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COLLABORATIVE EVALUATION SERIES

Evaluating Health Care Collaboratives: The Experience of the Quality Assurance Project

JUNE 2008

This report was prepared by University Research Co., LLC (URC) and its subcontractor EnCompass LLC for review by the United States Agency for International Development (USAID) and was authored by Tessie Tzavaras Catsambas, Lynne Miller Franco, Mary Gutmann, Elisa Knebel, Patricia Hill, and Ya-Shin Lin. The data collection for this evaluation was carried out under the USAID-funded Quality Assurance Project; the final report was produced by the Health Care Improvement Project, which is made possible by the support of the American people through USAID.

COLLABORATIVE EVALUATION SERIES

EVALUATING HEALTH CARE COLLABORATIVES: THE EXPERIENCE OF THE QUALITY ASSURANCE PROJECT

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To learn more about the HCI Project's work to evaluate improvement collaboratives, please contact Dr. Lynne Franco at lfranco@urc-chs.com. For more information on HCI's broader work, please visit www.hciproject.org.

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ABBREVIATIONS

ACP	AIDS Control Program (Uganda)
AIHA	American International Health Alliance
AMTSL	Active management of the third stage of labor
ANC	Antenatal care
AP	Action period
ARI	Acute respiratory infection
ART	Antiretroviral therapy
ARVs	Antiretrovirals
CA	Cooperating agency
CCP	Critical care pathway
CDC	Centers for Disease Control and Prevention
CQI	Continuous quality improvement
DCCS	Directorate of Clinical and Community Services (Uganda)
DOTS	Directly observed treatment, short course
DPQS/DSS	Division for the Promotion of Quality Health Services/Directorate of Health Care (Niger)
ENC	Essential newborn care
EOC	Essential obstetric care
EONC	Essential obstetric and newborn care
ETAT	Emergency triage assessment and treatment
FHI	Family Health International
FP	Family planning
HCI	Health Care Improvement Project
HR	Human resources
IDU	Intravenous drug user
IHI	Institute for Healthcare Improvement
IMCI	Integrated management of childhood illness
IPT	Isoniazid preventive therapy
LAC	Latin American and Caribbean Region
LQAS	Lot quality assessment sampling
LS	Learning session
M&E	Monitoring and evaluation
MCH	Maternal and child health
MINSA	Ministry of Health (Nicaragua)
MOH	Ministry of Health
NACP	National AIDS Control Program (Tanzania)
NVP	Nevirapine
OB/GYN	Obstetrician/gynecologist
PAHO	Pan American Health Organization
PDSA	Plan-Do-Study-Act
PEPFAR	President's Emergency Plan for AIDS Relief

PHI	Pediatric Hospital Improvement
PLWHA	People living with HIV/AIDS
PMTCT	Prevention of mother-to-child transmission
PPH	Postpartum hemorrhage
QAD	Quality Assurance Department (Uganda)
QAP	Quality Assurance Project
QA/QI	Quality assurance/quality improvement
QIT	Quality improvement team
QoC	Quality of Care (Uganda)
RCHS	Reproductive and Child Health Service (Tanzania)
RCM	WHO Referral Care Manual
RDS	Respiratory distress syndrome
SILAIS	Integrated local health system (administrative health region in Nicaragua)
SO	Strategic objective
TAG	Technical Advisory Group
TCS	Treatment, care, and support
TOR	Terms of reference
TOT	Training of trainers
TRAC	Treatment and Research AIDS Center (Rwanda)
UNAIDS	Joint United Nations Programme for HIV/AIDS
UNFPA	United Nations Fund for Population Activities
UNICEF	United Nations Children's Fund
URC	University Research Co., LLC
USAID	United States Agency for International Development
WHO	World Health Organization

EXECUTIVE SUMMARY

The Institute for Healthcare Improvement (IHI) in Boston, Massachusetts, developed the health care improvement collaborative approach in 1994, calling it the "Breakthrough Series" to reflect the belief that improvement collaboratives would help health care organizations make "breakthrough" improvements in quality while reducing costs. IHI's collaborative approach organizes teams from multiple sites to learn from each other as they seek to implement both best practices and change ideas in a single topic area, over a 12–18 month period. While traditional quality improvement and educational approaches had allowed health care organizations to improve care, IHI sought, through its breakthrough collaboratives, to accelerate the pace and reach of improvement, particularly in situations where current practice deviated from best scientific evidence.

As IHI promoted the collaborative approach and expanded its application, the U.S. Agency for International Development's (USAID) Quality Assurance Project (QAP) began to apply elements of the approach in Russia in 1998. That experience yielded impressive results in terms of improving health outcomes and spreading the improved systems of care to entire geographic areas. Based on the Russia experience and on IHI's continued success with the Breakthrough Series, QAP made the collaborative approach the central implementation strategy for the QAP III contract that began in 2002.

This report summarizes the findings of an evaluation of QAP's work to apply the collaborative approach during 2003–2007, when QAP implemented 35 collaboratives in 14 developing and middle-income countries. The purpose of the evaluation was to document and evaluate the implementation and results of QAP-supported collaboratives in specific countries using a formative, participatory methodology. The evaluation sought to document: (1) collaboratives as QAP implemented them in countries at different levels of development; (2) adaptations QAP made to the collaborative methodology to support its implementation in developing country settings; (3) lessons learned from QAP's experience with collaboratives; and (4) the value-added of collaboratives as a rapid, health care improvement methodology.

The evaluation team conducted interviews in person and by telephone and email, to probe the experience of all QAP-supported collaboratives. Field visits were made to six countries where QAP supported one or more major collaboratives. The field visit protocol was piloted in the first two site visits: Tanzania (August–September 2006) and Uganda (September–October 2006). Based on these visits, the interview protocols were revised to improve the efficiency and relevancy of data gathering. Visits were then made to four more countries: Nicaragua (October–November 2006), Niger (November–December 2006), Ecuador (January–February 2007), and Russia (March 2007).

As QAP considered how to adapt the IHI model for collaboratives for developing countries, it had to address several challenges: weak, often highly centralized health systems with limited resources, non-participatory management styles, and weak performance measurement capacity among health providers who had been asked to participate in collaboratives. Moreover, while IHI's collaboratives typically involved many different and unrelated health care organizations that volunteered (and even paid) to participate in a collaborative, QAP implemented collaboratives in Ministry of Health (MOH) systems where facilities were chosen to participate. QAP had to adapt the IHI model to meet these challenges.

While country programs were given flexibility to adapt the improvement collaborative model as needed in their settings, findings from the evaluation suggest more similarities than differences in how QAP-supported improvement collaboratives were implemented, especially with respect to aspects defined in the original IHI model. All collaboratives experienced a similar start-up process in identifying critical gaps in health care, defining the topic/subtopic area for improvement, developing a consensus on standards of care, and establishing an organizational structure to ensure buy-in and shared responsibility with key stakeholders. Additionally, they all developed implementation and management plans that included a process for site selection, a series of learning sessions with intervening action periods,

coaching or mentoring to support quality improvement teams, and ongoing training and capacity building in the use of indicators to track progress. Learning sessions served as the primary fora for imparting technical updates and for sharing site-level experiences, although some countries also used other methods to communicate best practices and lessons learned: national workshops, site visits by experts, and separate clinical training activities.

The evaluation found that the collaborative approach as adapted by QAP was robust and feasible in developing country settings. QAP implemented collaboratives in countries at varying levels of development, and yet in these different contexts, collaboratives produced clear gains in compliance with standards and proved to be effective in scaling up best practices across a number of key technical areas: essential obstetric and newborn care, prevention of mother-to-child transmission of HIV, AIDS treatment and care, pediatric hospital care, and pediatric AIDS care. Evidence from Niger, Ecuador, Honduras, Nicaragua, Tanzania, Rwanda, Uganda, and Russia shows that the collaborative approach was highly effective in improving quality of care, generally attaining levels of 80% or higher compliance with standards within 8–18 months of teams working on making improvements. Moreover, the experience in Niger, Russia, Ecuador, Nicaragua, and Uganda demonstrated that collaboratives can be effective in spreading improvements to large areas of a country or health system. This point was underscored by the evaluation finding that new teams in spread phases of a collaborative achieved results faster than the original teams had—mostly likely because the new teams benefited from a tested change package and the cumulative learning of the initial teams.

The impact of collaboratives on individuals, teams, and institutions was also significant. Collaboratives created communities of practice where individual health workers felt empowered to improve care and connected to others and to a greater mission. The early and increasing MOH involvement, both at the central and regional levels, was critical to the success of collaboratives and, ultimately, the sustainability of the improvements introduced.

Several essential features in the adapted QAP collaborative model emerged from this review:

- Well-defined improvement objectives or aims,
- Adequately supported quality improvement teams,
- An explicit implementation package,
- Regular analysis of measured results to guide quality improvement,
- Shared learning for accelerated improvement at greater scale,
- An explicit spread strategy, and
- Organizational structures to support the collaborative and improvement activities.

The sum of these features provides the structure for leveraging the power of the quality improvement model to raise health care quality across many sites and even at national scale.

The evaluation also suggested ways for making collaboratives more uniformly effective and efficient, including developing sustainable strategies for developing QI skills of health care providers, strengthening local capacity for data collection and analysis, gaining a better understanding of the factors that motivate individuals to participate in collaboratives, and better documenting the improvements made.

The evaluation found that the collaborative approach, as implemented by QAP, is a promising strategy for improving health care quality and strengthening health systems to address national health priority issues at scale. Several questions remain, however, on how to maximize results: How can collaboratives improve data quality and develop better data validation strategies? What strategies can be used other than spread collaboratives to accelerate spread? What additional strategies (in addition to learning sessions and coaching) can be used to strengthen human resource capacity building for supporting quality improvement? The follow-on to QAP, the USAID Health Care Improvement Project, will continue to explore these questions as it applies the lessons from QAP in support of ongoing and new collaboratives.

I. INTRODUCTION

The United States Agency for International Development (USAID) has funded the Quality Assurance Project (QAP) since 1990 to adapt and apply quality improvement methods for health care improvement in developing and transitional countries. In the third QAP contract (2002–2008), known as the Quality Assurance and Workforce Development Project, the project team, led by University Research Co., LLC (URC), sought to identify innovative quality improvement methods that would both accelerate the pace of its improvement work and achieve widespread impact. Taking good practices that had proven effective in resource-constrained countries and applying them at scale was very much needed to appreciably reduce acute health problems. Like developed countries, these countries have a significant gap between the application of the evidence base for quality health care and actual health care services.

Developed by the Institute for Healthcare Improvement (IHI), the health care improvement collaborative approach is a quality improvement (QI) methodology that "brings together groups of practitioners from different health care organizations to work in a structured way to improve one aspect of the quality of their service. It involves them in a series of meetings to learn about best practice in the area chosen, about quality methods and change ideas, and to share their experiences of making changes in their own local settings" (Ovreteit et al. 2002). This approach was seen as a way to harness and adapt the evidence base for high quality health care in resource-constrained settings to enable rapid scale-up of improved health care services.

IHI had had successful results with the improvement collaborative approach, as did QAP in applying some elements of the approach as part of the second QAP contract in Russia. Consequently, QAP made adapting and applying the approach in developing country health systems the centerpiece of the QAP III contract's technical assistance.[1]

This report summarizes the findings of an evaluation of QAP's work to apply the collaborative approach during 2003–2007. The evaluation sought to document: (1) collaboratives as QAP III implemented them in several countries, (2) adaptations QAP made to the collaborative methodology to support its implementation in developing country settings, (3) lessons learned from QAP's experience with collaboratives, and (4) the value-added of collaboratives as a rapid, health care improvement methodology. The report was prepared by EnCompass LLC, a small, women-owned company based in Bethesda, Maryland, in collaboration with URC and constitutes the key final product of QAP's evaluation component.

The evaluation findings are expected to interest several key audiences. Health managers and policy makers in developing countries need methods for rapid health care QI in their health systems to address national health priorities. This report will help them reflect on the appropriateness, value-added, and potential for sustainability of collaboratives. It will also help them understand the adaptations and performance of different aspects of collaboratives as they consider adopting this methodology. Last, it will help them explore the impact collaboratives have on health outcomes, health systems, and health worker motivation.

In addition, the international health community seeks to understand how QAP adapted collaboratives in developing and transitional countries and to derive insights on this methodology's effectiveness in improving quality rapidly and sustainably. When QAP initiated the adaptation of collaboratives in developing countries in 2003, the community watched with mixed interest, hope, and skepticism about the appropriateness of the method for developing countries. This report attempts to answer the community's questions about what we know so far regarding collaboratives from QAP's experience.

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[1] For further explanation of the improvement collaborative approach as adapted by QAP, see USAID Health Care Improvement Project 2008.

Finally, QAP staff have used the evaluation process to share good practices and lessons, increase awareness of the worldwide implementation of collaboratives, and continuously improve operational and strategic aspects of the work.

II. ADAPTATION OF THE IMPROVEMENT COLLABORATIVE APPROACH

A. The IHI Improvement Collaborative Methodology

The Institute for Healthcare Improvement in Boston, Massachusetts, developed the collaborative approach in 1994, calling it the "Breakthrough Series" to reflect the belief that collaboratives would help health care organizations make "breakthrough" improvements in quality while reducing costs. Health care organizations had achieved health care improvements with traditional QI and educational approaches, but IHI sought to accelerate the pace, particularly in situations where current practice deviated from best scientific evidence even while best practices had been implemented by some sentinel organizations or sites. IHI's leaders felt that providing a structure for learning and action that would engage organizations in making real, system-level changes would lead to more dramatic improvements in care.

IHI described the impetus for the approach in its *Innovation Series* white paper: "The driving vision behind the Breakthrough Series is this: sound science exists on the basis of which the costs and outcomes of current health care practices can be greatly improved, but much of this science lies fallow and unused in daily work. There is a gap between what we know and what we do" (IHI, 2003a, p. 1).

The working definition of the approach that QAP adopted early in its third contract was "A collaborative brings together a large number of teams from several health care facilities to work in a structured way to improve a common health area or service. Through active sharing of ideas for improvement and regular tracking of these changes made to the involved health system over a short period of time (typically 12–18 months), teams can adapt and spread existing better practices to multiple settings and achieve dramatic gains in the quality and outcomes of their services."

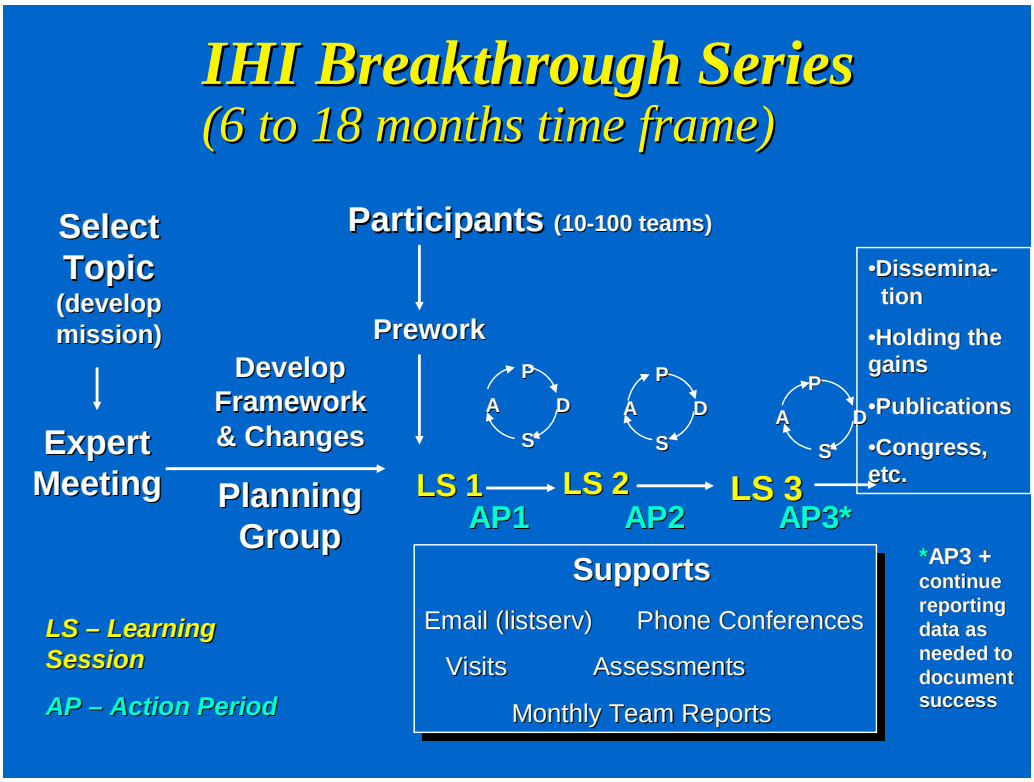
The IHI collaborative model generally includes the following features (Ovreteit et al. 2002):

- IHI would announce to the U.S. health care community that it was a starting a collaborative on a particular topic and invite interested health facilities to participate. Typically coming from many different private sector health care organizations, participating facilities would typically pay to participate and to send teams to learning sessions that IHI would organize;
- An **evidence base,** including gaps between best and current practice, would be developed;
- Experts would teach participants during **each of three to four "learning sessions"** (two- to three-day face-to-face meetings) about the evidence base and **QI methods** (e.g., how to plan, implement, and evaluate small changes in quick succession); participants would report their changes and results, share experiences, and consider how to spread their innovations to other sites;
- Between learning sessions (during "action periods"), participants at each facility would work as **multidisciplinary teams.** They would implement QI methods, test changes at their sites, and share their experiences with other teams through conference calls and an extranet website where teams could post their data; teams would set **measurable targets** and **collect data** to track their performance as they implemented a set of changes in care (the set is also referred to as the **"change package"**);
- During action periods, **collaborative organizers would provide communication and coaching support**, sometimes through site visits, email, conference calls, and websites.

The collaborative would often end with a final conference where teams would present their results, share what they had learned, and make plans to sustain and/or spread the improvements to other facilities within their organization.

IHI used the graphic in Figure 1 to depict the above-listed features of the Breakthrough Series collaborative model.

Figure 1. IHI's improvement collaborative model



Source: IHI (2003b).

This model lays out the structure that IHI-supported collaboratives typically followed. It provides that a collaborative is initiated by a planning group that identifies the particular health care issue ("topic area") where a significant gap exists between best and typical practice. This group provides overall strategic direction and leadership, including recruiting subject matter experts with demonstrated experience in the topic area. These experts help create a vision for a new system of care and provide technical leadership during the collaborative by teaching and coaching the teams. The planning group and experts define the boundaries of the topic area and its aspects that will be the focus of the collaborative. These might be clinical, organizational, and/or policy changes that together constitute the "change package"—the best practices and "actionable ideas" that the evidence suggests are the best ways to improve the area of care. The planning group and experts also define the collaborative's measurement strategy, which includes a set of indicators that would be measured by teams participating in the collaborative to assess improvement.

B. QAP's Initial Adaptation of the Collaborative Approach

Based on IHI's impressive results from the collaborative approach, QAP began to adapt elements of the approach in Russia in 1998. During that year, QAP began providing technical assistance to the Central Public Health Research Institute in Russia to develop three health care improvement initiatives that

drew on the approach to improve systems of care for pregnancy-induced hypertension, neonatal respiratory distress syndrome, and arterial hypertension. These experiences achieved impressive results in terms of both improving health outcomes and spreading the improved systems of care to entire geographic regions.

Based on the results obtained in Russia and on IHI's continued success with the Breakthrough Series, QAP considered the new approach as a major implementation strategy for its new contract that began in July 2002. The project identified three objectives that the approach would help accomplish: "1) dramatic improvements in the quality and outcomes of care in a short period, 2) a sharing of strategies for improvement of services among participating teams, and 3) spreading the new model of care from the initial collaborative sites to the rest of the parent organization" (QAP 2003, p. 1).

USAID supported the emphasis on collaboratives. Its technical directive to QAP in June 2003 notes, "Preliminary experience with the improvement collaborative approach in other developing countries has been highly encouraging. Further, this methodology addresses critical elements of quality assurance that have been weak in many programs, including: 1) scaling up from pilot QA programs, 2) increasing the focus of QA activities on clinical outcomes, 3) promoting the documentation, dissemination, and use of QA experiences, 4) provider incentives for improving quality, and 5) the pace and direct cost of improvement efforts…. Based on these considerations, the implementation of the contract should incorporate an explicit focus on improvement collaboratives that includes technical assistance, research and evaluation, training, and technical leadership" (confidential communication from USAID to URC, 2003).

As QAP considered adapting the IHI model for collaboratives for developing countries, it had to address several challenges:

Unstable and dispersed environments: A country's geographic dispersion, transportation costs, and social and economic instability would likely diminish participation in learning sessions and access to coaching.

Pressure for quality: Centralized health systems often mean top-down pressure for quality and limited attention to motivation.

Low resources: While in wealthier countries, health professionals generally have access to basic health care inputs, such as pharmaceuticals and equipment, in developing countries, shortages of essential inputs often make compliance with standards difficult. Low levels of technology create communication challenges, while staff availability to participate in a collaborative could be limited.

Centralized structure: All countries where QAP works have centralized health systems with various levels of private sector activity. The project needed to modify the approach's introduction, preparation, and structure to fit this reality and work respectfully with health ministries.

Non-participatory management/leadership: The approach's underlying philosophy potentially represents a major deviation from developing country management and leadership styles. Collaboratives leverage the empowerment of the teams to use evidence-based standards and QI methods to lead health care improvement. They also promote the coaching function of supervision, rather than the inspection function typical of centralized public sector health systems.

Weak performance measurement capacity: Weak health information systems and measurement capacity are a huge challenge for effective QI in developing countries. Capacity building for measurement and data management has been a critical investment in collaboratives, especially in Africa. Attitudes about information and performance measurement might hinder information sharing due to concern over losing face from unfortunate outcomes or hierarchical expectations of who has the right to share information.

As QAP began to implement collaboratives, it adapted the IHI model to meet these challenges.

Significant adaptations included:

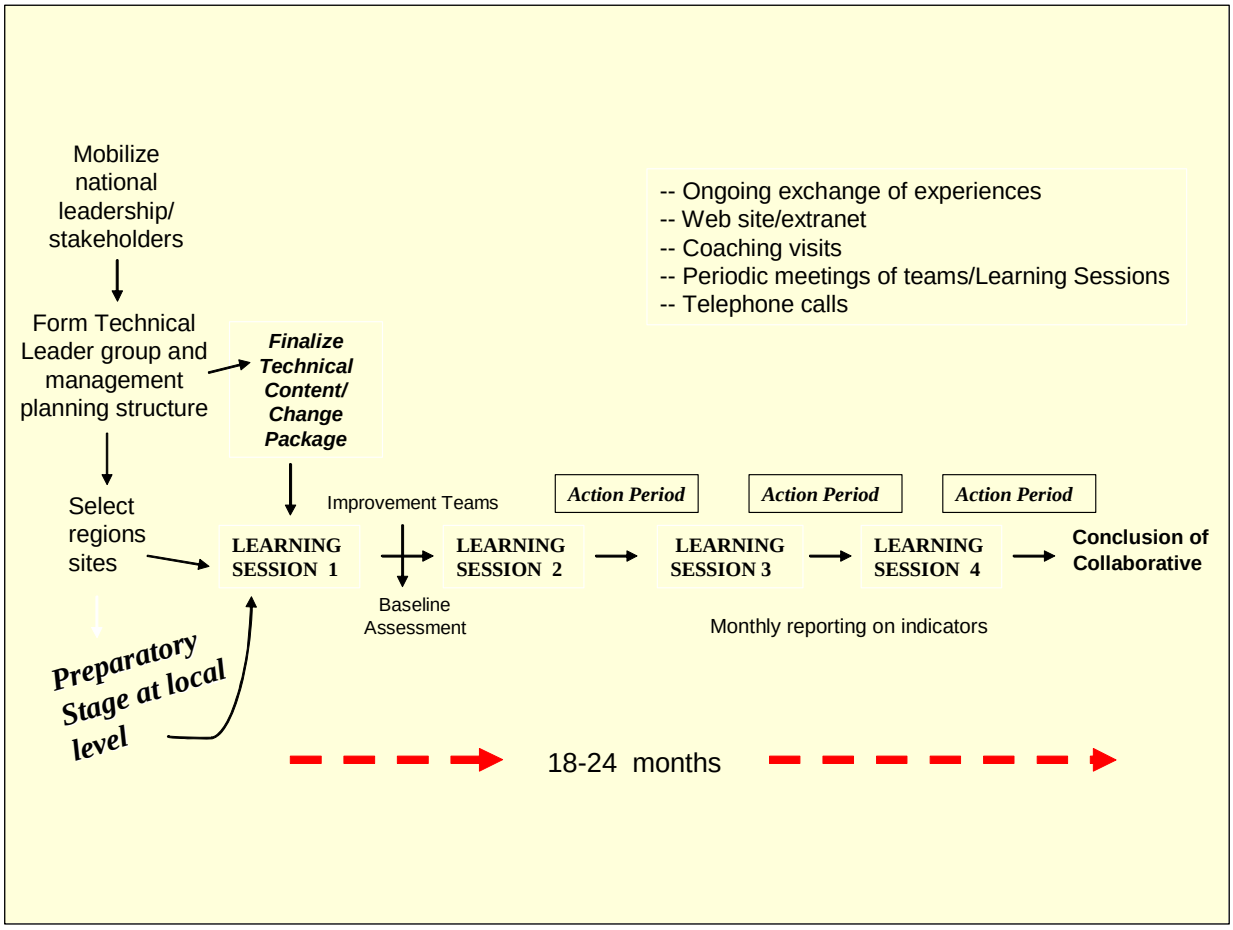
Ensuring national ownership of collaboratives: Because the sites participating in a collaborative generally belonged to the public health system, it was important to ensure ownership of the collaborative process within national structures and not as an independent (i.e., QAP) structure. That is, each collaborative had to be a national rather than a QAP collaborative. This required explaining the methodology to Ministries of Health and convincing them to take a leadership role in its implementation. Thus, the organizational collaborative structure tended to be a partnership with the government. Similarly, in many countries, QAP created partnerships with other USAID and PEPFAR partners working in the same clinical area and/or sites.

Building local capacity for quality data collection and effective data management: QAP staff recognized the need to improve the quality of medical records and the skills of health care personnel in extracting, tabulating, and analyzing data. These staff focused on introducing a systematic process for collecting and reviewing data on indicators of compliance with standards through collaboratives and preparing teams to collect such data, making a major contribution to the approach's success in developing countries.

Supporting innovative communication channels in the absence of widespread Internet capacity and technology: QAP explored technology options for communicating and reporting data and for team communications, including email, cell phones, and websites. Email and web-based communication were attempted in Latin America and Rwanda. The project tried to balance efficiency with appropriate use of technology. It also introduced the role of site and regional coaches who could promote sharing of lessons and facilitate communication across sites.

QAP's initial adaptation of the IHI collaborative model in Latin America for the essential obstetric care (EOC) collaboratives is in Figure 2.

Figure 2. QAP's initial adaptation of IHI's improvement collaborative model, 2003



C. QAP's Improvement Collaborative Model after Four Years

QAP adapted the collaborative model based on field experience. Experiences with such adaptation were shared among QAP staff and stakeholders during quarterly review meetings and informally. When EOC collaboratives were launched in Africa (in Benin and later Niger), technical staff reviewed lessons from earlier EOC collaboratives in Latin America and tried to leverage those lessons. Communication and technical leadership activities (such as workshop presentations and preparation of technical papers) in 2005 and 2006 led to greater reflection on how QAP had adapted the collaborative approach.

The most systematic discussion of implementation and methodological issues around QAP-supported collaboratives occurred during the Collaboratives Lessons Learned Week in June 2006 at URC headquarters in Bethesda, Maryland. The week brought together QAP field and headquarters staff to review the main areas where additional adaptations had occurred, as summarized below.

Role of experts: QAP staff initially expected to use experts at the outset of collaboratives just as IHI did. Two of the first collaboratives implemented—one in Rwanda for the prevention of mother-to-child transmission of HIV (PMTCT) and voluntary counseling and testing (VCT) and one in the Latin American and Caribbean Region (LAC) for EOC—did convene meetings of national and international experts to advise on the collaboratives' technical content. Both meetings had limited value for advising on the actual implementation of the collaboratives, so subsequent collaboratives de-emphasized the use of

international experts. Instead, more effort was placed on organizing groups of local stakeholders and experts who could advise on a collaborative's technical content, including reviewing existing norms in light of international best practices. This local experience proved to be more relevant for rolling out collaboratives, maintaining credibility with health workers, and increasing the chances for sustainable quality improvement.

Breadth of topic: The topics selected by most QAP collaboratives were broader than those typically selected for IHI collaboratives—for example, QAP might choose essential obstetrical and newborn care (EONC) while IHI might choose an area as narrow as asthma care. The pediatric hospital improvement (PHI) collaboratives tried to break the technical content into manageable pieces by beginning with one topic (emergency triage assessment and treatment) and introducing new ones at each successive learning session. Niger's EONC Collaborative addressed the challenges posed by a broad content area by using a phased approach, where an initial set of interventions was the focus of the first year or two of the collaborative (phase 1) and a second set of interventions was introduced at the end of the second year (launching phase 2).

Defining the technical interventions or "change package" of the collaborative: It was initially expected that a "change package" (a set of technical interventions to be implemented through the collaborative) would be defined based on a review of the relevant evidence. In fact, in some cases, a change package was not clearly articulated, but rather teams focused generally on improving compliance with standards based on national guidelines. Although the concept of the change package continued in use by QAP headquarters, field programs did not use it consistently. One explanation may be that the phrase "change package" does not translate clearly in Spanish and French. QAP also began to distinguish between two types of "changes": clinical interventions (such as the active management of third stage of labor [AMTSL]), which may or may not have been part of routine care, and operational or organizational changes that would enable teams to comply with standards of care. The phrase "change package" fell out of use, and the term "implementation package" was proposed to describe the set of technical interventions and operational knowledge that a collaborative seeks to introduce and spread.

Preparatory activities: Preparing to launch a collaborative was more time-consuming and politically sensitive than QAP had anticipated. Getting MOH agreement, deciding on an organizational structure, developing the roll-out plan, promoting effective partnerships, working on data quality, and getting buy-in at all levels all proved to be extremely important for the successful launch and implementation of a collaborative. Likewise, planning an effective technical implementation package, including simple improvement objectives, monitoring indicators, best practices and change ideas, and a training and supervision strategy for both QI and technical content, were both time-consuming and essential for successful implementation.

Collecting baseline data: In the IHI model, the first measurement that a team undertakes serves as its baseline against which improvements would be measured. However, most sites in QAP-supported collaboratives did not volunteer to participate, as in the IHI model, but rather were assigned to participate by the MOH. Consequently, it was often necessary in QAP collaboratives to convince participants of the need to improve quality, and often baseline data collection was a first step. Such collection occurred in different ways: 1) an intensive baseline assessment involving external data collectors was undertaken prior to the first learning session to define the focus of improvements and motivate participation in the collaborative (e.g., PHI collaboratives), 2) selected baseline data collection was undertaken to help focus the work of the collaborative, or 3) the first measurement served as the baseline (e.g., LAC EOC collaboratives). Baseline assessments were

> *"The data really woke us up. When I saw the baseline data results, I was humiliated. My head was down between my feet – I felt like a dog that had just bit his owner. Before, our consciousness slept with our habits. I had never realized that all those children died in the first 24 hours at the hospital."*
>
> – Urban District Health Director, Niger

likewise implemented in different ways in different settings, ranging from retrospective chart reviews when possible to more extensive baseline surveys based on external observation (e.g., PHI multi-country base-line survey). In some cases, baseline surveys used innovative assessment methodologies, such as Lot Quality Assessment Sampling (LQAS) in the Niger baseline survey of EONC practices.

Training: Health personnel needed training both in clinical areas and in QI methods, so learning sessions in all QAP-supported collaboratives focused on both. However, often the great need for strengthening clinical skills required additional means. In several LAC collaboratives, clinical training was delivered by MOH staff with assistance from QAP staff and consultants in regionally accessible training sites (often regional referral hospitals). In Russia, international and national experts delivered clinical training. In some of the African collaboratives, QAP staff and local experts provided clinical training. Over the course of QAP's experience in implementing this approach, many collaboratives increasingly emphasized on-site training, especially for focused areas of routine care such as AMTSL. On-site training had the added benefit of reducing costs and supporting optimum team functioning in that all members of the site team were trained together, reinforcing technical skills and knowledge across the team. Another area of innovation was the integration of QI and technical training, which allowed trainees to simultaneously acquire new technical and QI skills so that they could apply new QI skills immediately and efficiently while implementing the new technical content in their everyday work settings.

Coaching: In the IHI collaboratives, coaching took place by telephone and email between learning sessions by the IHI team supporting the collaborative. In the QAP collaboratives, with greater need for coaching and poor telecommunications, the MOH, local experts, or QAP staff provided coaching through site visits during action periods. These visits proved critical.

Time frame: Collaboratives were initially expected to be limited to a 12–18-month period, but two factors changed this span: 1) the changes tackled were much broader and had a much lower starting point than IHI collaboratives did (e.g., the collaborative had to begin with developing norms and improving data quality), and (2) when changes proved successful, ministries often wanted to expand them to cover more of the country, making spread integral to a collaborative. In addition, IHI did its preparatory work with a group of independently hired experts, while in QAP collaboratives, most experts were from the MOH or public universities, and the norms and standards developed had to be vetted through government bureaucracies.

Planning for spread: The published literature on collaboratives points to the importance of planning for spread from the beginning (IHI 2003a; Leape et al. 2000; Ovreteit et al. 2002; and Wilson et al. 2003). In the IHI model, spread was defined as spreading the improvements among the participating organizations: Change management for participating facilities was the responsibility of the teams. For QAP, spread meant spreading the changes to all facilities in a district, region, or whole country, so planning for spread proved to be critical. As the project unfolded, QAP advisors began planning more deliberately for spread, including sometimes planning to apply a set of interventions and innovations developed in one set of facilities to a much larger set. Once the initial collaborative came up with an operational set of changes that would improve compliance with standards, the changes served as the change package. A spread collaborative might then be developed that took the refined change package and engaged new teams in implementing them (as happened with the Ecuador AMTSL Collaborative and the Antiretroviral Therapy [ART] and TB-HIV Spread Collaboratives in Russia).

III. EVALUATION METHODOLOGY

A. Overall Approach

The purpose of the evaluation was to document the work of QAP-supported collaboratives in developing countries and to conduct a formative, participatory evaluation of QAP collaboratives in

several countries. The evaluation was designed around three main groups of questions:

1. Essential features: What were the essential features of a collaborative in a developing country setting? How did these vary from the main features of the original Breakthrough Series approach? How did QAP-supported collaboratives vary with respect to these features?
2. Results: What significant improvements in the quality and outcome of care were demonstrated by QAP collaboratives within 12–18 months after inception? What significant improvements in compliance with standards were seen in the spread phase compared with the demonstration phase?
3. Challenges and lessons: What were the major challenges and constraints faced in implementing collaboratives in developing country settings? How were these addressed? What lessons were learned to improve the efficiency of future collaboratives?

An evaluation protocol for conducting field evaluations was developed through discussions among URC, EnCompass LLC, and USAID. Key evaluation questions were identified with suggested lines of inquiry that evaluators could use with key informants, depending on their areas of expertise and knowledge. Focus group discussions with stakeholders and document review were also central to the data collection approach.

The evaluation aimed to support observers and participants to encourage reflection during QAP's implementation of collaboratives and to share and learn from the implementation. Because of the rapidly evolving nature of QAP's work with collaboratives and the many adaptations that were being made to the approach, attention was paid to documenting the experience of each major QAP-supported collaborative. The evaluation team conducted interviews in person and by telephone and email to probe into the collaboratives experience.

Field visits were made to six countries where QAP supported one or more major collaboratives. The field visit protocol was piloted in the first two site visits: Tanzania (August–September 2006) and Uganda (September–October 2006). Based on these visits, revisions were made in the procedures and interview protocols to improve the efficiency and relevancy of data gathering. Visits were then made to four more countries: Nicaragua (October–November 2006), Niger (November–December 2006), Ecuador (January–February 2007), and Russia (March 2007). A detailed description of the methods used is provided in the section on data collection methods.

1. Evaluation Team

The field data collection teams comprised one EnCompass evaluator (external) and one QAP staff member to enable the latter to learn from the evaluation in real time and to maximize the capture of depth and detail. To ensure an independent review, EnCompass evaluators who were not involved in implementing collaboratives took the lead in developing the evaluation methodology and in collecting and analyzing data. Also, QAP staff were assigned to collaboratives in which they had not been directly involved. This approach ensured that the field team had thorough knowledge of collaboratives, was balanced, and was independent from the collaborative under review.

The evaluation teams and visit dates were as follows:

- Dr. Jorge Hermida, QAP Deputy Director, and Dr. Mary Gutmann, EnCompass Evaluation Specialist, conducted the first evaluation visit in Tanzania July 24–August 4, 2006. They evaluated the PHI/Pediatric AIDS and Family Planning (FP) Collaboratives. They visited three of the 21 hospitals participating in the PHI/Pediatric AIDS Collaborative and two of the 15 sites in the FP Collaborative, conducting interviews with site teams, MOH representatives, and QAP staff.
- Drs. Hermida and Gutmann visited Uganda September 25–October 6, 2006, to evaluate the HIV/AIDS Quality of Care (QoC) Collaborative that had been established in November 2005 as

a joint effort among QAP, USAID, and the Ugandan MOH.

- Ms. Lori DiPrete Brown of EnCompass and Ms. Ya-Shin Lin of QAP evaluated the Nicaragua PHI and EOC Collaboratives October 22–November 3, 2006, visiting five hospitals and three health centers in four regions (Chinandega, Esteli, Madriz, and Nueva Segovia).
- Dr. Lynne Miller Franco of QAP and Ms. Laverne Webb of EnCompass visited Niger November 27–December 8, 2006, covering both of that country's QAP-funded collaboratives: PHI and EONC.
- From January 29–February 9, 2007, Ms. Ya-Shin Lin and Ms. Carolina Gonzalez-Schlenker of EnCompass evaluated the Ecuador EOC Collaborative, visiting five sites in three provinces.
- The final field visit was made to Russia March 11–22, 2007, by Dr. Stephen McLaughlin of EnCompass, who examined the original HIV/AIDS Treatment, Care and Support (TCS) Collaborative and visited the ART and TB-HIV spread collaboratives that arose from the TCS Collaborative in St. Petersburg and Orenburg. He was accompanied by Ms. Irina Kriukova, Moscow-based QAP Project Coordinator. Dr. Gutmann assisted in finalizing the Russia visit report after meetings with QAP/Russia staff.

2. Validation of Findings

Validation occurred in three ways:

1. Data from different sources were examined for consistency: The team compared data collected from the field with those collected from a sample of monitoring forms and data from QAP managers' reports.
2. The team engaged in validation of data collected from teams during interviews. The team asked to see records of measurement, logs, and other evidence that confirmed the work reported by teams.
3. The team recorded the presence of other known activities funded or implemented by other parties that may have "contaminated" the evidence with a synergistic effect.

B. Data Collection Methods

1. Sampling

QAP-implemented collaboratives spanned a wide ranged of health topics, countries, health systems, and resource levels. Each represented several sites, teams, and stakeholders (government staff, experts, coaches, etc.), and indicators, so the evaluation had to focus on priority questions to ensure its timely completion, while collecting sufficient data to capture the variation and detail of different collaborative experiences.

Data collection through document review, interviews, Collaboratives Lessons Learned Week, and the early survey covered all collaboratives. For field visits, an effort was made to include representative collaboratives from Africa, Latin America, and Russia and to cover at least two collaboratives in each major technical area: essential obstetric and newborn care, pediatric care, HIV/AIDS, and family planning.

2. Data Collection

The evaluation team began collecting data in 2004, when several collaboratives had been in place for about a year, and several others were starting up. Managers of individual collaboratives were seen as an important source of information, as they used their knowledge of the collaborative to make key decisions that affected the collaboratives' performance. These managers were contacted several times over the course of the evaluation. In mid-2004, the team interviewed them individually on collaborative

start-ups. In early 2005, these managers completed an extensive survey to provide data on each active collaborative's start-up and status. Results from this survey were presented to URC in a report entitled *Collaboratives Organization and Start Up*.

These managers gathered in June 2006, for Collaboratives Lessons Learned Week and provided additional information. Lastly, field visits were conducted from mid-2006 through early 2007 as described above.

The data collection methods employed needed to provide answers to the questions posed above, be credible for the broader international health community interested in developing country improvement collaboratives, fit in with the collaboratives methodology itself by building on the data actually collected by collaboratives, and contribute to internal learning for the project. The data collection methods used in this evaluation are presented below.

Document review

Document review took place throughout the evaluation. EnCompass initially undertook such review and made additional ones as new sources became available. The focus was to understand the experience of other evaluations of collaboratives. A detailed document summarizing key findings, lessons, and questions raised by the implementation of collaboratives was prepared. This evaluation considered some of the questions asked by earlier ones and explored QAP's lessons learned. For example, an early literature review suggested that a very broad or very narrow topic would pose a problem for evaluation and that more participatory learning sessions were associated with a collaborative's greater success (Ovreteit et al. 2002). These insights were further explored in the evaluation of QAP collaboratives.

Internal QAP documents were also reviewed, but an intensive review was done before, during, and after the mid-2006–2007 field visits. These documents included:

- Team documents: indicators, changes, improvements, and sharing and spread strategies;
- Learning session documents: agendas, training materials, and evaluations;
- Coaching documents: site visit reports and agendas; and
- External technical assistance from QAP headquarters staff: trip reports, quarterly reports, etc.

Guided interviews: Key QAP personnel and stakeholders were interviewed concerning the start-up and implementation of the collaborative, key decisions made, and lessons learned. They were also asked about the context of the collaborative, including the leadership and political environment.

Collaboratives Lessons Learned Week: To reflect on the collaborative approach QAP had developed during the prior three years, a Collaboratives Lessons Learned Week held June 19–23, 2006, at QAP headquarters. About 40 QAP staff from headquarters and nine countries met in small group and plenary discussions organized around evaluation questions designed to elicit staff experiences and insights on implementing collaboratives. The discussions illuminated the similarities and differences and provided an opportunity to document in-depth information on issues raised and lessons learned. During the week, the evaluation scheduled field visits to explore specific issues in particular countries in more depth so that staff could prepare for the evaluation visits.

Field data collection

Evaluation teams visited six countries. Except for Russia, all field visits were conducted by a two-person team—an EnCompass staff member or consultant and a QAP staff member who had not worked on the collaborative but had done so on another. Each field team prepared a detailed report on the collaborative it had evaluated.

3. Analysis and Synthesis of Data

The evaluation team analyzed data from the visits, QAP provided review and feedback, and the team then prepared this report. The evaluation team gave special attention to the data generated by the collaboratives over time. As the quality of data was central to the question of collaboratives' impact, it became important to review results reported by different collaboratives more closely. For that purpose, a member of the evaluation team worked closely with QAP staff to understand, clean, annotate, and synthesize different sets of indicator data gathered by collaborative teams. These data are presented in this report as well.

IV. THE EXPERIENCE OF QAP COLLABORATIVES

This section presents evaluation findings on the process of collaborative improvements. For each important collaborative element, we present the range of experiences of different QAP-supported collaboratives, highlighting common experiences, variations, and lessons.

A. Overview of QAP Collaboratives

From 2002 to 2007, QAP III implemented 35 collaboratives in 14 developing and middle-income countries. Three of these collaboratives (Eritrea PHI, Eritrea EOC, and Guatemala PHI) ended abruptly without a clear conclusion due to Mission closure or funding issues.

While IHI's materials describe two types of collaboratives—demonstration and spread[2]—QAP-developed collaboratives have often not fallen neatly into these categories. Many early QAP collaboratives were demonstrations in the sense that for the first time a group of sites was working together to make improvements in an area of care. Most of these collaboratives (e.g., the **three LAC EOC, Rwanda PMTCT,** and **Niger PHI**) began incorporating new ("expansion") sites within a year or two of their launch. In some cases, new sites joined in "waves" (e.g., **Rwanda PMTCT, Rwanda malaria,** and **Niger PHI**), while in others, new sites were continuously added (e.g., **Ecuador** and **Nicaragua EOC**). In 2006, QAP started "national" collaboratives in **Uganda (ART)** and **Niger (EONC)**, which were, in a sense, demonstration collaboratives begun at scale—that is, involving sites in most of the districts or regions in the country. These two collaboratives have also expanded to include additional sites.

In 2007, QAP started five spread collaboratives that fit the IHI definition of that type more closely: the **Ecuador AMTSL** Collaborative; the **ART** and the **HIV-TB** Spread Collaboratives in St. Petersburg, Russia; and the **ART** and **HIV-TB** Spread Collaboratives in Orenburg Oblast, Russia. In each case, a set of best practices or changes was identified that came out of a prior QAP-supported collaborative, and new strategies were designed to rapidly introduce these best practices to an entire geographic area. These five spread collaboratives were different from the previous "expansion" phases of QAP-supported collaboratives, where new sites were added and essentially went through the same QI processes as the original sites (though with some sharing of learning from the original sites). These five spread collaboratives focused on spreading and implementing the best practices arising from previous collaboratives and have had different types of learning sessions and action periods, where the emphasis was on communicating what changes or interventions facilities needed to implement, rather than how to conduct improvement cycles. QAP's experience with spread collaboratives is thus more limited compared to that with demonstration collaboratives, and lessons from spread collaboratives are only now being learned.

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[2] IHI defined a "demonstration" collaborative as "15–60 sites working intensively for 9–24 months to adapt to their local situation a best model of care" and a "spread" collaborative as "40–150 sites who work for 12–24 months to spread to their sites the best practices and solutions developed in the demonstration collaborative" (IHI 2003a).

Table 1 lists QAP collaboratives by topic, providing subtopics, time periods, type, and number of sites.

Table 1. QAP-supported improvement collaboratives, 2002–2007

Country (Subtopic)	Time Period	Type of Collaborative/Number of Sites
HIV/AIDS		
Rwanda (PMTCT/VCT)	7/03–8/06	Demonstration involving 37 sites in all 12 provinces
Rwanda (ART)	7/04–8/06	Demonstration involving 15 sites
Russia (TCS)	11/04–12/06	Demonstration in 4 (St. Petersburg, Samara, Saratov, Orenburg) of Russia's 89 territories
Uganda (ART, FP integration)	1/06–present	National collaborative involving 89 sites that cover 70% of Uganda's 80 districts
Nicaragua (VCT)	2/06–present	Demonstration involving health centers and hospitals in 10 health regions (SILAIS)
Russia (social services for HIV-positive women)	3/07–present	Demonstration collaborative involving 8 teams from 8 of St. Petersburg's 18 districts
Russia (ART)	3/07–present	Spread collaborative covering all 18 districts in St. Petersburg City
Russia (ART)	5/07–present	Spread collaborative of 11 teams covering the 4 main cities in Orenburg Oblast
Russia (IDU-ART)	5/07–present	Demonstration collaborative in 3 districts of St. Petersburg
Essential Obstetric Care (EOC)/Essential Newborn Care (EONC)		
Eritrea	7/04–10/05	Demonstration involving 8 facilities in 1 zone
Ecuador EOC	8/03–12/07	Demonstration originally in 1 province; expanded to 13
Nicaragua EOC	9/03–present	Demonstration originally in 1 health region (SILAIS); now expanded to 15
Honduras EOC	11/03–present	Demonstration originally in 1 region; now expanded to 5
Benin	2/05–present	Demonstration in 15 facilities in 2 districts; currently working in 10 facilities in 1 district
Niger	1/06–present	National collaborative, originally in 28 hospitals and now expanded to include 11 primary care sites as well
Ecuador (obst. compl.)	10/06–6/08	Demonstration in 6 provincial hospitals
Ecuador (AMTSL)	5/07–12/07	National spread collaborative involving 11 provinces
Family Planning		
Tanzania	10/04–7/06	Demonstration with 15 sites in 1 region
Russia (PLWHA)	3/06–9/07	Demonstration with 4 sites in 3 oblasts
Child Health		
Eritrea (PHI)	7/03–9/05	Demonstration in 10 hospitals covering 4 of 6 zones
Niger (PHI)	10/03–present	National collaborative involving 32 of 46 pediatric hospitals
Nicaragua (PHI)	10/03–present	National collaborative involving 17 of 22 pediatric hospitals
Malawi (PHI)	6/04–12/05	Demonstration involving 8 of 27 district hospitals
Guatemala (PHI)	6/04–12/04	Demonstration involving 13 district and departmental hospitals
Tanzania (PHI and pediatric AIDS)	10/04–6/2008	Demonstration involving 20 hospitals in 6 of 25 regions
Tuberculosis		
Russia (TB-HIV)	3/07–present	Spread collaborative covering all 18 districts in St. Petersburg City and 3 districts in Leningrad oblast
Russia (TB-HIV)	5/07–present	Spread collaborative covering 4 cities in Orenburg Oblast

Country (Subtopic)	Time Period	Type of Collaborative/Number of Sites
Bolivia (DOTS)	1/07–present	Demonstration involving 40 sites in 3 regions
Vietnam (TB-HIV)	4/07–present	Demonstration involving 13 hospitals in 1 province
Malaria		
Rwanda	6/03–8/06	Demonstration involving 54 sites in 4 districts
Other		
Russia ("Phase III" national collaboratives)	6/02–12/04	Teams from 23 oblasts participated in 5 national collaboratives related to maternal and child health and chronic diseases
Tanzania (infection prevention)	4/03–6/04	Demonstration involving 3 district hospitals and 1 private Mission hospital in 1 region

B. Organizational Structure

1. Overview of Collaboratives' Experience with Organizational Structure

"Although there is a strong tendency to equate 'structure' with an organizational chart or reporting hierarchies, organizing for quality refers to the delineation of responsibilities, authority, and accountability for both the quality of care and the implementation of QA" (Franco et al. 2002).

All QAP collaboratives had a coordinating body at the national level in the MOH that guided and led each collaborative in the country. This body was a steering committee, a technical advisory group, or a technical unit that oversaw the quality of care of the topic area that the collaborative was addressing. The MOH coordinating body selected the districts and facilities that would participate in the collaborative and provided guidance on roles and responsibilities to regional and district levels. In many instances, members of this body became members of the QAP trainer/advisor team; as such, they led learning sessions and provided coaching.

2. Coordination and Support

Many QAP collaboratives were coordinated by a partnership of the MOH and QAP, with frequent participation by other international partners. Frequently, QAP collaborated with other USAID cooperating agencies (CAs), especially where USAID funded a large health program in a country. Sometimes, private, NGO, and civil society organizations also participated. These actors typically formed a coordinating or technical advisory group that selected the collaborative topic, the participating sites, and indicators and provided overall strategic direction, oversight, and leadership for the collaborative.

National governments were a critical part of planning and creating a collaborative, making defining the role of the national government in the collaborative process very important. QAP managers invested a great deal of effort and strategic thinking toward making the relationship between QAP and the MOH constructive and ensuring that the collaborative fit in with MOH priorities.

For example, the overall structure of the **Tanzania PHI** Collaborative had a leadership team made up of members of the Integrated Management of Childhood Illnesses (IMCI) unit of the MOH, the respective regional medical officers, district health officers, and hospital directors and senior management staff. In addition, the QAP staff and other partners (e.g., World Health Organization [WHO], United Nations Children's Fund [UNICEF], and other international and national partners) provide training, mentoring, and coaching to the clinical staff to build capacity for implementing QI.

In the **Nicaragua EOC** Collaborative, several organizations participated in a technical advisory group (TAG), which QAP organized with the MOH. The TAG planned the roll-out of the initiative and coordinated partners' roles at each phase. The TAG was composed of MOH representatives (including the Director of the First- and Second-Level of Care, the national in-charge for Integrated Care of

Women, and the directors of the three participating health regions), Pan American Health Organization (PAHO), UNICEF, United Nations Fund for Population Activities (UNFPA), CARE, NICASALUD, and QAP/Nicaragua. Subsequently, a National Coordinating Group of the Ministry was formed to provide oversight and coordination as well as technical and political support to ensure that collaborative activities were well coordinated with other maternal health initiatives. A regional (i.e., at the level of the local integrated health system or SILAIS) Directorate Steering Group was also formed to organize and implement SILAIS EOC plans, provide technical assistance, and monitor improvement efforts. In addition, a Municipality Management Team was given the responsibility for supporting continuous quality improvement (CQI) teams in each municipality, but they were not very active.

For the **Rwanda PMTCT** Collaborative, the Treatment and Research on AIDS Center (TRAC) and the MOH Division for the Promotion of Quality Health Services/Directorate of Health Care (DPQS/DSS) sponsored the collaborative, though only the DPQS actively participated in the collaborative's organization and day-to-day coordination.

3. Levels of Government

QAP collaboratives typically worked with several levels of a country's national health care system. In addition to participating health facility teams, a collaborative sometimes involved representatives from the community, district, and national levels, and referral hospitals or NGOs operating in the area. Figure 3 is an example of this multi-level management in **Ecuador EOC** and Figure 4 of the **Uganda ART** Collaborative.

Figure 3. Management of the Ecuador EOC Collaborative

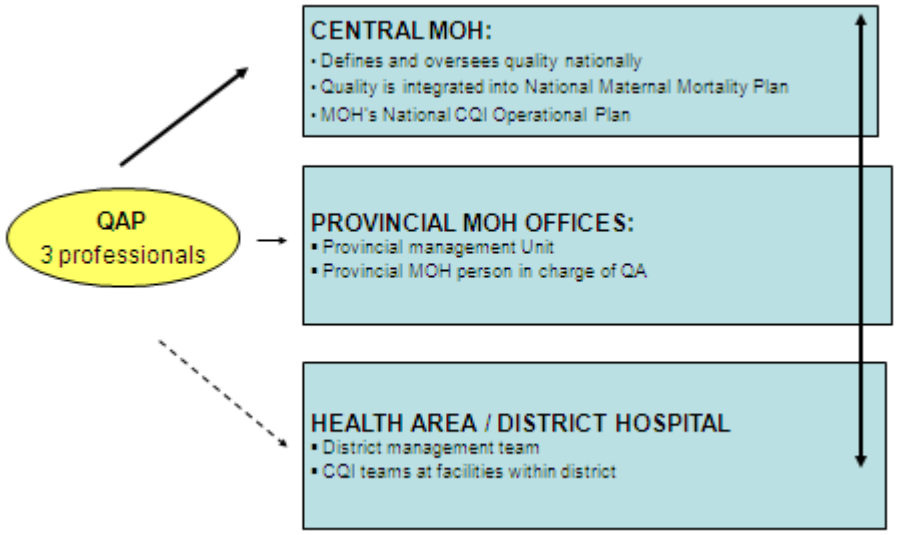
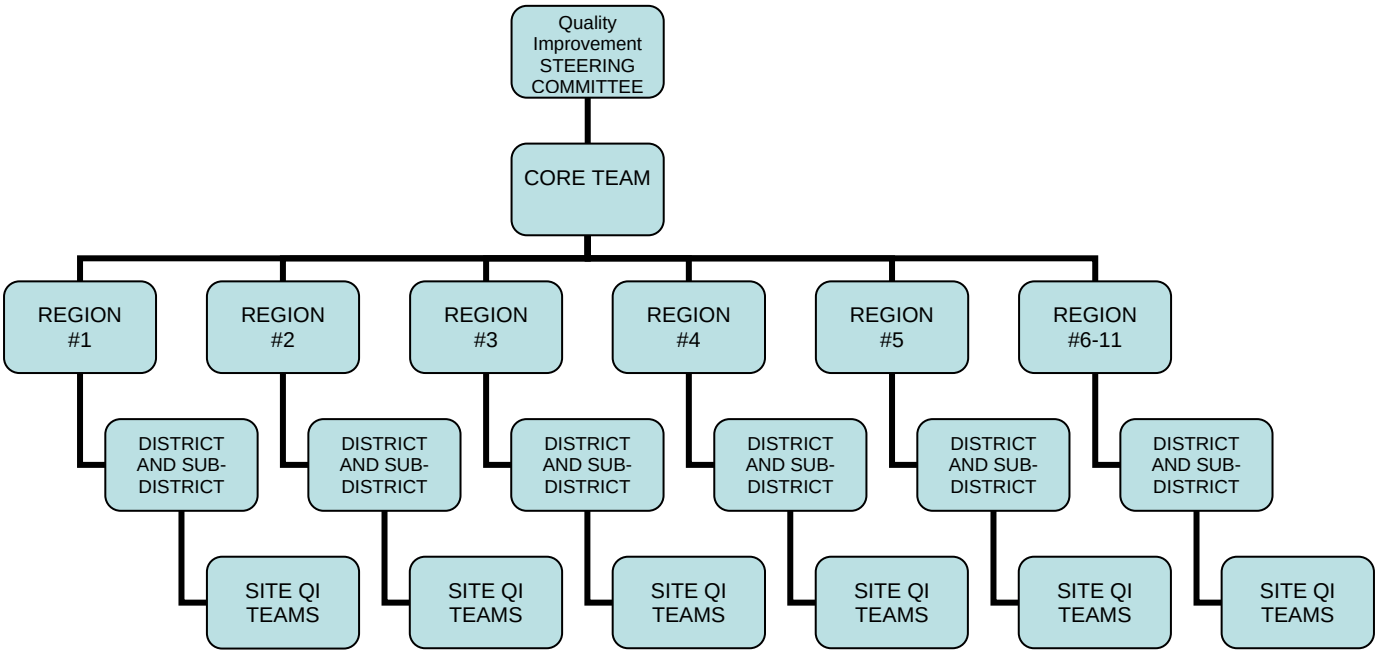


Figure 4. Structure of the Uganda ART Collaborative



An important observation of the **Uganda ART** Collaborative was the strong leadership and ownership taken by the MOH and its partners in the implementation of the Quality of Care (QoC). The various components of the structure were:

- A national steering committee was formed in October 2005 to provide strategic guidance and leadership in the implementation of the HIV/AIDS QoC Initiative. The committee is made up of members from several MOH departments, including the AIDS Control Program (ACP), the Department of Integrated Curative Services, the Quality Assurance Department (QAD), as well as the Regional Center for Quality in Health Care, USAID, WHO, and QAP.
- The next step was the formation of a core technical team composed of 14 physicians and technical staff from different departments in the MOH (QAD, DCCS, and ACP), the private sector, other HIV/AIDS providers, key local partners from the Joint Clinical and Research Center and Mulago Referral Hospital, as well as QAP/Uganda staff. This team's role was to train and supervise the Regional Technical Team that would have primary responsibility for directing collaborative activities in the 11 regions of the country. It also played a key role in developing the 27 improvement objectives and 33 quality indicators in five priority areas.
- The 11regional coordination teams (48 members in all) received training by the core technical team in December 2005, and together they selected the 57 sites to participate in the first phase of the collaborative using criteria developed by the steering committee.
- The site quality improvement teams are the true implementers of the quality improvement program at the health facilities and are an on-site, multi-disciplinary treatment team. Trained to track improvements through the data collection system developed for the collaborative, this team works to improve key programmatic indicators using the CQI model and are.

The organizational structure that was formed not only reflected the Ugandan MOH's leadership role, but recognized the importance of including key stakeholders at all levels of the health care system (i.e., national, regional, district, and community). Clear roles and responsibilities were defined in the terms of reference for each team, and training/support was provided to enable each group to carry out its

functions effectively.

4. Leadership

"Leadership" refers to the development of a vision for QI, creating an environment that will support that vision, empowering staff to implement that vision, overseeing the QI process, and allocating resources to initiate/sustain change. Leadership was evident at both organizational and individual levels. For example, in the **Tanzania PHI** Collaborative, the strong leadership of the head of the IMCI unit of the MOH Reproductive and Child Health Service (RCHS) was instrumental in both initiating and supporting the collaborative. As a result of the positive outcomes from the initial collaborative sites, Tanzania's MOH had a strong sense of ownership of the PHI collaborative and took on greater programmatic and financial responsibility for its implementation in new sites in the northern zonal regions. In the **Honduras EOC** Collaborative, a national coordinating group within the Secretariat of Health provided oversight and ensured that collaborative activities were well coordinated with other maternal health initiatives.

5. Use of Experts

In most collaboratives, QAP staff and/or the collaborative planning group identified 5–15 national subject-matter experts and clinicians who had demonstrated improvement in their own practices. In a few cases, these professionals constituted an expert group that was part of the overall structure of the collaborative, but more often they were simply drawn into the collaboratives in various roles or as part of national steering groups. Experts who participated in the collaboratives included:

- Content experts and officers from relevant MOH departments (central, regional, and district levels);
- Directors and experts from national programs (e.g., National HIV/AIDS Secretariat, National Malaria Control Program);
- Technical experts from international organizations and donors (USAID; UNICEF; WHO; the Centers for Disease Control and Prevention [CDC]; PAHO; UNFPA; Joint United Nations Programme for HIV/AIDS [UNAIDS]; The Global Fund to Fight AIDS, Tuberculosis and Malaria, etc.);
- Experts from partner organizations (Engender Health; John Snow, Inc.; DELIVER; etc.);
- Professional groups (physicians, nurses, midwives, counselors, clinicians, epidemiologist, etc.);
- Officials, opinion leaders, and key representatives from stakeholder groups (professional groups, civil society, NGOs, etc.); and
- Academic and research groups.

Experts contributed credibility and validity to the application of evidence-based improvement strategies and raised enthusiasm and buy-in among key stakeholders, MOH, and other partners. As they became more familiar with the collaborative approach, they also frequently acted as its "champions." During each phase, they assumed varied and important roles (Box 1). Selected experiences are summarized in Table 2.

Box 1. Role of experts

Initial preparatory phase

- Defined, focused, and clarified the improvement topic
- Developed national standards of care adapted from WHO or other international guidelines
- Reviewed, introduced, and reinforced evidence-based standards of care
- Developed the change package and the indicators for monitoring improvement
- Informed key stakeholders and obtained buy-in and commitment to collaborative objectives and methodologies
- Assisted in planning the roll-out and elaboration of the improvement objectives
- Selected sites

Ongoing technical support and capacity building

- Provided ongoing technical training and assisted in planning and delivering technical content in the learning sessions
- Provided ongoing technical support and coaching to teams
- Provided targeted training in specific technical areas
- Participated in innovative capacity-building strategies
- Revised indicators as needed and improved data collection system
- Trained trainers

Scale-up and spread

- Assessed preparedness for scale-up and readiness of new sites
- Provided technical guidance to new sites

Table 2. Roles and contributions of experts and types of experts

Collaborative: Role of Experts	Types of Experts
Benin EOC: Finalized key collaborative documents, including the statement of improvement objectives, quality indicators, and change package.	National University lecturers, other national EOC experts, MOH staff, and technical staff from other cooperating agencies (UNFPA, UNICEF, Engender Health/ ACQUIRE Project, and Projet Socio-Sanitaire/ Coopération Suisse)
Ecuador EOC: Reviewed standards of care from WHO and other international guidelines. Assessed the draft charter, the change package, and the measurement strategy for the intervention and suggested solutions for potential obstacles.	17 experts from various Latin American countries and international agencies, including members of Ecuador's MOH
Nicaragua EOC: Reviewed the evidence-based standards of care and indicators proposed for the LAC EOC Collaboratives and adapted them to Nicaragua's national standards.	MOH officials in charge of the topic area, key specialists in the country, representatives of the SILAIS and facility level, and NGOs and other partners
Nicaragua PHI: Reviewed the WHO standards, suggested changes, and reviewed the evidence base for a variety of pediatric conditions: This led to the adoption of new national guidelines for pediatric referral care. Judged the "Prize for Knowledge" competition.	Representatives from USAID, UNICEF, PAHO, NICASALUD, the national children's hospital, MOH (hospitals and IMCI directors), and the Nicaraguan Pediatrics Society
Niger EONC: Conducted an inventory of existing standards, and where they were out-of-date or missing, proposed standards and indicators. Participated in the baseline survey and provided training in EONC technical content and QI for providers from collaborative sites. Also provided on-site training and coaching to reinforce skills in the real-life settings where providers work.	National and regional MOH pediatricians, obstetricians, and midwives
Niger PHI: Adapted standards, participated in the baseline survey, developed strategies for IMCI at hospital level, developed indicators for monitoring and evaluation, and provided training in IMCI and quality. Played an active role in coaching and assisting with clinical training and learning sessions.	Most public sector pediatric specialists and IMCI trainers in the country
Russia Family Planning: Participated in learning sessions, offering expert opinion on specific topics. (Drs. Serebrennikova and Karpushkina presented a new manual on reproductive health of HIV-infected women.)	Director of a gynecological clinic in Moscow, a professor, Dr. Klara Serebrennikova, and Dr. Anna Karpushkina from John Snow Inc.

Collaborative: Role of Experts	Types of Experts
Russia HIV/AIDS TCS: Developed a shared vision and integrated models for effectively providing TCS services to people living with HIV/AIDS (PLWHA). AIHA's Partnership Program provided expertise on HIV/AIDS treatment and management through exchanges with experts from U.S. hospitals.	Key Russian health care policymakers; experts from WHO, the Global Fund, UNAIDS, UNICEF, USAID, and other international organizations; and clinicians, epidemiologists, and service providers from Russia and the U.S.
Rwanda PMTCT: Provided the collaborative's evidence-based care package and technical assistance during the learning sessions to address concerns or confusion about PMTCT/VCT and other aspects of HIV/AIDS.	Staff from TRAC and other cooperating agencies in Rwanda
Rwanda Malaria: Visited sites at least once or twice a month to provide encouragement and technical guidance in QI.	MOH staff from the original sites in the PMTCT and malaria collaboratives who best mastered QI methods
Tanzania Family Planning: Updated the Family Planning Programme Components and Standards to specify performance criteria against which FP services could be evaluated. Helped train a team of 11 trainers and coaches from the Dar es Salaam Region on the updated National Comprehensive Family Planning Clinical Skills Curriculum.	MOH/RCHS and Engender Health
Uganda ART: Developed key collaborative monitoring indicators and was responsible for building capacity of regional coordination teams and supporting them in coaching facility teams.	Technical staff from the MOH, the private sector, other HIV/AIDS providers, and QAP/Uganda

6. Selecting Sites

In most collaboratives, site selection was not solely a technical process, but a political one as well, with the MOH and USAID playing a large role (e.g., USAID only working in specific regions or the desire to cover the whole country). Factors such as the proximity to the capital were taken into account as were considerations of a spread strategy that would be implemented later.

Each country's experience with site selection differed slightly. In some instances (e.g., the three **LAC EOC** Collaboratives), the national coordinating groups determined the geographic area(s) and sites that should participate, as it was important that each area included a second-level or referral hospital and the surrounding first-level facilities in its catchment area, which together constituted a local "EOC system." In **Niger PHI**, the original 14 sites, many of them very far from the capital, were chosen to include five different regions with an eventual spread strategy planned. Selecting hospitals in five regions ensured a foundation for spread.

7. Role of QAP Advisors

QAP advisors provided continuous technical and managerial support for collaboratives, playing a range of roles: resident in-country managers, resident in-region advisors, and regional advisors resident at the project's U.S. headquarters. The role of QAP advisors in the implementation of the program was critical, as they provided technical leadership for QI in all countries. They invested in relationships with

collaborative stakeholders, including the MOH, teams, learning session facilitators, other partners, and QAP headquarters. QAP advisors were encouraged to adapt collaboratives in response to changes on the ground.

Within the project, two types of clusters developed among advisors. Regional teams tended to collaborate more closely and exchange information and lessons from implementation, resulting in a coherent regional strategy within collaboratives. A second affinity emerged among QAP advisors working in similar topic areas (EONC, PHI, HIV/AIDS, etc.). The maternal health strategic objective (SO) group within QAP was perhaps the most active internal technical coordination structure in the project and played an important role in sharing lessons from the initial EOC collaboratives in Latin America with those in Africa. The PHI collaboratives, led by the then-Deputy Director, also began with a high degree of technical coordination, which continued with the project's child health SO group. The need for such ongoing coordination in all technical areas was emphasized during the Lessons Learned Week, at the end of which, QAP advisors renewed their plans for technical coordination around all health focus areas.

The role of QAP advisors was important not only in the strategic direction of collaborative implementation in the field, but also in the evolution of the collaborative conceptual framework, terms used, definitions, and perceptions of essential features. This combination of freedom to act, close collaboration, and continuous participation—facilitated by strong management and the evaluation function—enabled QAP advisors to become key actors in the evolution of the framework and to increase learning.

8. Working with Partners

In most cases, QAP collaboratives worked side-by-side with other partners who were implementing improvement activities in similar technical and geographic areas. When many other organizations were present, QAP found it challenging, time-consuming, yet essential to work on these relationships. In the **Rwanda PMTCT/VCT** Collaborative, for example, many other organizations—Family Health International (FHI), INTRAH, WHO, and UNICEF—were working in the same districts. A great deal of time was spent managing those relationships.

In other cases, QAP invited other donors and implementers to serve on the collaborative steering committee. For example, in **Ecuador EOC**, PAHO, USAID, UNFPA, and UNICEF were on the steering committee. In **Honduras EOC**, PAHO, USAID, UNFPA, Engender Health, and JHPIEGO were on the national coordinating group. In **Malawi PHI**, WHO Malawi, UNICEF, Management Sciences for Health, and Malawi College of Medicine were on the TAG. In **Nicaragua EOC**, PAHO, USAID, UNFPA, UNICEF, Doctors of the World/Spain, Luxemburg Assistance, and SARED served on the TAG. UNICEF, CARE, Project Hope, Doctors of the World/Spain, and other NICASALUD members provided technical assistance with community EOC. For the **Russia TCS** Collaborative, QAP was tasked by USAID with coordinating its work with the Partnership Program of the American International Health Alliance (AIHA), which provided for exchanges of professionals between Russia and the U.S.

9. Lessons Learned: Organizational Structure

- **Clearly delineate the roles of all involved and try to build on structures that already exist:** For example, in the **Uganda ART** Collaborative, the MOH mandate for establishing the HIV/AIDS QoC was that all structures must be implemented within the existing health care system to avoid new or parallel structures and to maintain consistency with MOH guidelines and standards. To this end, a multi-tiered system was established that formalized the role of various MOH departments and key partners in implementing the QoC: a national steering committee provided strategic guidance and leadership in the implementation of the HIV/AIDS QoC Initiative; a core

technical team trained and supervised the regional coordination teams; those teams directed the collaborative activities in the regions.

- **Build leadership capacity before starting:** Train/orient leaders to the project and how QI works so leadership understands what is going on.
- **Identify a pool of experts (at national and regional levels) of individuals who are willing to be involved in the collaborative (including membership on a QI team):** Experts were critical, providing and supporting training, coaching, and learning sessions and serving as advocates for QI both at their sites and in general. Involve experts directly in baseline assessments; standards and indicators validation and modification over time; training of trainers; coaching; and organization of learning sessions. Most importantly, give them opportunities to interact directly with QI teams at the site level.
- **Allow initial collaborative structures to change and evolve as the organization proceeds through the various stages of QI institutionalization and as the organization's needs, capabilities, and resources change.**
- **Ensure that the collaborative is viewed as being owned by a country and not by a project.**
- **Involve the leadership at all levels of the health system.**
- **Be aware of and cooperate well with partners: invite them to be part of the strategy.**

C. Topic Selection

1. Overview of Collaboratives' Experience with Topic Selection

Under the QAP collaborative approach, a collaborative's topic of focus was generally decided upon by QAP and partners at the national level. Often, QAP already had a project in the country and approached its country partners about whether introducing the collaborative method would be helpful. For example, in LAC, QAP devised the idea of EOC collaboratives because of its prior work with the LAC Maternal Mortality Reduction Initiative. The impetus for selecting pediatric hospital improvement for collaboratives in multiple countries was the publication of WHO guidelines for integrated management of serious childhood illness and malnutrition at referral levels (i.e., the WHO Referral Care Manual [RCM] guidelines) and WHO's Pediatric Hospital Improvement Initiative.

In other instances, the choice was dictated by the country's funding situation. For example, when the **Rwanda PMTCT/VCT** Collaborative was faced with the rapid expansion of PMTCT/VCT sites countrywide, the MOH recognized that the existing PMTCT/VCT delivery model needed to be improved before its launch to additional sites. USAID/Rwanda provided funds to the MOH to develop an improved delivery model. For better efficiency and knowledge sharing, the Rwanda MOH and USAID recommended that teams from various sites across the country collaborate in making shared improvements. With prior experience in training Rwandan health providers in QI methods, USAID/ Rwanda and the MOH asked QAP to support the launch of the PMTCT/VCT Improvement Collaborative in April 2003.

Generally speaking, QAP-supported collaboratives started with rather broad topics. For example, EONC involved the whole spectrum of essential obstetric and newborn care. In some cases, QAP advisors created a plan for phasing in technical topics within a broad focus area.

Once the MOH agreed to the overall topic area, then discussions were held about the specific technical focus areas within it. Focus areas were sometimes chosen based on particular problem areas or current programmatic policy being implemented in the country.

In some cases, baseline assessments helped provide data toward this end. For example, in the **Niger EONC** Collaborative, QAP did a targeted baseline survey in 15 sites on the specific improvement areas

that had already been chosen: AMTSL and ENC. The survey helped establish a baseline from which to track improvements but did not guide the topic selection. This was also true of **PHI** multi-country baseline survey: The topic was selected based on survey findings and the new WHO first-referral IMCI guidelines.

In some cases, however, a collaborative was organized to allow teams to focus on different aspects of care within the same general topic area. In the **Uganda ART** Collaborative, for example, sites could choose which specific aspects of ART care to focus on within a range of MOH-set improvement objectives, although all sites were asked to work on at least three objectives. Also, in the **LAC EOC** Collaboratives, there was some variation in the indicator definitions among the three countries; Nicaragua, for example, had extra indicators on family planning. At times, this presented a challenge in sharing and comparing results.

2. Lessons Learned: Topic Selection

- **Define a collaborative's objectives clearly; they should align with MOH priorities.**
- **Use baseline data to identify critical gaps in care to guide selection of priorities for improvement.**

D. Evidence-based Standards

Standards, used synonymously here with "norms," are explicit statements of expected performance. In health care, standards represent performance expectations that, if attained, will lead to the highest possible quality care.

1. Overview of Collaboratives' Experience with Standards and Adaptation of Evidence-based Standards to Local Conditions

Applying the health care improvement collaborative approach in developing countries was a state-of-the art initiative to implement evidence-based standards of care and build local capacity for improving health care quality. Whereas traditional QI approaches might emphasize teams finding solutions on their own to current gaps in quality, collaboratives gave organizations evidence-based knowledge and expert advice about better practices, information that would be difficult or impractical for teams to assemble on their own.

QAP advisors began working on standards in different ways, depending on the level of development of extant standards. In some collaboratives (**Rwanda** and **Uganda**), a set of national standards and even indicators had recently been developed for HIV/AIDS services: QAP collaborative teams were able to refine and operationalize those standards.

In the **Niger EONC** Collaborative, national standards were incomplete with regard to the improvement objectives that had been identified for phase I (AMTSL and ENC) and needed further development. In the **Russia HIV/AIDS** Collaborative, international standards were reviewed, and experts were engaged to adapt them to the Russian context.

In the case of **PHI** collaboratives, there generally was no national set of standards for hospital-based case management of leading pediatric diseases, so a process to adapt the WHO standards to meet nationwide needs was an important step in implementing these collaboratives. For **Niger PHI**, 32 experts adapted the RCM guidelines before the collaborative roll-out to ensure that the standards fit the Niger context as well as possible. The adaptation process was facilitated by a WHO-convened PHI regional meeting in Niamey in October 2003: WHO experts were available to answer questions from Nigeriens on some of the standards, including needs for different classification criteria for health center level and for referral hospitals. A second experts session was held in February 2004 to adapt the WHO emergency triage assessment and treatment (ETAT) manual. Adaptations included language used to

describe equipment and certain tasks, as well as modification of standards for prescriptions to align with available medications.

This was also the case for adaptation of the RCM to incorporate the specific acute respiratory infection (ARI) drugs and rehydration solution being used in Nicaragua. Changes were also made to some diagnostic criteria; for example, the number questions about the duration of cough symptoms was reduced from 30 (WHO) to 21 to incorporate an existing Nicaraguan standard. Other changes related to adjusting the international standards to account for Nicaraguan disease patterns and population characteristics, adding, for example, urgent care for burns and hemorrhaging. Signs of pallor related to ARI were changed from pale palms to pale skin and mucous membranes. Symptoms were added to facilitate the recognition of cerebral malaria and meningitis. Also, nutritional guidance for severely malnourished children was added.

Many countries adapted international standards of care and best practices from other countries to define their own criteria for quality care. For example, the **Niger EONC** Collaborative modified and updated national newborn and prevention of postpartum hemorrhage standards using current evidence (e.g., Lawn at al. 2005) and standards in use in other countries, such as Benin's standards and Save the Children's Care of the Newborn reference manual.

Typically, standards were adapted through a consultative process of a participatory experts meeting. For example, in the **Tanzania PHI Pediatric AIDS** Collaborative, the National AIDS Control Program (NACP) was strengthened (September 2004) and the RCM adapted to the Tanzanian context with help from a team of national and international experts from Muhimbili University College of Health Sciences, URC/QAP, and clinicians from different regional hospitals.

In the case of **Ecuador**, when the MOH would not commit to revising national EOC standards to include AMTSL at the start of the collaborative, QAP pursued an alternative strategy that ultimately proved effective in establishing national consensus: QAP secured MOH permission to pilot test AMTSL as part of the collaborative in the original demonstration in Tungurahua Province to demonstrate that providers could performed AMTSL safely. Tungurahua sites participating in the EOC Collaborative were trained in AMTSL's use, and as new provinces joined the collaborative, AMTSL spread such that by 2006, nearly half the country's facilities were practicing it. QAP worked with the MOH to revise national EOC standards, and in April 2007, the MOH published an official addendum to national obstetric care guidelines to sanction the practice of active management.

2. Lessons Learned: Evidence-based Standards

Several challenges are noteworthy in the experience of collaboratives adapting standards:

- **Assess status of standards at the outset.** One should not assume that just because standards exist, health workers will be able to implement them. Collaborative managers need to ensure that relevant capacity-building strategies are in place and minimal equipment/material/drugs available: Managers need not necessarily provide such, but should work with teams to obtain it). Two examples follow:
- **Ensure availability of supplies.** Many collaboratives introduced standards where few had existed before. Many sites struggled to absorb so many changes at once while trying to obtain the equipment and supplies needed to implement such standards. In the **Niger PHI** Collaborative, for example, team morale and effectiveness were affected by the lack of supplies and materials required for meeting the new standards. This continues as a major constraint for the collaborative. To overcome this problem, teams in the **LAC Regional EOC** Collaborative in Honduras, Ecuador, and Nicaragua monitored readiness (the availability of equipment and supplies) to provide newborn care and compliance with routine newborn care standards.
- **Leverage local technical capacity to provide clinical training.** The lack of training centers

providing medical care was a critical challenge for the **Niger EONC** Collaborative, so a major focus of the training campaign involved working with national and regional MOH officials and leading national EONC providers to develop the Niamey and Zinder national maternity hospitals into national EONC training centers.

- **Adapt standards to local practices.**
- **Build consensus at the national level on revisions/adaptations made to standards that will be implemented through a collaborative; this also facilitates spread.** In both the **Nicaragua PHI** and **EOC** collaboratives, a highly participatory process of reviewing the evidence for proposed standards was frequently cited as key to the successful approval of standards at the Ministry level, as well as the adoption of standards in practice. Overall, the process used to develop standards in the **Nicaragua PHI** was a model for success. Including key players at the policy level, along with the broad participation of practitioners, was very important to building consensus. The consensus, in turn, allowed national leaders to act quickly. The policy effort was followed by broad dissemination, so that the groundwork for clinical training and process-oriented monitoring and supervision was in place.

E. Change Package

1. Overview of Collaboratives' Experience with Change Packages

A "change package" can be defined as a collection of changes that, when implemented, will improve quality, although this definition was not used in many QAP collaboratives. Other definitions included:

1) Where no standards or consensus on "proper" practice existed, the change package was a new set of standards.
2) Where standards existed but were out-of-date, the change package was an updated set of standards.
3) Where up-to-date standards existed but were not well implemented, the change package could be a set of "essential standards" that focused on the most important tasks needed to achieve improvement objectives.
4) Where standards existed but were not well implemented, the change package could be a "service delivery model" or a "model of care" that would more effectively ensure that standards were implemented and patients received what they needed.
5) Where standards and a model of care existed but were not well implemented, the change package was a series of organizational changes that facilitated their implementation.

All collaboratives defined areas for improvement and developed specific indicators to monitor change. The following summary is based on a broader definition of "change package" to include all types of improvement changes that QAP collaboratives focused on.

2. Nature of Change Package

Typically, collaboratives defined an initial "change package" as a set of changes that they wanted to introduce in their health care system in order to improve care quality. Change packages were most commonly delineated by the planning group or experts based on evidence-based best practices or guidelines. How far the experts went in doing this depended on the extent to which they could and the extent to which they felt they needed to let the collaborative teams delineate the package. Typically, the planning group and experts set the boundaries of the topic and the aspects of the topic that were the focus for the collaborative. These might have been clinical, organizational, and/or policy changes.

Change packages, in addition to clarified standards, sometimes included clinical and administrative processes that could be grouped as follows:

- Organization of care, such as creating triage systems, improving patient flow, using case monitoring forms, increasing compliance with standards of care, or developing tools for patient education and counseling;
- Skill building of health care staff, both in clinical management and in QI procedures;
- Improvements in inputs to ensure adequate supplies of essential materials, such as medical record forms, emergency medical supplies, drugs, laboratory, and triage facilities.

For its change package, the **Malawi PHI** Collaborative teams introduced triage in every facility; reorganized patient flow; established emergency treatment areas equipped with essential emergency drugs, equipment, and supplies; and trained staff to assess and triage patients. By June 2005, all participating facilities had well-established triage systems (as part of the refined change package) during the day and were monitoring the quality of the triage screening. Much of the new equipment came through sharing resources between facilities and leveraging resources with other partners, such as a bilateral health project managed by Management Sciences for Health.

In the **Rwanda PMTCT** Collaborative, the refined change package included making Nevirapine (NVP) and chlorohexadrine available in delivery rooms, in-service peer training, posting job aids in the delivery room, ensuring continuity of prenatal maternity care by tracking HIV-positive cases, hiring an additional counselor, home visits, reinforcement of counseling focused on taking NVP during labor, and urging HIV-positive mothers to adhere to treatment and create associations with other HIV-positive mothers.

3. Evolution of Change Package

For some collaboratives, particularly the demonstration collaboratives, a change package was refined and tweaked before it was ready to spread. If a certain operational detail was not part of the original change package, that detail was developed during the demonstration phase, and then the change package was refined to include the key operational changes found to work best. For example, based on the experience of the initial **Niger PHI** teams, the original change package was refined prior to the collaborative's spread phase to include:

- Formation of individual site PHI teams and institution of weekly meetings with rotating team roles (chairperson, secretary, timekeeper);
- Improvement (or creation) of medical record system;
- Development of formal triage system, including an ETAT flow diagram and a designated area for triage and emergency care;
- Posting of job aids;
- Implementation of monthly mortality audits;
- Improvement of tracking of essential inputs (medicines/equipment) and laboratory results;
- On-site training of pediatric providers by senior staff in ETAT and common case standards;
- Improvement of call system for 24-hour coverage; and
- Systematic postpartum evaluation of newborn prior to discharge, temperature monitoring, and routine vaccination of newborns before discharge.

After experience and ongoing monitoring, the final change package was often a result of:

- Expert review of evidence-based standards of care and recommendations;
- Local priorities and gaps in quality of care based on baseline studies;
- Capacity of local health care providers to carry out the change package (with the support of coaches and other technical assistance); and
- Institutional support (e.g., from MOH and facility heads).

4. Communicating Standards of Care

In many cases, collaboratives were built around a change package that introduced new standards. Since communicating standards was part of the work of all collaboratives, whether or not the standards were new or updated, QAP developed numerous strategies to share them and build local capacity to apply them. The strategies included job aids, training, distributing copies of the standards, and other innovative strategies outlined below.

Job aids

The **Tanzania PHI** Collaborative designed wall posters with clear diagrams of the triage and referral algorithms, checklists, self-assessment forms, case management forms, and data collection sheets around its standards. Patient case management maps[3] were also on QAP-provided clipboards at the foot of each bed on the pediatric wards. Compliance with the correct use of these forms was a standard part of the coaching visits.

Many hospital personnel in the **Niger PHI** Collaborative spoke of how much they valued the job aids and training materials, often pointing out educational and treatment protocol posters. One aptly described their value as "the walls that teach." Job aids for PHI included both references for technical tasks for case management of dehydration, malaria, pneumonia, and severe malnutrition and for counseling (particularly nutrition). The ETAT form used in triage was not only part of the information system, but also a job aid on what to look for.

Publishing standards

The **Nicaragua PHI** collaboratives published the standards in an attractive book format issued by the MOH and crediting all the participating organizations. It was distributed to all hospital personnel and at the health center level. At present there is not a large supply of copies available, as they have been distributed. Thus, new staff cannot get their own copies of the standards; however, copies are available for their use in their work areas and in the hospital libraries. In 2007, QAP began working with the MOH to update the national child health care standards to add pediatric AIDS.

Training

Organized training of health care providers was the primary method of informing and increasing the competence of providers in applying standards of care.

The **Niger EONC** Collaborative developed a system of whole-site training that covered both clinical standards and QI tasks. Through a "train the trainer" model, two pools of regional trainers attended a week-long program to prepare to deliver whole-site training at collaborative sites. Each was assigned to train an additional three regions. Training sessions included practice on mannequins, application of skills in the maternities, and other hands-on methods. Training manuals and QAP-produced provider job aids were incorporated into the training. Adaptations of the national partograph (birthing record) were introduced to facilitate compliance with monitoring of EONC standards.

[3] Case management maps (CMMs) are a type of job aid: a sheet of paper with information that guides health care providers in treating patients. Each patient has a condition-related CMM that is maintained in the patient's chart or near his/her hospital bed to inform providers of the treatment protocol, what treatment was provided when and by whom, what to do should a critical event occur, etc.

The **Nicaragua PHI** Collaborative also introduced a "Center of Excellence" concept where training centers were established to train people in IMCI standards through clinical rotations. These rotations had nurses and doctors from the health center level visit a hospital for a two-week practical training in the new standards of care. In practice, some health workers interviewed for the evaluation said they did not receive direct instruction and complained that the purpose of the program was to "get some work out of me." The MOH and QAP revamped the program by adding classroom-based refresher courses on the revised standards and by enhancing the supervision and support for visiting staff. The program ultimately became very popular among both health center and hospital staff. Interestingly, one of the things that hospital staff appreciated most about the program was how much they learned by being trainers, as it gave them a chance to review and deepen knowledge in key areas.

> *"[Before] we did not have [the same] understanding; there was more than one goal. Now nurses know the standards, so they speak up 'Doctor, you forgot this.' And the answer is 'Thank you" instead of 'I am the doctor.' Before, there was diversity of opinion."*
>
> – EOC QI team member, Maternal and Child Hospital, Chinandega, Nicaragua PHI

The Nicaragua QAP team also adapted UNICEF's strategy for solidifying pediatric care skills through a program called "Premio al Conocimiento" (prize for knowledge). Quiz show-like contests pitted hospital providers to compete in answering questions on the clinical management of ill children. Doctors and nurses were randomly chosen to represent each facility just before the contest, so all staff had to study the standards. Prizes (such as fans, calculators, and coffee makers) were given to the teams that answered the most questions correctly. These contests proved very popular and were a fun way to encourage providers to review their clinical knowledge. Based on the success of the strategy with PHI, these contests were also used in the EOC Collaborative.

In establishing both the training centers and prize for knowledge contests, QAP worked with other donors and programs to coordinate policy efforts, procure materials and equipment, and finance training.

In the **Nicaragua EOC** Collaborative, a national evaluation of health personnel competency in pregnancy, delivery, postpartum care, and care of pregnancy complications was conducted in 20 out of 22 departmental hospitals and 43 out of 175 health centers in June 2005. The results identified the areas of EOC competency where providers most needed improvement and gave impetus to the creation of more EOC training centers to address the knowledge and skill gaps.

5. Lessons Learned: Change Package

- **The term "change package" was problematic, possibly because of the wide range of forms that it took**. QAP advisors debated the utility of the term in the face of such wide diversity, but in the end, it was decided that it was important to have a way to refer to the set of changes the collaborative intended to implement. The concepts of "initial" and "refined" package were helpful to capture the dynamic nature of the change package. Ultimately, QAP advisors had to meet their counterparts at whatever level was needed and then build from there. That is, if no standards existed, begin by developing them; if standards existed, work on refining and adapting them; etc.)
- **Clearly define the initial change package.** Collaborative managers need a robust sense of the changes they want teams to implement, test, and operationalize. Then, managers can develop more effective plans for ensuring competency and materials that must accompany that change package.
- **Explicitly define the refined change package**. Collaborative managers need to explicitly capture the learning of teams in the demonstration or initial waves of a collaborative and articulate it to convey it to new teams.

F. Nature of Teams

1. Overview

Collaborative improvement teams were initially expected to consist of a group of interdisciplinary health workers from a single facility who would use their combined skills to improve the quality of care through participation in the collaborative. QAP usually held to this principle.

2. Number of and Management of Teams

Most collaboratives had one team per site, and in general, teams formed around the site's existing management structure. The **Nicaragua PHI** Collaborative was typical, with teams of four to six, including the facility director and the heads of various departments, such as pediatrics, OB/GYN, neonatology, nursing, epidemiology, and training.

However, some variation occurred in that model. Some sites had more than one team or collaboratives, and some had, in addition to facility-based teams, teams at the provincial or municipal level. For example, in the **Ecuador EOC** Collaborative, the provincial hospitals had more than one team: usually one for surgery/obstetrical complications and another for routine delivery. In addition, a steering team often served at the national level. In the **Nicaragua EOC** Collaborative, participating hospitals had two teams involved: a "hospital quality committee," consisting of the hospital director, an OB/GYN, and nurse in-charge, and a QI team, typically consisting of two doctors (an OB/GYN and a generalist) and a nurse. The QI team implemented the actual QI work while the hospital quality committee monitored their progress and facilitated the work when necessary.

Since the **Russia TCS** Collaborative focused much of its work on improving the continuum of care for HIV patients, the teams were not facility based, but rather represented the entire locality (city or oblast). A project coordinating committee formed in each location and served as a forum for discussion and decision making. Each committee was chaired by the area deputy minister and had 15–17 members who represented area institutions (i.e., local ministries of health, NGOs, social services agencies). Committees met regularly and had the authority to make or influence decisions to support institutionalization of new practices. Each locality had a team responsible for each of the four priorities (access and retention, patient management and adherence, patient care and coordination, and TB/HIV co-infection).

3. Team Members

Facility teams included key clinical staff directly involved with the care of patients (**Tanzania PHI** and **FP, Uganda ART, Niger PHI** and **EONC, Ecuador EOC, Nicaragua EOC**). These were multidisciplinary teams of physicians and nurses and may also have included midwives, laboratory and pharmacy staff, data collectors/statisticians, communications staff, social workers, and administrators. In the **Tanzania PHI** Collaborative, all clinical treatment [ward] staff—doctors, nurses, attendants, and other ancillary staff—were part of the QI team. Team size varied between eight and 20 people, depending on the size of the facility, structure of the clinical care team, and participation of staff from other units (e.g., outpatient department, laboratory, pharmacy, etc.).

The **Niger PHI** Collaborative focused on engaging all staff in QI where possible, including non-clinical personnel; and the teams reported significant benefits from this diverse composition.

4. Team Members' Roles

The team leader was typically the medical officer in charge of the treatment unit or ward (**Tanzania PHI, Uganda ART**). However, in a few collaborative, such as the **Niger PHI** Collaborative, team management roles rotated among members. Besides the leadership role were the roles of secretary and

timekeeper. In the **Tanzania FP** Collaborative, each team had a secretary who called the meetings and recorded, filed, and distributed minutes to team members. Minutes were usually recorded and kept for review by coaches and QAP staff. The evaluation team made asked for the minutes and reviewed them when possible during field visits. The timekeeper's duty was to ensure that the meeting agenda provided time for all relevant issues that that the meetings were not overlong or boring. The secretary or another team member team followed up assignments to ensure they were implemented.

Some collaboratives had "expert patients" or community health workers as unofficial team members to extend services to patients or facilitate outreach to communities. In the **Uganda ART** Collaborative, expert patients provided patient counseling and support, usually on a voluntary basis. They often participated in the team meetings and provided important input into team discussions.

5. Team Meetings

Although some collaboratives began with weekly meetings, most found that one to two per month worked well. In the **Uganda ART** Collaborative, meetings were usually held on the days of the ART clinic and scheduled for before or after clinic hours to facilitate staff attendance. Attendance varied but averaged five to eight people: usually the team leader and those who were most active on the team.

Meetings were typically chaired by the medical officer in charge. Problems that occurred on the ward were brought to the team meetings and potential solutions discussed and acted on. For example, the types of problems identified by the **Tanzania PHI** Collaborative tend to be those that affected the team's everyday operations.

The agenda for the **Uganda ART** Collaborative meetings generally followed the process for CQI:

- Identification of areas for improvement,
- Progress on an action plan,
- Review of data and run charts,
- Sharing of information from learning sessions, and
- Challenges and the way forward.

6. Use of Job Aids for Team Functioning

The development and use of job aids contributed to the teams' effectiveness in implementing some collaboratives. For example, the **Niger** collaboratives developed tools and job aids to support team functioning and effectiveness: a record of team membership showing title, job function, time at site, record of training, and contact information; a tracking sheet for team meetings; a job aid for effective meeting planning and management; a format for producing the meeting report; and a tracking sheet for activities planned and executed, with space for explanations for those not executed. Overall, tools to support team functioning included:

- Guidelines for effective meetings,
- A job aid for writing meeting minutes,
- A site team functionality form, and
- A site decision follow-up form.

7. Lessons Learned: Teams

The challenges teams faced are no different than general human resource issues in developing countries. These include:

- **Frequent turnover of trained staff.** In several instances, team members either were transferred to other facilities, left for extended training and thus left a vacancy on a team, or were replaced by individuals who had not been trained. This deterred the collaborative work

and necessitated ongoing training for new team members.

- **Lack of motivation or commitment, especially from physicians.** In many cases, physicians were reluctant to participate on teams and in data collection, as they thought that data collection was a nurse's job or did not see the relevance of the collaborative to their work. For example, in the **Rwanda ART** Collaborative, many teams were either unable to meet or did not see the importance of doing so, and some doctors may have felt they had little to learn from nurses. To address this issue, some countries trained doctors and nurses separately—in teamwork and understanding the importance of working together—then they came together as a team in future sessions.
- **Heavy work load of QI activities beyond regular job.** Several team members commented on the extra work from QI. In one hospital in the **Nicaragua PHI** Collaborative, staff commented that they did not have time to do QI during work hours and that they had to do it after work hours. Scheduling team meetings in the **Uganda ART** Collaborative was a real challenge because of the high clinic load (50–150 patients per day, including 20–30 new patients) and because most staff had additional responsibilities in other clinics and departments. Over time, as the improvement process became incorporated into the work routine, the process required less time.

Lessons learned in optimizing team performance included:

- **The best-performing teams had the least turnover.** A frequent change in team membership, especially team leaders, negatively affected certain team performance. Teams with stability could advance and address problems.
- **The inclusion of non-clinical personnel is helpful.** As evident in **Niger PHI,** teams that included non-clinical personnel, such as laboratory and administration staff, had influence and capacity to affect the PHI care processes.
- **Building on prior experience helps master QI.** Many staff involved in the **Niger** EONC or PHI Collaborative had also participated in the quality assurance activities implemented in the Tahoua region during the 1990s. In addition, the EONC sites were the same facilities as the PHI sites, so they could reinforce each other's learning.
- **Employ measures to motivate health professionals to participate.** Various strategies were used to boost staff motivation and commitment, and particularly that of physicians:
  - **Positioning the collaborative as staff development.** Being part of the team was viewed as professional development. "It is the first professional development in my 18 years in this hospital," one of the doctors at Ambato said (**Ecuador EOC**).
  - "We optimize with whatever we have and sacrifice based on our commitment and our love for our institution," said the head nurse at the Ambato hospital; she also reported having one nurse for 47 pediatric patients (**Ecuador EOC**).
  - **Offering incentives.** At one of the sites in the **Tanzania FP** Collaborative, the facility paid extra to staff for their time in team meetings
  - **Using internal coaches.** During a site visit to a national maternity hospital in the **Niger EONC** Collaborative, a team member remarked on the value of the internal coach, "She really kept us going in the beginning."

G. Team Coaching

1. Overview of Collaboratives' Experience with Coaching

Collaboratives thrived when dispersed teams could share ideas and successes between learning sessions, but the technological mechanisms for such sharing, such as web sites, etc. were difficult in these settings. Consequently, face-to-face coaching became critical to the QAP collaborative approach. In most

collaboratives, QAP tried to include people from the government as coaches; in many cases, they coached together with QAP staff members. Coaches gathered progress reports, reports on the results of other teams, and generally acted as a communication conduit among the teams between learning sessions. Coaches built teams' capacity by reviewing quality improvement and health care concepts at each visit. Such visits were instrumental in motivating teams, maintaining the momentum of improvement, and addressing concerns. Table 3 provides examples of country experiences with coaching.

Table 3. Overview of coaching by QAP-supported collaboratives

Name of Collaborative Profile of Coaches	Role of Coaches	Frequency of Coaching
Ecuador EOC		
Provincial facilitators: Provincial MOH staff responsible for maternal health (doctor or nurse) under the Provincial Directorate of Standards Local facilitators: Usually the area coordinator, a doctor who was also the canton hospital director, or the area nurse	Trained facility teams on collection of indicator data, conducting rapid cycles, and managing the indicator database/spreadsheet. Supervised data quality, by medical record review (spot checking).	Quarterly due to limited provincial budgets with priority to sites that requested a visit; otherwise, focused on those that had had more difficulty with the work.
Nicaragua PHI		
QAP staff, together with regional (SILAIS) supervisors	Ensured that needed equipment and supplies were available; focused on the process of monitoring care via the standardized tools and instruments; and responded to needs/requests they learned of between visits. QAP staff conducted coaching visits with the SILAIS supervisors, reinforcing the existing chain of command and allowing coaches to train teams and team supervisors simultaneously.	Visited hospital sites regularly and less frequently over time until the SILAIS supervisors could provide needed support alone.
Nicaragua EOC		
QAP staff along with SILAIS maternal and child health (MCH) coordinator QAP supported SILAIS authorities to provide technical support and quality monitoring and improvement coaching	Assessed how functional a team was, whether its data were up-to-date, whether it was using its data, what problems it was facing, its level of leadership support, what activities it had completed according to its plan, and data quality. Made recommendations of how to address issues identified.	Averaged one visit every 2 months, depending on how much coaching was thought to be needed at a site.

Name of Collaborative Profile of Coaches	Role of Coaches	Frequency of Coaching
Niger PHI		
External coaches: Regional hospital pediatricians and nurses and regional MOH focal persons (IMCI, QA). Internal coaches: District-level physicians with clinical responsibilities or nurses with major roles in PHI services and membership on the QI team. Each district hospital had an internal coach; each regional hospital had 2; each national hospital had 3 or 4.	Regional teams of trained, veteran Phase I "external coaches" and internal "on-site coaches" provided essential support at the regional level, with close technical support by QAP staff. Visits lasted 2–8 hours, averaging 4.4 hours. Each coach covered 4 sites on average.	Varied widely
Tanzania FP		
QAP staff	Reviewed progress on work plans developed for that action period, collected data for verification and later analysis. Coached on standards of care, issues related to stock-outs, screening for medical eligibility, counseling skills, etc. Networked with other RCHS units and advocated for FP services.	2 or 3 times each week
Uganda ART		
"Core Technical Team": 14 physicians and technical staff from different MOH departments, the private sector, other HIV/AIDS providers, key local partners from referral hospital, and QAP/Uganda staff	Supervised, in collaboration with regional coordination teams, the appropriate implementation of improvement strategies to improve health services delivery. Built capacity of regional, district, and sub-district personnel in the implementation of quality improvement in health services.	Monthly or more frequently if needed

2. Rationale for Coaches

QAP found coaching to be an important reinforcement for the QI teams and that new and established teams needed ongoing technical support to initiate and sustain quality improvements. Coaching served a number of important functions:

- Creating the conditions to comply with standards of care (e.g., securing needed equipment and supplies, proper documentation on standardized forms and tools, etc.);
- Serving as a clinical reference on the proper treatment and care of patients based on evidence-based standards of care;
- Ensuring data quality by providing technical assistance and guidance on the measurement of

indicators, data collection, and verification methods;
- Raising team motivation and team spirit;
- Serving as a conduit for information exchange between teams;
- Building capacity of regional, district, and sub-district personnel in QI; and
- Serving as a liaison to other components of the health care system to improve coordination, communications, and collaboration.

3. Profile of Coaches

Who coached depended on the structure of the collaborative and the MOH structure where the collaborative was conducted. In some instances, coaches were national, regional, and/or district-level health care managers (**Niger PHI**); in other countries, coaches were provincial and local facility staff (**Ecuador EOC, Benin EONC)**. In some instances, coaching was conducted by QAP staff (**Nicaragua EOC**). **Niger PHI** and **EONC** collaboratives had national and regional coaches, as well as "internal" coaches: members of the QI team who received additional training as a coach and could play that role on site.

4. Selection of Coaches

In the beginning, QAP staff did most of the coaching, often in conjunction with MOH staff. In countries where QAP had worked previously, coaches were selected largely on the basis of prior QI experience. Some were selected because they had participated in a collaborative from the early stages and could ease into that role. Selection criteria included the available MOH capacity where the collaborative was conducted. In all collaboratives, holding a supervisory role, availability for coaching for the long-term, and familiarity with QI or team supervision were all desired characteristics for coaches, albeit often not present.

5. Training of Coaches

Training of coaches consisted of both formal training courses and on-the-job training through joint coaching visits focusing on the basic roles and responsibilities of coaches, as well as specific skills building in QI processes, data collection and verification, and facilitation skills. Some collaboratives, e.g., **Niger EOC** and **PHI,** developed a curriculum for training coaches.

6. Role of Coaches

Coaching roles were fairly similar across countries and collaboratives and consisted of various supportive functions including training, data analysis, conflict management, technical assistance, facilitation, and evaluation. Tasks during a coaching visit included:

- Assess team functionality and level of leadership support;
- Review QI indicators and verify data collected for analysis and reporting;
- Review progress on work plans developed for that action period;
- Review documents, patient files, or records;
- Address specific issues or problems such as indicator formulation, data collection, etc.;
- Provide on-site training on using various job aids, monitoring collaborative indicators, or conducting rapid cycles
- Provide assistance in using the tools that help teams implement and document QI processes (e.g., standardized patient care forms, formats for team meeting minutes, work plan matrices, data collection forms, etc.); and
- Discuss standards of care, issues related to stock-outs, counseling skills, etc.

Some collaboratives developed Terms of Reference (TOR) for coaches to specify their roles and

functions during specific action periods (**Tanzania PHI** and **FP, Uganda ART**). The specific tasks of coaching were then tailored to the improvement objectives for that period.

7. Frequency of Coaching

The frequency of site visits was often a function of geographic spread, number of sites each coach was responsible for, and the perceived need for coaching support. Typically, coaches visited their sites once every month or two. However, coaching in the **Tanzania FP** Collaborative (done exclusively by QAP technical staff) was done more frequently (two or three times per week) because the sites were primarily narby. Coaching support was usually more intense and frequent during the early stages of a collaborative when the teams required more assistance and guidance, particularly in establishing the QI process and in monitoring indicators.

8. Structure and Implementation of Coaching

Most collaboratives had trained coaches who were external to the team. However, in **Niger PHI**, coaching was done on site by an external expert team of MOH and QAP/Niger staff and internal coaches of MOH staff. External coaches included members of the Regional Health Directorate, experts group, and staff from other sites. For MOH supervisors, coaching and supervision were intertwined. QAP coaches accompanied Regional Health Directorate staff in every coaching visit. In general, the external coaches dealt with the bigger picture and standards of care while internal coaches addressed the day-to-day functioning of the QI team (see Table 4). The coaching and support provided to teams at the service delivery level was cited repeatedly as a unique and important aspect of the Niger PHI effort. QAP staff visited hospital sites regularly and could respond to needs and requests they became aware of between visits. MOH colleagues at the central level sometimes accompanied QAP staff on coaching visits and credited much of the improvements in the process of care to the consistent, hands-on approach to coaching.

While coaching was usually done through on-site visits, in **Ecuador EOC** Collaborative used meetings at the provincial and national levels for this purpose. The **Uganda ART** Collaborative had strong representation from the central and regional MOH who took major responsibility for the coaching together with QAP staff.

Table 4. Roles and functions of the external and internal coaches in the Niger PHI and EONC collaboratives

External Coaches	Internal Coaches
Technical Assistance ▪ Organize learning sessions ▪ Strengthen QA and clinical capacity of teams ▪ Provide technical assistance in QA and standards Training ▪ Facilitate technical/QI training as part of formal training and regular coaching sessions Supervisor/Facilitator ▪ Provide regular follow-up of teams ▪ Supervise teams ▪ Bring about improvements ▪ Verify conformity with standards ▪ Help with team functionality ▪ Help solve problems without blaming Coordinator ▪ Serve as moderator and facilitator for teams ▪ Coordinate action period activities Advocate ▪ Communicate ▪ Advocate for the benefit of the team: reduce conflicts and garner resources Supporter ▪ Help improve data collection ▪ Help calculate indicators ▪ Help improve analysis and interpretation of data ▪ Help teams analyze data for CQI ▪ Verify data validity ▪ Support data management at regional level	Trainer ▪ Facilitate continuous training Supervisor/Facilitator ▪ Stimulate team spirit ▪ Prepare teams for learning sessions ▪ Help with process diagrams ▪ Be involved in bringing about QA Coordinator ▪ Follow up on implementation of action plan ▪ Ensure regular meetings ▪ Ensure functionality of team ▪ Prepare monthly report Supporter ▪ Provide technical support (QI and clinical standards) ▪ Help analyze cloudy steps in process ▪ Analyze data ▪ Ensure quality data collection and management ▪ Ensure effective use of collected data for QI Motivator ▪ Encourage health staff and bring others to become engaged in the QI process ▪ Support optimal team functioning Communicator ▪ Disseminate information ▪ Communicate results

9. Tools Used to Enhance Coaching

Some collaboratives developed a set of tools to standardize and facilitate coaching. For example, **Niger PHI** developed a *Guide for Team Coaching for Quality Improvement* that provides a tool for diagnosing, understanding, and developing solutions for supporting teams at five stages. In **Tanzania PHI,** a site visit report was used as a reference for follow-up action. Some coaches in the **Ecuador EOC** Collaborative developed their own forms for providing written feedback after a site visit, which teams found to be very motivating.

10. Benefits/Impact of Coaching

The benefits of the coaching visits were repeatedly mentioned by the site teams as one of the most

valued aspects of collaboratives. Benefits included:

- Helped teams gain confidence in their ability to collect and use quality data;
- Reinforced skills in the real-life settings where providers worked;
- Ensured the collection of accurate and complete data for evaluating the quality of care and compliance with standards, since documentation and data collection were not part of the culture in many developing countries;
- Supported a decentralized model of health care while enhancing quality of care at all levels;
- Engendered understanding and support of the QI process and enabled partnerships to be formed by including MOH counterparts in coaching visits; and
- Fostered a culture to support quality improvement.

11. Challenges to Coaching

The major constraint to quality coaching was the ability of country programs to provide or sustain facility-level coaching at all sites, especially as collaboratives scaled up to new regions and topics. Even training and supporting coaches within the MOH or other professional groups to take a prominent role in the coaching of existing and new sites created a huge demand on QAP resources.

The shifting of responsibilities to the MOH also created a human resource challenge for the ministries and required additional resources and a new methodology for the design and implementation of the training.

12. Lessons Learned: Coaching

- **More intense coaching is needed in the early stages of a collaborative to establish well-functioning QI teams and put in place monitoring procedures.**
- **Coaching teams <u>on site</u> was extremely important for maintaining momentum and supporting the collaborative.** Most countries have poor communication infrastructures, and the only opportunity that teams had to collaborate and communicate was during the learning sessions and through coaching visits. Such visits were instrumental in motivating teams and correcting errors and concerns.
- **Grafting the collaborative coaching structure onto existing supervisory or oversight functions within the health care system made it easier to engage central, regional, and district levels of the health ministry in the implementation of the collaborative**. Integrating coaching with existing supervisory structures also favored the sustainability of quality improvement activities.
- **Coaching was one of, if not the, most important factors in the success of a collaborative.** The consistency and high quality of the coaching was seen as critical to a team's success.

H. Learning Sessions

1. Overview of Collaboratives' Experience with Learning Sessions

Learning sessions were face-to-face meetings that brought together representatives from each site participating in a collaborative and the experts to exchange ideas. In learning sessions, teams covered progress, shared action steps, learned QI methods and best practices, and presented their results in a supportive environment.

Teams reported that they valued learning sessions most for:

- *Increasing clinical competence.* Learning sessions reinforced clinical skills. For example, in the

Rwanda Malaria Collaborative, teams learned new guidelines for the management of malaria and severe illnesses in children. In the **Nicaragua PHI** Collaborative, participants valued the clinical skills they learned, such as neonatal resuscitation: they held separate learning sessions for teaching QI methods and provided clinical training through the establishment of training centers. The collaborative also worked to improve an existing training program to give a stronger focus on pediatric case management. A system of rotations had been in place where staff from health centers would spend two weeks in a hospital to refresh their skills. In practice they did not receive training and many felt that the purpose of the program was to "get some work out of me." The QAP team revamped the program, adding classroom-based refresher courses on the revised standards and enhancing the supervision and support that visiting staff received. The program was very popular among both health center and hospital staff. Interestingly, one of the things that hospital staff appreciated most about the program was how much they learned by being trainers, as it gave them a chance to review and deepen their own knowledge in key areas.

- *Identifying problem areas*. In the **Rwanda** collaboratives, the discussions of trends in the data that teams were reporting helped teams identify "system" problems—those challenges that teams faced due to faulty processes at higher levels of the health system.
- *Increased knowledge of QI processes*. Participants reported a better understanding of indicators and how to measure them. For example, the Leon teaching hospital joined the **Nicaragua EOC** Collaborative some months after it had started and was not monitoring use of the partograph. The site was invited to attend a learning session and witnessed teams sharing results from measuring this indicator. The teaching hospital told Somoto hospital: "We will start to monitor partographs as well, and in six months, we will do better than you." They fulfilled their promise.
- *Networking*. Through networks developed during the sessions, participants continued to support and learn from each other outside of the sessions. The **PHI** learning sessions served as a mechanism to create a national network for sharing and learning around acute care for children. In **Ecuador EOC**, provincial and area facilitators stayed in close contact with each other to accompany team progress.
- *Sharing and exchange of information*. QI team members reported the high value they placed on the stories and examples shared at these sessions, which supported discussion of constraints and solutions to common problems. For example, in the **Nicaragua EOC** Collaborative, the exchange of experiences between SILAIS as well as facilities and "sharing of information on health sector initiatives" (e.g., health sector reform, Mother and Baby Friendly Hospitals initiative) provided opportunities for learning that facility-level staff had not had before.

> *"After a learning session, those participating provided feedback to the whole team, including problems and solutions they had heard about. This feedback is obligatory, and this kind of thing never happened before the collaborative: People went to workshops and kept what they learned to themselves. Now we share the experience, and we see from the learning sessions what is applicable here in our hospital."*
>
> – Rural District Hospital Director, Niger

2. Content of Learning Sessions

The primary function of learning sessions in QAP collaboratives was to promote shared learning among participating teams for more rapid improvement in the topics or care processes addressed by the collaborative. During learning sessions, teams shared results of changes they had tested during preceding action periods and in many cases agreed on common changes they should all try to incorporate in their action plan for the ensuing action period. Learning sessions also provided a critical forum for continuous refresher and in some cases new training in collaborative technical content and QI skills.

Learning sessions 1-2

The first and second learning sessions were generally used to lay the ground for evidence- based quality improvement, which included:

- Definition and measurement of indicators,
- PDSA cycles,
- Change packages and improvement strategies,
- Team functions and team work, and
- Flow charts and graphic presentations of results (run charts).

All collaboratives presented similar material on CQI methodologies. In addition to QI methods, each introduced clinical content during these sessions. Examples of clinical content discussed are in Table 5.

Table 5. Clinical content presented in learning sessions, selected QAP-supported collaboratives

Topic	Technical Information Presented at Learning Sessions
PHI	▪ Introduction of reference manuals and standards such as the RCM and the WHO ETAT manual ▪ Tools and guidelines for the use of the RCM and ETAT manual ▪ Adapted WHO algorithm for screening children suspected of having HIV infection ▪ Critical care pathway forms ▪ Evaluation and treatment of pediatric emergencies ▪ Case management of diarrhea and fever
EOC, EONC	▪ Basic standards for maternal care and indicators ▪ Review of standards for care of malaria in children and pregnant women ▪ Compliance with antenatal care standards ▪ Adequate completion of the partograph ▪ Active management of the third stage of labor ▪ Selected aspects of routine newborn care ▪ Review of standards of care for newborns at birth
HIV/AIDS	▪ Review of MOH policies and guidelines on HIV/AIDS care ▪ Guidelines for the initiation of ARV and co-trimoxazole prophylaxis ▪ Review of ways to monitor and improve patient adherence to ART ▪ Ensure availability of guidelines for management of co-infections and tuberculosis ▪ Discuss issues related to medication stock management and prevention of stock-outs
Family planning	▪ Ensure availability of guidelines for determining medical eligibility for family planning ▪ Review of different contraceptive methods, including hormonal contraceptives ▪ Importance of preventing stock-outs of preferred contraceptive methods ▪ Counseling patients and families on FP

Information was not readily available on the percentage of learning session time spent on technical versus QI topics. In the sessions the evaluation team observed, approximately 1/2 to 1 day of a 2-day session was devoted to QI, with wide variation. The relative emphasis on clinical or technical content may have varied depending on the perceived need for clinical capacity building.

After the first learning session, teams were guided in planning for their first action period (AP). In some cases, instructions for or the results of a baseline assessment were discussed to set the stage for future

monitoring of improvement changes. This was the case in **Niger PHI and EONC, Ecuador EOC, Nicaragua PHI,** and **Tanzania PHI**.

In the **Tanzania FP** and the **PHI** collaboratives, the results of an external baseline assessment were also presented in the second session to help identify gaps in quality of care, assist teams in identifying priority areas for improvement, and generate ideas for changes to implement during subsequent action periods.

Learning sessions 3-6

Subsequent sessions were based on what was learned during the preceding action period and often reviewed Ministry policy or guidelines; facilitated communication between sites; and provided a forum for presenting collaborative results and lessons to regional and national officials. Teams were expected to present their progress using the following format:

- Team functionality
  - Number of meetings planned and held, percentage of meetings planned and held, activities planned, activities completed, percentage of activities planned and accomplished, and general observations
  - Challenges of team functionality
- Indicator data (run charts)
- Changes introduced
  - Specific changes linked to indicators
  - General changes
  - Challenges faced in implementing changes
- Recommendations (based on the above challenges)

3. Methodology of Learning Sessions

Learning sessions covered a large number of heterogeneous activities: training; exchange; feedback; and meeting with officials, receiving policy explanations, and asking them questions. Methodologies included a mix of: 1) didactic lectures (often on clinical topics or QI methods) presented by QAP staff, health experts from within the public health system, or external experts from international organizations; 2) presentations by site teams on their progress and lessons learned with feedback; 3) small group work in teams, including the use of case studies; and 4) plenary discussion sessions. The sessions with the most proactive kind of learning used a variety of active learning methodologies, including role play.

Some collaboratives, like **Niger EONC** and **Nicaragua EOC**, went beyond the traditional learning session approach and used other training modalities such as national workshops on specific topics and whole-site training interventions to complement or reinforce learning. At the national learning session (2nd learning session) for the **Niger EONC** Collaborative, they arranged a creative competition among participants from different levels of care (i.e., national, regional, and district) and presented their activities and results to their colleagues. Each group selected one site whose accomplishments stood out for presentation at the plenary session on Day 2 and then developed a presentation. Each group had to define criteria for the selection of "best site" in their group. On Day 2, global results were presented for each level of care, followed by a presentation by the most successful program at that level. In plenary discussions, other participants posed questions, shared their experiences, and commented on the information presented. This session brought out a positive sense of competition and good humor, enlivening the presentations and session. Since the evaluation, Niger collaboratives mostly hold regional learning sessions, and then when they bring everyone together for a national learning session, they present by region.

Learning sessions varied from two to three days with a set agenda. In some of the sessions, note takers synthesized the previous day's session at the beginning of each day or the end of the day, and in others, synthesis discussions occurred in plenary sessions.

> *"We are always comparing ourselves to others [at Learning Sessions]."*
>
> *"The competitive climate at the Learning Sessions is there – and we don't want to be the last."*
>
> *"The competition generated at Learning Sessions and regular coaching are keys to motivating the teams—they feel valued by others and feel their own value."*
>
> – Participants, Niger EONC Collaborative

4. Participants at Learning Sessions

The primary participants at learning sessions were members of the QI teams from facilities participating in the collaborative. In most cases, one or two members of a team would attend a learning session on a rotating basis so that more members would be exposed to the learning. The selection of attendees was usually left up to the QI team or facility head. Only in one case were participant profiles proposed and specific individuals matching those profiles selected by the teams (**Niger PHI**). Given the large number of sites in some collaboratives, the number of participants at learning sessions could be as high as 180–190.

In addition to QI team members, representatives of the central and regional levels of the MOH and in some cases community leaders attended some of the learning sessions and contributed to its discussion on quality of care issues. Other stakeholders, such as partner organizations (e.g., PAHO/WHO, UNICEF, CARE, UNFPA, etc.), also participated in learning sessions as well as contributed to their funding.

5. Planning Learning Sessions

The planning and organization of learning sessions was usually a joint effort by QAP staff and the MOH at the local and/or national levels. QAP provided the technical expertise and support for capacity building in CQI methodologies and as such had a major role in the design and delivery of learning sessions. Initially, QAP staff provided most of the training on CQI principles and methods, but in some instances QAP trained MOH facilitators at the regional level (**Ecuador EOC**) and members of the Core Technical Team (**Uganda ART**) in CQI methodologies and facilitation skills so that they could assume increasing responsibility for the design and delivery of QI content in learning sessions.

The MOH role varied according to the collaborative's organizational structure. For example, in the **Uganda ART** Collaborative, the MOH, represented by the Core Technical Team and Regional Committees, played a major role in planning, designing, and facilitating the learning sessions, with technical support by QAP**.** In contrast, the QAP staff of the **Tanzania FP and PHI collaboratives** were the primary organizers of the learning sessions, although the MOH provided funding for the sessions and participated in their planning and implementation.

Expert groups also played a role in planning and designing learning sessions. In Phase II of the **Niger PHI** Collaborative, regional collaborators and QI teams played a larger role. A similar use of experts was evident in the **Niger EONC** Collaborative in which the first learning session was preceded by a national expert meeting (convened in December 2005) to introduce the collaborative at national and regional levels. The expert meeting was attended by national authorities of the MOH, leading obstetricians, and midwifery experts.

6. Location of Learning Sessions

Learning sessions were generally held in regional centers to minimize travel time and costs for participants, and to give provincial stakeholders and authorities a prominent role. Collaboratives that started with national learning sessions often shifted to more decentralized ones as the number of

participating sites grew (**Nicaragua** and **Ecuador EOC, Nicaragua PHI, Niger PHI**).

National level meetings were then held for different purposes and with different stakeholders. For example**, Phase I of the Niger PHI** Collaborative culminated in a National PHI Conference where lessons learned and best practices were summarized and results to date presented to a wider audience, including the MOH. These presentations resulted in an enthusiastic endorsement of the expansion to 15 new sites.

Holding learning sessions at regional centers meant that the sessions had to be repeated in series to cover all participating sites. For example, for the **Uganda ART** Collaborative, each learning session was conducted in rounds of four to accommodate all 57 sites in 11 regions. Approximately 15 sites from three regions attended each session, with two representatives from each site. The session was usually held in a location central to the participating sites to minimize travel time and facilitate networking. Holding learning sessions at the regional level also had the advantage of having the provincial office of the MOH cover some of the costs (**Ecuador EOC**).

7. Frequency and Roll-out of Learning Sessions

In the IHI model, participants from QI teams were expected to have at least three learning sessions over a 12–18-month period. QAP collaboratives, however, held six sessions or more. The interval between the first and second learning session was typically one to four months, whereas the interval between subsequent learning sessions was more variable, depending on the activities planned for the action periods and other logistical/organizational considerations.

All collaboratives that had been in operation for 18 months or more had completed four or more learning sessions by July 2006. From the 18th through the 36th month, collaboratives held an additional two to four learning sessions, with an average of five to six learning sessions for each collaborative. Collaboratives that had the benefit of prior experience with QAP seemed to initiate learning sessions in more rapid succession (**Niger EONC, Uganda ART, Tanzania FP**). Likewise, spread collaboratives held learning sessions rapidly, often in conjunction with learning sessions for demonstration sites (**Rwanda PMTCT, Uganda ART, Nicaragua PHI, Niger PHI-Phase II).**

8. Evaluation of Learning Sessions

Formal evaluations of learning sessions were not done regularly, although in some cases, QAP used a process of feedback and reflection at the end of a learning session to garner lessons learned and insights that would help inform follow-up coaching with CQI teams (**Uganda ART, Niger PHI, Niger EONC**). Both collaboratives in **Niger** had a practice of internal reflection and soliciting feedback during the sessions and including these in their synthesis reports produced following the learning sessions.

9. Lessons Learned: Effective Learning Sessions

- **Learning sessions are a critical part of collaboratives.** Funding constraints sometimes led to a more decentralized approach to learning, and sometimes learning sessions were suspended. Central to the success of a collaborative, learning sessions provide new tools, confidence for using them, motivation to use them, connectedness with a broader health professional community, and commitment to improving quality.
- **Learning sessions were most successful when they emphasized results and used a mix of learning methods.** Teams most appreciated learning sessions when they allowed for interaction and leadership by the teams themselves, with teams having the opportunity to share best practices and results and when time was set aside to develop work plans for the next action period and skill-building around a specific technical area. Learning methods that were

most appreciated included role plays, use of mannequins for skills practice, job aids, and feedback.

- **Planning out from the start the phased introduction of technical content can be helpful in collaboratives that address a broad topic area.** In some collaboratives, QAP advisors found it helpful to develop an overall curriculum for a collaborative's learning sessions. This was modified as needed, but helped to make the collaborative's goals and path clearer and support gradual achievement of improvement objectives over time.
- **Make learning sessions short and practical.** Most collaboratives found that the learning sessions should not exceed one to two days and that they should be as practical and related to the "real work" of the facilities as possible.
- **Learning session content should be adapted to the needs of the learners.** At the start of a collaborative, most participants were not familiar with QI, data collection, formulating indicators, and technical aspects of the collaborative topic. It was important to adapt the sessions to the learning style and level of the audience, particularly streamlining training in QI to essentials. Adapting the content was greatly facilitated by administering a pre-test.
- **Ensure that those who attend learning sessions are the ones who actually do the work.** Sometimes, less active team members or even representatives from a site who were not on the site's team attended the learning session. It was important for participants to understand that the learning session was not an end in itself but a tool to enable people to work at their sites.
- **Involve MOH, regional MOH offices, and partners.** This means involving them at the beginning (during kick-off) and all the way through the final learning session, when issues and strategies for sustainability were often addressed.

Other lessons learned include the following:

- Compensate for staff turnover using strategies that help create more depth of knowledge in the collaborative team.
- Pace content across learning sessions based on where teams really are in their ability to absorb and use the new knowledge and skills.
- Teach system analysis, especially the introduction of systems thinking.
- Decentralize learning sessions to maximize local participation and ownership.
- Follow up and reinforce the content and skills teams acquired in learning sessions through on-site coaching, additional training events, and subsequent learning sessions.
- Build a cadre of learning session facilitators and trainers to take greater responsibility for learning sessions during spread or scale-up.

I. Communication

1. Overview of Collaborative Experience with Communication

Communications between teams and coaches and among QI teams occurred through various channels, including:

- Regular meetings or learning sessions;
- Site visits from coaches;
- Technology including: web, e-mail, fax, telephone.

However, due to poor access to information technologies, communication among sites and sharing of information outside the learning sessions was an area that was not effective in most collaboratives.

Table 6 provides an overview of each collaborative's communication experience.

Table 6. Overview of communication channels used by QAP-supported collaboratives

Collaborative	Site visit	Web	Phone	Email	Intra-country meeting	Learning Sessions	Radio
Ecuador EOC	X	X	X	X	X	X	
Nicaragua EOC	X	X		X	X	X	
Honduras EOC	X	X		X	X	X	
Malawi PHI	X					X	
Nicaragua/PHI	X					X	
Niger/EONC	X		X			X	X
Niger/PHI	X		X			X	X
Rwanda PMTCT	X	X				X	
Rwanda Malaria	X		X			X	
Tanzania PHI	X					X	
Tanzania FP	X					X	
Uganda ART	X					X	

2. Experience with Web-based Communication

A few collaborative tried to institute a web-based communication or e-workspace approach and had varying success. At the inception of the **Rwanda PMTCT** Collaborative, an extranet site for sharing data among teams was initiated. Eventually, 15 sites began to regularly report and share their indicator data through the site, but it was discontinued shortly thereafter, due to factors including turnover in information technology support at QAP's Rwanda office, slow connections, and frequent electricity blackouts.

The **Latin American EOC** collaboratives were more successful in using information technology to promote sharing between teams. Created in 2003, the Maternal Mortality Reduction Initiative web site (www.mortalidadmaterna.org) continued to be an important vehicle for sharing results among the now more than 200 teams participating in the EOC collaboratives in Ecuador, Honduras, and Nicaragua through 2006. In 2005, the LAC EOC collaboratives introduced another innovation: a technical e-mail forum to solicit ideas from teams on how to overcome obstacles in a particular problem area. The vast majority of LAC EOC sites had regular e-mail access, and about 10% of them posted responses to the discussions.

3. Lessons Learned: Communication

In most settings, communication was very difficult. For nearly all the African collaboratives, due to the lack of technology to support web-based communications and sharing of information, communications among sites was limited to the learning sessions and the sharing of information by coaches as they traveled from site to site. This clearly affected the spread of improvement changes and the extent to which sites truly "collaborated" in shared learning. More recently, there have been some cross-country newsletters for PHI. Other strategies need to be developed to facilitate knowledge dissemination and collective learning.

J. Measurement

1. Overview of Collaboratives' Experience with Measurement

Regular measurement of results to guide continuous quality improvement is a primary function of measurement in a collaborative. One of the major functions of teams was to collect data for regular measurement of results to guide CQI at the site level, specifically linking measured results to specific changes tested and implemented within a designated time period. This involved regular team collection of data and calculation of indicators that were used for continual self-assessment, CQI at site level and reporting to the larger collaborative. This section presents an overview of approaches to measurement used in QAP-supported collaboratives, and covers common challenges, types of indicators used and their evolution, team capacity for quality data collection, and approaches used to manage and validate data.

Table 7 presents the types of indicators, data collection and analysis methods, and approaches to verification of self-collected data.

Table 7. Overview of measurements by QAP-supported collaboratives

Number of Indicators	Collection and Analysis Method	Verification
Ecuador EOC		
26 indicators classified into 6 clinical areas	Record review, observation checklists (for inputs), and client exit interviews. Team members entered data into an Excel sheet that generated run charts automatically. Separate workbooks were maintained for each year. Versions of this Excel workbook were maintained at the area, province, and national levels.	The supervisor (provincial MOH facilitator) checked the forms, which contained medical record numbers.
Nicaragua EOC		
15	Periodic medical record review and client satisfaction survey. Team members entered data into an Excel sheet that generated run charts automatically. Separate workbooks were maintained for each year. Electronic copies of these files were transferred to the SILAIS during coaching visits, and then SILAIS staff entered data onto another Excel spreadsheet that compiled indicator data at the SILAIS-level.	Supervisor (coach) conducted medical record reviews at least every 2 months; QAP staff regularly checked data quality during site visits. Some teams registered the reviewed records, ensuring data quality by reviewing them anew. In other sites, where specific record numbers were not registered, QAP staff measured indicators of a new random set of records. Another (indirect) method used to verify reported data was to cross-check data with expected numbers.

Number of Indicators	Collection and Analysis Method	Verification
Niger PHI		
32 for demonstration phase; reduced to 15 as PHI went to scale	Teams compiled data and reported monthly to coaches (often regional MOH IMCI coordinators) who compiled data for the region and reported the results to the National IMCI coordinator and QAP office. Composite run charts were developed at the QAP office, but analysis and interpretation of results were done by the team. Teams that were more facile with computers produced their own run charts (from a standard template developed by QAP).	QAP/Niger staff verified data, examining them for completeness, trends, and coherence, both in the QAP/Niger office and during coaching visits to sites. To check actual indicator calculations for process indicators, sites were asked to number the medical records they reviewed so that a coach could do a secondary review of the same records to verify the data reported.
Niger EONC		
11	Teams collected and compiled data. They entered the data so that runs charts could be generated for their analysis (their computer had a program that generated the charts automatically).	Same as Niger/PHI (above)
Russia HIV/AIDS		
30, including 16 PEPFAR and 11 project indicators	Teams used a variety of primary data sources for the indicators, including facility records, desk audits, and monthly reports. Qualitative data were also collected on such topics such as stigma and social factors affecting access to treatment.	Data were checked against patient records and other original sources.
Tanzania PHI		
14	Teams recorded their indicator data at the end of each month in a data collection form; coaches gathered and analyzed the data for them.	QAP staff and coaches periodically checked reported data against site records.

2. Indicators

QAP-supported collaboratives used several types of indicators, as seen in Table 8.

Table 8. Types of indicators used in QAP-supported collaboratives

Type of Indicator	Description	Example
Process: Compliance with standards of care	Indicators that directly reflect the quality of provider actions as part of a process of care	▪ % of pregnant women in prenatal consultation for whom 12 standards activities were performed and recorded in the prenatal record ▪ % of children under 5 years assessed and classified according to IMCI standards ▪ % of births where alert curve & cervical dilation curve were correctly drawn with partograph and documented ▪ Average % compliance with pediatric malaria case management standards
Health outcomes	Indicators that measure desired health outcomes related to improved processes of care	▪ Postpartum hemorrhage rate ▪ Maternal mortality rate ▪ Perinatal asphyxia rate ▪ Number of patients on ART with weight gain over previous 12 months
Other	Indicators that measure patient actions, coverage, utilization, and inputs	▪ Number of ANC clients registered in a month ▪ % of children under 5 years diagnosed with malaria who were brought to the health center for care within 24 hours ▪ Number of serious malaria cases detected in children under 5 years at the health center ▪ % of patients adhering to ART

Selection of indicators

As in other QI efforts, collaboratives for the most part tried to select indicators that met the following criteria: measured quality of care, linked to clinically important tasks, kept to a minimum number, could be calculated from existent medical record, and were simple enough for health workers to routinely calculate in the field. In keeping with these criteria, QAP in most instances worked with host country organizations to define key elements of clinical performance that should be the focus of improvement and then developed indicators to monitor changes in performance in these clinical areas.

Development of key indicators was usually achieved by a collaborative's national coordinating group, typically led by the MOH and including major donor and technical CAs working in the target system of care. For example, for the **Nicaragua EOC** Collaborative, the base document for the Regional Initiative for Reduction of Maternal Mortality outlined general principles for improving an EOC system, lines of action, target areas for clinical improvement, and suggested indicators. Using this framework, the national coordinating group met in a series of meetings in July and August 2003 to review the EOC standards from Ecuador, WHO best practices, and the scientific literature supporting the obstetric care standards and discussed them until they reached agreement on a set of 16 standards and 22 corresponding indicators. The MOH published them in September 2003 (*Standards and Indicators of Quality for Processes of Care of the Pregnant Woman and the Newborn*), officially launching them at the national level for all MOH hospitals and health centers. For the **Nicaragua PHI** Collaborative, QAP

led the MOH and the other partners (UNICEF, PAHO, and CARE) in an exercise to adapt the RCM to Nicaragua national standards, resulting in the MOH's formal adoption of the adapted standards.

With regard to HIV/AIDS collaboratives, most countries were already using a set of indicators based on PEPFAR or other international indicators. This meant resistance to the addition of new indicators related to compliance with standards. In addition, although many of the indicators were intended to be used on a national scale, in some collaboratives, individual sites or facilities were given the autonomy to select the indicators most relevant to their targeted areas of improvement. For example, to reduce the burden of monitoring, participating sites in the **Uganda ART** Collaborative were asked to select at least one indicator from each of five categories to begin baseline data collection and to gauge improvement. Sites were thus encouraged to choose indicators of particular interest to them. Later in a collaborative's implementation, however, the MOH and QAP decided that all teams should monitor, in addition to whichever indicators the team had chosen, three "focus" indicators that related to priority aspects of HIV/AIDS care.

Sources of data

Medical records were the typical data source, although some collaboratives used additional sources as well. For example, teams in the **Ecuador EOC** Collaborative reviewed 30 perinatal clinical history records (randomly sampled if the universe of cases that month was over 30), observation checklists (for inputs), and registers (emergency room, maternal death, and epidemiological), and conducted client exit interviews. Denominator data were taken from registers (normal delivery discharges, delivery, civil, vital), annual planning documents for the health area, and monthly activity consolidation forms. Indicators were generally constructed on the basis of the documented completion of clinical activities.

In some countries, existing medical records did not include the new evidence-based interventions being implemented, and innovations included modification of the existent record (such as adding a rubber stamp to the partograph in the **Niger EONC** Collaborative to record information about AMTSL and newborn tasks) and/or creating a new record (e.g., triage forms to record compliance with urgent pediatric case management tasks in the **Tanzania** and **Niger PHI** collaboratives).

Data collection and monitoring

In larger health facilities (such as a district or regional hospital), monitoring was typically done monthly by one or two staff members who randomly selected 20 or 30 records for the targeted service and reviewed the records to determine whether the standards were met (according to the information in the record). In smaller facilities, one staff member reviewed all case records for the previous month. In the **Niger PHI** Collaborative, based on team feedback, the number reviewed was reduced from 20 to 5 per facility per month in 2006 to reduce the monitoring burden and allow time for adequate quality review. In a few instances, teams organized themselves around peer assessment: staff from one facility visited a neighboring facility to review records.

The **Tanzania FP** Collaborative used exit interviews with patients to assess whether the client was adequately counseled, screened, and given basic information on the FP method (how to use, side effects, and complications). Twenty new clients were reviewed monthly and the results submitted to QAP for analysis. Similarly, following a standardized daily group health talk for all clients, a sample of 20 clients in a month was interviewed about the benefits of birth spacing, type of FP methods available, modes of HIV transmission and prevention, and the benefits of HIV counseling and testing.

Training facility staff to measure performance using record review made staff more conscious of the importance of recording all tasks and information for every client, and better record-keeping enabled better care processes.

In some instances, data collected by facility teams were then aggregated at higher levels (such as districts

and regional directorates in Honduras and SILAIS in Nicaragua) to track progress across administrative units. In most cases, facility-level data were aggregated at the national level, typically by QAP staff.

3. Improving Data Quality and Validity

All collaboratives made some efforts to improve data quality and validity, using any of the following strategies:

1. Simplifying indicators
2. Correlating indicators with other data to identify errors
3. Verifying data through audit of clinical records
4. Building capacity and motivating local QI teams and MOH coaches to improve accuracy of data

Simplifying indicators

The **Niger PHI** Collaborative reformulated its indicators and revised data collection tools to focus on percentage of adherence with case management standards, as opposed to the proportion of cases treated according to all case management standards, an "all or nothing" measure. This change provided a more sensitive gauge of progress with a continuous rather than dichotomous variable. They also sought to align collaborative indicators more closely with national and regional health information system indicators to reduce the burden of monitoring for providers. In addition, they focused monitoring on a number of essential standards, reducing their number for which compliance was measured from more than 30 to 10–12.

Correlating indicators with other data

National and hospital-level teams in the **Nicaragua PHI** Collaborative tracked case fatality for severe diarrhea and pneumonia and correlated those rates with compliance with standards data as an indirect measure of the validity of performance monitoring data.

In the **Nicaragua EOC** Collaborative, QAP staff and MOH supervisors would also indirectly verify reported data by comparing reported results with expected numbers. In cases where a weak or non-functional team reported superior indicator results, a coach would look more closely at the team's data.

More extensive baseline surveys were carried out in **Niger EONC** and **Uganda ART** collaboratives at the start to draw a broad picture of how facilities were doing vis-à-vis standards of care and to provide a point of reference for comparing results reported later by teams. During these baselines, issues of data quality and data systems were explored, and steps were identified to strengthen these data systems. In Niger, a more in-depth baseline was carried out in a limited number of sites (15 out of 29) using Lot Quality Assessment Sampling to minimize the number of records needed to determine which areas most needed improvement and to establish a baseline against which to track improvement.

Verifying data by auditing clinical records

Facilitators, supervisors, and quality improvement coaches in collaboratives in **Ecuador, Honduras, Nicaragua,** and **Niger** accepted responsibility for reviewing clinical records during site visits to verify reported indicator values. In some sites, teams registered the specific records that were reviewed, allowing supervisors and coaches to ascertain data quality by reviewing anew the same records. In other sites, where specific record numbers were not registered (usually at health centers), QAP staff checked data quality by measuring compliance with standards in a new randomly selected set of records.

Strategies for motivating the improvement of data quality

Increasing the visibility of data and coaching were two key strategies for motivating teams to improve

data quality. Coaches in **Niger PHI** gave written feedback to teams on any errors in data reporting and on areas for improvement. Teams reported that they found written feedback motivating. As part of implementing a "service strategy," quality teams in **Nicaragua** regularly and publicly posted quality monitoring data in health facilities, raising client awareness of health workers' efforts to improve quality and client expectations of quality service and acceptable interpersonal treatment.

In Niger, QAP staff provided focused training and supervision to local QI teams and MOH coaches to improve their indicator calculation and monitoring skills. A "monitoring" coordinator was designated on facility QI teams and regional coach teams in the **Niger PHI** and **EONC** collaboratives. QAP staff also sought to build the general monitoring capacity of regional and district MOH managers and encourage them to look at quality of care indicators in addition to traditional coverage indicators.

4. Reporting and Sharing

Different strategies were used for reporting and sharing data other than during learning sessions. In all cases, the MOH saw itself as owning the data, with QAP providing varying levels of support in collecting, storing, and analyzing data. In some cases, such as in the **EOC collaboratives in Latin America**, collaborative data were prepared and reported by facilities through the MOH regular channels, and QAP received the data for further analysis. In the **Niger** collaboratives, sites collected their own data and then sent them to QAP where they were compiled, stored, and analyzed at collaborative level. The MOH continuously used the data for its needs, but came to the QAP office to retrieve the latest data. In **Uganda**, QAP had some trouble accessing sites' data, as its role was seen primarily as providing technical assistance on the collaborative and not on data management.

Three issues are highlighted in this section related to sharing and reporting: frequency of reporting, use of consolidated data, and web-based reporting.

Frequency

Modifications in the frequency of chart reviews resulted not only in more efficient monitoring, but provided quicker feedback to teams on performance. For example, medical record review was initially a monthly activity in the **Nicaragua EOC** Collaborative. One facility, Rio San Juan, decided to implement a more frequent medical record review to reduce the burden of a single session measuring all indicators and to provide quicker feedback to staff not adhering to standards. This strategy proved effective: Medical record review was incorporated into the regular functioning of the Obstetrics Department, so that measuring indicators and providing individual feedback to non-adherent colleagues were conducted weekly.

A number of teams in the **Nicaragua PHI** Collaborative reported that in addition to the monthly monitoring, they did daily monitoring of compliance with standards via record reviews, reviewing all cases. This allowed for immediate correction of errors, and was quite feasible at the end of the shift in hospitals with smaller case loads. In La Trinidad Hospital in Esteli one doctor explained, "We don't want to wait a whole month to correct something that we could take care of today. We all review our cases at the end of every shift."

Data management: Consolidation of data from multiple sites

Consolidating facility data helped reveal improvement trends across an entire geographic or administrative area (such as a province or department) and to guide regional MOH management of improvement work. Consolidating data across sites was also essential for effective collaborative management and reporting and for advocacy on the importance of quality improvement at regional and national levels.

At the beginning of the **Ecuador EOC** Collaborative, data from all facilities providing delivery care in

Tungurahua Province were routinely consolidated, with QAP assistance, at the provincial level into a single spreadsheet that yielded run charts for each key indicator for the entire province. Eventually, the MOH CQI coordinators in other provinces that joined the collaborative took this responsibility. Later, QAP assistance focused on helping the national MOH create a national database with data from all reporting provinces. The MOH created a position of database manager with its own funds.

For the **Nicaragua EOC** Collaborative, regional MOH staff routinely consolidated data for all facilities in the regions that were participating in the collaborative. In **Honduras,** this was done by the Secretariat of Health's CQI facilitator in each departmental area. In both **Honduras** and **Ecuador**, QAP staff assisted national-level authorities in consolidating data from all participating areas (e.g., for all five departmental areas where QAP was providing support in Honduras and for all 11 provinces participating in EOC CQI activities in Ecuador.

In the **Niger EONC and PHI** collaboratives, data from facilities were compiled in several types of categories: old and new sites; by region; and by level of facility (national, regional, and district hospitals).

In **Tanzania PHI**, data were compiled only by QAP staff, based on data that teams provided. In **Uganda**, QAP helped the core team consolidate data reported by individual sites.

Use of web-based applications

QAP designed three different web-based reporting systems to make it easier for teams to report quality monitoring data and enable consolidation of data at different levels. Web-based applications were created for the original (non-HIV/AIDS) **Russia** collaboratives (www.healthportal.mednet.ru), for the **LAC EOC** collaboratives (www.mortalidadmaterna.org), and to support the **Rwanda PMTCT** Collaborative (http://qacollabs.org).

The experience with web-based communications varied widely depending on the region or country. QAP advisors encountered two major challenges: (1) weak connectivity and low technological infrastructure and (2) the need to encourage use of the site by team members and leaders. In LAC, there is clear evidence of website use not only by collaborative participants, but others as well (by June 2006, the website had received over 11,000 visits). In Russia, the use of the web portal was limited and, although, collaborative participants were collecting data and were ready to share it in face-to-face learning sessions, they were reluctant to upload data on the portal, even after encouragement from collaborative managers. In Rwanda, internet-based communication was abandoned with the close-out of QAP activities there. Therefore, the effort to develop and maintain a website as part of an improvement collaborative's sharing strategy needs to be reviewed on a case-by-case basis depending on the preparedness and willingness of collaborative participants in each culture, the country's level of connectivity, and cost.

5. Building Capacity for Monitoring and Evaluation

In all collaboratives, teams were trained in the measurement and application of indicators. In many countries, local capacity for effective monitoring of quality indicators was very rudimentary among providers and MOH supervisors, including designated MOH health information system specialists. Many collaboratives invested tremendous effort in building local capacity for monitoring quality of care indicators and for managing quality data across multiple sites at MOH regional levels. This capacity building was an essential step in institutionalizing district and regional health care improvement work. Extracting data from records and calculating numerators and denominators for quality indicators was difficult at first for many health providers. However, with practice and coaching, teams learned to audit records for compliance with standards and gained proficiency in calculating and charting quality indicators.

In Africa, considerable time was spent in each learning session to ensure that site teams understood the

improvement objectives and the correct processes for data collection and calculation of quality indicators associated with specific indicators. Coaches provided critical support to the quality monitoring process by reviewing data with teams during site visits, discussing any discrepancies, correcting misunderstandings about how indicators were calculated, and helping teams gain confidence in their ability to collect and use data related to the quality of care.

Some countries designed special tools to build capacity in measurement. For example, the **Niger PHI** Collaborative created a monitoring manual with the forms needed for compilation, analysis, and transmission. The manual includes forms used for data collection and sections on 1) organizing data collection; 2) collecting and compiling data for the general, ETAT, and disease-specific indicators; 3) compiling data for the indicators; 4) graphing the data and interpreting results; and 5) verifying data.

6. Lessons Learned: Measurement

Common challenges noted at all sites included:

- Of all aspects of the collaborative methodology, teams had the most difficulty with data collection and indicator calculation.
- Considerable time was needed in each learning session, especially in Africa, to ensure that site teams understood the improvement objectives and the associated quality indicators.
- In some sites in Africa, were frequent stock-outs of the patient record forms needed for recording data about care and of forms and registers for data collection and compilation.
- The burden of monitoring often conflicted with other tasks.

Lessons learned included:

- **Attention to ensuring data availability when designing the measurement strategy** is a critical task in planning a collaborative. An example of a creative solution was adding a stamp to include the recording of AMTSL in the partograph in Niger.
- **Where applied, web-based applications facilitated more rapid sharing of data and improvement ideas and results among teams** and allowed for closer monitoring of activities and outcomes by QAP staff.
- **Sustainability of monitoring depended on several elements**:
  - Perceived value of the task to users,
  - Competency to carry out monitoring tasks,
  - Availability of forms and registers for data collection and compilation,
  - Accountability for monitoring results within the system,
  - Time for monitoring, and
  - Incorporation of the task into the routine monitoring system.
- **A transition to less frequent monitoring should occur when processes have stabilized**. Collaborative managers in Ecuador and Niger reported that they did not believe it was necessary to measure inputs every month. Niger measured newborn care frequently at first, but less over time. Process indicators need to be measured more frequently during initial introduction of a new technical intervention.
- **Poorly defined criteria for judging compliance with standards weakens data quality.** Scoring compliance first involves defining standards and criteria for judging compliance with those standards. Early experience showed that data were less reliable when criteria were not well defined. At the same time, having a complicated data collection tool can also lead to errors.
- **Having consistent Excel files for data storage can greatly improve collaborative management and data sharing.** The evaluation team found it a major challenge to have very different formats and even types of data collected by different collaboratives. A great deal

of time was spent pursuing data sets, cleaning them up, and analyzing them. More consistent guidance and practice in data collection and storage would allow for more meaningful comparisons across collaboratives.

K. Action Periods

1. Overview of Collaboratives' Experience with Action Periods

Action periods are the times between learning sessions when teams work on improvements at their facilities, supported by technical assistance from coaches. Teams in a number of collaboratives developed action plans or work plans at the end of each learning session for implementation during the subsequent action period. The work plans followed a similar format that defined the area for improvement, the activities or steps to be taken, indicators to track progress, the responsible person(s), resources needed, and a timeline for these activities.

Action periods served as the "engine" of the collaboratives: periods when improvements or changes in processes were developed, tested, and implemented. Teams were expected to apply QI methods to plan, implement, and evaluate many small changes in quick succession. For collaboratives that reached completion, as in the **Rwanda PMTCT and malaria** collaboratives, action periods near the end were often devoted to institutionalizing and sustaining the improvements introduced through the collaborative.

2. The Work of Action Periods

The action periods following each learning session varied in length depending on the stage of the collaborative, anywhere from four to 24 weeks.

Some collaboratives devoted their initial learning sessions to setting up QI teams and organizing baseline studies to document the current status of health care delivery and identifying gaps in quality of care that became the focus of improvement changes in subsequent action periods. For example, in the **Ecuador EOC** Collaborative, the first learning session (LS1) focused on concepts and methodologies for quality improvement, formation of teams, and planning for the baseline assessment. The subsequent action period was then used to establish the QI teams, organize team meetings, and implement a baseline study. The initial results of the baseline study were presented in LS2 to identify target areas for improvement.

In the **Uganda ART** Collaborative, the first action period (AP1) in February–March 2006 was devoted primarily to establishing site teams and the collection of baseline data to document the current status of ART service delivery at participating sites. Coaches conducted their first round of site visits to support the teams in their initial set-up and baseline data collection and to review the patient registers and verify the baseline data. The results of the baseline assessment were presented in LS2, when teams received additional training on the use of indicators and the PDSA cycle. Also, teams developed action plans to address some of the improvement gaps revealed by the assessment. AP2 extended from April through August of 2006.

The **Niger EONC** Collaborative used a different approach of doing whole-site training, team formation, baseline assessments, process analysis, and action planning at facilities several months before LS1, so AP1 actually preceded it.

3. Improvement Methods

An underlying assumption of the collaborative approach is that teams use the Plan, Do, Study, Act (PDSA) cycle to test and implement improvement changes during action periods. QAP did not require teams to make one change at a time and document the effects of each. The "rapid cycle" improvement

approach encourages teams to focus on improving their processes and making small, rapid changes. Learning sessions focused on clarifying standards and existing processes of care through flow charts rather than on teaching teams how to apply different QI tools. Teams were encouraged to test changes continuously, often on a very small scale and in a short period, and then apply whatever they learned from the tests on increasingly larger scales: What worked on a small scale was applied on a larger scale and adapted as needed to continually improve results. Box 2 presents the experience of a team during the **Rwanda PMTCT** Collaborative.

In the **Ecuador EOC** Collaborative, review of a convenience sample of improvement reports revealed that most changes were centered around helping providers perform according to standards, such as reminding and motivating them to comply with standards; training all new staff in related skills, such as partograph use or administration of oxytocin; scheduling periodic refresher training on clinical skills and measurement of EOC indicators; posting flowcharts on the wall; and identifying and giving feedback to staff who were not filling out prenatal records correctly.

In the **Nicaragua EOC** Collaborative, most of the problem areas addressed related to lack of adherence to clinical standards of care, lack of correct documentation of procedures (e.g., correct completion of partograph or perinatal clinical record), or poor client-provider communication. To address these gaps, teams tried different feedback approaches, including: private feedback meeting with non-adherent colleagues; public posting of names of non-adherent colleagues; invitation to non-adherent colleagues to participate in QI team monitoring of indicators, which served to reinforce the standards; and invitation to non-adherent colleagues to lead a refresher training on the clinical standards in question during grand round meetings.

Box 2. Improvement processes at work

Muhura Health Center in Rwanda serves over 30,000 people and was one of the original sites in the PMTCT Collaborative. The Muhura QI team expressed enthusiasm for improving the quality of care at their site from the very first learning session (6/2003) but took a while to understand what they were doing and how to do it. It was not until the end of LS3 (12/2003) that the team, with some difficulty, was able to present charts for most of its indicator data, which showed that all indicators were quite low.

Discouraged by low performance, team members brainstormed how to change their situation. They decided on and made many original changes that other teams had not thought of or had reported at learning sessions. At the next learning session (03/2004), the Muhura team received the prize for the team with best improvement. In subsequent learning sessions, the team heard that some of their strategies had been applied by other teams at other facilities.

After early 2005, however, the team decided to meet just once a month, and sometimes the meeting didn't occur, reflecting irregular monitoring of indicators. Once the team started noticing that their performance was suffering, the coach held intensive sessions with them to analyze the problems. The team took steps that brought their indicator data back to the previous levels.

Their success in PMTCT led the team to establish QI teams for other health center services, such as malaria and nursing.

One of the questions that emerged from the interviews with the **Tanzania PHI** Collaborative teams and QAP staff was whether the teams were actually implementing PDSA cycles during the action periods. Review of some of the team meeting notes and work plans indicated that a range of problems and issues were identified for action, some that were simple operational issues (e.g., lack of clip boards for patient monitoring forms) and others that involved systems and required more complex actions (e.g., delay in laboratory results). Further documentation would be needed to determine whether the various steps of the PDSA cycle were actually being implemented, and whether the process was more or less effective in addressing different types of problems of differing complexity.

In was noted that in the **Niger PHI** Collaborative, most of the changes implemented early on related to reorganization of services, clarifying roles and responsibilities, and ensuring availability of equipment and supplies. Teams were often so eager to implement changes that they implemented many at once. Many were obvious if the facility was to comply with the standards that were introduced through the collaborative and did not require specific application of PDSA or other QI methods. As teams started to plateau in their results, the changes needed to make improvements became more difficult and required more deliberate approaches to solution development and testing.

> *"Before, pediatric patients entered the hospital grounds and went wherever they wanted and there was no triage. We wanted to do triage so we set up a triage unit with staff whom we trained, but children were still not all being triaged because they were not all coming through the triage unit. We decided to close the hospital gate, putting a watchman at the door who told everyone as they entered to go through the triage unit. That made a big improvement, but some children were still slipping through. Finally, we had doctors send any children coming to them without a triage form back to the triage unit."*
>
> – Rural District Hospital Director, Niger PHI Collaborative

Another strategy used in the **Ecuador EOC** Collaborative was to involve more staff and assign new responsibilities to them, for instance by informing staff not on the CQI team about the improvement efforts (e.g., sharing baseline data) or assigning new responsibilities (e.g., having cleaning staff distribute clinical history forms, nursing staff triage patients, in-charge review clinical histories each day). A popular process change involved reorganizing staff schedules, including changing work starting time.

4. Lessons Learned: Action Periods

- **Creating buy-in of the facility leader was critical to ensuring implementation of desired changes.** Where there was little or no buy-in by facility leaders to the quality improvement process, little or no change happened. In a case in **Nicaragua**, a hospital director quit the improvement team because he saw collaboratives and CQI usurping his authority. He did not want to answer to a request for "evidence." When facility leaders bought into the concept of collaboratives and QI, however, they became true quality leaders, such as the District Medical Officer in **Niger** who became passionate and vocal about QI and the collaborative approach.
- **Empowering and motivating teams to take action is essential.** Some teams did not want to follow standards of care because they were overworked. Some teams waited for instructions from an authority before implementing changes. Some settings lacked incentives for teams to engage in this work. In the **Niger EONC** Collaborative, managers went to each facility and trained the majority of the staff there to ensure broad capacity to carry out quality improvement and instill a wide sense of ownership for the collaborative work.
- **Lack of specificity over what constituted an improvement change made it difficult to determine what were key or effective changes**. For example, in the **Ecuador EOC** Collaborative, many improvement reports were filled out such that the improvement change was simply the indicator itself (e.g., "implement partograph," "improve treatment of client"), which made it difficult to understand what was actually done to obtain that result. Other changes also tended to be one-time solutions rather than process changes, such as buying necessary supplies (e.g., forms, folding screens, reactants) rather than, say, implementing a periodic supply-checking and purchasing system.

L. Spread/Scale-up

1. Overview Collaboratives' Experience with Spread/Scale-up

QAP used the terms "spread" and "scale- up" were used interchangeably to describe the extension of existing activities to new sites. In many cases, when new sites joined a collaborative, it often began to be referred to as a "spread collaborative," irrespective of whether the original or a refined change package (based on the experience of the initial sites) was introduced to the new sites. In some cases (such as the **LAC EOC** collaboratives), the same technical content was introduced to progressively more sites. Other collaboratives (such as **Niger PHI**) modified the change package and indicators based on the experience of the initial sites and introduced these modified elements to the new sites.

In the case of the **Russia HIV/AIDS Treatment, Care and Support** Collaborative, the original collaborative led to four spread collaboratives, as improvements in two areas (ART and TB-HIV integration) were each introduced as a separate spread collaborative in two regions (St. Petersburg City and Orenburg Oblast).

Early on in the implementation of many collaboratives, there was pressure to spread what was being learned so that other sites and regions that were not participating in the collaborative could also benefit. In some instances, MOH officials began adding sites to the collaborative even before QAP believed the collaborative was ready to expand. At the same time, this pressure from MOH leadership structures to extend improvements as widely as possible was seen as critical in ensuring the success of an eventual formal scale-up.

Table 9 provides an overview of spread and scale-up by country and collaborative. It should be noted that not all collaboratives started out with a clear notion of or explicit scale-up strategy.

Table 9. Overview of spread by QAP-supported collaboratives

Collaborative	Scope of Initial Improvement Activities (Start Date)	Extent of Scale-up of Activities as of June 2007
Benin EONC	15 facilities in 2 health districts (out of 34 in the country) (February 2005)	None
Ecuador EOC	All 7 health areas in 1 province (August 2003)	76 health areas in 12 provinces (out of 22 in country)
Ecuador AMTSL	All public facilities performing deliveries in the other 10 provinces that had not participated in the EOC Collaborative (May 2007)	167 out of 169 health areas and 26 out of 27 provincial hospitals
Ecuador Obstetrical Complications	6 provincial hospitals (November 2006)	No expansion yet but spread planned for 2008
Honduras EOC	1 health region out of 7 in the country (November 2003)	62 facilities in 5 departmental areas out of 20 in country
Nicaragua EOC	3 local health systems (SILAIS) out of 17 in the country (September 2003)	14 out of 17 SILAIS
Nicaragua PHI	6 out of 22 maternal and child care hospitals in the country (October 2003)	14 out of 22 maternal and child care hospitals
Niger EONC	3 out of 3 national maternity hospitals, 4 out of 5 regional maternity hospitals, and 21 out of 33	Addition of 8 primary maternities

Collaborative	Scope of Initial Improvement Activities (Start Date)	Extent of Scale-up of Activities as of June 2007
	district hospitals in the country (January 2006)	
Niger PHI	6 out of 10 national/regional pediatric hospitals, all 3 national maternity hospitals, and 8 out of 33 district hospitals in the country (August 2003)	8 out of 10 national/regional pediatric hospitals; 3 out of 3 national maternity hospitals; 21 out of 33 district hospitals
Russia FP	Pilot sites in 4 cities: St. Petersburg, Saratov City and Engels in Saratov Oblast, and Togliatti in Samara Oblast (January 2006)	None
Russia ART	1 district in St. Petersburg and 11 facilities in Orenburg City (November 2004) (Note: This was part of the Russia HIV/AIDS TCS Collaborative in four regions)	123 facilities in all 18 districts in St. Petersburg and 3 districts in Leningrad Oblast; 45 facilities in the cities of Orenburg, Novotritsk, Orsk, and Gai in Orenburg Oblast
Russia TB-HIV	1 district in St. Petersburg and Orenburg City (November 2004) (This was part of the Russia HIV/AIDS Treatment, Care and Support Collaborative in four regions)	22 TB clinics in all 18 districts in St. Petersburg and 3 districts of Leningrad Oblast; 5 TB clinics in the cities of Orenburg, Novotritsk, Orsk, and Gai in Orenburg Oblast
Rwanda PMTCT	18 sites, at least 1 in each of the country's 12 provinces, representing 100% of the PMTCT facilities at that time (July 2003)	At closure in June 2006, 36 sites (17 original sites and 19 expansion sites)
Rwanda ART	16 sites covering all 12 provinces, representing 100% of the ART facilities at that time (August 2004)	At closure in June 2006, 30 sites (16 original sites and 14 expansion sites)
Rwanda Malaria	60 health centers and hospitals in 4 of the country's 39 districts (January 2003)	At closure in June 2006, 3 district hospitals and 51 health centers
Tanzania PHI	7 hospitals in 3 regions (out of 25 mainland regions in the country) (October 2004)	19 hospitals in 7 regions
Tanzania FP	9 facilities in all 3 districts in one region (capital), out of 25 mainland regions in the country (October 2004)	None
Uganda ART	57 sites in 51 of the 56 districts in the country (January 2006)	89 sites in 56 of the now-80 districts in the country

Spread typically occurred in stages. In some cases, collaboratives held separate sessions for new sites that ran parallel to the original sites' learning sessions. In these cases, new sites benefited from a refined change package and frequently caught up quickly to the level of performance of original sites. In other cases (**Tanzania FP, Rwanda PMTCT**), new sites were merged with original sites in the same learning sessions and were expected to catch up with less formal support. In these joint learning sessions, new sites benefited from the best practices and learning of original sites, and experienced staff from the original sites became important champions and mentors for new sites. Examples of differing collaborative scale-up processes are described below.

The EOC collaborative in **Ecuador** spread in stages, beginning in one province in August 2003 and

quickly adding others previously exposed to CQI work in maternal care as part of the CQI program that QAP was assisting the National Free Maternity Program implement. By June 2005, 11 provinces had been incorporated into the EOC Collaborative. As a result of the collaborative, QAP played a catalytic role in changing Ecuador's national maternal health policies to adopt active management of the third stage of labor as part of the country's official standards. To complement the EOC Collaborative work, which is now being implemented with provincial health authorities in 12 of the country's 22 provinces, QAP supported the MOH to launch in May 2007 a national spread collaborative to extend the AMTSL practice to all facilities attending births in the other provinces where it had not been formally introduced.

In **Uganda**, both the MOH and USAID were committed to scaling up the collaborative to include all ART treatment facilities by 2008. However the rate at which scale-up could occur depended on the resources available to QAP to provide the technical and management support needed. At the time of the evaluation visit in September 2006, QAP Uganda was bringing on additional technical and administrative staff to support the collaborative's scale-up to 32 additional sites by the end of 2006. Discussions were underway with USAID and WHO for additional funding to support the expansion.

In the case of the **Nicaragua PHI** Collaborative, some of its interventions spread in the context of national implementation of a Ministry of Health (MOH) program: Mother and Child Friendly Health Units Initiative. This national, UNICEF-supported program aimed at certifying hospitals and health centers as mother and child friendly, based on criteria related to available services and quality. Thus, while the QAP effort initially focused on only six hospitals, many of the tools and methods were shared more broadly through the larger program, and spontaneous expansion of the project methods and philosophy were seen at the regional levels. For example, a number of regional supervisors stated that they were not waiting to implement the methods at additional sites, but were already working beyond the selected hospitals, because the methods were effective and made their work easier. Further, there was evidence of efforts to use QI methods to systematize other types of care (both with and beyond pediatrics) with job aids or by developing local guidelines and to monitor the quality of these processes.

Spread also happened to the non-government sector. In the **Nicaragua EOC** Collaborative, QAP successfully provided assistance in implementing the collaborative's interventions to private medical care organizations that provide services financed by Social Security in seven SILAIS.

In **Niger,** QAP introduced a new technical collaborative, EONC, at scale based on scale-up of a previous technical collaborative (PHI) in same sites. The existing QI capacity in the sites and lessons learned in the other collaborative made it possible to introduce a new technical area and achieve rapid results at scale. This example demonstrates how QAP could build in-country QI capacity at scale that was efficiently mobilized for rapid improvement in new technical areas for priority health care problems.

2. Planning for Scale-up and Spread

In several collaboratives, as the MOH and USAID saw improvements through the data reported, they asked QAP to scale up its activities by adding new sites to the collaborative. Sometimes, plans for scale-up were discussed in the beginning when setting up the collaborative. In retrospect, scale-up was often planned using a combination of the following criteria:

- Strong commitment of the MOH,
- Original teams ready to work without technical assistance so that coaches could focus on new sites,
- Performance at existing sites had been sustained over time,
- Internal QI capacity was available, and
- Partners/stakeholders were ready for scale-up.

Examples of criteria used in specific collaboratives are featured in Table 10.

Table 10. Criteria used for scale-up in selected QAP-supported collaboratives

Collaborative	Criteria
Niger PHI and EONC	▪ Geographic accessibility ▪ Dynamism of district health team ▪ Ensured availability of a set of best practices and requisite resources (materials and equipment) to enable proper implementation of standards ▪ Mobilized partners locally to ensure requisite resources ▪ Strong local capacity (regional or district) in coaching, monitoring, and training to support spread to new sites ▪ Ensured regular opportunities for sharing among teams at new (and old) sites
Nicaragua PHI and EOC	▪ Need (mortality rates as an indicator) ▪ Potential for success (leadership, potential to learn) ▪ Potential partners
Uganda ART	▪ Representation of different levels of the health care system (i.e., different types of facilities and different levels of care) ▪ Delivery of ART for at least one year

3. Implementing Spread Cost-effectively

As spread began, collaboratives had to address the challenge of finding the resources necessary to support spread. One important challenge was finding and training enough coaches for new sites. To address resource constraints while supporting spread, collaboratives came up with several innovations. In the **Niger PHI** Collaborative, for example, the number of coaches was inadequate for the total 32 sites after the spread. The collaborative developed a decentralized strategy, training regional coaches who would provide coaching support from a closer distance. Regional coaches included the regional IMCI focal person and the pediatrician from the regional hospital. Further "decentralization" was deemed necessary and an additional training of "internal" coaches and district/regional statisticians was held to support monitoring and provide a source of facilitation and knowledge within the team itself.

Learning sessions had previously been organized on a national level. With the additional sites, the costs became prohibitive. Thus, learning sessions were decentralized to the regional level, with each region organizing learning sessions for sites in their region, and external coaches, experts, and QAP Niger staff visiting the regions to participate. This also allowed regions to address issues that were specific to them as well as those that were more global. Having regional learning sessions was the strategy adopted in the **Uganda ART** Collaborative from the outset, since that collaborative sought to cover the entire country with at least one participating site in virtually every district.

4. Lessons Learned: Spread

- **Spread was most often facilitated when the institutionalization of quality by MOH was happening simultaneously.** When there was a movement to decentralize health care and or efforts to integrate QI within the health system, there was a larger interest in expanding the collaborative.
- **Specific events to present best practices can be effective in showcasing the benefits of the collaborative and thus promote spread.** Bringing the first phase of a collaborative to a close with an evaluation of what had been learned and a conference was found to motivate stakeholders to support expansion.
- **Spread/scale-up should be part of the original plan and initial sites selected with eventual spread in mind.**

- **Plan for scale-up by developing local capacity.** It was essential to build local capacity of providers to serve as mentors and coaches to guide newer facilities and providers in quality improvement mechanisms, supervision, reporting, and monitoring.
- **Spread of an enhanced change package yields gains in efficiency for new sites.** In the **Niger PHI** Collaborative, the additional sites did not start the collaborative process from the beginning, but built on experiences and best practices developed by the original sites. This was associated with faster improvements in compliance with standards of care, mainly because of the adoption of the lessons learned and sharing and use of best practices demonstrated by earlier sites.

V. RESULTS

The most important criterion for determining the value of the improvement collaborative methodology is its impact on quality of care and health outcomes. This section of the report focuses on the collaboratives' results, addressing the following evaluation questions:

(1) What significant improvements in the quality and outcomes of care were demonstrated by QAP-supported collaboratives?
(2) How did these improvements compare between improvement and spread collaboratives?
(3) What was the impact of participation in a collaborative on individuals, teams, and institutions?

A. Effect of Collaboratives on Quality of Care and Outcomes

Data from QAP collaboratives could fill volumes, as the backbone of the initiative has been data collection and analysis. Data are available and used by teams in all collaboratives to self-monitor progress on quality of care and outcomes. This section highlights cross-cutting results from several QAP collaboratives using the following inclusion criteria: 1) at least 12 months of results available, 2) data collected on common indicators across collaboratives, and 3) confidence in the quality of the data. It should be noted that all data presented are from self-assessment: Site teams monitor their own results and submit data to the collaborative for aggregation. To varying degrees, in most collaboratives, self-collected data are validated during coaching visits. Data quality has been a significant issue over time, and much work has been undertaken within collaboratives to improve the rigor of data collection and quality (see Box 3). Although this section attempts to highlight cross-cutting results, exact comparisons between countries are not possible because indicators and sampling have not been standardized across countries.

The data presented primarily measure changes in indicators of compliance with standards (process indicators). It has been more difficult to demonstrate changes in outcome indicators for a number of reasons: 1) there are often other factors that affect outcomes besides the care processes targeted by the collaboratives; 2) the numbers of observations are not high enough to detect changes in outcomes; 3) the quality of outcome data has often been low due to weak local reporting capacity; and 4) for certain health care problem areas (e.g., maternal deaths due to obstetrical complications), outcomes are relatively rare at the facility and collaborative levels despite high morbidity in nationwide reports. Details on outcome indicator performance are presented for each topic covered in this section.

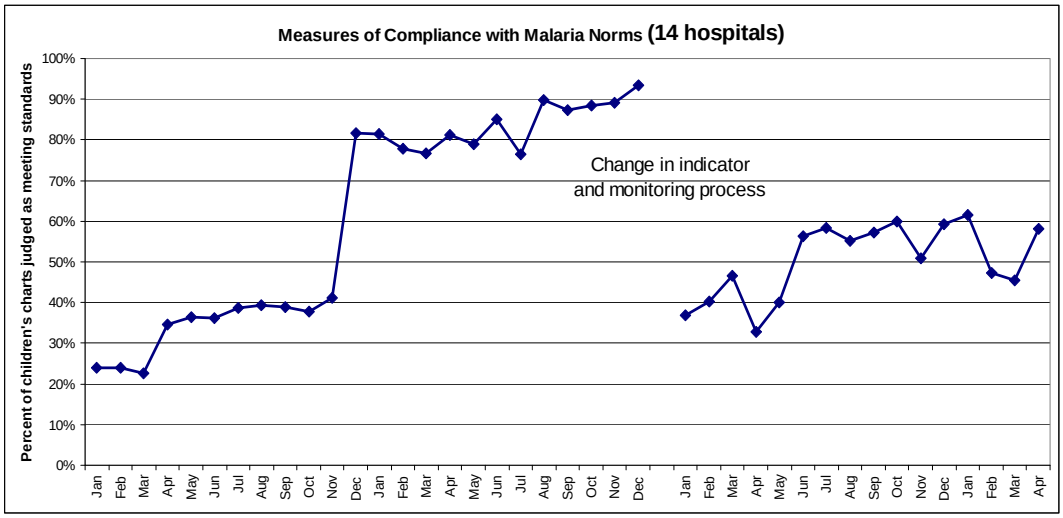
Box 3. Data quality

The monitoring of a common set of indicators by all collaborative site participants is a key component of the collaborative approach. Shared measurement of common indicators allows teams to evaluate their progress, to discern the effects of changes they are implementing, to share improvement work in line with shared targeted results, and to compare themselves with other participating sites in the spirit of friendly competition. This routine of data collection (generally monthly), analysis, and sharing for effective decision-making and improvement has often not been part of the organizational cultures where collaboratives are operating, especially in Africa where medical records are weak and measurement capacity is often rudimentary. Thus, the essential monitoring function in collaboratives, critical for promoting shared learning and accelerating improvement, is fraught with challenges.

Some collaboratives have had to do significant reflection and work to strengthen the monitoring of health outcomes and health care improvement as demonstrated by compliance with evidence-based standards. One example is the Niger PHI Collaborative. At first, indicators for quality included one that attempted to measure whether patients were managed in compliance with all designated standards—more than for many illnesses—an "all or nothing" criterion. Each month, a sample 20 records representing a particular illness would be reviewed to determine whether all standards for that illness were performed and recorded. If one record missed just one standard, its score for that month fell to 95%. After two years of calculating the all-or-nothing compliance indicator, there remained concern about the quality of the indicator: Did health care documented in charts that were recorded as meeting the compliance criteria really comply with all designated elements of the standards? Could teams maintain quality of data collection given the large number of charts required for review each month? And was an all-or-nothing indicator the most conducive to measuring improvement at the facility level for complex care processes for severe pediatric illness at the district hospital level? Teams often felt discouraged by the all-or-nothing compliance indicator.

After reflection, the PHI expert team in Niger decided to change the calculation of the compliance indicator to one measuring percentage of compliance with a set of minimum standards rather than an all-or-nothing measurement. The number of minimum quality standards for case management of specific illness (malaria, pneumonia, diarrhea) was reduced to 8–10 essential standards (from >30 standards) for each disease according to basic evaluation/ diagnosis, treatment, and discharge categories. The number of required charts for monthly review was decreased from 20 per illness to 5 per illness. The collaborative produced a set of clear guidelines and tools for monitoring and provided additional training and coaching on monitoring for site teams. As a result, as seen in Figure 5, a data artifact was created—what appears as a drop in "quality of care" is actually reflecting an increase in the "quality of data." In both periods (before and after the change of indicator and monitoring procedures, the trends are probably relatively accurate reflections of improvement, but the absolute levels being measured in the first two years are most probably inflated because of poor data quality. The lessons learned in monitoring quality at scale in the PHI collaborative benefited greatly the EONC collaborative launched in Niger a year after the scale-up of the PHI collaborative.

Figure 5. Changes in results reflecting changes in monitoring practices
Example: compliance with standards for hospital case management of malaria, Niger



As outlined in section IV. J. (experience of QAP collaboratives related to measurement), each collaborative had a set of indicators on the process of care (measuring compliance with standards) and some outcome indicators. This section compiles results across collaboratives where possible to show tends and presents the changes teams implemented to achieve these results. With few exceptions, results are presented only for indicators that are similar across more than two countries. The purpose of this section is not to examine results from any one collaborative in isolation, but to measure quality results achieved across multiple collaboratives in QAP to allow for evaluation of the improvement collaborative as a methodology for improving quality. For the data presented, the intent is to take common improvement objectives in a given technical area and demonstrate results across several collaboratives, including analysis of key changes implemented by collaborative teams to achieve improved health care.

QAP-supported collaboratives demonstrated results in several topic areas across multiple countries: essential obstetric and newborn care (EONC), pediatric hospital improvement (PHI), HIV/AIDS, family planning, and malaria. The process of analyzing results from collaboratives illuminated issues around data quality, collection, and reporting. In fact, the evaluation team determined that, at the time of the evaluation, good quality data for more than one country were available only for three of these topics: EONC, PHI, and HIV/AIDS. These data are presented in the following sections.

1. Essential Obstetric and Newborn Care

The overall purpose of the EONC collaboratives is to improve basic and expanded maternal and newborn health care. Earlier phases of QAP had defined a set of evidence-based standards for improving EONC care, and the early EOC collaboratives in the LAC region refined these standards. Given the breadth of maternal newborn care services across the perinatal continuum, it was decided to focus on the following key intervention areas:

- Active management of the third stage of labor (AMTSL) for prevention of postpartum hemorrhage (PPH);
- Use of the partograph;
- Essential newborn care for improved routine newborn care;
- Obstetrical complications (hemorrhage, pre-eclampsia/eclampsia, sepsis); and
- Routine antenatal care

Although EONC collaboratives were started in six countries, adequate data for examining results over time were not available for Eritrea (ended too early) and Benin (inadequate data). Results presented for EONC collaboratives include data from Niger, Ecuador, Nicaragua, and Honduras.

Effect on quality of care

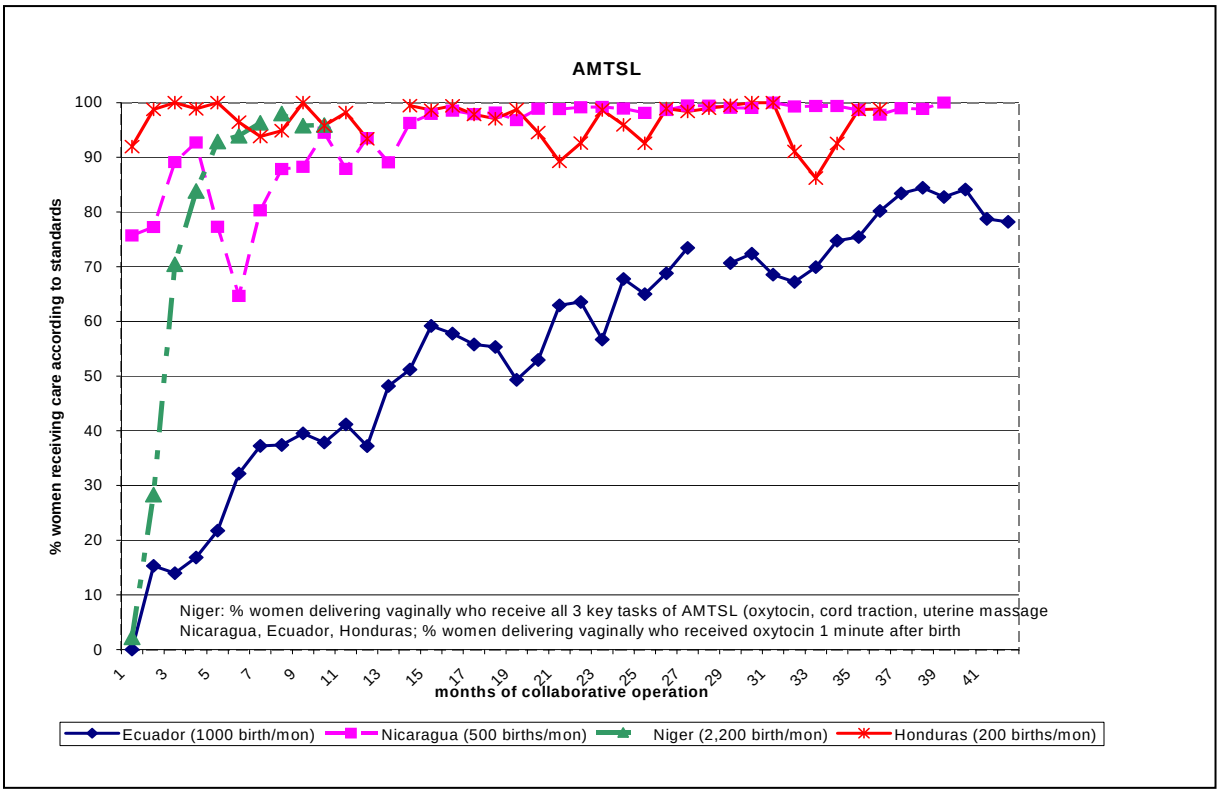
Data on quality of care (compliance with evidence-based standards) provided in Figures 6–8 are based on information extracted by quality improvement team members from medical records at health facilities, ranging from a sample of about 200 births per month in Honduras to 2,200 births per month in Niger. Data for compliance with AMTSL, use of the partograph during labor and delivery, and essential newborn care are shown below.

Active management of the third stage of labor

Figure 6 presents the results of monitoring AMTSL in collaboratives in **Ecuador**, **Nicaragua, Honduras**, and **Niger**. AMTSL was not new to the Nicaraguan and Honduran health systems when the collaboratives started, but in Niger and Ecuador, the collaboratives were responsible for introducing AMTSL into their systems. All three Latin American countries monitored the application of oxytocin one minute after delivery as their indicator. The Niger EONC Collaborative monitored compliance

with all three key AMTSL tasks (oxytocin, controlled cord traction, and uterine massage). In the case of Nicaragua, Niger, and Honduras, stable performance at 80% and above was reached within 15 months, with Niger going from 0% to above 90% in just 5 months.

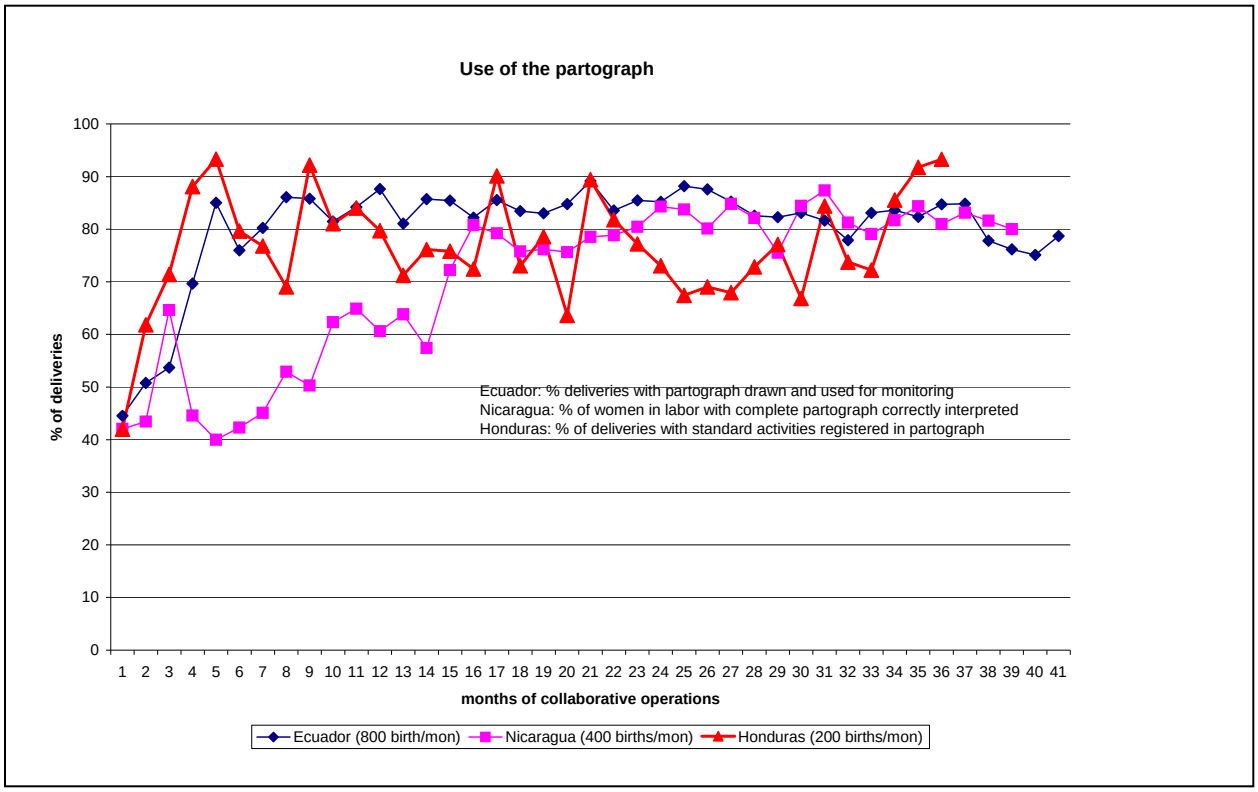
Figure 6. Compliance with AMTSL standards, Ecuador, Nicaragua, Honduras, and Niger



In Niger, the introduction of AMTSL was part of a package of EONC interventions introduced through integrated clinical and QI training delivered on-site. Achieving these levels of compliance was accomplished through a series of changes, including: introducing call schedules to ensure presence of skilled birth attendants at all deliveries, organization of pre-filled syringes of oxytocin in coolers in the delivery room, modification of the partograph to include a space for coding AMTSL and other EONC tasks, and posting of job aids.

In Ecuador, there was significant early resistance to the change in standards, but high levels of compliance were eventually achieved. Changes to achieve these results included meetings with providers to raise awareness, presentation of the evidence-based literature, practice on mannequins, and the introduction of job aids.

Figure 7. Quality of use of the partograph during labor and delivery, Ecuador, Nicaragua, and Honduras



Use of the partograph

Three collaboratives monitored use of the partograph during labor and delivery as part of the EONC package (**Ecuador**, **Nicaragua**, and **Honduras**). As shown in Figure 7, the partograph was in use prior to the inception of these collaboratives, but, at 40%, its use was not considered adequate in all three countries. After the collaboratives began, in Ecuador, 80% of deliveries had appropriate use after about eight months; in Nicaragua, it took longer, but use rose to over 80% consistent use after 22 months. In Honduras, there was more variation over time, but with a general upward trend. Changes made to ensure quality use of the partograph included more frequent training and coaching on correct partograph completion for all births.

Essential newborn care

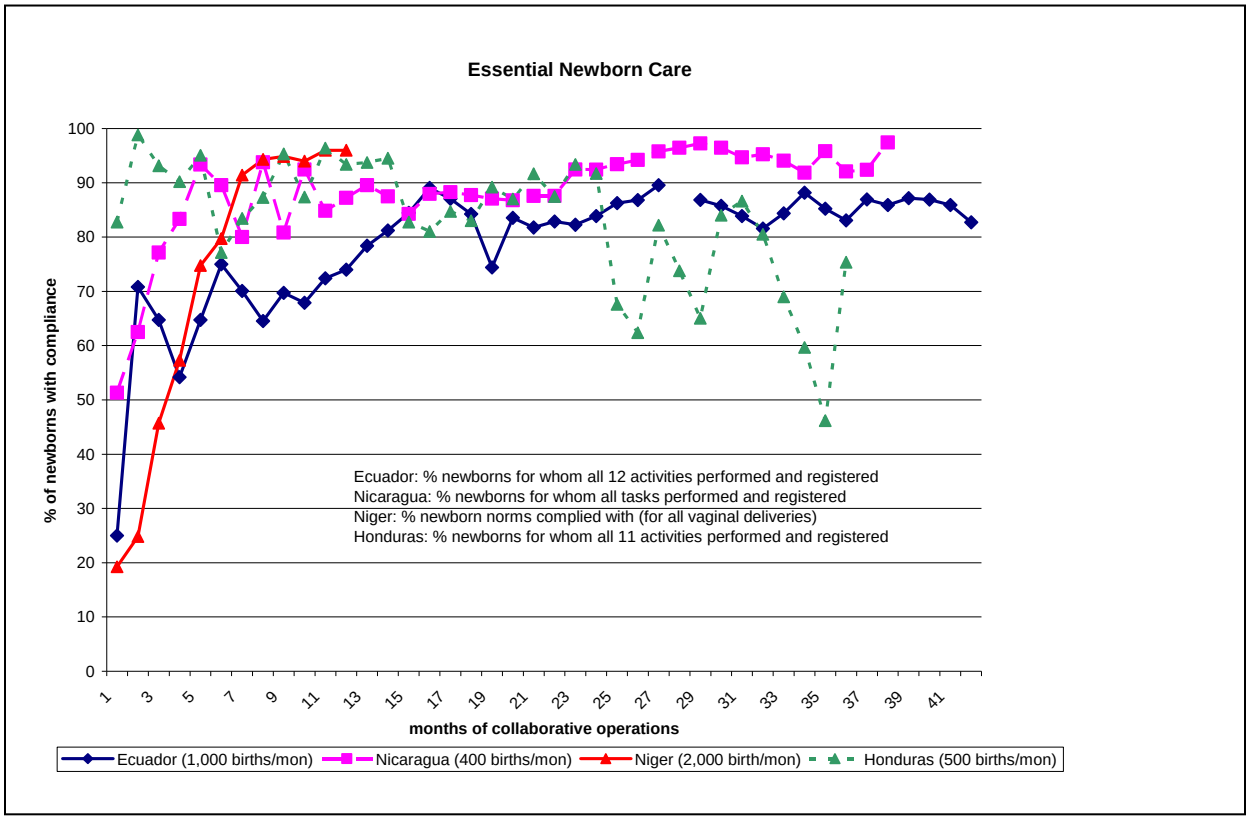
All four countries collected data on indicators related to essential newborn care (ENC), a package of routine interventions demonstrated to reduce newborn mortality by more than 50% (Lawn et al. 2005). The three **Latin American** collaboratives measured the percentage of newborns for whom the key tasks were completed and recorded. In the **Niger** Collaborative, they used an alternative formulation: average percent compliance with the package of ENC standards per review of a monthly random sample of charts.[4] As seen in Figure 8, all countries rapidly achieved (within 15 months) a high level of

[4] This indicator was considered to be a more sensitive measure of improvement since it gave credit for activities carried out and was not an all-or-nothing score.

compliance with their indicators. Moreover, the collaboratives generally maintained those levels, with the exception of Honduras. In Niger, these results were achieved even more quickly, within five to seven months, and continued to be sustained for six months after reaching high levels of about 95% or more.

Changes implemented to reach these high levels in Niger included: integrating immediate newborn care with AMTSL as part of immediate postpartum care using two-person team approach (usually skilled provider and auxiliary nurse), maintaining the delivery room at ambient temperature (turn off air conditioners and fans) and immediate drying and wrapping of the newborn for thermal control, immediate breastfeeding within one hour of delivery, creation of examination space for newborn, introduction of routine newborn exam (previously not conducted) in immediate postpartum period and prior to discharge, routine monitoring of newborn vital signs, integrating newborn vaccination into routine maternity services, assigning the midwife responsibility for care of the newborn, and frequent technical updates for staff.

Figure 8. Essential newborn care, Ecuador, Nicaragua, Honduras, and Niger



Treatment of obstetrical complications

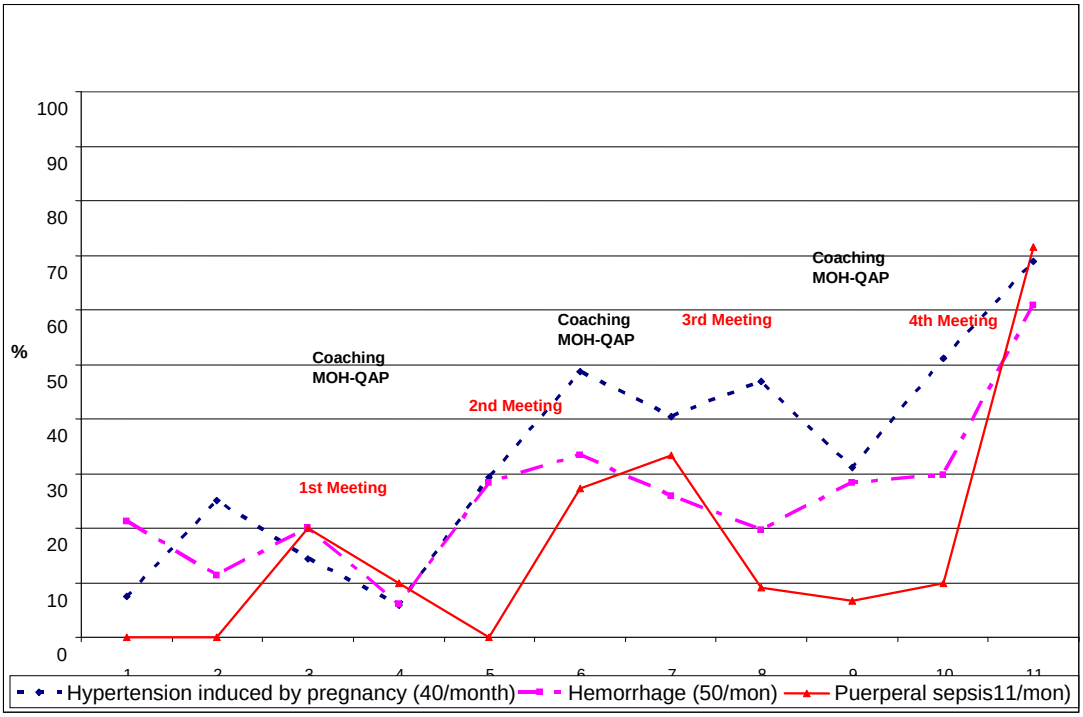
In principle, all three Latin American countries addressed improving care for obstetrical complications (primarily, hemorrhage and pre-eclampsia/eclampsia, which represent leading direct causes of mortality) as part of their EOC collaboratives. However, QAP found that within the broad scope of the EOC collaboratives, teams did not tend to focus specifically on obstetrical complications. To address this gap, **Ecuador** initiated a separate collaborative with six provincial hospitals in October 2006 to focus on standardizing and improving care for the three main complications: hemorrhage, pre-eclampsia/eclampsia, and sepsis. Data from the obstetrical complications collaborative in Ecuador are shown in Figure 9, where one can see a general trend in improved compliance with standards over the

short time span of the collaborative.

The six participating provincial hospitals struggled with the simultaneous introduction of improvement interventions for three different complications, all requiring complex case management and in many cases inputs and skills previously unavailable in targeted facilities. Over a period of 12 months, compliance with standards increased from 0–20% at baseline to about 70%; the collaborative is still ongoing. Changes implemented to achieve these results include: raising the visibility of obstetrical complications through improved documentation of complications and outcomes, redistribution of service delivery personnel to assure availability of skilled providers 24 hours a day, and introducing a spreadsheet of compliance with standards to allow analysis of the patient care process.

Figure 9. Management of obstetrical complications in Ecuador, six hospitals

Percentage compliance with case management standards for three main obstetrical complications



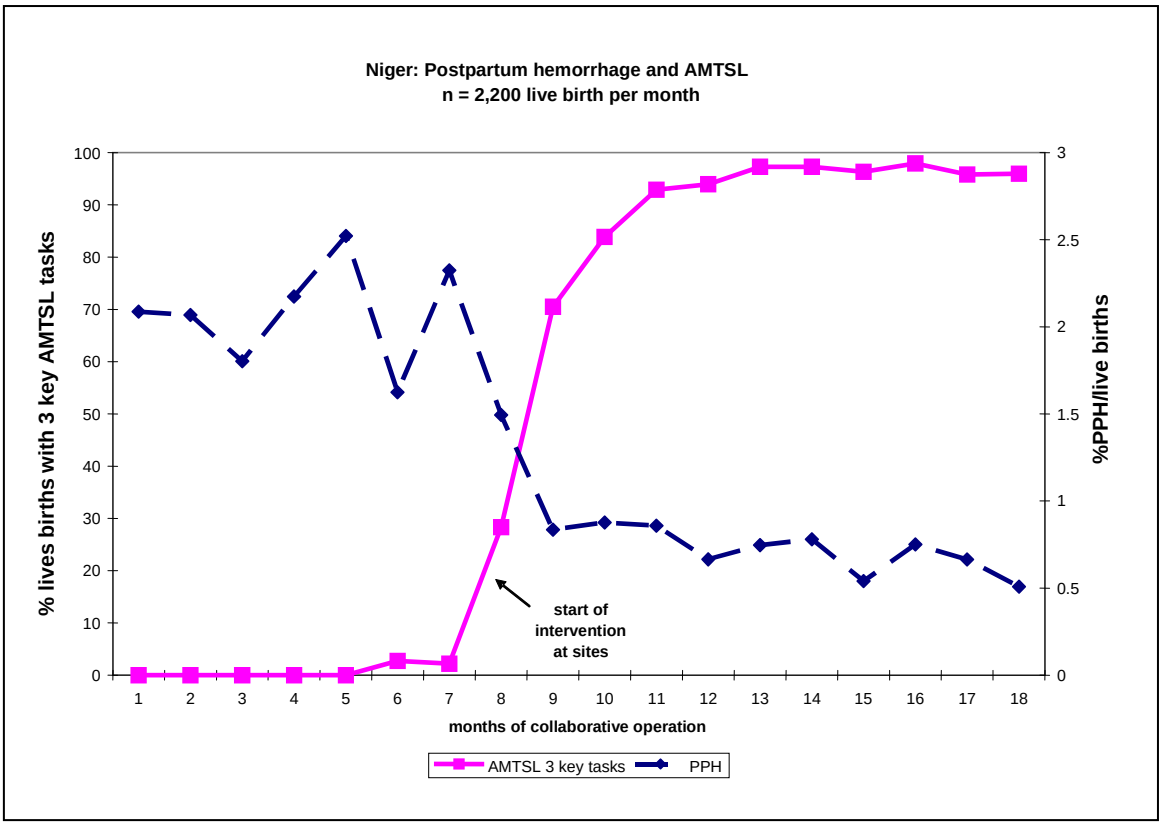
Impact on outcomes

All four collaboratives (**Ecuador**, **Nicaragua**, **Honduras**, and **Niger**) attempted to measure the effects of the changes made through the collaborative on health outcomes, either general maternal mortality or case fatality rates in the participating hospitals. It must be noted that the impact of the EOC collaboratives on maternal outcomes was difficult to demonstrate given the relative infrequency of maternal deaths in the participating facilities and the fact that most collaboratives targeted single complications (e.g., hemorrhage), while maternal mortality rates reflect a range of causes, including delays in seeking care at facilities.

The **Niger EONC** Collaborative also measured a proximal maternal health outcome, the incidence of postpartum hemorrhage (PPH). Measurement of PPH incidence assesses the effectiveness of the evidence-based AMTSL improvement intervention. The Niger collaborative monitored the incidence of PPH for vaginal births in all participating sites. Figure 10 demonstrates a decreasing incidence of PPH, measured for an average 2,200 live births per month, as AMTSL was introduced as part of routine immediate postpartum care. While one might argue about the precision of measures of postpartum

hemorrhage and thus the absolute level of effect, the trend reflects an impact. Training in the Niger EONC Collaborative emphasized correct measurement of PPH (defined as loss of > 500 cc blood).

Figure 10. Postpartum hemorrhage, Niger



2. Pediatric Hospital Improvement

The Pediatric Hospital Improvement Initiative included six collaboratives in six countries, but only three had continued funding and adequate data to monitor effects on process and outcomes over time: Nicaragua, Niger, and Tanzania. It should be noted that Tanzania's focus was on pediatric HIV/AIDS.

Effect on quality of care of pediatric care

Emergency triage assessment and treatment (ETAT)

Introducing ETAT involved a major redesign of processes of care in settings where, for the most part, triage had never been routine. Introducing ETAT required pediatric providers to acquire new responsibilities related to prompt and effective care for children arriving at their sites with urgency and emergency signs. The introduction of ETAT enabled health staff to reduce mortality for children arriving with urgency signs and empowered pediatric providers, who often struggle with the personal effects of caring for such high numbers of severely sick children. Acquiring competence in ETAT

Box 4. Case study: improvement of ETAT in Niger

Emergency triage assessment and treatment was a major component of the change package in all PHI collaboratives, including Niger. Prior to the collaborative, which started with 14 hospitals (two national, four regional, and eight district hospitals), no triage process existed in most facilities, and health staff were accustomed to taking patients on a "first-come, first-served" basis. Thus, creating an effective triage system required many changes in organization, knowledge and skills, and resources:

- Organization of care: creating a triage system with a room for triage; creating a stabilization room for emergencies; instituting triage forms, medical records, and case monitoring forms; on-call systems and better coordination with laboratory and pharmacy services (after hours); clear task delegation; treating emergencies without asking for payment; and daily staff meetings;
- Knowledge and skills: continuous on-the-job training during staff and other meetings, posting job aides, demonstration and practice of key tasks, awareness-raising about the importance of following standards; and
- Resources: ensuring availability of oxygen concentrators, medical records, and glucometers; creating a stock of emergency drugs available in the triage/stabilization rooms, the pediatric ward and the delivery room; and redeployment of personnel.

The following comments by PHI site team members exemplify the processes used to change the behavior of both providers and patients into a new way of addressing emergency pediatric cases:

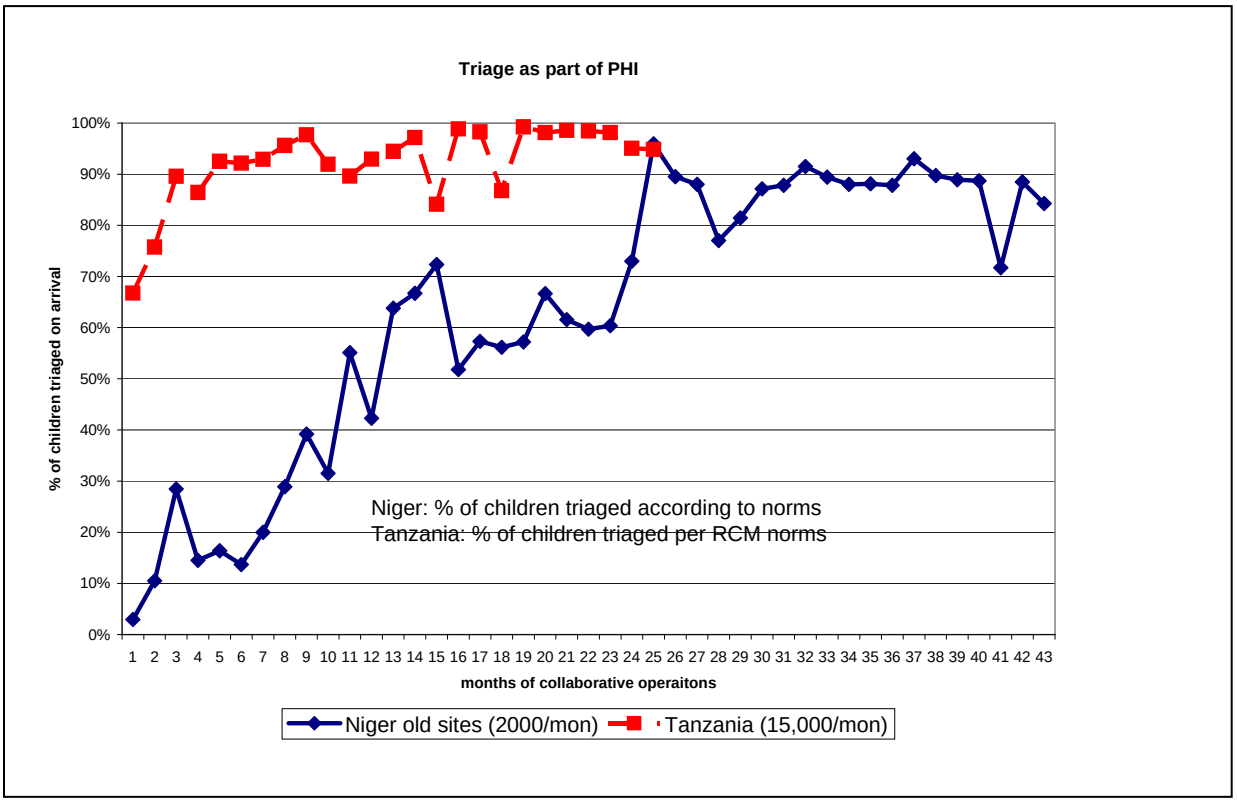
"Now we have learned to look at what is waiting for us on the benches outside our office. I find myself glancing at who is outside my office for who needs care first. Before, we never thought of doing anything else than 'first come, first served'." – Urban District Health Director

"Before, pediatric patients entered the hospital grounds and went wherever they wanted; there was no triage. We wanted to do triage so we set up a Triage Unit with staff which we trained. But we found that children were still not all being triaged because they were not all coming through the triage unit. So we decided to close the gate to the hospital, putting a watchman at the door who told everyone as they entered that they needed to go through the Triage Unit first. That made a big improvement, but some children were still slipping through. So finally, we added the step of the doctors sending any children coming to them without a triage form back to the Triage Unit." – Rural District Hospital Director

resulted in a strong feeling of empowerment and personal fulfillment for providers. Box 4 provides more detail on the ETAT experience in the **Niger PHI** Collaborative.

Collaboratives in both **Niger** and **Tanzania** measured the percentage of children being triaged. It should be noted triage was not performed in either country prior to the collaborative and that collaborative sites engaged in major process redesign to introduce systematic and routine triage processes. Figure 11 shows the results for triaging children and indicates that although steady progress is being made in Niger, the systems of triage are not yet stable. The slow increase of the curve indicates the substantial effort and profound changes required in Niger in terms of skills, organization, and inputs (see Box 4 for details). Significant turn-over of personnel, a common challenge throughout Africa's health care systems, has continued to present major challenges and has affected the consistency of ETAT results in Niger. Staff turn-over may in part explain the drop in triage coverage in Figure 11. The Tanzania collaborative data collection started about 18 months after Niger's, applying best practices from Niger and elsewhere to achieve faster improvements. Fairly stable results of greater than 90% triage coverage can be seen within about six months of the start of the **Tanzania PHI** Collaborative.

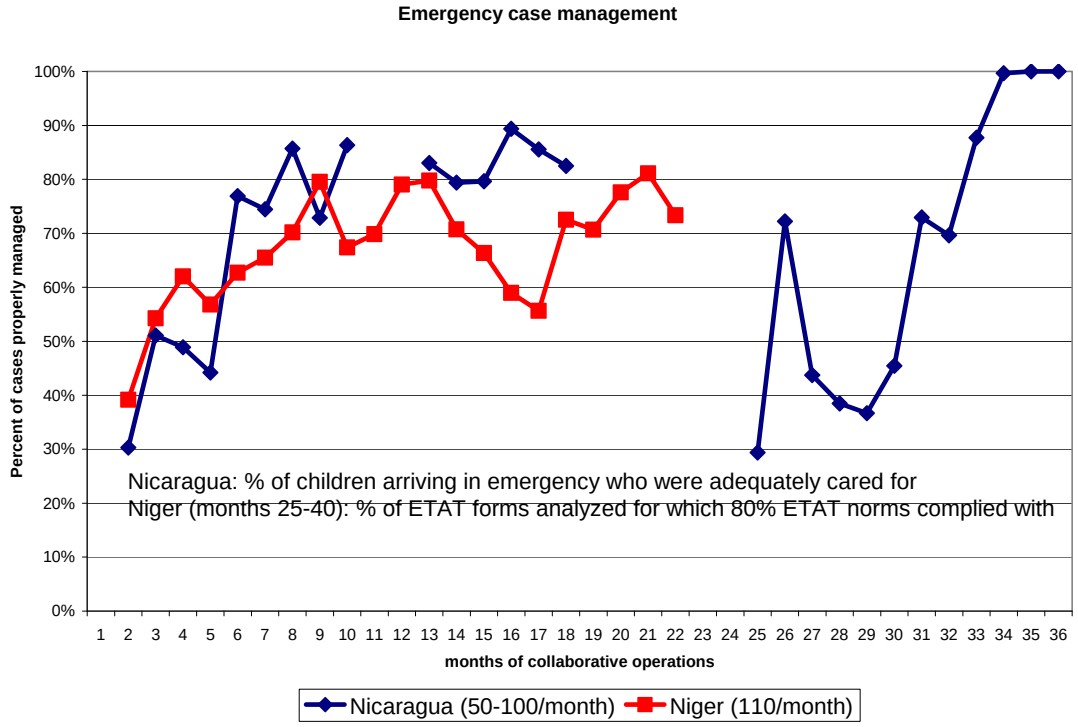
Figure 11. ETAT, Niger and Tanzania



In addition to instituting a system for triage, ETAT sought to put in place systems to improve case management of children with danger signs, such as respiratory distress, severe dehydration, etc. Some of the improvements introduced by teams including bringing the laboratory services directly into the pediatric ward, pre-assembling pediatric emergency care trays with drugs and equipment, posting charts with infant and child referral care and nutrition guidelines in all pediatric care areas, and introducing Critical Care Pathway forms into the medical record for all admitted children.

Figure 12 shows results for **Niger** and **Nicaragua**, where PHI collaboratives monitored compliance with treatment for emergency conditions based on adapted WHO ETAT standards. Again, it can be seen that Niger and Nicaragua PHI collaboratives achieved levels of 70–90% compliance within six months, but that sustaining compliance with ETAT standards presented more challenges. Data from Niger start from month 25 of the collaborative because this was when reliable data were consistently available (see Box 3 for details). The breaks in the Nicaragua data are due to a health worker strike that not only affected data collection but also created the need for re-introducing effective processes and teamwork to achieve results.

Figure 12. Compliance with standards for emergency pediatric care, Nicaragua and Niger

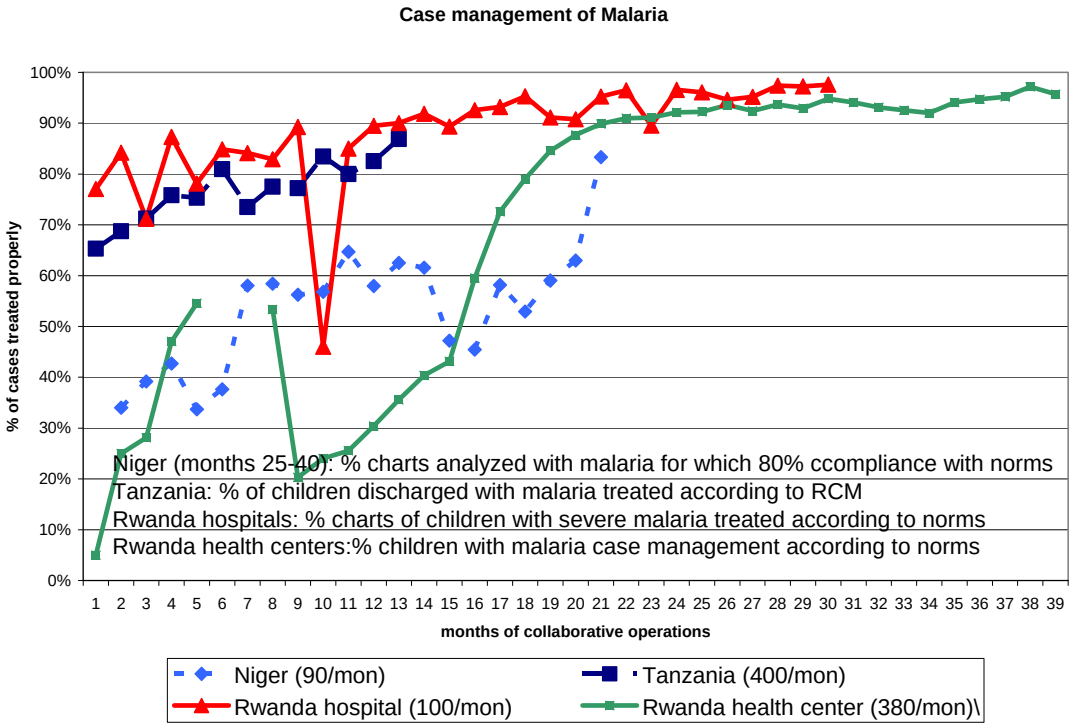


Case management of malaria

PHI also included case management of non-emergency cases of malaria. As seen in Figure 13, the PHI collaborative in **Tanzania** and the **Rwanda Pediatric Malaria** Collaborative (which was not part of PHI) were able to achieve consistently high levels of compliance within 12–18 months. In **Niger**, where the indicators are quite strict and focus on essential tasks, the progress has been less consistent.

The improvements implemented include on-call schedules, twice daily monitoring of hospitalized children, training, and provider job aids. Figure 13 also includes data on compliance with malaria treatment standards from Rwandan health centers: Here improvements took longer to become institutionalized, but by 18 months, the 20 health centers had reached 80% compliance consistently. These results were achieved through staff training, improved division of labor, and ensuring permanent lab staff and equipment. At the hospital level in Rwanda, triage systems were implemented, as well as on-call systems, training, job aids, and improved laboratory services.

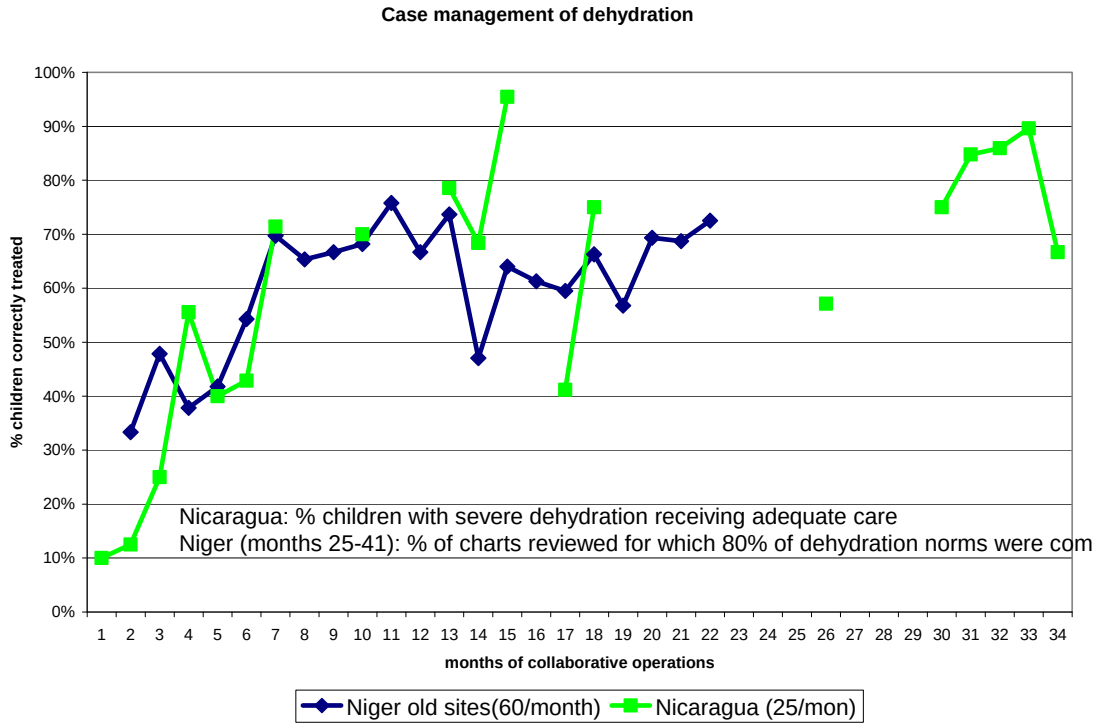
Figure 13. Routine case management of pediatric malaria patients, Niger, Rwanda, and Tanzania



Case management of dehydration and diarrhea

The PHI collaboratives in **Niger** and **Nicaragua** measured compliance with case management standards for diarrhea and severe dehydration. The numbers of cases here are small, but compliance shows steady improvement over time (see Figure 14). There is still work to be done, however, to consistently achieve compliance with dehydration case management standards.

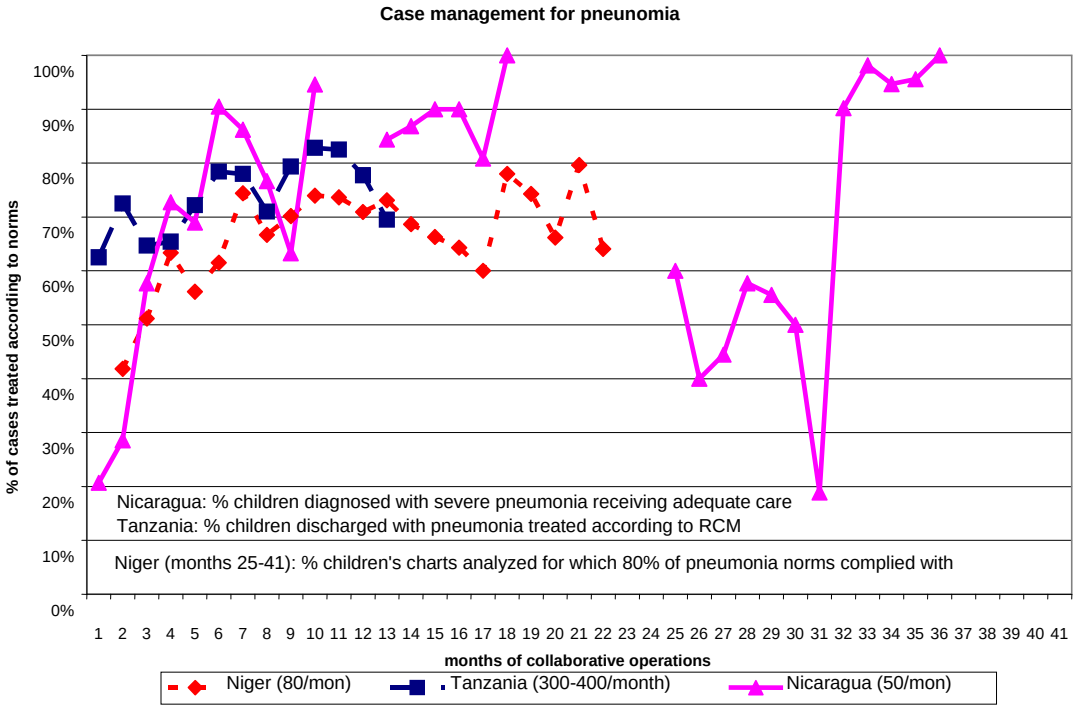
Figure 14. Routine case management of hospitalized pediatric patients with dehydration, Niger and Nicaragua



Case management of pneumonia

Case management of pneumonia shows similar patterns to those of dehydration: steady progress in complying with case management standards but not as consistent improvements as in malaria (Figure 15).

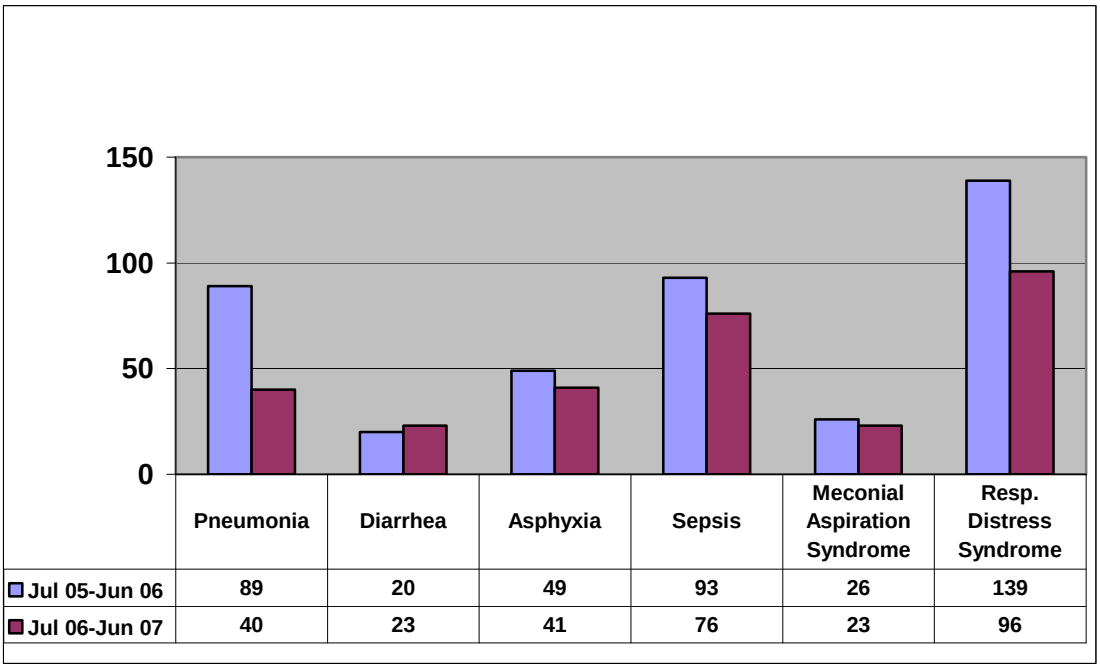
Figure 15. Routine case management of hospitalized pediatric pneumonia patients, Niger, Tanzania, and Nicaragua



Impact on outcomes

The issues of outcomes data quality discussed for maternal health interventions are similar for child health outcomes. Even a measure such as reduction in 24-hour mortality has issues stemming from lack of baseline information and limitations on how the indicator is constructed. The **Nicaragua PHI** Collaborative attempted to measure impact on cause-specific mortality, both in terms of trends in total number of deaths by cause and in case fatality rates. Figure 16 compares total number of deaths among children under five years admitted to the hospital for six different causes for 11 of the 14 hospitals participating, comparing two consecutive 12-month periods. Large drops were seen in the number of deaths due to pneumonia and respiratory distress and, to a lesser extent, sepsis. The **Niger PHI** Collaborative was able to measure reductions in acute malnutrition case-fatality stemming from the nutritional recuperation intervention (see Table 11).

Figure 16. Hospital deaths by pediatric condition, 11 PHI hospitals, Nicaragua



	Pneumonia	Diarrhea	Asphyxia	Sepsis	Meconial Aspiration Syndrome	Resp. Distress Syndrome
Jul 05-Jun 06	89	20	49	93	26	139
Jul 06-Jun 07	40	23	41	76	23	96

Table 11. Results from introducing effective nutritional recuperation, Niger, 15 PHI sites

Total admissions from April 2006 to March 2007: 1,936 children with acute severe malnutrition

Indicator	Apr-Jun 2006	Jul-Aug 2006	Oct-Dec 2006	Jan-Mar 2007
% children admitted referred from primary health center or community	43%	45%	64%	55%
% children seen in health sites systematically screened for nutritional status	0%	13%	30%	41%
% available essential inputs	67%	79%	72%	91%
% acutely malnourished children with > 80% case-management compliance with recuperation standards	12%	31%	74%	88%
Acute malnutrition case-fatality rate	29%	26 %	16%	13%

3. HIV/AIDS

QAP has implemented collaboratives on services related to HIV/AIDS in Rwanda (PMTCT/VCT and ART), Tanzania (treatment of pediatric AIDS), Uganda (ART), Russia (HIV-TB, ART), and Nicaragua (PMTCT/VCT). Data will be presented for Rwanda, Uganda, Russia, and Tanzania (Nicaragua's collaborative is still too new to have comparable data).

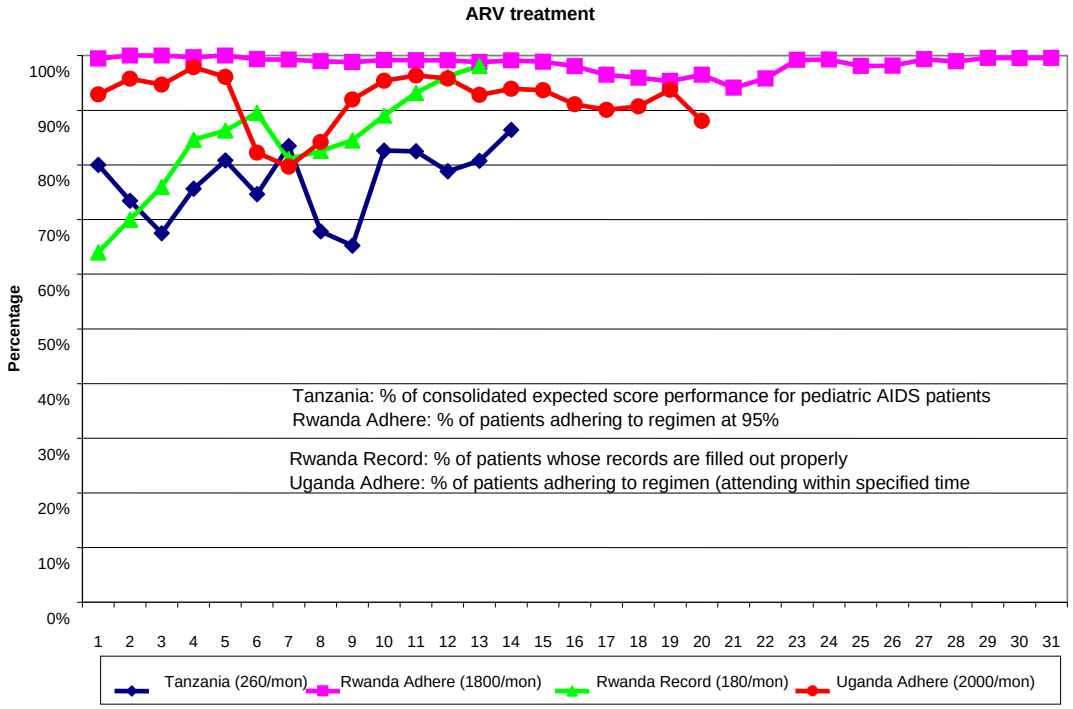
Effect on quality of HIV/AIDS services

In the HIV/AIDS collaboratives, in contrast to those related to EONC and PHI, national level standards had been generally developed and/or updated just prior to the collaborative, so the collaboratives worked on improving operational issues related to implementation of these standards. In many cases collaboratives used national level HIV/AIDS indicators as their measures of process and outcomes.

Treatment with ART

While four countries collected data on ART (Tanzania, Uganda, Rwanda, and Russia), only **Tanzania**, **Uganda**, and **Rwanda** had sufficient data over time to compare. The trends, seen in Figure 17, reflect a variety of indicators and patient groups. Tanzania's line focuses on adherence to standards of care for pediatric AIDS patients, while Rwanda and Uganda measured patient adherence (adults). Rwanda also examined record keeping. Adherence measures in Rwanda were high to start and remained stable, while in Uganda the data had more ups and downs, but still remained higher than 80% throughout. In Tanzania, provider behavior, as measured by record keeping in Rwanda and provider compliance with standards started lower and made progress over time. In Rwanda, providers were sensitized to the importance of record keeping and worked to complete patient records during the consultation. In Uganda, improvements included introducing special forms for assessing client adherence, conducting adherence-specific counseling and recording counseling in a register, creating an adherence scoring table, and asking patients to bring in pill containers and pill balances.

Figure 17. Quality of care for ART patients, Tanzania, Rwanda, and Uganda

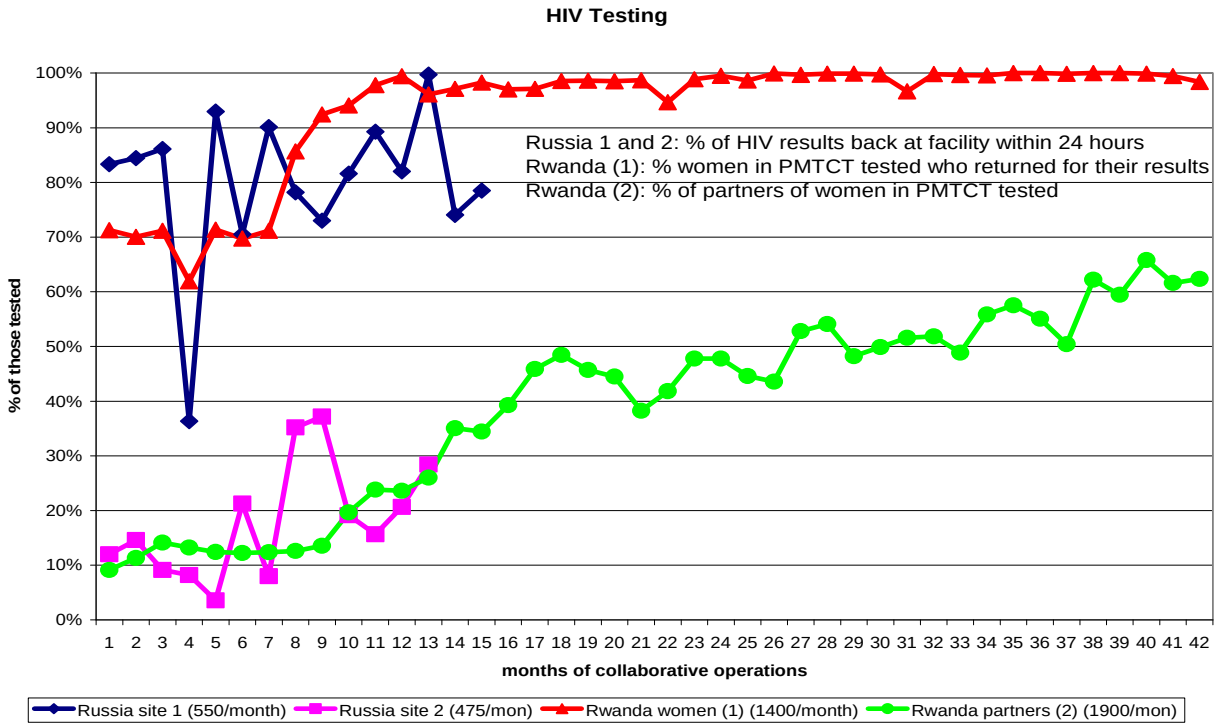


Testing for HIV: VCT and PMTCT

Two collaboratives had measures on the quality of VCT/PMTCT. In **Russia**, they monitored the speed of test results. In **Rwanda**, where women were tested in the PMTCT program during prenatal visits, collaborative teams monitored whether the women actually retrieved the results of their tests and whether their partners were tested. Figure 18 shows that after about 10 months, facilities were achieving consistently high levels of women retrieving their test results. This was achieved primarily through changes in the system to ensure that test results were available on the same day as the testing, so that women did not have to return for their results. Changes instituted to achieve the rapid turnaround of test results were: sending samples immediately rather than sending them in batches and

analyzing them immediately; and reducing staff lunch to ensure all clients received post-test counseling the same day. Testing of partners took longer to reach higher levels, but made steady progress over time also. To achieve this rise, a variety of strategies was used to get partners to come in for testing, including sending letters to partners to accompany their spouse to the next prenatal visit and community meetings with local authorities to inform and educate men on the importance of testing. In Russia, improvements in testing for HIV included: improved algorithms for exchange of information between those conducting testing and the AIDS centers, creating a database of all tested patents and recording when test results were confirmed, and training of providers.

Figure 18. Testing for HIV, Russia and Rwanda



Box 5. Successful changes in the Rwanda PMTCT/VCT Collaborative

The Muhura health center had been part of the PMTCT Collaborative since March 2003. Located in the East Province of Rwanda, this site is a large Catholic missionary health center that serves over 30,000 people. In an effort to raise low indicators after the third learning session, the Muhura QI team developed many unique changes that other teams at learning sessions had not thought of. For example, to increase the percentage of partners of women at the prenatal clinic who were tested, they implemented the following changes:

- Sent invitations to partners to get tested,
- Counseled women how to motivate their partners to get tested,
- Created association of people living with HIV/AIDS,
- Involved local authorities who would get tested themselves during VCT sensitization campaigns, and
- Involved church leaders in VCT sensitization campaigns.

The team implemented other improvement changes to increase the percentage of women who delivered at the health center:

- Encouraged partners to attend informational sessions at the health center, where importance of facility delivery was emphasized;
- Allowed women who live far away to stay at the health center free during the period before delivery;
- Sensitized women on joining community health insurance schemes (*mutuelles*);
- Held a wide sensitization campaign on importance of delivering at a health facility;
- Gave incentives to community health workers to refer women for delivery at the health center; and
- Provided monthly refresher training to aid nurses, community health workers, and women in associations of people living with HIV/AIDS on spreading the message.

Such interventions brought on spectacular changes in a very short period of time, and in the subsequent learning sessions, the team heard that some of their strategies had been applied by other teams at other health centers and hospitals.

Integration of HIV and TB screening

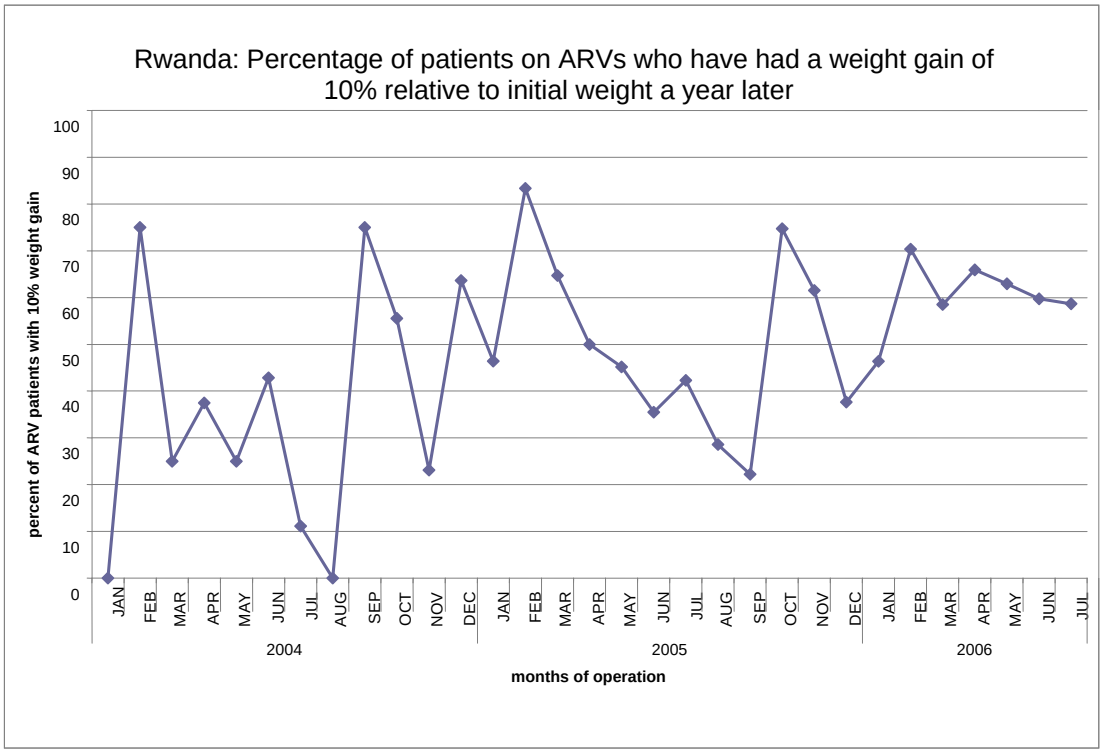
To maximize the number of HIV patients receiving TB treatment and the number of TB patients screened for HIV and thereby eligible for ART, screening programs need to be in place. In **Uganda**, the HIV/AIDS program screened for active TB among AIDS patients, while in **Russia**, the collaborative focused on screening TB patients for HIV co-infection. Both collaboratives show steady improvement. Uganda has succeeded in reaching close to 100% of AIDS patients with TB testing. In Russia, data have been reported mainly as counts of TB patients who received VCT, rather than proportions. The one exception is the TCS collaborative pilot TB clinic site in St. Petersburg (TB Dispensary #5), which demonstrated a doubling of the proportion of TB patients provided with voluntary counseling and testing for HIV in 2006 compared to 2005: The percentage of TB patients registered at the TB clinic who received VCT once a year rose from 13.9% in 2005 to 31.3% in 2006. The change was most notable after the TB specialist at the clinic was trained in VCT in September 2005.

Improvements in Uganda included sensitization of PMTCT/ANC staff about TB screening, systematic screening of all VCT clients for TB, and checklists for TB assessments. In Russia, improvements included screening algorithms and new reporting forms, as well as systems for referral when HIV is detected.

Impact on outcomes

As in the case of pediatric hospital care and much of obstetric and newborn care, there are few outcome measures for which the collaboratives could achieve a visible impact (due to other factors, sample sizes, and data issues). In **Rwanda**, one measure was monitored: the percentage of patients on ARVs who had a 10% weight gain over initial weight at entry into the ART program (see Figure 19). This measure did not show a consistent increase over time.

Figure 19. ART outcomes: impact of treatment on weight gain, Rwanda



B. Comparing Results between Improvement and Spread Collaboratives

Collaboratives can be categorized into demonstration and spread collaboratives, as a mechanism for extending the change package and moving towards scale. One can look at the phenomena of spread and scale-up in a variety of ways:

- What levels of coverage of the possible universe of facilities were reached?
- How fast was the collaborative able to move to that degree of coverage?
- Are there efficiencies gained at new (spread) sites, due to learning from sites participating in the initial demonstration phase?

1. What Level of Coverage Was Achieved? Was Quality Achieved at Scale?

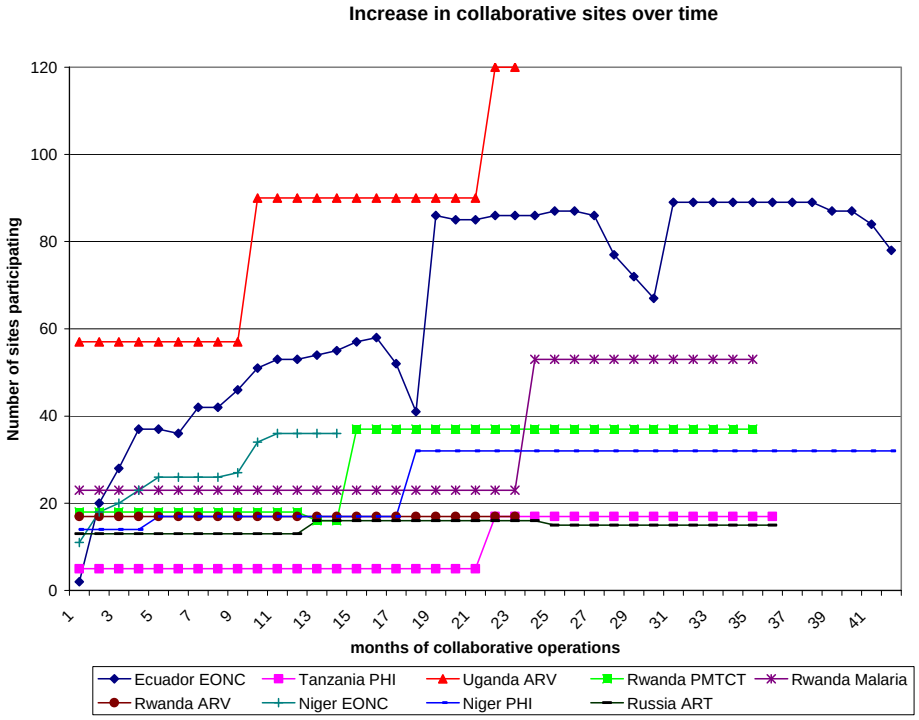
The extent of coverage with an improved change package will be a function of the size of the universe, the number of geographic areas covered, and the percentage of facilities covered within a geographic area, among other factors. As supported by the information in Table 9 on extent of spread by collaboratives, QAP-supported collaboratives (listed in Table 1) achieved coverage of over 80% of

regions or districts in five of the 14 countries where QAP III implemented collaboratives: **Ecuador**, **Nicaragua**, **Niger**, **Rwanda**, and **Uganda**. This is a remarkable achievement in scale-up of improvements. Moreover, in **Honduras** and **Russia**, QAP achieved complete coverage of facilities in regions included in the collaboratives.

2. How Fast Were Collaboratives Able to Spread Improvements?

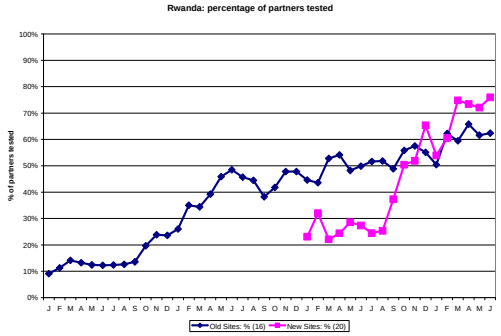
It should be noted that not all collaboratives had intentional spread strategies from the beginning. However, almost all of the collaboratives that lasted more than 18 months have increased the number of sites participating (see Figure 20). Expansion of sites has generally taken place within 12–21 months of the start of the collaborative.

Figure 20. Rapidity of spread and number of sites in selected QAP collaboratives



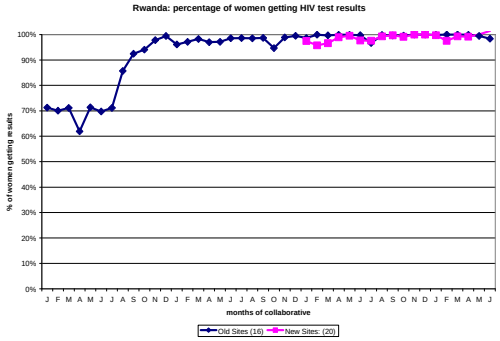
While collaboratives in Uganda and Ecuador had the largest number of sites, they also had a large number of possible sites. The Ecuador EOC Collaborative covered, as of June 2007, about half the hospitals in the country; the AMTSL Spread Collaborative that followed on the EOC Collaborative has sought to achieve 100% coverage of public sector facilities that attend deliveries. As of January 2008, the Uganda ART Collaborative covered 55% of possible facilities (120 out of 220). The Niger EONC and PHI collaboratives cover about 65–75% of referral facilities, even though the absolute numbers are smaller. In Honduras, the EOC collaborative covers all five departments that are priority for USAID (a quarter of the departments in the country) and has covered 100% of hospitals and 82% of health facilities within those departments.

Figure 21. Testing partners, Rwanda



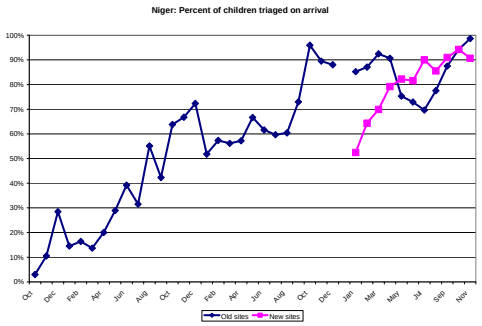
(Jan. 2003 – June 2006)

Figure 22. Test results, Rwanda



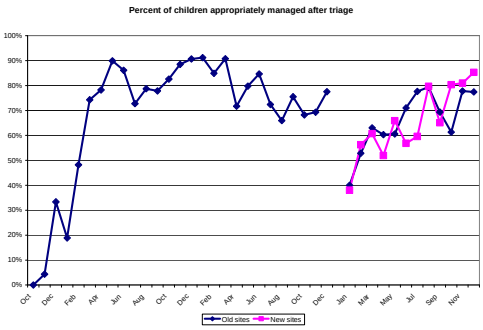
(Jan. 2003- June 2006)

Figure 23. Triage, Niger



(Oct. 2002 – Dec. 2005)

Figure 24. Case management, Niger



(Oct. 2002 – Dec. 2005)

3. Does Extension of a Collaborative Lead to Faster Results in the Spread Sites?

Only a few of the collaboratives stored their data in ways that were easy to parse results for old and new sites separately. Some examples are presented here from Rwanda and Niger where such analysis was possible. These results indicate that new sites were able to reach equal levels of performance more quickly than did old sites. This is true both for the point at which they start (higher) and how quickly they reach good performance.

Data from the **Rwanda PMTCT** Collaborative (Figures 21 and 22) show that teams added at later stages of the collaborative caught up with initial teams in their indicator performance faster than it took the original teams to achieve the same level of results (such as getting partners tested as part of PMTCT). Moreover, the new teams were able to start at a high level of performance in the case of getting test results back to women. The latter shows the impact of an improved change package, which was able to immediately achieve the desired results.

Data from the **Niger PHI** Collaborative indicate that new teams were able to quickly catch up (in the case of triage) and were able to operate at the same levels as old teams for appropriate management of children after triage. It should be noted that the

> "*We were having a terrible time with the mobility of our health personnel. It was having an effect on our graphs, which oscillated up and down as trained staff left, and untrained staff took their place. I took our graphs to the Ministry to show the effects and advocated for more stability*!"
>
> – Regional Coach, Niger

case management indicators were modified (see Box 4), so the data in the first part of the graph in Figure 24 are not directly comparable with those in the latter part. Nonetheless, after January 2005, when the new sites were added, one can see that they were able to start at the same level as old sites and improve at similar speed. Similar results were seen in Niger for hospital case management of malaria, dehydration, and pneumonia.

The spread of AMTSL in **Ecuador** through the EOC Collaborative and then the AMTSL Spread Collaborative provide evidence for the faster rate of uptake of a best practice among expansion sites. When the EOC Collaborative was launched in 2003, AMTSL was not practiced in Ecuador and was not included in the national obstetric care standards of the Ministry of Health. QAP started a dialogue with the MOH about the international evidence for AMTSL and obtained MOH permission to test this internationally accepted intervention in the collaborative facilities. Although all three elements of AMTSL were taught, only administration of oxytocin was monitored for practical reasons.

Use of AMTSL increased slowly but steadily and reached levels of around 60–70% by the end of 2004. Two main reasons for the slow pace of increase were the fact that new facilities kept joining the cohort at different points in time, thus lowering the group average and resistance from some health personnel to apply AMTSL when it was first introduced in a facility. Resistance came mainly from the unfounded suspicion among providers that oxytocin would actually retain the placenta and the fear of doing harm to the mother by applying controlled cord traction. Additional difficulties had to do with lack of sufficient oxytocin and lack of awareness of the benefits of AMTSL. CQI teams in the collaborative discovered and addressed these sources of resistance by testing several interventions, such as distributing medical literature on AMTSL, training activities, advocacy for AMTSL by recognized obstetricians, and posting of job aids.

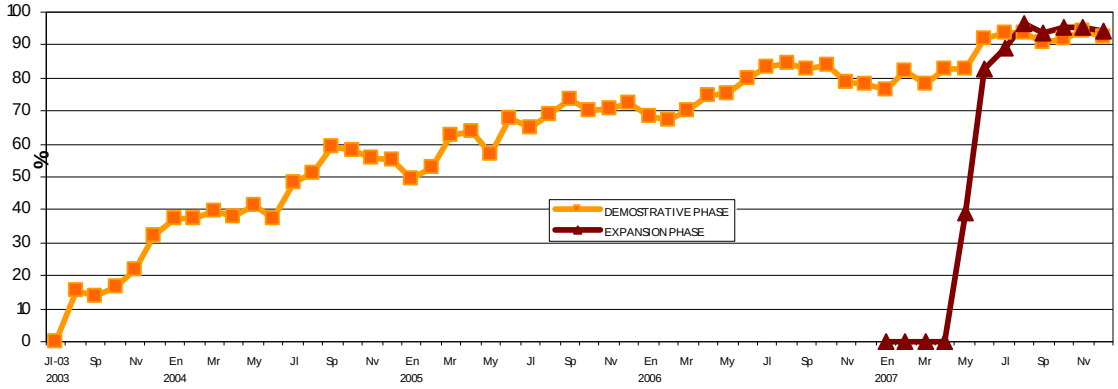
In early 2006, after continued advocacy by QAP and the results showing successful practice of AMTSL in the facilities participating in the collaborative, the MOH approved an addendum to its national policy that officially incorporated AMTSL in obstetric care standards. In April 2006, the MOH convened a national meeting to officially launch its Maternal Mortality Reduction Plan and policy documents for implementing specific strategies in the entire country, including AMTSL and continuous quality improvement of EOC.

In 2007, QAP and the MOH started a new spread collaborative that was designed to rapidly achieve high levels of coverage of AMTSL in facilities in provinces that had not participated in the EOC Collaborative. Based on what CQI teams had learned in that collaborative, the AMTSL Spread Collaborative distributed a package with strong evidence for AMTSL and a video demonstrating the application of AMTSL and provided training on the specific elements that providers were having difficulty understanding and implementing. High-profile doctors were enlisted to help in the training and lend credibility to the new practice.

Figure 25 shows the increase in the use of oxytocin as a proxy measure for AMTSL in 12 of Ecuador's 22 provinces between July 2003 and December 2007 and for 58 spread facilities for January–December 2007. It is notable that the practice of AMTSL increased from 0% to 70% of attended normal deliveries in a 30-month period in the original (EOC) sites, but from 0% to over 90% in a 12-month period in the spread sites. The national campaign to spread AMTSL in the new sites also appears to have helped to improve compliance with AMTSL in the original sites.

Figure 25. Percentage of deliveries where oxytocin was administered, Ecuador, demonstration and expansion phases

July 2003–December 2007



C. Impact of Participation in a Collaborative on Individuals, Teams, and Institutions

1. Impact on Individuals Participating in the Collaborative

QAP collaboratives had a remarkable impact on participating individuals (see examples from Niger in Box 6). One of the common themes across collaboratives for individuals was "empowerment." It has been empowering for health professionals to see that results have "real meaning" and can drive decisions. Individuals participating in collaboratives feel that they matter. In Niger, a health professional

Box 6. Testimony from those participating in a collaborative at site team level

"In the beginning, we were afraid that applying all those norms would take a lot of time, but now it has become the habit." – Midwife, rural district hospital

"I have been given clear responsibilities and I feel up to the job! Before we did not work as a team at the maternity, everyone just stayed in their own corner." – QIT member, rural district hospital

"Before, I thought I was the big boss. Now, I understand that everyone has something to contribute."

– Urban district hospital director

"We achieved these reductions [in in-hospital pediatric deaths] through team spirit, applying the norms, self-assessment, improved communication, and dynamic leadership."

– QIT, pediatric ward, Central Hospital

"This is really the first time we really worked in a team." "We feel guided and supported by the team. We have a place to discuss our problems." – QIT members, Central Hospital

"The collaborative approach brings about a change in behavior. Staff from various wards now meet to talk about problems and solutions! This never happened before. Consciousness has been raised to manage patients and resources better. We have seen that we can make improvements without a great influx of resources."

– Director, National Hospital

"Now we can discuss problems and find our solutions within the team, without always having to ask the Head Doctor or the Administration of the hospital." – QIT member, Regional Maternity

"The collaborative helped us find the willingness and desire to do things well."

– QIT member, Regional Maternity

said, "Now, when I have an idea, people will listen to me." Collaboratives contribute to a more egalitarian participation in decision making: Doctors listen to nurses, and hospital directors listen to health staff when they have data to present and ideas for improving compliance with standards and health care results.

In the Niamey Central Hospital, improvement in quality of care was achieved through the work of teams under **Niger PHI**. Then, the hospital stopped receiving essential drugs (because funds were diverted to other activities), and quality measures declined. The hospital unit director was able to show the related data and make the case for the essential drugs that were necessary to comply with standards and provide good quality care. Another health manager in Niger was able to provide evidence of the negative effect of turnover to the Ministry of Health and to argue, "Stop taking my people!"

Many initiatives work with data without showing such evidence of personal empowerment, so how does empowerment come about in collaboratives? An important factor contributing significantly to empowerment is the context of team sharing (typically, in learning sessions). This sharing has helped to create a *community of practice* that has promoted sharing and friendly competition and honors the contributions of individuals and teams to improving care in everyone's home facility. As team members get more skilled in and comfortable with analyzing and using data, they use it for improving care and for advocacy. It gives them a new and convincing language to interact with other parts of the health system. Members of collaboratives report feeling part of something bigger and important for their country. Not only do they have data for improving care, but they are doing it side-by-side with colleagues, national health leaders, and international health experts.

This by no means happens to everyone. It happens to enough collaborative participants, however, to create a sense of a larger mobilization toward important common goals.

2. Impact on Institutions Participating in the Collaborative

QAP collaboratives also had a significant impact on participating institutions (see Box 7 for example from Niger). In many QAP-supported collaboratives, an institutional plan was established from the beginning along with a plan for spread. This made it possible to build institutional solutions side-by-side with the evolution of the collaborative.

Box 7. Testimony from the field on changes at an institutional level, Niger

"We are already integrating coaching into our regular supervision and we now require that collaborative results indicators be presented at all regular district and regional meetings. We hope that when our partners are no longer here helping us, the activities will continue because they have been routine for us."

– Deputy Regional Health Director (and regional coach)

"Before, it was really hard to make changes. The changes we wanted to make all needed the approval of the District Medical Officer (e.g., establishing a triage service, assigning staff to triage, acquiring material and equipment), and he was not involved or interested in what we did. But now he even participates in some of our meetings and he tries to help us solve the problems."

– Rural District Hospital Director

Some of the motivation for this impact is directly related to the impact of collaboratives on individuals. Individuals stationed in high positions who have become motivated by their participation in collaboratives have initiated policy and institutional changes to support continued health improvements. An example is a WHO representative in **Niger** who became convinced of the power of collaboratives to increase compliance with standards based on his experience with the PHI collaborative. He then began promoting the use of the collaborative approach and, in fact, introduced it for improving IMCI

compliance. As a member of an important organization, he had the power to promote collaboratives through his institution.

From the beginning, the **Nicaragua PHI** Collaborative was aligned with country policies and took place in the context of national implementation of the *Iniciativa de Unidades Amigas de la Madre y la Niñez* (Mother and Baby Friendly Health Units Initiative), a focused accreditation program based on criteria related to availability and quality of services. Thus, while the QAP effort focused initially on only six hospitals, many of the tools and methods were shared more broadly because it took place in the context of a larger national program. The Ministry of Health's Director of the Department of Hospitals (Dr. Roberto Jimenez) described how he perceived the project at the time as a roadmap for his mandate [for decreasing pediatric morbidity and mortality and improving quality of care] as director of secondary hospitals: "I was willing to take a risk because I was aware as a pediatrician that it was my responsibility…then they came and offered me the solution, with all the supporting evidence."

In **Rwanda**, a number of the improvements tested successfully by **PMTCT** collaborative teams were adopted nationally. At the end of QAP's work with the collaborative, it was common practice for health facilities to provide HIV test results on the same day as the test, give Nevirapine at first contact (the same day as the HIV-positive test result is given), and provide written invitations to partners to be tested (a change developed by the Kabgayi site and replicated through the collaborative structure).

In the **Russia TCS** Collaborative, many of the successful innovations developed by the pilot teams led to the development of administrative orders (*prikazy*) that mandated the spread of a practice to other institutions and organizations throughout the region. In Orenburg, new practices for pre- and post-test counseling, algorithms of care delivery to PLWHA, and information exchange between levels of care were mandated throughout the oblast through Order #76. In May 2007, the Orenburg Oblast Ministry of Health issued Order #666 on TB screening and isoniazid preventive therapy (IPT) among HIV patients. The order has seven appendices, including the algorithm of TB screening among HIV patients; the screening program, including those responsible for TB screening organization and implementation venue, methods and information exchange; IPT guidance; TB screening and IPT trackers; and a register for patients with TB/HIV co-infection. The decentralization of authority to monitor patients on ART to primary care providers in Saratov Oblast through Order #613 is the result of the organizational model and ART guidelines developed and tested by the Saratov/Engels teams.

The significant results in institutional impact achieved in many QAP collaboratives is also likely due to QAP's strategy of close collaboration with MOH staff and existing Ministry structures to implement collaboratives. In the **Ecuador EOC** Collaborative, for example, initially, QAP worked very closely with the semiautonomous Executive Unit of the Law of Free Maternity at the start of the collaborative. The Executive Unit's commitment to implement the law and be responsive to the community meant that it was very much on board with the collaborative's focus on quality. The National Directorate of Standards (*Dirección Nacional de Normatización*)[5] was not on board at first, though it would have been the natural internal MOH unit for this work. As the results of the collaborative became apparent, over time, the Director of Standards seemed increasingly inclined to join in and during the evaluation's field interviews proudly talked about how his directorate oversees all the collaborative's work. Ultimately, collaborative standards were adopted in the *Manual de Estandares, Indicadores, e Instrumentos para la Calidad de la Atención Materno Infantil* published by the Ministry of Health of Ecuador in September 2006.

[5] Originally, Directorate of Promotion and Integrated Health Care (*Dirección de Promoción de la Salud y Atención Integral a la Salud*).

VI. CONCLUSIONS AND FUTURE DIRECTIONS

A. Overall Findings and Conclusions of the Evaluation

QAP adapted, implemented, and refined the IHI improvement collaborative approach for developing country settings, encouraging local innovation based on local needs yet remaining true to a set of core principles. In adapting collaboratives, QAP advisors had to solve many operational and logistical problems to make the approach work in different country contexts. These adaptations were reviewed through this evaluation to reveal how common features may have taken different forms in different countries. The evaluation enables a deeper understanding of the processes, successes, and challenges experienced in each country and provides an opportunity to reflect on the key elements of an improvement collaborative as well as on the areas of convergence and divergence as each country applied the approach to its own environment.

Several essential features in the adapted QAP collaborative model emerged from this review:

- Well-defined improvement objectives or aims,
- Adequately supported quality improvement teams,
- An explicit implementation package,
- Regular analysis of measured results to guide quality improvement,
- Shared learning for accelerated improvement at greater scale,
- An explicit spread strategy, and
- Organizational structures to support the collaborative and improvement activities.

It is the sum of these features that provides the structure for leveraging the power of the quality improvement model to raise health care quality and address specific priority problems across many sites and even at national scale. Without any one of these features or with any misapplication, some of the potential impact of the collaborative was lost, especially in achieving rapid scale-up of activities.

All QAP-supported collaboratives went through a similar start-up process in identifying critical gaps in health care, defining the topic/subtopic area for improvement, developing a consensus on standards of care, and establishing an organizational structure to ensure buy-in and shared responsibility with key stakeholders. Additionally, they all developed implementation and management plans that included a process for site selection, a series of learning sessions with intervening action periods, use of coaching or mentoring to support quality improvement teams, and ongoing training and capacity building in the use of indicators and measurement to track progress. Learning sessions served as the primary fora for imparting technical updates and for sharing site-level experiences, although some countries also used other methods of communicating best practices and lessons learned, such as national workshops, site visits by experts, and separate clinical training activities.

Across QAP-supported collaboratives, there were similarities in adaptation away from the original IHI model. One trend was the tendency toward decentralization of two key collaborative elements: learning sessions and coaching. In the case of the former, eight collaboratives (Niger EONC and PHI, Rwanda PMTCT, Uganda ART, Ecuador EOC, Honduras EOC, Nicaragua EOC, and Russia AIDS TCS) have held regional learning sessions for sites to share and exchange experiences, instead of, or in addition to, national level learning sessions. Similarly, the original model does not provide explicit recommendations on coaching, beyond a coach's requisite qualifications. In QAP's experience, collaboratives either gravitated toward or applied at the onset a strategy of regional coaches (e.g., Niger PHI/EONC, Rwanda Malaria, Nicaragua PHI, Ecuador EOC, Honduras EOC, and Nicaragua EOC). This approach has proven both practical and sustainable thus far. Another innovation across collaboratives was the development of the role of internal coach, which occurred in Niger, Ecuador, and Rwanda.

The evaluation found that the collaborative approach as adapted by QAP was robust and feasible in developing country settings. QAP implemented collaboratives in countries at varying levels of development, and yet in these different contexts, collaboratives produced clear gains in compliance with standards and proved effective for scaling up best practices.

The impact of collaboratives on individuals, teams, and institutions was also significant. Collaboratives created communities of practice where individual health workers felt empowered to improve care and connected to others and to a greater mission.

The evaluation also identified a number of important issues related to the impact, institutionalization, and sustainability of improvement collaboratives in developing countries. One challenge in evaluating impact is the lack of uniformity in the definition, measurement, and reporting of indicators across collaboratives and topic areas. While these variations provide contextually rich data, they make cross-collaborative comparisons challenging. Nevertheless, the evaluation found evidence of results from Niger, Ecuador, Honduras, Nicaragua, Tanzania, Rwanda, Uganda, and Russia showing that the approach was effective in improving quality of care in USAID-assisted countries. Moreover, the experience in Niger, Russia, Ecuador, Nicaragua, and Uganda demonstrates that collaboratives can be effective in spreading improvements to large areas of a country or health system. This point was underscored by the evaluation finding that new teams in spread phases of a collaborative achieved improvement results faster than the original teams—mostly likely because they benefited from a tested change package and the cumulative learning of the initial teams.

The early and increasing involvement of the Ministry of Health, both at the central and regional levels, was critical to the success of collaboratives and, ultimately, the spread and sustainability of the improved systems of care. The timing, pace, and method of scale-up varied considerably depending on a variety of factors, including availability of resources, perceived need and readiness for spread, and national MOH priorities.

In reviewing QAP's experience, several observations support the viability of the collaborative approach as a way to improving health care in less developed countries:

- Countries launched more than one collaborative.
- Most countries continued to add sites over the life of the collaborative.
- In several countries, the MOH developed specific policies on promoting QI and assigned responsibility for implementing them to a specific MOH unit.
- Individuals involved in collaboratives seemed to be motivated by personal commitment rather than perfunctory compliance with a directive to participate.
- Collaboratives achieved early success in quality improvement at a national scale. This seems to have motivated health ministries to embrace using collaboratives to spread improved practices for priority health areas.

Sustaining the quality improvement work of collaboratives will involve additional learning and practice in countries that embrace the approach until the ability to launch and lead collaboratives is institutionalized in health ministries.

B. Recommendations

The evaluation revealed many good practices and lessons from QAP's experience with collaboratives that suggest ways for making collaboratives more uniformly effective and efficient. The following recommendations will help URC and other organizations to increase the rigor and impact of future collaboratives.

- Consolidate and disseminate the learning from QAP's experience with the improvement collaborative methodology

Making this learning widely available to other organizations will encourage wider use of the approach.

- Explore sustainable strategies for developing QI skills of health care providers

Clearly, QI training provided during learning strategies and on-site coaching by QAP staff was effective in developing QI skills among health professionals. In the future, additional and more sustainable strategies for imparting QI skills should be considered. Strategies are also needed to address needs for ongoing capacity development as a result of turnover in QI team membership due to staff re-assignment. This might involve working with local partners to develop national sources of QI training, expanding the use of whole-site training, developing e-learning programs, and incorporating QI in pre-service training.

- Increase attention to strengthening local capacity for data collection, management, and analysis within collaboratives

Having site teams monitor a set of indicators common to all sites participating in a collaborative was an essential component of the collaborative approach. Such data allowed teams to see their own progress, to discern the effects of changes they were implementing, and to compare themselves with other participating sites. However, the routine (generally monthly) data compilation and analysis, and subsequent use of data for decision making, were not part of the organizational cultures where collaboratives were operating, and medical record systems were often very weak, especially in Africa. Thus, the monitoring component, critical to measuring a collaborative's impact, was fraught with complications. Before beginning any collaborative, adequate time needs to be devoted to augmenting health professionals' skills in measurement. In addition, gaps in the data quality and incompleteness of data records need to be addressed before a collaborative begins. Future work should test different strategies for strengthening the quality of both medical records and the data used to measure improvement in collaboratives.

- Document and study the factors that motivate individuals and institutions to participate in collaboratives

Collaboratives did surprisingly well in inspiring developing country health professionals to participate actively and get excited about the changes they created. This was an important success of collaboratives that was essential for achieving impressive health care improvement results. A challenge for collaboratives will be how to maintain high levels of motivation in spread phases that will likely receive less attention from experts or less training.

- Strengthen the documentation of the improvements implemented by collaboratives and their results

The evaluation team had difficulty finding consolidated process and outcome data for many of the collaboratives. This was partly due to the measurement challenges outlined above but also to the limited number of measures that QAP had in place to adequately capture the work of the collaboratives. It is recommended that QAP institute more rigorous processes for collecting data from the field. These might include requiring that all QAP field teams report monthly using specific templates and creating job aids to help QI teams document the changes they make to processes of care and the results.

- Conduct further research on how collaboratives can be implemented more efficiently and improvements spread more effectively and institutionalized within health systems

Due to the increased demand for human and technical resources, supporting spread and scale-up of collaboratives was one of the biggest challenges, largely because it involved spreading coaching and other limited resources across a larger number of sites. Key issues with spread include determining the extent to which spread collaboratives need to look and operate like demonstration collaboratives (with

learning sessions, etc.) and identifying the advantages of combining old and new sites as opposed to starting new sites on a new set of learning sessions. QAP should continue to explore and share with others effective strategies for adding and building the capacity of new sites. There is also the question of defining when the change package is sufficiently "refined" so that a collaborative structure is no longer needed.

In the future, spread strategies other than spread collaboratives should also be explored, and different strategies for supporting spread more cost-effectively should be tested. QAP has experience in involving partners in implementing collaboratives, and more partner support should be explored for implementing spread strategies.

- Document costs of implementing collaboratives

It was not a task of this evaluation to calculate the costs of implementing collaboratives. However, it is clear that initiating and implementing collaboratives required a significant investment in terms of funds (both donor and national resources) and human resources (local and international health professionals). To further spread the methodology, a critical issue will be to demonstrate to donors the relative cost-effectiveness of this methodology in scaling up improved health care, particularly when compared to the costs of training and other traditional improvement approaches.

C. Questions for Future Research

Overall, the range of improvements achieved by QAP-supported collaboratives was impressive. At the same time, some collaboratives only attained modest results. Collaboratives, as implemented by QAP, seem to be a promising strategy for improving health care quality and strengthening health systems to address national health priority issues at scale. Several questions remain, however, on how to maximize results:

1. How can collaboratives improve data quality and develop better data validation strategies?
2. How can collaboratives be monitored in more consistent ways to enable managers to monitor progress and performance of their collaboratives?
3. What strategies can be used other than spread collaboratives to accelerate spread?
4. What additional strategies (in addition to learning sessions and coaching) can be used to strengthen human capacity building for supporting quality improvement and the collaboratives process?

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