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# PREVENTING POSTPARTUM HEMORRHAGE: WHY QUALITY IMPROVEMENT MATTERS

## POSTPARTUM HEMORRHAGE IS THE LEADING CAUSE OF MATERNAL DEATH WORLDWIDE

**M**ore than half a million women die every year of complications related to pregnancy or childbirth. Postpartum hemorrhage (PPH)—unchecked uterine bleeding occurring after childbirth—is the leading cause of maternal deaths worldwide. PPH usually occurs unexpectedly and can lead to death in under two hours if untreated. In many developing countries a woman who begins to hemorrhage has limited or no access to health care that can save her life. Thus, preventing PPH is a critical strategy to reduce maternal mortality. Uterine atony, which occurs when uterine muscles fail to contract normally following birth, is the leading cause of PPH and can be prevented in a majority of cases through an evidence-based clinical practice known as *active management of the third stage of labor* (AMTSL). Yet, many health services worldwide fail to routinely deliver AMTSL, a gap that represents a major quality problem in maternal health care.

AMTSL reduces PPH by over 50% when administered to a woman just after the delivery of her baby and before delivery of the placenta, during the third stage of labor (Prendiville et al. 2000). AMTSL consists of three steps, listed in Box 1. The World Health Organization (WHO) recommends that all women receive



*“We estimate that annually 1.4 million deliveries do not receive correct active management of the third stage of labour. . . . This represents 1.4 million lost opportunities to prevent postpartum haemorrhage, which is the leading cause of maternal death.”*

*Stanton et al. 2009*

### BOX 1

#### **The three elements of active management of the third stage of labor to reduce PPH**

- 1) Administer a “uterotonic” drug such as oxytocin *immediately after birth* to help the uterus contract.
- 2) Control the delivery of the placenta through careful traction on the umbilical cord while providing external counter-traction to the uterus.
- 3) Massage the uterus externally during and after delivery of the placenta.

*Source: World Health Organization 2007a*

AMTSL administered by a skilled care giver, who is usually a nurse, midwife, doctor or, in some circumstances, a trained auxiliary nurse (WHO 2007a).

Health care interventions such as AMTSL are considered “high impact” because they impact a leading cause of mortality and “evidence based” because they have been proven to reduce mortality through rigorous research methods. Recent publications have summarized the high-impact, evidence-based interventions that can reduce maternal and newborn mortality and morbidity (Darmstadt et al. 2005; Campbell and Graham 2006; Lawn et al. 2009). However, there is less understanding and research available to guide effective implementation and scale-up approaches for the delivery of high-impact intervention packages as part of routine childbirth care for all women and newborns.

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## THE CASE FOR QUALITY IMPROVEMENT: WHY DRUGS AND TRAINING ARE NOT ENOUGH

In countries where the greatest numbers of women die from postpartum hemorrhage, many barriers prevent women from receiving AMTSL. Lack of access to skilled health care due to financial, geographic, and cultural constraints presents one of the greatest barriers. In many high-mortality countries, most women deliver at home, often without a skilled birth attendant. However, even when women do have access to skilled care, they often do not receive AMTSL. In settings where AMTSL is reportedly part of routine postpartum

*... even when women do have access to skilled care, they often do not receive AMTSL.*

care, observation studies have found common problems with adherence to AMTSL standards, including correct timing of uterotonic administration and compliance with all three AMTSL elements (Harvey et al. 2007; Stanton et al. 2009). A seven-country study demonstrated correct use of AMTSL in only 0.5% to 32% of observed deliveries; training in active management did not appear to contribute to the use of the practice (Stanton et al. 2009).

Challenges to implementing AMTSL occur across multiple areas of the health system. WHO has defined six key health system building blocks as part of its framework for action for strengthening health care systems: service delivery; health workforce; information; medical products, vaccines, and technologies; financing; and leadership and governance (WHO 2007b). When analyzing common barriers to the reliable delivery of any set of high-impact services, it is useful to consider these six areas to identify gaps and prioritize action. In the case of AMTSL, as with most health interventions, obstacles to routine implementation occur across all health system areas, as seen in Table I.

TABLE I. SPECIFIC CHALLENGES TO AMTSL IMPLEMENTATION, BY WHO HEALTH SYSTEM BUILDING BLOCK

Health system building block	Barriers to routine AMTSL administration
<b>Service delivery</b>	
Organization of care	Care processes are not effectively organized for reliable administration of AMTSL for every delivery; e.g., absence of standards-based processes for triage, labor, delivery, and postpartum care.
Compliance of care with standards	Providers do not perform the three AMTSL steps correctly
Accessible care	Affordable childbirth care not available when and where women deliver
Acceptable care	Childbirth does not meet client expectations and/or cultural norms
<b>Workforce</b>	
Human resources	Inadequate number and distribution of skilled birth attendants
Workforce competence	Skilled birth attendants not trained in AMTSL Lack of regular pre- and in-service training/supportive supervision
Workforce engagement	Lack of incentives to engage and motivate workers to provide quality care
<b>Information</b>	
Medical records	Non-inclusion of AMTSL standards in medical record/birth register
Monitoring	No routine measurement of AMTSL (quality, coverage) or PPH rates
Analysis and dissemination	No routine analysis and/or dissemination of AMTSL and PPH measures to guide continuous improvement throughout the health system
<b>Medical products and technologies</b>	
Drugs and cold chain	Non-availability of uterotonic drug and/or cold chain capacity
<b>Health financing</b>	
Cost of care	Skilled delivery care unaffordable to client
Workforce compensation	Staff not adequately or reliably compensated
Infrastructure and drugs	Lack of funding
<b>Leadership and governance</b>	
Leadership	Lack of champions for AMTSL Lack of leadership for training/supervision and/or for rational deployment of skilled birth attendants
National standards	Lack of national AMTSL standards

## HOW QUALITY IMPROVEMENT METHODS OVERCOME BARRIERS TO IMPLEMENTING AMTSL

Quality improvement methods can strengthen health systems to overcome the implementation barriers listed in Table 1 to make AMTSL a routine part of childbirth care, even in resource-constrained settings. Quality care can be defined as accessible health care that is adherent with evidence-based standards and delivered according to client needs. Quality improvement (QI) consists of systematic, data-guided activities specifically designed to bring about prompt and substantial improvements in the performance of health care processes (Batalden and Davidoff 2007). QI methods are based on four principles, listed in Box 2.

QI activities change processes within all parts of the health system and typically are implemented by front-line health care providers and managers. In addition to improving health care service delivery, QI methods can help break down access barriers to skilled childbirth care by empowering communities to identify and implement changes that improve women's access to needed care. QI methods implemented at the community level empower consumers to demand and access quality care.

While the general health system barriers to implementing or improving quality of AMTSL (Table 1) are often similar across diverse health systems, the specific form that an implementation barrier takes is usually unique to each setting. For example, in all health care settings, a viable uterotonic drug (maintained at the correct temperature if oxytocin) must be available for effective administration of AMTSL. However, different settings face distinct challenges for ensuring continuous availability of oxytocin for every childbirth.

To overcome the implementation barriers unique to each setting, QI teams of front-line providers and managers are usually best positioned to identify, test, adopt, and sustain effective changes for

### BOX 2

#### Four principles of quality improvement

- 1) Understanding and focusing on client needs
- 2) Understanding how processes of care function within a system
- 3) Using data to measure results and guide continuous improvement of care
- 4) Effective teamwork that engages teams of managers, service providers, and community stakeholders in a common aim to improve care

improved quality of service delivery. To be fully effective, however, front-line teams working to improve service delivery must be supported by a larger health system in which all six of the WHO-defined building blocks are effectively functioning. Thus, QI interventions necessarily target all essential health system functions, working via teams at multiple levels to strengthen all essential health system functions necessary for the reliable delivery of high-quality care for optimal client outcomes.

## ACCELERATING AMTSL SCALE-UP THROUGH COLLABORATIVE IMPROVEMENT

While QI methods can be effectively applied by individual teams to improve services in a single site, engagement of multiple sites in a common QI process has been shown to accelerate implementation and scale-up of high-impact interventions for improved outcomes (Catsambas et al. 2008; Franco et al. 2009). In a QI model called the *improvement collaborative*, pioneered in the United States by the Institute for Healthcare Improvement, multiple QI teams from individual health care sites collaborate to improve quality and efficiency of health services in a targeted technical area such as the

prevention of PPH. Teams from individual sites collaborate intensively to identify, test, and share effective changes for achieving shared objectives measured by a common set of indicators.

The central innovation of the collaborative improvement model is the structured shared learning across multiple sites that accelerates the spread of effective implementation approaches. In a collaborative, individual site teams are typically supported by regional and national manager teams that promote shared learning among teams and continuous capacity-building in clinical, QI, and monitoring skills. Through deliberate dissemination of effective implementation approaches to new sites joining successive

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*QI activities change processes within all parts of the health system and typically are implemented by front-line health care providers and managers.*

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phases of the collaborative, it becomes an efficient model for scale-up of high-impact interventions. Typically, results are achieved more rapidly during subsequent spread phases of a collaborative due to the active dissemination and rapid adoption of best practices identified in earlier phases. Veteran site teams play a key facilitative role as new sites enter the collaborative, promoting efficiency and sustainability.

Through the USAID Health Care Improvement Project and USAID-funded country projects, University Research Co., LLC (URC) has implemented improvement collaboratives in over 20 developing countries in sub-Saharan Africa, Asia, and Latin America. In 2008, URC-supported maternal newborn improvement collaboratives in Niger, Benin, Nicaragua, Honduras, and Ecuador reached an average 62% of districts in each country, covering 190,234 births in all five countries. In most countries, AMTSL

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## Case Study: NIGER

### Accelerating prevention of PPH in a high-mortality setting

In 2005 when URC initiated a maternal newborn improvement collaborative in Niger, a country with one of the highest maternal mortality rates in the world, the national birth record (partogram) did not include AMTSL standards. A 2005 baseline survey found that only 7% of 57 randomly surveyed maternal health providers (midwives, nurses, and doctors) in government district maternities had received AMTSL training.

QI teams from over 33 government maternity facilities collaborated intensively to improve maternal newborn care, including routine immediate postpartum care with AMTSL and essential newborn care. QI teams of midwives, nurses, doctors, and managers met weekly in each site to identify, test, and measure the effects of specific changes for integration of high-impact practices, including AMTSL, into routine childbirth care. The effectiveness of changes tested at each site was measured against a set of common indicators tracked by all teams. Teams came together quarterly at the regional level to share effective changes as measured by indicator results. A highly publicized national annual meeting

synthesized best practices across all regions and disseminated collective results.

Twenty-four months after initiation of the Niger maternal newborn collaborative in 33 government facilities, AMTSL coverage of births in participating facilities increased from less than 5% at baseline to 98%, and the PPH rate decreased from 2.5% at baseline to 0.2% (Figure 1). In 2008, 31,085 births representing 27% of country-wide facility births benefited from AMTSL within government maternities participating in the collaborative. In all sites, AMTSL was implemented as part of a postpartum package that included essential newborn care, and similar gains were seen for immediate newborn care. Collective results in the form of run charts, exemplified by the one in the figure, were widely and continuously disseminated, boosting the engagement of individual site teams and regional managers already motivated by local results. A data



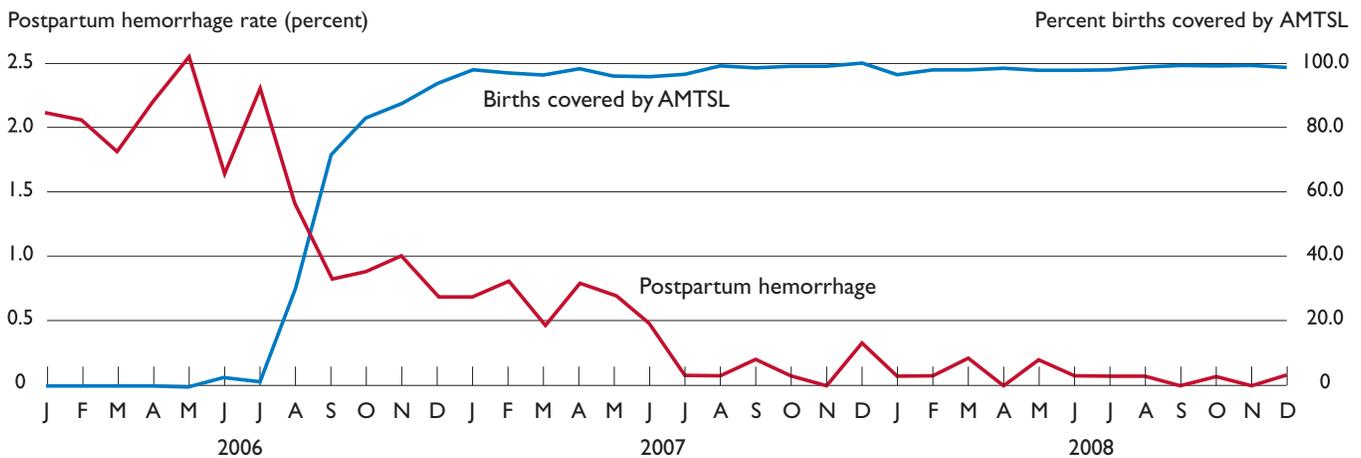
**QI team of midwives in Niger maternity**

validity study found that data recorded in clinical records and reported at collaborative regional meetings correlated highly with independent chart audit and periodic provider observation.

Eight months after the official end of the collaborative in June 2009, operations research conducted by the HCI Project found continued monitoring and compliance with AMTSL at levels achieved during the collaborative. The finding was based on external partogram audits and direct observations in 17 former collaborative facilities.

**FIGURE I. ACTIVE MANAGEMENT OF THE THIRD STAGE OF LABOR AND POSTPARTUM HEMORRHAGE RATES IN TARGETED FACILITIES, NIGER, JANUARY 2006–DECEMBER 2008**

*Total births – 2006: 24,785 (28 sites); 2007: 31,073 (33 sites); 2008: 31,085 (33 sites)*



## Case Study: ECUADOR

### Introducing and Taking AMTSL to National Scale

As part of assistance to the Ecuador MOH to improve the quality of maternal care, URC, through the USAID-funded Quality Assurance Project (predecessor to the USAID-funded HCI Project), began advocating in 2003 for the introduction of AMTSL into Ecuador's national maternal care standards. Many MOH officials and senior obstetricians had reservations about the effectiveness and safety of AMTSL. Recognizing the importance of including AMTSL as a key element of a high-impact essential obstetric care package, URC proposed the introduction of AMTSL on a pilot basis in a single province as part of an essential obstetric care (EOC) improvement collaborative that the MOH and URC initiated in 2003. As the collaborative expanded to new provinces in 2004 and 2005, an increasing number of facilities began to implement AMTSL, demonstrating that it could be safely administered by providers in provincial and small district hospitals. By late 2006, nearly half (75 of 152) of government hospitals were routinely implementing and monitoring AMTSL as part of the EOC collaborative.



**QI team of health professionals and traditional midwives in Ecuador**

In 2006, on the tail of vigorous advocacy by URC, partners, and national champions, the MOH published and disseminated a national maternal health addendum mandating universal AMTSL provision in all government facilities. In 2007, the MOH, URC, and partners began planning for national scale-up of AMTSL to all government maternity facilities. A key scale-up strategy focused on the dissemination of effective AMTSL implementation approaches that QI teams had identified in early collaborative phases.

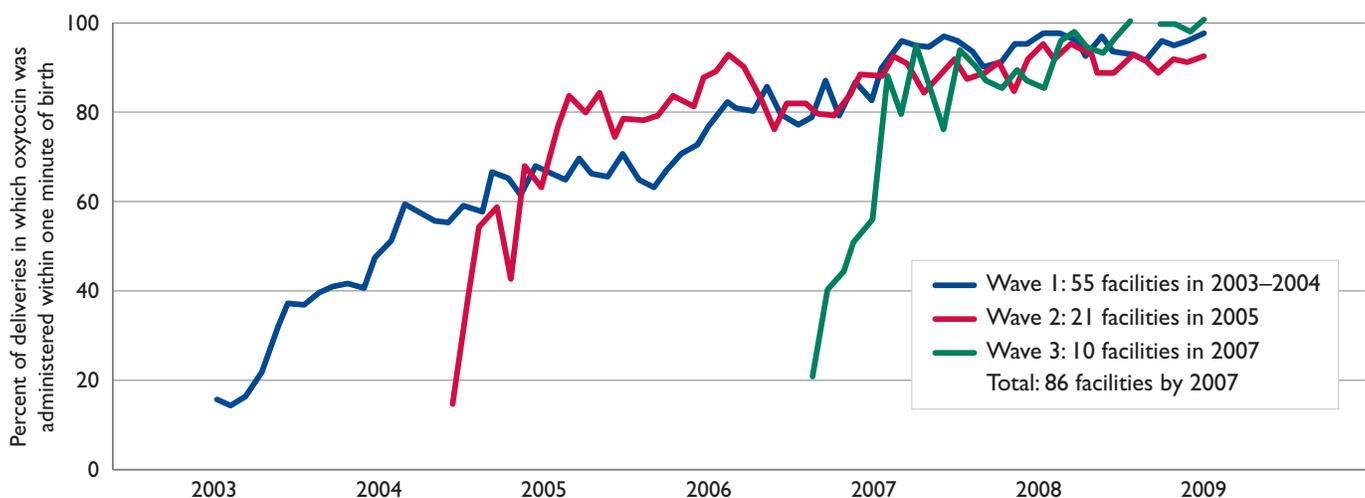
The MOH and URC provided intensive technical assistance for building regional capacity to support training, supervision, monitoring, and continuous QI processes in sites targeted for the spread of AMTSL. Figure 2 shows the more rapid uptake of AMTSL in new sites during the collaborative expansion phase. Faster uptake is thought to be due to active dissemination of effective implementation approaches identified by maternity QI teams during the initial demonstration phase

of the collaborative. The third wave of the collaborative had 10 additional government hospitals, bringing the total number of MOH facilities practicing and reporting on compliance with AMTSL standards to 86: 57% of all government facilities providing childbirth care in Ecuador.

The MOH is leading an intensive initiative to spread AMTSL to all public facilities providing childbirth care in Ecuador, including facilities in Ecuador's two largest cities, Guayaquil and Quito, which had not previously participated in the collaborative.

**FIGURE 2. EXPANDING PREVENTION OF PPH IN ECUADOR'S PUBLIC MATERNITIES**

*Successive waves of maternities joining an essential obstetric care collaborative, July 2003–April 2009*



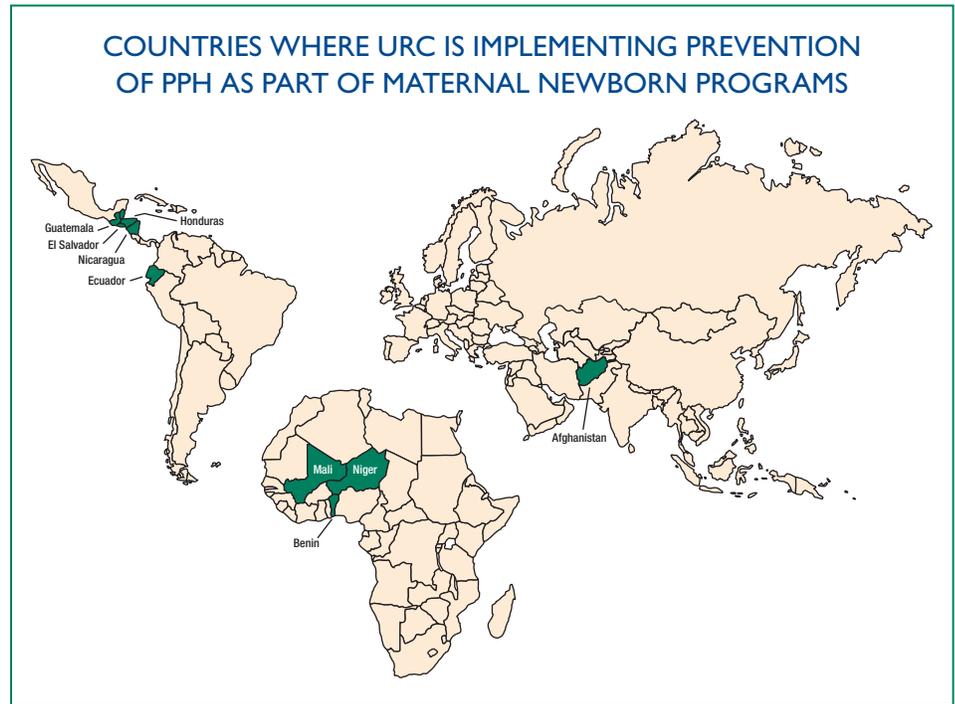
**TABLE 2: CHANGES MADE BY QI TEAMS TO INTEGRATE AMTSL INTO ROUTINE CARE FOR EVERY DELIVERY**

<b>Health system building block</b>	<b>Changes made by QI teams to ensure routine AMTSL administration</b>
<b>Service delivery</b>	
<b>Organization of care</b>	<p>Re-organization of childbirth care into distinct standards-based triage/evaluation, labor, delivery, and postpartum phases</p> <p>Specific childbirth care tasks, such as preparation of oxytocin syringe, assigned to specific team-member.</p> <p>Integration of AMTSL with immediate newborn care and postpartum surveillance of mother and newborn</p> <p>Storage/pre-preparation of oxytocin in immediate delivery area (e.g., pre-loaded syringe placed in cooler next to delivery table when woman begins pushing)</p>
<b>Compliance of care with standards</b>	<p>AMTSL job aids posted in delivery rooms</p> <p>Observation, using checklist, of provider AMTSL skills (simulated or live birth) as part of quarterly MOH supervision visits</p> <p>On-site, peer-to-peer evaluation using structured observation checklists</p>
<b>Accessible care</b>	Community-facility QI teamwork to identify and reduce obstacles to skilled care (e.g., birth preparedness as part of antenatal care)
<b>Acceptable care</b>	<p>Promotion of presence of birth companion</p> <p>Creation of client-provider teams to test and implement changes for improved interpersonal communication and cultural appropriateness of care, such as choice of birthing position</p>
<b>Workforce</b>	
<b>Human resources</b>	<p>Presence of trained provider at all deliveries (e.g., call schedules)</p> <p>Redeployment of personnel within facility</p>
<b>Workforce competence</b>	<p>Competence-based training (simulated mannequin births and live births) with assessment and certificate of competence</p> <p>Observation, using checklist, of AMTSL skills integrated into MOH supervision visits</p> <p>Integration of AMTSL skill-building into national midwifery training programs</p>
<b>Workforce engagement</b>	<p>High-performing providers or site teams recruited as paid trainers and supervisors for other sites in their region</p> <p>On-site peer-to-peer support</p> <p>Performance-based financial incentives</p> <p>Awards for highest performing collaborative teams</p>
<b>Information</b>	
<b>Medical records</b>	<p>Adaptation of birth record to include AMTSL standards (e.g., rubber stamp introduced into partogram)</p> <p>Advocacy with partners for revision of national record to include AMTSL standards</p>
<b>Monitoring</b>	<p>Monthly monitoring of AMTSL coverage and standards compliance by individual sites</p> <p>Regular sharing and public dissemination of site results</p> <p>Regular monitoring of regional/national AMTSL results by regional/national MOH officials</p>
<b>Analysis and dissemination</b>	<p>Monthly analysis of AMTSL indicators by site QI teams</p> <p>Regular regional/national analysis of AMTSL indicators and public dissemination of results to track common progress across sites.</p>
<b>Medical products and technologies</b>	
<b>Drugs and cold chain</b>	<p>Designated staff person and protocol for stocking uterotonic drug</p> <p>Cost-recovery funds for purchase of uteronic drug (when not covered in budget)</p>
<b>Health financing</b>	
<b>Care unaffordable to client</b>	Advocacy for local and central financing mechanisms
<b>Workforce compensation</b>	Rewards for quality performance
<b>Infrastructure and drugs</b>	Advocacy for inclusion of uterotonic as essential childbirth drug
<b>Leadership and governance</b>	
<b>Leadership</b>	<p>AMTSL champions recruited to leadership positions within collaborative</p> <p>Mentoring and promotion of professional opportunities for AMTSL champions</p>
<b>National standards</b>	<p>Dissemination of AMTSL evidence to experts and decision-makers</p> <p>Advocacy for inclusion of AMTSL within national standards</p>
<b>Training and supervision</b>	Recruitment of pre- and in-service trainers and respected opinion leaders as collaborative trainers and coaches

continued from page 3

was administered as part of an immediate postpartum package that included essential newborn care and postpartum surveillance and care of mother and newborn. Boxes 3 and 4 describe how improvement collaboratives scaled up AMTSL in Niger and Ecuador, respectively.

Table 2 gives examples of changes made by QI teams to implement AMTSL as a routine part of childbirth services in URC-supported maternal newborn improvement collaboratives. These examples include changes implemented by individual site QI teams at the point of service delivery and changes adopted within the larger health system by Ministry of Health (MOH) collaborative leadership teams.



## SUCCESS FACTORS FOR SCALING UP PREVENTION OF PPH IN AN IMPROVEMENT COLLABORATIVE

URC maternal newborn collaboratives share several common themes for successfully leveraging improvement approaches to scale up AMTSL for prevention of PPH:

- Strong leadership, including leadership opportunities for participants;
- Ongoing capacity-building of facility-based QI teams in quality improvement, clinical, and monitoring skills;
- Unified monitoring strategy employing a set of common indicators;
- Decentralized management of collaborative activities and support to each site team by regional MOH authorities;

- Supportive supervision of site teams to promote rapid identification, testing, and adoption of successful changes for implementation of AMTSL;
- Regular opportunities for shared learning at regional and national levels;
- Dissemination of successful implementation approaches from a collaborative's first ("demonstration") phase to new sites during scale-up phases; and
- Promotion of a permanent "community of practice."

## CONCLUSION

Prevention and prompt treatment of PPH is essential for reducing maternal deaths. AMTSL constitutes a powerful tool in the battle against PPH. However, as with many high-impact clinical interventions, the reliable administration

of AMTSL depends on essential health system functions that are often weak in high-mortality settings—hence the common failure of health services to deliver AMTSL even when endorsed by official standards. QI approaches such as the improvement collaborative are an effective strategy for strengthening essential health system functions to accelerate scale-up of AMTSL and other high impact interventions and should be a part of every maternal newborn program.

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