ABT THOUGHT LEADERSHIP PAPER

The Centers of Excellence Approach in the Dominican Republic
Empowering Teams to Improve Maternal and Neonatal Health Outcomes

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ABSTRACT

The global burden of maternal and infant deaths currently amounts to more than 500,000 women and 100,000 infants annually, 99% of which occur in low-resource countries. The Dominican Republic emulates global trends in that the maternal mortality ratio is 159 per 100,000 live births and the infant mortality rate, primarily neonatal, is 31 per 1,000 live births. These figures are alarming given that 98% of deliveries occur in health facilities and are conducted by qualified personnel, with a reported 95% of women receiving prenatal care.¹ A clear disparity exists between the high maternal and infant mortality rates and the high percentage of institutional births. The reasons for this disparity are closely associated with the management and quality of care, and motivational issues among health providers and staff.²

In an effort to address this challenge and reduce maternal and neonatal mortality in the Dominican Republic, Abt Associates implemented an innovative approach with USAID and the Ministry of Health to develop Maternal/Child Health “Centers of Excellence” from 2009 to 2014. Ten public hospitals, responsible for 23% of the country’s births implemented this model, in which Abt combined health system strengthening and evidence-based maternal and infant service quality improvements.

The ten target “Centers of Excellence” hospitals reduced maternal deaths by half (49.2%) and neonatal deaths by 42.1% between 2010 and 2011, representing an estimated 30 maternal and 115 neonatal deaths averted. The reduced mortality rates were sustained through 2012 and 2013. These results demonstrate that it is possible to achieve outcomes through systemic changes in the health system that ultimately led to service delivery and quality improvements.

At the heart of Abt Associates’ “Centers of Excellence” model is the empowerment of health facility personnel to achieve excellence by “doing the ordinary in an extraordinary way”. This paper describes how the “Centers of Excellence” in the Dominican Republic developed best practices for reduction of maternal and neonatal deaths and systemic improvements that produced a direct impact in the quality of care.

¹ CESDEM, Demographic Health Survey, 2013.
INTRODUCTION

Reducing maternal and infant deaths is a top public health priority and one of the key Millennium Development Goals. The primary causes of maternal morbidity and mortality continue to include hemorrhage, sepsis, high blood pressure, unsafe abortion, and obstructed labor, most of which are preventable. In many resource-limited settings, efforts to reduce maternal and neonatal deaths have been slow to produce results given the weaknesses of health systems and the difficulties in addressing key aspects of clinical and community care. In the Dominican Republic, the maternal mortality ratio was 159 per 100,000 live births and the infant mortality rate, primarily neonatal, was 32 per 1,000 live births in 2007. A 98% rate of institutional deliveries conducted by qualified personnel and a reported 95% prenatal care coverage rate indicate that the burden of maternal and neonatal deaths can be largely attributed to the quality of care. Multiple studies, such as that of Dr. Suellen Miller and collaborators, identify management of care, compromised provider communication and inattention to patient needs, motivational issues among health providers and other staff and overall quality of care as the key challenges.

Research suggests that one of the key components in saving the lives of mothers and infants is the ability to strengthen the response of health systems to prevent complications and provide key life-saving obstetric and neonatal care to address unexpected complications.

Too often, public health efforts to address maternal and infant mortality address only clinical components related to the provision of care but fail to address other systemic components that play key roles in saving lives. For example, a hospital’s ability to conserve key commodities and medications, such as oxytocin used to reduce hemorrhaging in active management of the third stage of labor and sulfate magnesium for control of hypertension. Monitoring of key indicators that contribute to maternal and infant morbidity and mortality has proved pivotal in multiple countries.

In response to these challenges and with the support of USAID, Abt Associates assisted the Ministry of Health of the Dominican Republic to develop the Maternal & Child Centers of Excellence (CoEx) model to reduce maternal and neonatal mortality and morbidity by expanding access to efficient, high-quality maternal and child services. This effort was implemented from 2009 to 2014 in ten selected hospitals to create a cohort of “positive deviants” with the capacity to share best practices and lessons learned with other hospitals throughout the country.

METHODS & STRATEGIES

Central to the Centers of Excellence Model was the development of a cohort of “positive deviants” with the capacity to achieve tangible maternal and child health outcomes and then share experiences to expand the implementation of best practices throughout the Dominican Republic. The model operated on the premise that if hospitals could generate changes and develop the capacity to mentor other facilities, this would have the potential to reduce the maternal and neonatal deaths in target hospitals and could also be a sustainable way for the health system to expand quality improvement efforts and produce important systemic changes.
Selection Of Participating Facilities: Setting the Stage for Success

The Abt Associates team worked directly with the Ministry of Health to design and implement each of the processes of the Centers of Excellence approach. This began with the joint selection of participating facilities through a competitive process. Twenty-seven of 152 facilities were pre-selected based on epidemiological impact and geographic balance and requested to submit proposals for participation. All 27 facilities submitted proposals which were evaluated based on the following criteria: willingness of the hospital management teams to implement change and potential to leverage resources to address additional gaps. Fifteen of the applicants met the criteria. The final selection was made together with the Ministry of Health based on their priorities and interest in leveraging additional funding necessary for improvements in infrastructure, equipment and staffing needs. Ten facilities strategically located throughout the country were selected, including one National Maternity Hospital, six Regional Hospitals and three Provincial Hospitals which together represented 23% of the country’s deliveries. The participation of the Ministry of Health and the competitive application process generated commitment by facility leadership and alignment with national priorities. The selection of facilities at different levels of the health system (provincial, regional, national referral) and geographically throughout the country laid the groundwork for the development of a model in different contexts with potential to generate national-level impact and scale-up of best practices.

Implementation Process: What Interventions Helped to Generate Results?

Figure 1 depicts the overall strategy combining high-impact technical interventions and health systems strengthening components. Key aspects of health systems were strengthened including:

- change management teams to execute actions;
- management of supply chain;
- tools and methods for close monitoring of maternal and infant morbidity and mortality and key service indicators;
- information systems to manage electronic medical records; and
- systems for biosafety, waste management and infection control. These were combined with high impact technical interventions, which targeted key causes of maternal and infant mortality.

Figure 1: Guiding Strategy
Description of Interventions by Phase

As detailed in Figure 2 below the implementation process was organized into phases, beginning with interventions to set the groundwork for the quality improvement process followed by efforts to capitalize on the leadership of change management teams to launch processes that would mobilize staff and create buy-in through visible changes in the management of service delivery. Using the strengthened management and processes platform for as a springboard, targeted efforts to improve maternal and neonatal care were introduced to target weakness and move closer to target programmatic outcomes. The final stages included management and quality control processes to complete the cycle and ensure that departments that directly support service provision were able to operate with the expected efficiency to avoid bottlenecks. Careful work to institutionalize processes and foster sharing of best practices with other health facilities aimed at strengthening links within Regional health networks helped to facilitate the sustainability of the process.

Phase 1: Preparation and Induction

Full implementation of phase one activities began with the preparation of each facility to design their shared vision for the future and define the changes that would improve the overall quality of services. At the outset, interdisciplinary change management teams were formed, trained and later charged to lead the implementation process with the involvement of representatives from different departments of the hospital. The approach from the outset was for the Abt project team to accompany change management teams to assess strengths and weaknesses of each department of the facility or service area and develop plans to overcome weaknesses identified through systematic implementation of activities. These teams were empowered with tools that allowed them to clearly identify problems that needed addressing through checklists, pictures and shared discussion about solutions and methods to ensure accountability. For example, teams that conducted the assessment of biosafety presented pictures of providers without protective clothing in restricted areas and incorrect separation and disposal of waste; this created a sense of shared responsibility and commitment to generate changes. Improvement plans were accompanied by indicators and mechanisms to ensure follow up to determine the proportion of activities that had been successfully completed. Other key interventions at the institutional level included strategic and operational planning and participation in the National Competition for Quality using the tools for systematic quality improvement such as the Common Assessment Framework. As a result of these initial efforts teams adopted the Centers of Excellence models and were

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7 The Common Assessment Framework (CAF): Improving Public Organizations through Self-Assessment, European Institute for Public Administration, 2013

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Figure 2: Implementation by Phases: Centers of Excellence Approach

<table>
<thead>
<tr>
<th>Phase 1: Preparation and Induction</th>
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<tr>
<td>• Development of change management teams and shared vision</td>
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<td>• Strategic and operational planning</td>
</tr>
<tr>
<td>• Assessment of needs using tools, ie: Common Assessment Framework</td>
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<tr>
<th>Phase 2: Hospital-wide Improvements</th>
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<tr>
<td>• Customer service offices with automated records and information system.</td>
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<tr>
<td>• Biosafety</td>
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<tr>
<td>• Clinical management of maternal and neonatal services</td>
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<tr>
<th>Phase 3: Management and Quality Processes</th>
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<tr>
<td>• Supply chain management</td>
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<tr>
<td>• Processes and procedures for administrative and clinical management</td>
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<tr>
<td>• Financial management: costing and budgeting</td>
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<th>Phase 4: Consolidation and Institutionalization</th>
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<tr>
<td>• Institutionalization of change processes</td>
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<tr>
<td>• Participation in Regional network and referrals/counter referrals</td>
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<tr>
<td>• Dissemination of best practices to other facilities</td>
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Cross-Cutting Actions: Monitoring and Evaluation & Certification as a Center of Excellence
committed to a new culture of quality leading the change process based on the needs of their facilities and “doing the ordinary in an extraordinary way”.

**Phase 2: Implementation of Hospital-wide Improvements**

Phase two focused on the implementation of key quality improvement interventions essential to generate active participation from staff and departments throughout the facility. These interventions were designed to produce visible changes that would foster buy-in for the entire quality improvement process required to achieve changes in maternal/neonatal health outcomes. **Biosafety** activities focused on forming committees to assess needs and direct actions for continuous improvement, development and dissemination of risk maps and waste management processes for both clinical and support staff. **On-the-job training** was conducted and tools to track progress of activities and results of mothers and newborns sepsis cases were implemented. **Customer service offices** were renovated, teams worked to organize patient records and link these records to an electronic information system. **Hospital Management Information Systems** were developed and implemented to include modules for the management of patient records, supplies, vaccines, and sub-systems for the management of births and the Perinatal Information System. These efforts ultimately led to the standardization of the management of patient/user information, elimination of duplicate records and as a result clinical files with complete client history were readily available.”

Care, evidence-based strategies to address key causes of neonatal morbidity and mortality such as asphyxia with Helping Babies Breathe techniques, and careful follow up and care to premature infants through Kangaroo Mother Care, clinical supervision and tracking of clinical indicators to measure the progress of clinical care following trainings. Tools were implemented to observe clinicians and record observations during service provision in key areas such as prenatal care, birth and postpartum as well as neonatal care. Weaknesses were then presented internally, along with progress on key indicators as a mechanism to stimulate continued improvement. Committees were formed and strengthened to conduct audits of both maternal and neonatal “near deaths” and deaths. These committees extended analysis and discussion to other facilities within their respective Regional networks to stimulate improvement in referrals and clinical management across facilities.

**Phase 3: Implementation of Management Systems and Quality Improvement**

Phase three involved improving management systems and reinforcing processes and procedures that directly have an impact on maternal/neonatal health services. Key processes were mapped and flow charts were designed to generate understanding of the step-by-step of each process and procedure that feeds into MCH. Supply chain management efforts included renovation and automation of inventory control and quality control. Training, information systems and renovation of spaces were central to these interventions. Costing and budgeting of all services with more detailed attention to maternal/neonatal service provision also complemented
these efforts. This was given priority due to the facilities’ need to improve billing in order to sustain services within the current health financing structure.

Phase 4: Institutionalization and Sharing of Best Practices

During Phase 4, mechanisms were established to institutionalize processes by working with Regional Health Offices responsible for service provision at the decentralized level, and MOH National level officials. Activities included reinforcing the change management teams and others responsible for sustaining the change processes, strengthening clinical and managerial data collection, follow-up, and analysis of information for decision making. Focus was also placed on preparing facilities to replicate best practices in other hospitals, which was used as a strategy to expand adoption of the centers’ quality improvement processes throughout the health system. While this phase occurred at the end of the Project, facilitators were trained, training programs were developed and relationships with peer hospitals were improved as a gradual process throughout the project’s duration. This allowed for the preparation of a “team” fully able to mentor and transfer their best practices to other hospitals.

Quality Improvement Program: Certification as Centers of Excellence

Abt designed a quality improvement system for the Certification of Hospitals as Centers of Excellence, which was developed based on eight technical components that comprise 18 standards and 90 sub-criteria that follow the “Plan-Do-Check-Act” (PDCA) cycle. A scoring system was used to assign points to each of the standards to measure progress and recognize achievement. The tool served to recognize strengths and weakness, inform ongoing quality improvement plans and provides robust metrics to illustrate progress over time. Participating facilities could obtain plaques and collect up to five stars for high scores and fulfillment of all criteria. The components include: a) self-assessment and development of improvement plans for providers, based on established guidelines; b) implementation of the improvement plans to meet quality standards; c) external assessment of providers conducted by trained technical staff; and d) acknowledgment and recognition of compliance and recognition by way of “Plaques” and “Stars” according to the rating received through external assessments as illustrated in Figure 3.

The project’s Certification system, which was adopted by the Ministry of Health, served as a key motivator for facilities to continue the quality improvement process and work towards national recognition. Beginning in Phase 2, hospital teams were trained in the certification process and use of technical tools. They proceeded to conduct periodic assessments each semester, which entailed an extensive review of standards included in each of the quality “components” through verification of documentation, observation of processes and other methods, resulting in the assignment of a “score” expressed as a percentage of standards met.

This approach structured the quality improvement process and held facilities to set standards through documentation and evaluation, fostering a culture of accountability and continuous review of progress. The eight areas of quality improvement followed the Centers of Excellence implementation phases so that teams could implement improvements and see how their progress directly translated into compliance with quality standards, bringing them closer to a potential

Figure 3: Centers of Excellence Scoring System

<table>
<thead>
<tr>
<th>SCORING SYSTEM</th>
<th>PLAQUE: When a hospital achieves between 500 and 580 Points (50-58%) + a minimum of 35% in all Characteristics</th>
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<tbody>
<tr>
<td>Award</td>
<td>Points Achieved</td>
</tr>
<tr>
<td>Star 1:</td>
<td>581-660 (58-66%)</td>
</tr>
<tr>
<td>Star 2:</td>
<td>661-740 (66-74%)</td>
</tr>
<tr>
<td>Star 3:</td>
<td>741-820 (74-82%)</td>
</tr>
<tr>
<td>Star 4:</td>
<td>821-900 (82-90%)</td>
</tr>
<tr>
<td>Star 5:</td>
<td>901-1000 (90-100%)</td>
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Certification. The external evaluation led teams to be highly motivated not only to carry out periodic revision of practices and procedures involving virtually all departments of the Hospital but also to execute immediate changes to improve their overall scores. Since Certification required excellence in an array of components that comprise quality improvement, ranging from biosafety, maternal and neonatal care to emergency preparedness, this also fostered hospital-wide participation and periodic follow up. The Ministry of Health's Quality Assurance Directorate's decision to adopt the Certification System for Centers of Excellence was an indication of the effectiveness of the participatory process to generate ownership and sustainability. This began with the collective definition of standards and was followed by the implementation of external quality assessments and eventual awards for those who met criteria.

**Monitoring and Evaluation: The Importance of Accountability**

While monitoring and evaluation are typically central parts of any intervention, it was particularly important for the Centers of Excellence teams to begin monitoring key outcomes, such as maternal and neonatal deaths and “near misses” in which the mother arrived at the facility in critical condition, and their causes. Gaining a better understanding of why mothers and babies were dying, and making the numbers visible in public forums was a key strategy to drive change in each of the facilities. Tracking weekly epidemiological bulletins of maternal and neonatal deaths by facility, sharing this information by email, and quarterly discussions of indicators with all ten facilities and Regional discussions all helped to improve data collection, data quality and use of information to make changes in service delivery. At the end of the project, all facilities were using tools to track indicators and graphing progress on a public bulletin board to present data on maternal and neonatal causes and morbidity that were previously unknown.

This helped to instill a culture of accountability and use of strategic information, which is a consistent challenge of most public hospitals in the Dominican Republic.

**Results: Reduction in Maternal and Neonatal Deaths**

Important reductions in maternal and neonatal deaths occurred in the ten Abt-supported facilities from 2010 to 2013, which contributed to a National level reduction in 2011. As illustrated in Graph 1, maternal deaths declined by almost half (49.2%) in Abt-supported hospitals between 2010 and 2011. The ten target “Centers of Excellence” hospitals reduced maternal deaths by half (49.2%) and neonatal deaths by 42.1% between 2010 and 2011, representing an estimated 30 maternal and 115 neonatal deaths averted. The reduced mortality rates were sustained through 2012 and 2013.

**Graph 1: Maternal Deaths Reported by Ten Centers of Excellence**

The decline in maternal and neonatal morbidity and mortality coincided with the Project’s efforts to produce increased use of proven lifesaving clinical practices, improved management, and the overall quality of services. Key emergency obstetric care practices increased significantly, in 2009 only 32% of providers practiced active management of the third stage of labor and now it has become standard practice with a 96%
compliance rate (2013) and restrictive episiotomies were reduced from 30% in 2009 to 17% in 2013. As a measure of increased quality of prenatal care, those receiving systematic measurement of weight, blood pressure and uterine height also increased from 82% to 96%.

As illustrated in Graph 2, Centers of Excellence hospitals improved their management capacity index, which is measured by standards related to planning, human resources, strategic planning and health service provision management. The score, measured through repeated interviews with key informants, increased from 33% in 2010 to 64.4% in 2013, doubling scores in planning, management of clinical programs and human resource management. These results provide additional evidence that health systems strengthening activities conducted from 2009-2013 generated improvements in management, planning and use of strategic information.

In addition to improvements in management capacity, all of the Centers of Excellence hospitals increased compliance with quality standards from baseline (2010) to the end of the project (2013). This measurement was based on the quality standards contained in the Maternal-Child Health Certification System operated by the Ministry of Health. An essential part of the certification process relies on each institution’s ability to conduct a self-assessment of their compliance with each of the quality standards and identification of specific activities aimed to improve identified weaknesses. All facilities conducted at least two self-assessment processes and took part in an external evaluation. This is evidence of the ongoing quality improvement processes conducted at each site, which resulted in increased compliance with each of the quality standards that form part of the Center of Excellence certification system. As illustrated in Graph 3, all of the intervention Hospitals increased compliance with quality standards from baseline to the end of the project. The average level of improvement was 30%.

Graph 3: Results of Quality Assessments in Ten CoEx Hospitals

These results suggest that the combination of improved clinical and technical practices, quality improvement processes and management structures for stronger health systems helped to generate outcomes in the reduction of maternal and newborn deaths at target facilities. A Study of Hospitals implementing the Center of Excellence Model indicated that the most significant change that led to the reduction of maternal and infant deaths was in putting women at the center of care.

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* Hospital records from 10 intervention sites, 2009-2013.
According to this study:

*Most important has been a change in responses to patients' needs, especially when complications and emergencies arise. Not only have the hospitals instituted a number of evidence-based practices to prevent and manage complications, they also have reconfigured the organization of clinical and administrative services to facilitate rapid and competent response to life threatening events.*

These practices include 24 hour obstetric and pediatric care staffing, regular rounds, biosafety to prevent infections, and application of preventive measures such as active management of the third stage of labor (AMTSL), use of partograph and Kangaroo Mother Care and helping babies breathe to reduce complications associated with respiratory distress and premature birth.

**Discussion: How The Center of Excellence Approach Made a Difference**

In the Dominican Republic, like many other limited-resource settings, public health interventions are typically designed around a desired programmatic outcome, whether it is HIV/AIDS, Maternal/Child health or TB. Many times, the health systems components that are directly related to the provision of these services or desired behavior changes are either ignored or not integrated because they require more complex, long-term, costly interventions. Abt's Centers of Excellence approach provided user-friendly tools and methods that combined health systems strengthening with technical improvements in maternal and neonatal health services leading to buy-in by both the Ministry of Health and hospitals and coinciding with sharply better practices and outcomes. Hospital directors recognized at the outset that unlike interventions specific to HIV/AIDS or TB that are directed solely to reach a portion of its clients, an approach that integrates health systems strengthening and maternal/child health could benefit the overall hospital management structure as well as improve outcomes specific to mothers and newborns. For example, team members from the pharmacy department helped to improve supply chain management, which ultimately led to the detection of problems in the temperature control of oxytocin, essential for active management of the third stage of labor to prevent hemorrhaging. Strengthening of hospital-wide biosafety produced reductions in maternal and infant sepsis, both key causes of maternal and infant deaths. Both examples were designed and led by the hospitals’ own teams with support from Abt's project team and approached from a holistic, health-systems perspective. This fostered genuine participation of all staff and implementation of processes that were ultimately adopted by the whole institution, rather than a particular program area or department.

“Strengthening of hospital-wide biosafety produced reductions in maternal and infant sepsis, both key causes of maternal and infant deaths.”

Much like “broken windows” produce a feeling of disempowerment in a community, strategic structural and organizational improvements in the workplace produced the opposite effect, increasing staff motivation, adherence to clinical and administrative standards, and commitment to achieving outcomes. The renovation of client service offices, organization of files, hospital-wide clean-ups to kick off biosafety interventions that were completed in the initial phases of the Project produced significant changes in the culture and behavior of managers, providers and clients alike. This laid the groundwork for subsequent change processes and participation of the entire hospital in technical processes that directly produce impact on clients.

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In response to the fact that hospital departments typically function without a great deal of communication with one another and the leadership is often centralized, Abt’s Project team dedicated time during the initial project phase to build solid change management teams composed of representatives from an array of Departments, including those who would not traditionally participate in Hospital management such as pharmacists and maintenance managers, together with clinicians. These teams were used to drive all change processes and facilitate the decentralization of management processes, which was a key element of the success of the Centers of Excellence approach.

Abt’s staffing structure and project team were vital to harnessing the power and full participation of facility change management teams. Field managers built strong relationships with these teams and offered mentoring and coaching to build the capacity of hospital teams by guiding them in the application of tools and processes to approach quality improvement in a systematic way. Abt’s project team used a “bottom up” approach to help hospital teams detect and understand their own needs and develop tailored actions to remedy problems. All interventions were designed with and for the individuals, not simply to comply with a norm. Each of the field managers also had a “technical specialty” in one of the project’s components, such as clinical care, biosafety, or HIV/AIDS, which allowed for a robust set of skills on the project team available to respond to the needs of any of the ten target facilities’ specific needs.

“Abt’s project team used a ‘bottom up’ approach to help hospital teams detect and understand their own needs and develop tailored actions to remedy problems. All interventions were designed with and for the individuals, not simply to comply with a norm.”

CONCLUSIONS

All of the Centers of Excellence Hospitals produced tangible improvements in the quality of services and saw improvements in maternal and neonatal health indicators. In the final replication phase, teams went on to share their best practices, helping to improve supply chain, emergency obstetric care and biosafety of other hospitals in their regional networks, serving as peer mentors for the change process. This is an indication of the fact that a team-centered approach, where Abt’s project team structured the quality improvement process through coaching and systematic implementation has the potential to yield high impact results.

The challenges ahead are many. Health systems around the world, such as that of the Dominican Republic, lack many of the basic resources necessary to overcome challenges not only in MCH care but also in health service provision as a whole. Lack of institutionalization generates constant shifts in leadership and skilled personnel. However, this experience shows that health systems-related changes and technical improvements in health providers’ management and execution of MCH care can make a substantial difference in the lives of mothers and infants.

Where can the Centers of Excellence approach be implemented?
- Management support units: Health District and Provincial offices
- Public Health facilities: hospitals and health centers
- Private sector clinics
- Other non-health sector establishments

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