as complications of prematurity (41 per cent), severe infection (16 per cent) and birth asphyxia (15 per cent). Most deaths occur within the first two days of life, and conditions surrounding labour, delivery and the immediate post-partum period have been pinpointed as contributory factors. Only if measures are instituted to reduce newborn mortality more rapidly can we hope to achieve MDG 4 by 2015. Similarly, the Philippines also has a high burden of maternal deaths with an estimated 5,000 deaths annually. Results from a recent national health survey revealed maternal mortality in the country has in fact increased from 162 per 100,000 live births in 2006 to 221 per 100,000 live births in 2010.

Post-partum haemorrhage continues to be a major cause of maternal mortality (41 per cent). A study was conducted in 2009 in 51 of the largest hospitals in 9 regions in the Philippines using an assessment tool developed by the WHO to assess birthing practices. Results of the study showed that performance and timing of evidence-based interventions for immediate newborn care were below WHO standards. In these hospitals, practices prevented Philippine newborns from benefiting from their mothers’ natural protection in the first hour of life, compromising the newborn’s chance for maintenance of warmth, needed for its survival.

Strategy
In 2009, the Philippines’ Department of Health began a hospital-based initiative to change practices for safe and quality care of mothers and newborns. Supported by the WHO and the Government of Philippines’ Joint Programme on Maternal and Neonatal Health, the project is referred to as the ‘Scale-Up Essential Intrapartum and Newborn Care Project’ or ‘Unang Yakap 4&5’. It is a call for all practitioners and health facilities to adopt and embrace safe and quality essential intrapartum and newborn care (EINC). EINC practices are evidence-based standards recommended for adoption in hospitals with maternal and newborn care services and birthing facilities, both in the government and private sectors.

The recommended EINC practices during the intrapartum period as part of this protocol include continuous maternal support by having a companion of choice during labour and delivery, freedom of movement during labour, monitoring progress of labour using the partograph, non-drug pain relief before offering labour anaesthesia, position of choice during labour and delivery, spontaneous pushing in a semi-upright position, non-routine episiotomy and active management of the third stage of labour. The recommended EINC practices for newborn care are a series of time-bound interventions: immediate

Why is this innovative?
This approach was initiated as a quality improvement initiative in referral hospitals in contrast with the existing approach of starting capacity-building in primary facilities. It emphasizes a chronological core sequence of actions, performed methodically (step by step) such that essential, time-bound newborn interventions are not interrupted, treating the mother and newborn as an inseparable socio-biological unit.

and thorough drying of the newborn, early skin-to-skin contact between the mother and newborn, properly timed cord clamping and cutting, and non-separation of newborn and mothers for early breastfeeding initiation.

Implementation
Since 2010, selected Department of Health hospitals have trained in and adopted the EINC set of practices as part of a programme of the Department of Health funded by the Joint Programme on Maternal and Neonatal Health and WHO. This innovative strategy is a joint collaboration effort of the Department of Health, WHO and UNICEF. WHO took the lead in the assessment of the newborn care practices in selected health facilities in the country. UNICEF is supporting the scale-up of the initiative in its Local Government Unit health facilities.

The EINC strategy uses a health systems strengthening approach with various components:

- A clinical practice guideline on newborn care component that used GRADE (Grades of Recommendation, Assessment, Development, and Evaluation) methodology;
- Policy support for the newborn clinical practice guideline through the issuance of a Department of Health national policy and incorporation with existing policies for Mother-Baby Friendly Hospital Initiative criteria and the MNCH and nutrition policy;
- Health financing incentivization of the new practices through reforms in the maternal and newborn care packages of the national health insurance system;
- Incorporation of EINC protocols in pre-service and in-service curricula starting with medical, nursing and midwifery academic societies and incorporation in professional licensure examinations;
- Creation of a social marketing handle (‘The First Embrace’ or ‘Unang Yakap’) and campaign initially targeted to change health worker behaviour and institutionalize the change in pilot hospitals;
- Use of social media for the dissemination of and sustenance of trained centres and personnel;
- Creation of centres of excellence through technical assistance for the hospital.

Scaling up the implementation of EINC was undertaken in 11 government hospitals collectively representing about 70,000 annual live births, approximately 3 per cent of all national live births. Since October of 2010, in each of these hospitals, the scale-up process has entailed:

- A baseline situational analysis including delivery assessments, time-motion studies in delivery areas and newborn intensive care units, baseline neonatal morbidity and mortality data;
- Training workshops for all hospital staff;
- Monitoring and evaluation or facilitated supervision phase consisting of weekly meetings with the hospital’s EINC Working Group over a typical six-month period with repeat assessments.

Recommended EINC practices have been replicated by primary facilities (called ‘lying in centres’) connected to hospitals that were part of scale-up activities through their referral systems. This led to the creation of training teams within the pilot hospitals themselves. There are spontaneous requests from many private facilities, local government units and even legislators who seek to have health workers in their locality trained in EINC. The process was replicated by the USAID-funded SHIELD project in Mindanao where they used the Quality Improvement Collaborative process to create service delivery networks between rural health units and provincial hospitals.
Results
Results of the EINC scale-up implementation programme have been positive, with admissions to neonatal intensive care units dropping, and reduced neonatal sepsis rates, lower maternal and newborn deaths and more satisfied mothers. More hospitals and health professionals are aware of the protocol and are providing EINC care.

In the 33,421 cumulative live births across the 11 project sites, this scale-up process has been effective in changing practices. There was as much as a 75 per cent reduction in newborn intensive care unit admissions, lower mortality and sepsis case, and lower fatality rates, and an increase in exclusive breastfeeding rates on the seventh and twenty-eighth day follow-up visits. It was found that in one hospital, in an early prospective cohort of 1,459 newborns, babies who benefited from skin-to-skin contact were almost twice as likely to appropriately breastfeed within one hour compared to those who did not receive immediate skin-to-skin contact. Babies who breastfed according to recommended practices were almost twice as likely to exclusively breastfeed at 28 days. Skin-to-skin contact was associated with lower number of deaths and cases of sepsis and other newborn complications. In addition, improvements were also seen in maternal care and infection control practices, and in reduced workloads and expenses. Breastfeeding initiation rates and the duration of the first breastfeed have both improved.

An example of improved outcomes was the administration of intramuscular oxytocin. It was documented to range, with the most dramatic outcome at one hospital which had an oxytocin coverage of 28 per cent at baseline in the first month and 100 per cent by the second month, which remained at 100 per cent by the sixth month.

Simple cost-saving calculations by hospitals have revealed substantial savings averaging almost 500 Philippine pesos per vaginal delivery (approximately 12 USD).

Lessons learned
EINC is impressive in its ability to change health worker behaviour within a short period of time and has the ability to reduce newborn morbidity and mortality. Based on experiences to date, constraints to the rapid national scale-up include the need for a critical mass of trainers and innovative means of training large numbers of health workers, with an opportunity for a refresher or review, perhaps through the use of the Internet and computer-based technology. A present constraint might be the lack of a functional health information management system in many facilities that can capture real-time data.
Next steps
Scale-up to reach a wider number of facilities, mostly primary, is ongoing. Health facilities in identified Joint Programme on Maternal and Neonatal Health areas of UNICEF, UNFPA and WHO are being targeted. Trainings of health workers will be done under the Joint Program on Maternal and Newborn Health. Scale-up will also be done functionally. Aside from primary facilities, the Joint Program will expand to creating service delivery networks for seamless delivery of quality care.

The potential for nationwide scale-up is large because the health systems elements such as policy and financing are in place for its adoption in all health facilities and by all SBAs. The social marketing handle is catchy and the national government has assumed ownership of the brand. Compliance at the facility level is monitored through the use of facility-based checklists and monitoring formats, as part of the quality improvement initiative. At the national and subnational management levels, compliance is to be monitored through the incorporation of the EINC indicators in the national programme monitoring tool and in the checklist for accreditation.

Potential application
This evidence-based practice model shows that simple but effective EINC practices during the intrapartum period can have substantial positive health outcomes. With positive results such as reduced number of admissions to neonatal intensive care units and decreased neonatal sepsis rates, it would be worthwhile for other countries to learn from this experience and to explore opportunities to implement such interventions adapted to their local context.

Acknowledgements: Willibald Zeck (UNICEF Philippines), Soe Nyunt-U (WHO), Mariella Castillo (UNICEF Philippines), Anthony Calibo (Department of Health, Philippines), Juanita Basilio (Department of Health, Philippines), Martha Cayad-an (UNICEF Philippines), Nabila Zaka (UNICEF East Asia and Pacific Regional Office)

RWANDA: SMS alert system to monitor pregnancy and reduce maternal and child deaths

Background
Rwanda is among the sub-Saharan African countries where the largest total percentage decline of maternal mortality (51 per cent reduction) occurred between 1990 and 2008.23 Despite this progress, Rwanda has yet to meet its MDG target to reduce maternal mortality, corresponding to 325 per 100,000 live births. Rwanda has recently developed a comprehensive information technology strategy plan that includes eHealth (the combined use of electronic communication and information technology in the health sector) and mHealth as important components.

Established in 1995, the Rwanda community health programme aims to increase the uptake of essential maternal and child clinical services through the education of pregnant women, the promotion of healthy behaviour and follow-up and linkages to services. The first line of service delivery is provided by over 45,000 CHWs operating at the village level. Working as volunteers elected by community members, CHW responsibilities are divided into ‘binomes’ (a male-female CHW pair) providing basic care, and a CHW in charge of maternal health. CHWs receive training and supervision through the health system. For CHWs in charge of maternal health – the focus of this case study – specific responsibilities in the community consist of identifying pregnant women, making regular follow-ups during and after pregnancy and ensuring deliveries occur in health facilities with an SBA.

Strategy
The SMS-alert system for MNCH, ‘RapidSMS-MCH’, was designed to provide an SMS-based platform that enables effective and real-time two-way communication and alert system for action through mobile phones between CHWs at the community level and the health system, including emergency transport services and health facility staff at the district hospital and central level. Developed by UNICEF and the Rwanda Ministry of Health, the RapidSMS platform supports the documentation of pregnancies in the community, increases contact with health facilities through ANC, and increases institutional delivery and hence by proxy, professional care at birth. The primary expected result of the system is improved access to ANC, PNC, institutional delivery and emergency obstetric care. Clinical records of maternal care and deliveries are centralized by RapidSMS in a database.

Implementation
Musanze, a mountainous district with an estimated population of 347,692 and lower than average indicators for maternal and newborn health, was selected for the pilot phase. The percentage of assisted deliveries in health facilities in Musanze was estimated at 48.8 per cent in 2009, ranking among the lowest in the country.24 The district includes 13 health centres and one district hospital and has 18

---

general practitioners, five specialists and 300 nurses. Additionally, the district counted 1,296 CHWs, including 432 CHWs specifically tasked with maternal and newborn health. Each health centre has a community health officer (supervisor) supervising an average of 55 CHWs operating in the villages within the health facility’s catchment area. A community health representative working at the district hospital level manages the supervisors or CHWs from the facilities. The estimated number of pregnancies in Musanze was approximately 14,200 per annum, for an average ratio of 30 pregnancies per year and 2–3 per month to be identified and managed by each CHW.

RapidSMS, an open source SMS application platform, was developed to track the pregnancy life cycle, enabling instant reporting of a pregnancy-related event and timely notification for emergencies by alerting health facilities, hospital and ambulances. In early 2010, programmers developed the first version of the SMS-based application which ran temporarily on a simple desktop computer linked to a modem with a Subscriber Identity Module (SIM) card and short code number obtained from Rwanda’s Utility Regulatory Agency. The SIM card provided by the mobile operator, MTN Rwanda, had reverse billing to the Rwandan Ministry of Health, which allowed end-users to send SMS messages without charge. An iterative design and development approach was employed, obtaining feedback from Musanze district hospital and Ministry of Health staff and from regular field testing. Feedback was analysed, documented and used to improve system functionalities. The application was later moved to a server and connected to a mobile gateway with enhanced capability to handle multiple and simultaneous SMS queries from the system. The final version was installed in a central server and linked to a public IP address.

A password-protected web user interface gives access to aggregated and disaggregated data and enables individual patient history tracking as well as output of reports. The interface presents an overview of the system’s outputs including individual and aggregated reports, statistics, and system administration, log of reminders and activity of CHWs. Data can be filtered and viewed at three levels: national, district and health facility. A user working in a health facility at the district level will be assigned an account, granting him or her permission to view and possibly modify data only from his or her health facility’s catchment area.

The system allows a two-way flow of information: a registered CHW creates and sends an SMS to the system using a short code telephone number and the message received by the server will immediately trigger a specific feedback to the sender. For each registered pregnancy, the system will send automated reminders of upcoming ANC visits and due date of delivery to the CHW’s phone to follow-up with the individual. In case of danger signs during pregnancy reported to the CHW – including haemorrhage, being in labour at home, or a serious and unknown condition – the CHW sends an emergency SMS alert to the system, sent simultaneously to the driver of the nearest ambulance vehicle and the manager of the facility for immediate intervention. This SMS includes the danger sign reported, the name of the village and the telephone number of the health worker who sent the original message. Another SMS is sent to the CHW indicating immediate action to manage the danger signs and prepare for the pending ambulance arrival.

The system incorporates features enabling continuous technical monitoring to recognize and record, in an error log, inconsistencies such as wrong SMS formatting or mistakes in logic, indicating that the message’s sender may have been having difficulties with reporting. Upon receipt of such messages, the system would reply to the sender with suggestions of how to revise or resend the message in the appropriate format. The error log contributes to facilitate management of CHWs by supervisors who can use these logs to provide feedback to CHWs.
A cascade training approach was adopted, consisting of an initial training of 10 national trainers affiliated with the Ministry of Health and partners – UNICEF and Management Sciences for Health working in the district. National trainers were encouraged to take part in the development of training material. A second phase of training consisted of one-day training of 24 community health supervisors and data managers, operating at the district level and conducted by the national trainers. The third and last stage of training involved a two-day training of 432 CHWs by the 24 supervisors and data managers. A total of 500 phones were distributed to the CHWs in charge of maternal and child health and health facilities in Musanze district, marking the official launch of the RapidSMS-MCH system. Training materials were translated into the local language (Kinyarwanda). Each training session of the CHWs was conducted by two trainers and included a maximum of 20 trainees. Training was followed by intensive follow-up supervision, and refresher training and feedback sessions to ensure effective capacity transfer. Performance of CHWs is regularly assessed through analysis of data sent into the system and error logs.

Results
Between May 2010 and April 2011, 35,734 SMS reports were submitted to the system, including 11,502 pregnancy registrations (81 per cent of the 14,200 estimated annual pregnancies in the district). During this period, three maternal deaths and 137 child deaths were registered in the system. SMS reminders were sent out to the CHW’s phone in relation to each registered pregnancy. Reporting compliance among CHWs was 100 per cent. The percentage of deliveries varied between 72 and 92 per cent in health facilities and between 8 and 28 per cent at home. CHWs reported being more proactive in finding new pregnant women and following up registered pregnant women as a result of reminders forwarded to their mobile phones. Error rate (the number of SMS sent with formatting errors) dropped from 54 per cent in the first four months to 8 per cent by the end of April 2011.

The number of SMS alerts associated with danger signs was 163. The most common danger sign reported was antepartum and post-partum hemorrhage, accounting for 30 per cent of emergency cases.

Rwanda designed and implemented a mobile phone-based system in Musanze district between May 2010 and April 2011 with the aim of monitoring pregnancy and reducing bottlenecks in communication associated with maternal and newborn deaths. Usage patterns and challenges encountered by end users were collated and used to make adjustments to the overall system (e.g., SMS form, system’s application, etc.).
Lessons learned
Contributing factors to the success of the pilot included an already existing and well-organized community-based health programme, performance-based financing approach, scale-up of community health insurance and cell phone coverage reaching even the most remote areas of the country. Furthermore, clear delineation of administrative boundaries with defined roles and responsibilities for CHWs facilitated monitoring and quality assurance.

CHWs were instrumental in addressing the infrastructure and geographic barriers that negatively affected access to care in most low-resource countries. In Rwanda, CHWs are organized in cooperatives in each sector of the district, and their income is mostly based on performance.

The most critical enabler in Rwanda was the strong commitment of the government to this innovative strategy in general, and the use of the RapidSMS-MCH technology from the start. Among other support it provided to the pilot, the Ministry of Health engaged the private sector in a public-private partnership to substantially lower the recurrent cost of SMS. The initially agreed upon cost of SMS dropped 90 per cent, from 30 Rwandan francs (0.05 USD) to 3 Rwandan francs (0.005 USD). This cost reduction was crucial to its expansion and sustainability.

The maintenance of mobile phones was a common challenge reported in addition to the lack of or limited access to electricity in a number of communities. The CHWs were advised to recharge their telephones at the closest health centre. However, CHWs located far from health centres had to therefore walk long distances on a regular basis. CHWs in the present project perceive greater trust and respect in their communities as a result of being empowered to request an ambulance in case of emergencies. The RapidSMS-MCH system has therefore contributed to putting mobile phones, a powerful tool, into the hands of female CHWs in Musanze district.

Next steps
The early results of this initiative prompted the Rwanda Ministry of Health to develop a national scale-up plan. A total of 15,000 phones are being distributed to more than 7,000 trained CHWs.

Potential application
RapidSMS-MCH demonstrates that mobile phone technology offers an opportunity to overcome barriers that limit access to quality maternal and newborn health. Mobile phones can help women, their families and local health workers to seek timely, appropriate medical assistance for an obstetric and newborn emergency by reducing the time that elapses between a health crisis and care.

Acknowledgements: Friday Nwaigwe (UNICEF Rwanda), Janet Kayita (UNICEF East and Southern Africa Regional Office)

SIERRA LEONE: Capacity development of human resources for maternal and newborn health

Background
Sierra Leone faces a situation of high poverty, illiteracy and fertility levels, high teenage childbearing rates and a low uptake of family planning. The country also faces a chronic human resource shortage in the health sector, especially in underserved rural areas. These factors combine to produce the highest MMR in the world, estimated at 860 per 100,000 live births.25

There have been recent improvements in childhood mortality indicators in Sierra Leone; nevertheless, they remain high. The under-five mortality rate is 140 deaths per 1,000 live births; infant mortality is 89 deaths per 1,000 live births and neonatal mortality is 36 per 1,000 live births. Forty per cent of all infant deaths take place during the first 28 days of life, largely from four preventable conditions: birth asphyxia, neonatal infections, hypothermia and low birth weight.26

Why is this innovative?
This ‘skills and drills’ approach to training of health workers is innovative because it uses simple technology incorporating the use of mannequins to train them in skills and knowledge, in environments where that is not otherwise possible due to low patient case loads. Use of this innovation in Sierra Leone has demonstrated that it is possible to take the training to a national scale while building in-country capacity. The incorporation of a monitoring and evaluation mechanism for the capacity-building activity has shown that it is possible to achieve high level results: a reduction in case fatalities, increased recognition of complications and a reduction in still births.

Skilled attendance during delivery and skilled PNC during the first 24 to 48 hours offer the best chances for survival for both mothers and newborns since most of the associated mortality takes place during this period. However, many Sierra Leonean women and newborns are excluded from this lifeline because only 50 per cent of births occur in health facilities and about 62 per cent of deliveries are assisted by a skilled service provider.27 In addition, only 38 per cent of mothers receive their first postnatal check-up within four hours of delivery.28 The skill level of service providers and the number of such providers have long been a recognized bottleneck in Sierra Leone’s health care system that is in the process of recovering from long periods of neglect.

The country has approximately 1,275 health facilities, most of which are run by the government. As of 2010, the public health sector had about 24 public health specialists, 29 medical specialists, 115 medical officers, 132 community health officers, 1,017 nurses and 825 maternal child health aides. Following efforts to recruit additional staff as part of the Free Health Care policy launched in April 2010,29 the number of health facilities with only one staff person reduced from 59 per cent to 33 per cent. However, acute human resource shortages remain, particularly high in rural areas.

---

26 Child Epidemiology Reference Group, SMART Survey, Sierra Leone, 2010.
27 Multiple Indicator Cluster Survey 4, Sierra Leone, 2010.
28 Sierra Leone Demographic and Health Survey 2008.
29 Launched in April 2010 in Sierra Leone, the Free Health Care Policy provides free care to all pregnant women and children under 6 years of age in public facilities.
Strategy
The goal of the ‘Make It Happen’ project is to improve knowledge and skills of health workers, leading to a better quality of clinical practice through competency-based training. The project used a tested innovative model developed by the Liverpool School of Tropical Medicine, WHO and the Royal College of Obstetrics and Gynaecology to develop the competency of health personnel in providing EmONC. The programme delivered a competency-based training package adapted to the country context which was sustained by the training of in-country trainers and through supportive supervision and mentorship within the workplace. A common monitoring and evaluation framework was applied across all target countries to measure project performance and impact at the health care provider level, at the facility level and wherever else possible on health outcomes for mothers and babies.

Implementation
A critical first step in the development of this training programme was to assess the baseline status of all target health facilities providing EmONC. In Sierra Leone, assessments were conducted in 21 hospitals (CEmONC centres made up of referral, regional and district hospitals) and 72 Community Health Centres (CHCs) (BEmONC centres) drawn from all 13 districts in the country. Assessments were undertaken for maternal and neonatal health and in particular SBAs, EmONC, numbers and cadres of staff, record-keeping practices and whether or not there were any ongoing quality improvement activities. Data collected during these assessments informed the development of a work plan for training activities and provided a baseline to assess effectiveness of training.

The approach was based on a ‘skills and drills’ package delivered over a 3-4 day period depending on the cadre of health workers involved. Maternal Child Health Aides (MCH Aides) were trained for four days while all the other higher level cadres were trained for three days. Mannequins were used to teach the skills and for drilling instead of the traditional approach of relying on live patients. After the intensive training, a national supervisor with support from the Liverpool School of Tropical Medicine conducted a scheduled support supervision of all the trainees at their place of work to reinforce the application of knowledge and skills acquired during training.

In the traditional training model, the available patients may not represent the range of conditions needing treatment; meaning that not all skills may be demonstrated in facility-based training. This new method of training using mannequins, however, is far more comprehensive. It includes modules on communication, triage and referral, resuscitation of the mother and newborn, shock and the unconscious patient, severe pre-eclampsia and eclampsia, haemorrhage, obstructed labour, sepsis, assisted delivery, other common obstetric emergencies, complications of abortion and early newborn

30 Training package developed by the Liverpool School of Tropical Medicine in collaboration with the Royal College of Obstetricians and Gynaecologists and the Department of Making Pregnancy Safer at WHO Geneva in 2006.
care. The training package includes a section on surgical skills and on normal delivery, i.e., skilled birth attendance. Lectures and content of breakout sessions, discussions and demonstrations are standard and documented in a facilitator’s guide, which also contains practical details of the course structure.

Both the manual and course content were designed with the awareness of very real barriers to accessing care that women in resource-poor countries face, as well as the realization that many health care providers trying to provide skilled attendance at birth and essential (or emergency) obstetric care for women with complications work in difficult circumstances with limited equipment and medical commodities. All case scenarios were based on actual everyday experience for all health cadres involved in obstetric and newborn care in Sierra Leone.

Results
Training of health workers: A total of 837 health workers were trained over the period 2009–2012. This included 69 national trainers who were actively engaged in rolling out the training programme.

Participating facilities: The 837 health workers were drawn from a total of 93 health facilities made up of 21 hospitals (CEmONC centres) and 72 CHCs (BEmONC centres). A total of 77 facilities were targeted over the implementation period: 12 hospitals and 65 CHCs.

Change in knowledge and skills: A representative sample of 381 (46 per cent) of the total number of health workers trained showed a statistically significant improvement (pre-test and post-test) in both knowledge (mean of 46–65 per cent) and skills scores (mean of 31–70 per cent).

<table>
<thead>
<tr>
<th></th>
<th>Mean pre-test score (%)</th>
<th>Mean post-test score (%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>46.2</td>
<td>64.6</td>
<td>0.001</td>
</tr>
<tr>
<td>Skills</td>
<td>31.4</td>
<td>69.7</td>
<td>0.001</td>
</tr>
</tbody>
</table>

From key informant interviews and focus group discussions with training beneficiaries it has been established that the improved skills and knowledge led to improvement in clinical practice, including increased use of manual vacuum aspiration, the partograph, use of vacuum extraction and kangaroo mother care.

UN signal functions: At baseline, 19 per cent of facilities had all UN signal functions for EmONC, increasing to 38 per cent after 12 months of training. In 2008, only one hospital and none of the CHCs provided all signal functions. By the end of 2012, 11 of the 21 public hospital and 22 of the 72 CHCs were providing the full complement of EmONC signal functions according to their level of service provision.

Deliveries: Data from participating facilities show that in the period 2009–2012, there was a rapid increase in the number of deliveries at health facility (overall 63 per cent increase), mainly in CEmONC facilities. This was the same period that the Free Health Care initiative was launched in Sierra Leone resulting in an increased demand for health care services. The large number of women using facility-based delivery services therefore benefited from better services as a result of the improved skills and knowledge of the personnel.

Complications: The number of women recognized as needing EmONC and documented as having received this care increased by 18 per cent at 12 months, increasing more at the BEmONC level than the

CEmONC level. The training approach therefore had greater effect in BEmONC facilities than in CEmONC facilities.

**Still births:** Despite an overall increase in the number of deliveries taking place at the health facility level and an absolute increase in the number of still births, the still birth rate decreased by 7.6 per cent in CEmONC and 15 per cent in BEmONC health facilities. This is evidence of the programme’s impact on still births.

**Client satisfaction:** Feedback from programme beneficiaries indicated that programme interventions were reaching intended beneficiaries and with the desired positive effects. A client satisfaction survey targeting in-patients and discharged patients from four districts (Freetown, Bombali, Bo and Port Loko) using key informant interviews and focus group discussions were conducted. Overall, the women interviewed indicated that staff attitude among health workers had improved, but there were a few reports of negative staff attitude as well.

**Lessons learned**
- Traditional facility-based training requires high patient case load and most existing training programmes take no less than 10 days. Even then, some complications can be missed so that it is difficult for trainees to achieve comprehensive skills in relation to most important complications.
- Training has greater effects in lower level facilities than in hospitals as shown by recognition of complications and reduction in case fatality an important lesson given challenges facing the set-up of BEmONC services.
- The approach to training can be adapted to suit different health professional cadres.
- Training is possible in local setting, with significant cost savings.
- Involvement of institutional tutors in the in-service training has made it easier to adopt the approach in the pre-service training programmes as well.
- National scale up of the training activity is possible and quality can be assured by building national capacity even when international inputs are reduced.
- It is good practice to obtain direct feedback from beneficiaries, more so when the information is used to improve delivery of interventions.

**Next steps**
The Ministry of Health and Sanitation and UNICEF are collaborating on the implementation of pre-service training programme for nurses including a component on competency-based training in EmONC over the next two years in all 13 district-based schools. Roll-out of in-service competency-based training will be taking place for the next set of 65 CHCs over the next two years and with follow-up and refresher training in previously covered facilities. Regular client satisfaction surveys are being introduced and feedback will be used to improve programme delivery and training approach.

**Potential application**
The project launched in October 2009 with the objective to cover 65 health facilities in three districts in three years. The fact that this approach has shown positive results implies potential for replication in similarly challenged countries, where there is a chronic human resources shortage, lack of skills, weak supervision systems and where the case load may not be sufficient in supporting competency-based training.

**Acknowledgements:** Kennedy Ongwae (UNICEF Sierra Leone), Yaron Wolman (UNICEF Sierra Leone), Mariame Sylla (UNICEF West and Central Africa Regional Office)
TIMOR-LESTE: Involving communities in addressing maternal health inequalities

Background
Timor-Leste is a young nation with one of the highest rates of maternal mortality in the world: 557 per 100,000 live births. Inequalities in the utilization of health services impede progress towards MDGs 4 and 5. The proportion of women accessing institutions for delivery is about 12 times higher in the richest quintile as compared to the poorest quintile.

An analysis of maternal health data reveals variations in the utilization of health services. The figure of concentration curves of maternal health indicators visually depicts the inequalities between the richer and poorer populations for utilization of various maternal health services. Almost all the variables have lower values among poorer groups. Institutional delivery is most unequal between the poorest and richest quintiles.

Why is this innovative?
Timor-Leste implemented a new community-based participatory model to overcome barriers to access MNH services by the most vulnerable populations. This strategy is participatory and allows the identification of hard to reach and deprived women, and the development of community action plans (with strategies such as facilitating transport, financial incentives, micro-credits) to increase equitable access and use of maternal and newborn health services by women in the community.

Strategy
The innovative approach discussed here is primarily aimed at developing a model for community action to reduce the inequities in maternal health care in a defined administrative unit. Specific objectives include:

- Developing a model for community diagnosis and action for addressing inequities in maternal health;
- Piloting the use of the model for addressing inequities in maternal health care in a defined geographical area;

---

Documenting the lessons learned for refining the model and scaling up its application in the future.

The project focused on using community empowerment as a key method for addressing inequities. A critical aspect is the model for community action focused on addressing inequalities in maternal health.

Implementation

In the first phase, the project was undertaken in an area of Ermera district with a population of 2,023 and in the second phase the project was expanded to cover the subdistrict of Hatolia in Ermera district with a population of 34,999.\textsuperscript{34}

The model was implemented with community representatives including pregnant women and key influencers to collaboratively explore the reasons for the inequities in the utilization of institutions for delivery among women from the richest to the poorest quintiles. The model involved five stages with this target group: vision (sharing of aspirations for the future); assessment (awareness and realization of the existing situation and its implications); analysis (using the problem tree for causality analysis); design (arriving on innovative solutions, agreeing on the best alternative and development of the action plan); and action (implementation with oversight).

The project was implemented by the Ministry of Health and UNICEF in partnership with NGOs and UNFPA. While UNICEF provided the technical support in designing and planning and financial support for the intervention, the Ministry of Health and a national NGO were responsible for field implementation. UNFPA provided support by providing maternity packages to pregnant women accessing health facilities for delivery services.

Results

Process: Findings from the analysis of the drivers of inequities and barriers to access health care were used to develop the community action model. The first phase of the project helped in refining the five-step model. The first phase was implemented using a participatory approach at Suco Humboe, a relatively disadvantaged area in Ermera district. The causality analysis revealed underlying reasons for poor utilization of health facilities among women, such as feeling shy around male providers, unavailability of money or transport, doubts about the quality and availability of services at facilities, inability to predict the timing of the onset of labour, and not getting permission from the husband.

This exercise also revealed that communities can identify members most likely to be deprived of services. The end result of the exercise was the identification of 26 mothers most likely to need support to access health facilities for delivery services.

An important outcome of the exercise was also the development of an action plan focusing on these mothers, involving local innovative solutions, with clearly earmarked activities, responsible persons and an accountability mechanism. In May 2012, the implementation of the project was expanded to one subdistrict (Hatolia) in Ermera district. Community action plans were prepared for all villages in the subdistrict. Some examples of solutions in the community action plan include public commitments from health volunteers and local leaders to help mothers requiring support, community members volunteering to provide transport to health facility, and mother support groups (micro-credit groups) providing social and financial support to mothers in need.

\textsuperscript{34} Timor-Leste Census, 2010.
Outcomes: This model of addressing inequities successfully exploited the community's desire for change, propelled communities into action and encouraged local solutions and mutual support, thus leading to greater ownership of the process. In the first phase in Suco Humboe, almost 100 per cent of women (26 pregnant women) identified as likely to be deprived of services for institutional delivery were visited at their homes by the health community workers and women’s group members for counselling on birth preparedness.

The percentage of women accessing institutions for delivery increased from 11 per cent before intervention (8 out of 70 deliveries) to about 86 per cent (6 out of 7 deliveries in the 3-month period following implementation of the intervention, taking into account small sample size). In the second phase, in Hatolia subdistrict, about 89 out of a total of 106 pregnant women (84 per cent) were identified as being in need of support. Preliminary reports show a significant jump in deliveries at the community health facility in Hatolia subdistrict in the months after the intervention. A detailed analysis of the outcomes including comparison with a control area (area without intervention) is underway.

Lessons learned
The process and findings were documented in the form of a case study and were presented formally to the senior management of UNICEF and to the decision makers in the Ministry of Health of the Government of Timor-Leste. This exercise has generated interest for a nationwide scale-up as a way forward to address the high MMR.

Next steps
While the study focused on the demand-side issues for addressing inequities, the findings also suggest important areas for action on the supply side, for the consideration of all stakeholders. The key actions, which are important to ensure that the increased demand after project scale-up is adequately met, include: developing new health facilities closer to the poorest communities in need, ensuring quality of care by increasing the number of SBAs, and exploring public-private partnerships to improve access to maternal health care services in remote areas.

An important element for sustainability of the programme is ensuring that the capacity and ownership of the Ministry of Health is encouraged during the process of scaling up. In addition, the Ministry of Health may require assistance from NGOs in conducting quality interactions with communities.

Potential application
The analysis of equity in utilization of health services is incomplete without an understanding of the causes of these inequities. A more comprehensive understanding would be possible by combining the findings from both quantitative and qualitative data. The five-step model also provides some important lessons in engaging with communities to address inequities.

With appropriate facilitation, community members are capable of identifying members most likely to not access health services and can plan and implement solutions at the local level to help these members access services. If implemented successfully on a large scale, this approach could help in targeting people in the poorest quintile for service delivery and dramatically reduce health inequities.

Acknowledgements: Aderito Gregorio do Carmo (UNICEF Timor Leste), Carla Jesuina Quintao (UNICEF Timor Leste), Sherin Varkey (UNICEF Timor Leste), Monjur Hossain (UNICEF Timor Leste)
3. Implications for public health programming

These case studies present a range of interventions across the continuum of care and they address different health system issues. Some innovative approaches may not be demonstrably new or different globally, but were new when introduced at the national or subnational level and hence have been innovative in the particular country or context. The compendium allows us to highlight some strategic points that should be considered when implementing an innovative solution, strategy or intervention in maternal and newborn health based on the lessons that emerged from the case studies.

Ensure government leadership and commitment to evidence-based initiatives

Maternal and newborn health programmes are guided by policies and guidelines defined by a country’s government; however, those policies need to be informed by evidence. In China, for example, an evidence-driven assessment and advocacy was useful in informing policy makers in the development and promotion of a policy that ensured insurance for newborns.

It is also of the utmost importance that new initiatives be overseen and led by the government. This increases their chances of sustainability and scaling up, if proven effective. The Government of Ethiopia, for instance, led the introduction of magnesium sulfate in public and private hospitals, which involved capacity-building and task-shifting of drug provision to nurses and midwives.

The government should also lead the implementation of a financial scheme to reduce barriers to utilization or improve the quality of care. This compendium highlights finance-based approaches implemented in some countries to increase maternal and newborn survival such as:

- Addressing user fee barriers through community emergency loans, and making available insurance funds for EmONC through insurance schemes that pool and manage capital to pay for user fees, transport, medication, and follow-up care.
- Performance-based incentives including cash or in-kind payments to national or subnational government managers, staff at health facilities, providers or consumers after pre-defined health results have been achieved.

Adopt a comprehensive approach to accelerate results

In most cases studies, innovative strategies in maternal and newborn health were implemented through a comprehensive health systems approach that took into consideration the different components of the health system: For example:

- The upgrade of primary health facilities into birthing centres in remote areas of Nepal took into account many factors such as training providers to improve supply, and mobilizing communities to increase demand for services.
- The improvement of BEmONC services in Pakistan was done by introducing several initiatives to improve both supply and demand: to improve supply, 24/7 service delivery, performance-based financing systems, and eHealth monitoring were introduced; and to improve demand, incentives were targeted to mothers and C4D approaches used for communities.

Integrate newborn care within maternal health services to ensure the continuum of care

These case studies also reinforce the importance of integrating maternal and newborn health services both at the facility and community level, and strengthening mutual links between the two. The different case studies on the integration of health services highlighted the importance of the following:
• Government commitment to securing financial resources;
• Strengthening linkages and referral systems between health facilities and communities through measures such as targeted home visits during pregnancy and referrals to facilities for deliveries, as well as home visits during the post-partum period and referrals for complications;
• Task-shifting, by investing in the training of frontline workers to upgrade their skills and capacities in maternal and newborn care;
• Providing supplies including drug and medical devices to avoid stock-outs;
• Providing incentives to health care workers in remote areas, who often experience a high workload.

**Develop public-private partnerships to reduce costs**
Implementing an innovative solution, even on a small scale – such as building MWHs, upgrading primary health facilities into birthing centres or providing delivery kits to increase demand for care – can involve high costs. Countries should consider mobilizing technical and financial resources by developing or strengthening collaboration with the private sector. Rapid SMS-MCH using mobile phones to monitor mothers throughout pregnancy up to delivery and the post-partum period, or to inform and mobilize communities, requires high mobile connectivity (cell phone coverage), Internet connectivity, software equipment for storing information, and maintenance costs. As seen in the Rwanda case study, public-private partnerships can lower the recurrent costs of SMS.

**Target the marginalized and the poorest populations to reduce gaps and address inequity**
All the case studies strongly emphasize equity, and the need to reach disadvantaged and vulnerable target populations in various ways. For instance, almost all the innovative approaches in Sierra Leone, Nepal, Afghanistan and Pakistan targeted mothers and newborns in rural or hard to reach areas, who were in need of maternal and newborn health services, thus reducing inequities in access and increasing maternal and newborn survival.

**Prepare for scale and replication**
While most case studies described are scaling up to a subnational level, several case studies are currently going to scale at a national level, and these range from large countries such as China to countries with much smaller populations and geographies. Approaches moving to national scale include the SMS system for CHWs in Rwanda, the policies on magnesium sulphate in Ethiopia and improving facility-based delivery in China. Some case studies are already seeing uptake in another country, replicating the approach with some local adaptations: the approach to low-cost MWHs that involved converting a room in an existing facility in China is being replicated in some areas of Tibet; the mHealth approach in Uganda is being replicated in Zambia.

**Broker, strengthen and cultivate partnerships**
These case studies provide concrete examples of the longstanding collaborations among H4+ agencies. They emphasize the importance of the H4+ partnership in supporting governments to meet their commitments to the UN Secretary-General’s Global Strategy for Women’s and Children’s Health. Several case studies describe how WHO, UNFPA and UNICEF have worked together to test and implement innovative approaches that support national policies to reduce maternal and newborn mortality and morbidity. These case studies highlight the difference that the H4+ is making to the health of women and children.
4. Conclusion

These case studies demonstrate various innovative strategies and solutions that address health system bottlenecks and improve access and utilization of quality maternal and newborn health services for vulnerable populations in countries working to achieve MDGs 4 and 5. Evidence-based strategies, government ownership and political will, comprehensive and integrated equity-based approaches, and supportive partnerships are shown to be effective and accelerate progress towards achieving MDGs 4 and 5.

Increasingly, countries are learning from each other’s approaches, methods and interventions, and are replicating and adapting them to their particular contexts. This compendium serves as a resource for information on interesting approaches that are showing results. Collaboration among countries and regions in the global South must continue to be promoted and facilitated to enhance progress, save the lives of millions of women and newborns and improve the well-being of their families.