



USAID
FROM THE AMERICAN PEOPLE

HEALTH CARE
IMPROVEMENT
PROJECT

RESEARCH AND EVALUATION REPORT

Sustaining Better Maternal and Newborn Care and Quality Improvement in Niger: *Challenges and Successes*

MARCH 2011

This report was prepared by University Research Co., LLC (URC) for review by the United States Agency for International Development (USAID). It was authored by Maina Boucar, Lynne Miller Franco, Djibrina Sabou, Zakari Saley, Larissa Jennings, and Diwakar Mohan of URC. The study was carried out under the USAID Health Care Improvement Project, which is made possible by the generous support of the American people through USAID.

RESEARCH AND EVALUATION REPORT

Sustaining Better Maternal and Newborn Care and Quality Improvement in Niger: Challenges and Successes

MARCH 2011

Maina Boucar, University Research Co., LLC
Lynne Miller Franco, University Research Co., LLC
Djibrina Sabou, University Research Co., LLC
Zakari Saley, University Research Co., LLC
Larissa Jennings, University Research Co., LLC
Diwakar Mohan, Consultant

DISCLAIMER

The views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

Acknowledgements: We wish to express our gratitude to Dr. Ekoye M. Saidou, Mr. Bawan-Allah Goubakoye, and Dr. Yaroh Asma from the Ministry of Public Health of Niger for their help in carrying out this study. We deeply appreciate the utmost cooperation and contributions from the District Health Teams and Regional Public Health Departments in Niamey, Tahoua, Tillabéri, Zinder, Diffa, Dosso, and Maradi regions. The authors also wish to acknowledge the contributions of the data collection team and the participation of the facility in-charges and the facility-based QI teams visited.

This study was supported by the American people through the United States Agency for International Development (USAID) and its Health Care Improvement Project (HCI). HCI is managed by University Research Co., LLC (URC) under the terms of Contract Numbers GHN-I-01-07-00003-00 and GHN-I-03-07-00003-00. URC's subcontractors for HCI include EnCompass LLC, Family Health International, Health Research, Inc., Initiatives Inc., Institute for Healthcare Improvement, Johns Hopkins University Center for Communication Programs, and Management Systems International. For more information on HCI's work, please visit www.hciproject.org or write hci-info@urc-chs.com.

Recommended Citation: Boucar M, Franco LM, Sabou D, Saley Z, Jennings L, Mohan D. 2011. Sustaining Better Maternal and Newborn Care and Quality Improvement in Niger: Challenges and Successes. *Research and Evaluation Report*. Published by the USAID Health Care Improvement Project. Bethesda, MD: University Research Co., LLC (URC).

TABLE OF CONTENTS

LIST OF BOXES, FIGURES, AND TABLES.....	ii
ABBREVIATIONS.....	iv
EXECUTIVE SUMMARY	v
I. INTRODUCTION.....	1
A. Institutionalization: What Do We Know? What Does It Mean?	1
B. The Context of this Research: The Essential Obstetric and Newborn Care Improvement Collaborative, 2006-2008	1
C. Study Objectives	3
II. METHODOLOGY.....	3
A. Design and Variables of Interest.....	3
B. Sampling and Data Collection.....	5
C. Analysis.....	7
III. The Intervention: Developing an Institutionalization Change Package	7
A. The Process.....	7
B. The Package (Objectives and Change Concepts)	8
C. MOH Plans to Implement the Package.....	8
IV. RESULTS	9
A. Maintaining the Gains in the Quality of EONC Care.....	10
B. Status of Institutionalization of Quality Improvement at the Site Level	14
C. QI Support from Higher Levels of the System: District, Regional and Central Levels	21
D. Factors Facilitating and Hindering Institutionalization in Niger	30
V. DISCUSSION	32
VI. CONCLUSIONS AND RECOMMENDATIONS	34
REFERENCES.....	38
Appendix I: Excerpt from the Institutionalization Change Package.....	39

LIST OF BOXES, FIGURES, AND TABLES

Box 1: Coverage of the EONC collaborative: 7 out of 8 regions in Niger	2
Box 2: Key indicators used in the EONC collaborative.....	2
Box 3: Improvement objectives of the Niger institutionalization change package	8
Figure 1: Conceptual framework for measuring institutionalization	4
Figure 2: Maintaining gains in quality of care and outcomes for active management of the third stage of labor (AMTSL) – January 2006-April 2010 in 20 sites in 7 regions of Niger	10
Figure 3: Maintaining gains in quality of care for essential newborn care (ENC) – January 2006-April 2010 in 20 sites in 7 Regions of Niger	11
Figure 4: Maintaining gains in quality of care for management of pre-eclampsia and eclampsia – January 2006-April 2010 in 20 sites in 7 Regions of Niger.....	12
Figure 5: Implementation of operational changes over time in EONC I – average number of changes implemented in the category across sites (n=20 sites)	122
Figure 6: Implementation of operational changes over time in EONC II (n=20 sites)	13
Figure 7: Implementation of QI activities over time: mean percentage across sites and activities (n=20 sites).....	15
Figure 8: Competency of QI team members 20 months post collaborative broken down by tasks (n=83 QI team members).....	17
Figure 9: Mean number of QI team meetings per month per team (n=20 sites).....	18
Figure 10: Comparison of number of QI team meetings held by teams which have ventured into new domains and those that have not ventured (n=20 teams).....	19
Figure 11: Implementation of the tested change package (n=20 teams).....	21
Figure 12: QI coach competency and activity level at 20 months post collaborative – August 2010 (n=21 coaches).....	22
Figure 13: Percentage of QI tasks related to EONC collaborative implemented by DHMT, RHMT, and central level staff interviewed (DHMT: 2009 – 42; 2010 – 40; RHMT: 2009 – 45; 2010 – 48; Central: 2009 – 8; 2010 – 5).....	23
Figure 14: Percentage of general QI support activities implemented by DHMT, RHMT, and central level staff interviewed (DHMT: 2009–42; 2010–40; RHMT: 2009–45; 2010–48; Central: 2009–8; 2010–5).....	24
Figure 15: Mean competency score for the 7 QI tasks 6 months (2009) and 20 months post collaborative (2010) interviewed (DHMT: 2009–42; 2010–40; RHMT: 2009–45; 2010–48; Central: 2009–8; 2010–5).....	25
Figure 16: Change ideas implemented at the district level (n=68 ideas for each district; 12 districts)	28
Figure 17: Change ideas implemented at the regional level (n=73 ideas for each region; 7 regions).....	29
Figure 18: Change ideas implemented at the central level (n=42 change ideas).....	29
Table 1: Variables to measure institutionalization and periods for which variables are available.....	4
Table 2: Sites in the sample	5
Table 3: Sample size for each of the data collection instruments.....	6
Table 4: Comparison of type of facility between sample and all participating collaborative sites	9
Table 5: Comparison of samples between 2009 and 2010 surveys.....	9
Table 6: Continuing availability of key inputs for EONC (average across 20 sites: 19 EONC I and 12 EONC II sites).....	14
Table 7: Applying QI to a new domain.....	16

Table 8: Factors in the enabling environment that can affect QI implementation at 6 months and 20 months post collaborative (n=20 sites).....	17
Table 9: Mean number of meetings (range) conducted in a three-month interval (n=20).....	19
Table 10: QI-related actions (15) to be planned for and financed in annual action plan and whether they were executed by site	20
Table 11: QI activities included in annual action plans that were financed and executed at district, regional, and central levels	26
Table 12: Capacity-building events supported in the post-collaborative period based on materials developed during the collaborative	30
Table 13: Perceptions of institutionalization from different levels of the system	31

ABBREVIATIONS

AMTSL	Active management of the third stage of labor
CSI	Integrated health center
DHMT	District Health Management Team
ENC	Essential newborn care
EONC	Essential obstetric and newborn care
HC	Health center
HCI	USAID Health Care Improvement Project
HR	Human resources
MCH	Maternal and child health
MOH	Ministry of Health
NGO	Non-governmental organization
PAPDS	<i>Programme d'Appui à la mise en oeuvre du Plan de Développement Sanitaire</i> (Implementation Support Program for Niger's National Health Plan)
PDSA	Plan-Do-Study-Act (also known as the Shewart Cycle)
PEE	Pre-eclampsia and eclampsia
QI	Quality improvement
RHMT	Regional Health Management Team
UNDP	United Nations Development Program
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

Introduction

Evidence exists of quality improvement interventions succeeding in achieving better results for patients in the short term, yet little attention has been paid to measuring whether these achievements have been sustained over time, the extent to which support for quality improvement (QI) activities from higher levels of the system continues over time, and how critical is such support to maintaining gains in the long term.

Collaborative improvement is a QI strategy to improve the quality of care and facilitate the emergence of a culture of quality in a network of participating sites, by bringing together the energy and creativity of different sites to address key quality issues in an efficient and effective manner. Little research has been done to document the extent of institutionalization achieved at the end of formal collaborative improvement activities. This evaluation examines the extent of institutionalization of quality improvement after the end of technical assistance to an essential obstetric and newborn care (EONC) improvement collaborative in Niger. This quality improvement initiative was launched by USAID's Quality Assurance Project in 2006 and aimed to improve the quality of maternal and newborn care services according to evidence-based standards. When external technical support for the learning sessions and coaching visits ended in December 2008, this afforded an opportunity to study whether the gains achieved during the program could be sustained.

Methodology

This longitudinal study used a modified pre/post design to measure sustained gains and continued implementation of QI activities through the collaborative and post-collaborative period. A first post-collaborative assessment was done in June 2009; the findings from this assessment were used to develop the "institutionalization change package", which was introduced to the sites in October 2009. A second assessment was done in August 2010 to measure the impact of the institutionalization change package. Both assessments focused on a sample of 20 out of the total 52 sites participating in the EONC collaborative. Data collection methods included site level interviews with key informants and QI team members, observation of care, simulations, and clinical chart reviews. Interviews and discussions were also held with officials at district, regional, and central levels in the Ministry of Health.

Results

Quality of care and QI tasks: Sites were able to maintain performance rates (percent of clients receiving care in compliance with standards) at 80% or greater for active management of the third stage of labor (AMTSL) and essential newborn care (ENC) for all 46 months (100%) of observation since they reached at least 80%, even 20 months after all technical support to the collaborative had ended. Results for management of pre-eclampsia and eclampsia reached 80% but subsequently have tended to waiver between 70% and 85%. Key factors that contributed to sites' ability to maintain gains include continued orientation of new staff and continued implementation of operational changes that focused on availability of key inputs. QI tasks that continued to be implemented even 20 months after the end of the collaborative include staff capacity building and calculation of indicators. Other QI tasks have shown deterioration in implementation, such as meetings to discuss results, graphing data, and annotating time series charts, although quality of care remained high. Notably, 60% of the 20 sites had applied their QI skills to make improvements in new areas.

Staff mobility and competency: High staff turnover constitutes a large challenge for institutionalization. About 20% of staff at sites had been there less than one year, and over a third of QI team members had been there less than two years. Staff turnover at the management levels was even higher: in 2009, the average percentage of interviewed District Health Management Team members who had been there less than two years was over 60%, and in 2010, it was 46%. Turnover was slightly less at the regional level:

48% of Regional Health Management Team members interviewed had been there less than two years in the 2009 survey, and one third in the 2010 survey.

Despite high mobility, the competency levels in 2010 were slightly higher than those in 2009 (although the difference was not significant). This could be explained, at least partially, by the hypothesis that staff mobility may have worked in favor by taking QI capacity to higher levels. It should be noted that during the 1990's, USAID supported a substantial QI intervention in one region of Niger, and the individuals involved have since been promoted and reassigned to various parts of the country.

Institutionalization activities: The institutionalization change package was designed to strengthen ongoing efforts in quality improvement and ensure support from higher levels of the system. However, its dissemination did not reach down to all districts and facilities, and there was no clear accountability for its implementation. At the site level, on average, only 20% of the 15 institutionalization activities to be included in actions plans for 2010 were included, although 73% of these had already been implemented by August 2010. Rates of inclusion of institutionalization activities in annual action plans was higher at the regional and national levels (around 40%), while the district level average was 27%. At all three levels, about three-quarters of these activities had dedicated funding.

Conclusions and Recommendations

Although this study did not have the power to test hypotheses, it has shed light on some assumptions about collaborative improvement and its contribution to institutionalization:

1. *Participating in a collaborative will build technical and organizational capacity to maintain gains in quality over time:* The collaborative experience has generated some of this capacity, but staff mobility and lack of clear leadership have allowed some deterioration of this capacity.
2. *Participating in a collaborative will build QI skills needed to maintain quality of care:* At the site level, quality of care for EONC has successfully been maintained so far, but QI capacity deteriorates over time.
3. *Conducting QI in one technical area builds skills to apply QI to another technical area:* Evidence from this study indicates that the willingness to apply QI to other domains does exist, although the quality of that application is not known.
4. *A minimum set of QI activities (less than those implemented as part of a collaborative) can maintain gains in quality of care:* The results from these 20 sites indicate that ensuring orientation of new staff and at least on-site clinical mentoring, and ongoing measurement of indicators contributes significantly to maintenance of gains, even if many of the other QI activities and team meetings are no longer taking place. However, the longer term effects of staff mobility on quality of care are not known, in the absence of active teams to ensure maintenance of gains.
5. *Hospital management, district/region and national level actors have specific QI roles to play to ensure maintenance of gains in quality and continued practice of QI:* While the sample is small for any multivariate analysis, respondents at all levels either praised support they received from higher levels or decried the lack of it.

More effort is needed in the following areas: integration of quality concepts into policy and action, assigning clear roles and responsibilities for QI and actions for institutionalization, and defining sustainable mechanisms for ongoing QI implementation. Nonetheless, this study has helped to elucidate the determinants of institutionalization of quality improvement and important health system obstacles to achieving it.

I. INTRODUCTION

A. Institutionalization: What Do We Know? What Does It Mean?

Quality improvement (QI) aims to identify, implement, and maintain best clinical and organizational practices that ensure better care for clients in order to achieve positive health outcomes. QI programs usually include numerous elements that contribute directly to sustainability of specific improvements once they are implemented, including periodic measurements of adherence to quality standards and the resulting outcomes, feedback of measurement results to key providers of care, and locking in system changes (redesign) that result in better care. Institutionalization—to “establish and maintain [QI] as an integral, sustainable part of a health system or organization, woven into the fabric of daily activities and routine” (Silimperi et al. 2002)—requires, however, more: leadership and a culture supportive of QI in individual facilities and among the broader community of health care providers that fosters ongoing quality improvement. Such a culture sustains not just individual improvements, but the belief in and practice of continuous quality improvement and the processes, structures, and resources that make it happen.

There are many examples of QI interventions having succeeded in achieving better results for patients in the short term (Chin et al. 2008). However, sustaining these better care practices, QI activities, and corresponding results has not received as much attention (Stevens et al. 2009), nor has the extent to which support continues for quality improvement activities from higher levels of the system after a QI activity ends and the role of these in maintaining gains in the long term.

Collaborative improvement is a QI strategy to improve the quality of care and facilitate the emergence of a culture of quality in a network of participating sites. However, a collaborative itself is not intended to be a permanent structure, but rather one that brings together the energy and creativity of different sites to address key quality issues in an efficient and effective manner. Collaborative improvement has been implemented in many developing and middle income countries over the last decade and has been shown to lead to significant improvements that appear to be sustained for a period of time in many cases (Franco and Marquez, 2011). Yet, implementation of the collaborative improvement process could be adjusted to better encourage institutionalization so that gains in quality of care and QI implementation are truly integrated into the health system.

The question of institutionalization is pertinent for activities that help improve the quality of care at all levels and focuses on what continues to happen and why, after an intervention (such as a collaborative) has ended. Little research has been done to characterize the extent of institutionalization achieved at the end of formal collaborative improvement interventions. This research study sought to do just that, while providing crucial information needed to develop and evaluate strategies to strengthen institutionalization once formal collaborative improvement activities had ended.

B. The Context of this Research: The Essential Obstetric and Newborn Care Improvement Collaborative, 2006-2008

On average a Nigerien woman faces a 1:7 risk of dying from pregnancy complications over the course of her lifetime, the highest of any country in the world (UNICEF 2009). For every maternal complication and death, there is an even higher number of newborn deaths and morbidity (Filippi et al. 2006). While Niger had experienced localized quality improvement efforts since the 1990's,¹ the Ministry of Health (MOH), with support from the USAID Health Care Improvement Project (HCI), initiated efforts to

¹ These experiences included two funded by the United States Agency for International Development (USAID): team-based problem solving in the Tahoua Region (1992-1997) and a pediatric hospital improvement collaborative in 29 hospitals (2003-2006).

reduce maternal and newborn mortality with an integrated package of evidence-based best practices in essential obstetric and newborn care (EONC), introduced with a collaborative improvement strategy. Between 2006 and 2008, 52 MOH maternities in seven of Niger's eight regions² participated in the EONC collaborative (see Box 1). The collaborative was implemented in two phases:

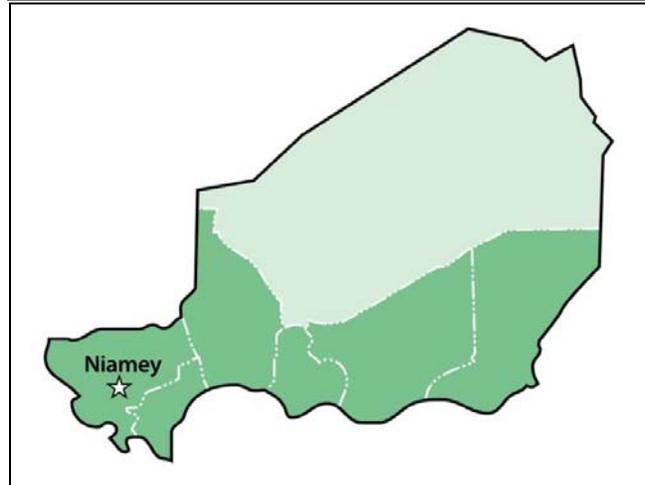
- Phase I, (2006-2007), known as EONC I, focused on improvement of basic infection prevention; active management of the third stage of labor (AMTSL), including administration of oxytocin, controlled cord traction, and uterine massage after delivery of the placenta; and essential newborn care (ENC).
- Phase 2 (2008), known as EONC II, focused on management of pre-eclampsia/eclampsia (PEE) and also expanded the Phase I package to new sites.

The EONC collaborative management structure included technical assistance from HCI, the MOH's Family Health Division, and clinical experts in EONC. This group of stakeholders developed a minimal set of indicators to monitor quality of care and results. Key EONC I and EONC II indicators used in the two phases of the collaborative are listed in Box 2.

Because AMTSL and some aspects of EONC were not part of Ministry of Health practice prior to 2006, developing clinical as well as QI competency was an important part of the collaborative's intervention. The MOH's Family Health Division and HCI developed a cadre of trainers to build capacity of maternity staff for the new integrated EONC package and QI, using a "whole-site" training model. During this on-site training, in which health facility staff received training in the clinical aspects of AMTSL and ENC, teams were established and trained in QI and their team tasks.

EONC I was originally launched in 28 reference maternities (representing 77% of national/regional and 62% of district hospitals in the seven regions). In February 2007, the collaborative expanded to include an additional 10 primary care maternities, raising its coverage to 38 total maternity care facilities in 64% of Niger's districts. These facilities accounted for 32% of public facility births (45,760 births) in 2007.

Box 1: Coverage of the EONC collaborative: 7 out of 8 regions in Niger



Box 2: Key indicators used in the EONC collaborative

Phase I indicators:

- % births in which all 3 elements of AMTSL were applied
- % births with immediate breastfeeding occurred
- % compliance with AMTSL standards (composite)
- Post-partum hemorrhage rate (PPH)
- % newborns for whom ENC standards were met

Phase II indicators:

- % compliance with pre-eclampsia and eclampsia case management standards

² The eighth region that was not included in the collaborative is primarily in the Sahara desert and largely unpopulated.

The collaborative organized quarterly regional learning sessions funded through HCI, during which local midwives and doctors from different sites shared effective changes for rapidly integrating AMTSL, EONC, and improved infection prevention practices into routine delivery care. A written summary of the most effective changes identified at the regional level was shared among all collaborative participants so that individual sites could adopt successful innovations that had been tested by other sites. A national learning session was held in August 2007 with national and regional health officials and coaches to synthesize results and best practices from all the teams participating in EONC I.

During the collaborative, local teams received regular on-site internal coaching that integrated technical and QI skills so that participants learned to problem-solve to reduce obstacles to implementing the new standards in their local settings. Bimonthly supervision visits by regional MOH “external coaches,” with technical support from HCI staff, provided ongoing reinforcement to individual site teams.

In January 2008, EONC II, the second phase of the collaborative, was launched, focusing on improving management of pre-eclampsia and eclampsia (PEE), the next major contributors to maternal mortality in Niger after post-partum hemorrhage. By June 2008, 31 health facilities (primary and referral), of which 15 (all integrated health centers or CSI) were new to the collaborative, initiated efforts to improve management of PEE; however, the funding for the EONC collaborative ended somewhat abruptly in October 2008, and collaborative activities (EONC I and II) drew to a close by the end of 2008.

C. Study Objectives

This study began with an initial assessment of institutionalization after HCI funding ended in order to help the MOH develop a strategy to strengthen maintenance of gains in care quality achieved during the collaborative and integration of quality improvement into the Niger health system, this was followed by another assessment to measure the situation a year later. The specific objectives of this study were to:

- Determine the extent of institutionalization of quality care and of QI implementation, at site, district, regional, and central levels and its evolution over time.
- Identify factors that facilitated or hindered institutionalization of quality care and QI at all levels of the system, over time.
- Describe the extent of implementation of the MOH’s “institutionalization change package”³, including its integration into annual action plans and requisite resource mobilization at the different levels of the system.

II. METHODOLOGY

A. Design and Variables of Interest

This longitudinal study used a modified pre/post design to measure sustained gains and continued implementation of QI activities during the collaborative and post-collaborative periods. In the post-collaborative period, measures were taken before and after the introduction of the institutionalization change package that had been developed based on the findings from the first post-collaborative assessment.

Figure 1 presents the key concepts that were measured and a timeline indicating periods of activities being assessed. Table 1 presents the variables of interest and the time periods for which each variable was measured.

³In collaborative improvement, the “change package” refers to the set of evidence-based, better practices that all providers should implement to achieve the desired results. These often include both changes known to yield improvement (changes that have already tested by other QI teams) as well as good ideas for changes that may be expected to yield desired results.

Figure 1: Conceptual framework for measuring institutionalization

Areas of Measurement for Study of Institutionalization of QI and Better Care Practices (EONC)			
Processes of Institutionalization	Intermediate Results	Outcomes (Evidence of Institutionalization)	Impact
<ul style="list-style-type: none"> • Awareness raising (Preparation phase) • Developmental Process (Demonstration Phase) • “Hard-wiring” processes (Synthesis and Consolidation Phase) 	<ul style="list-style-type: none"> • Enabling environment for implementing better care at sites <ul style="list-style-type: none"> - Availability of resources - Team competency - Employee engagement - Team Functionality and Dynamics • Enabling environment for implementing QI <ul style="list-style-type: none"> - Coaching - Supervision - Accountability 	<ul style="list-style-type: none"> • Maintenance of QI and better care at point of service delivery <ul style="list-style-type: none"> - Clinical norms - Organizational changes - Minimum QI activities • Maintenance of QI at higher levels of the health system <ul style="list-style-type: none"> - District level - Regional level - National level 	<ul style="list-style-type: none"> • e.g. maternal postpartum hemorrhage
			Additional Factors

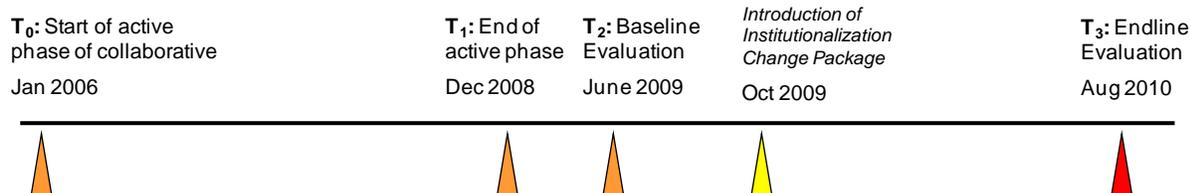


Table 1: Variables to measure institutionalization and periods for which variables are available

Variables	Before 2006 <i>Before collaborative</i>	2006-2008 <i>During collaborative</i>	2009 <i>6 months post collaborative</i>	2010 <i>20 months post collaborative</i>
Evidence of institutionalization				
Quality of care	X	X	X	X
Operational changes	X	X	X	X
QI activity implementation		X	X	X
Enabling environment for better care				
Drugs/supplies	X	X	X	X
Providers trained			X	X
Engagement			X	X
Enabling environment for implementing QI				
QI competency			X	X
QI activity level (meetings)		X	X	X
QI team stability		<i>Assumed to be 100%</i>	X	X
Team collaboration			X	X
Enabling environment for QI support from higher levels				
Coaching content		X	X	X
Coaching frequency				X
Coach competency			X	X
District support		X	X	X
District competency			X	X
Regional support		X	X	X
Regional competency			X	X
National support		X	X	X
National competency			X	X
Institutionalization change package				
Change package ideas implemented			X	X
QI integrated in annual action plan				X

B. Sampling and Data Collection

1. Sample

Data collection in this study focused on a sample of 20 out of the 52 sites participating in one or both phases of the EONC collaborative, due to research resource constraints and long distances in Niger. The 20 sites were chosen to represent all seven regions where the collaborative was active, the different levels of health facilities, and participation in EONC I, EONC II, or both. The sample included two national referral maternities, three regional maternity centers, twelve district hospitals, and three integrated health centers (see Table 2).

Table 2: Sites in the sample

Structure type	Niamey	Dosso	Tahoua	Diffa	Tillabéri	Maradi	Zinder	Total
National maternity	1		1					2
Regional maternity		1		1		1		3
District hospital	1	1	3	1	2	2	2	12
Integrated health center	1	1	1					3
TOTAL	3	3	5	2	2	3	2	20

2. Data collected at sampled maternities

This study began with an initial assessment of institutionalization six months after HCI funding ended (June 2009); a second assessment measured the situation a little over a year later (August 2010). Several data collection instruments⁴ were used at each of the 20 sites, and other sets for coaches, for district health management teams (DHMT), for regional health management teams (RHMT), and for MOH staff. The 2009 survey tools were used again in the 2010 survey, with some additions for assessing implementation of the institutionalization change package. Data were collected by four teams of EONC experts, including generalist physicians, gynecologists, and experienced midwives. Data collectors included collaborative managers, coaches, and EONC clinical trainers who had significant experience working with teams on monitoring and clinical mentoring.

Provider level: Two types of information were collected on all providers/QI team members available at the site on the days of data collection:

- Individual interviews about perceived competency on a set of 14 QI tasks, engagement relative to their job (23-item scale, see HCI 2009) and relative to their QI team (based on a 20-item scale), and team collaboration (based on a 9-item scale)
- Observation and simulation of EONC care -- Observations of direct patient care or simulation of clinical situations were conducted by the same expert group of investigators, including doctors, gynecologists, and experienced midwives. Observations of direct patient care were conducted either in the antenatal care room or the delivery room, and all health staff providing antenatal care or deliveries on the day of observation were observed provided services to a single patient. Simulations were conducted for health staff when no deliveries were in process or they were not on call that day. Simulations were conducted using mannequins designed for delivery and immediate newborn care that had been used in EONC training in Niger.

Site and QI team level: At each of the 20 sites, an interview with a key informant (usually the team leader) was used to collect information on formal provider training in AMTSL/ENC and case management for pre-eclampsia and eclampsia, QI team stability (presence of original QI team members), frequency of QI team meetings (validated with document review of meeting plans and meeting records),

⁴ All the data collection tools used for this study can be found at: <http://www.hciproject.org/node/1286>.

availability of key resources, implementation of QI activities, implementation of key operational changes, and support from higher levels. In the 2010 survey, questions were added about integrating QI into annual action plans and implementing specific change ideas included in the change package. Longitudinal data on quality of care was extracted from clinical records by an external audit group of investigators that included generalist physicians, gynecologists, and experienced midwives, using the same tools for data extraction as QI teams used. This expert group was composed of collaborative managers, coaches, and EONC clinical trainers who had significant experience working with teams on monitoring and clinical mentoring. External evaluators used the sample selection and methods of calculation that QI teams used for their self-assessment, using all partographs for assessment of the three AMTSL tasks, PPH, immediate breastfeeding, and taking newborn temperature; and taking a random sample of five partographs to calculate percent compliance with norms for AMTSL and newborn care. Self-assessment of the quality of care by QI teams was compiled from their monitoring charts.

Coach level: Internal coaches (QI team members with extra QI training) and external coaches (from regional and national level) were interviewed about perceived competency and coaching activities.

District, regional and national level: All DHMT and RHMT members present on the day of the surveys, and those in the central MOH in key technical directorates, the QA unit and the HR unit were interviewed individually about their perceived competency and QI activities they participated in during and after the collaborative. The 2010 survey included additional questions about integrating QI into annual action plans and implementing specific change ideas included in the change package. At the national level, only a few individuals were interviewed in both the 2009 and 2010 surveys; thus, central level results may not be representative for all actors at the national level.

Table 3 shows the sample sizes for data collected through external audit, observation, and interviews.

Table 3: Sample size for each of the data collection instruments

Data collection on quality of care	Sample 2009	Sample 2010
SITE LEVEL		
Interviews with key informants	20	20
Interviews with Individual QI team members	90	83
External observation checklist for compliance with clinical norms		
• AMTSL	40	43
• Essential newborn care	40	43
• Eclampsia	18*	20*
Simulation		
• AMTSL	65	34
• Essential newborn care	65	34
External record review AMTSL	January, April	July, October
• Essential newborn care	July, October	2009; January,
• Eclampsia	2008; January, April 2009	April 2010
DISTRICT LEVEL		
Individual DHMT members	42	40
Group discussions	12	12
REGIONAL LEVEL		
Individual RHMT members	45	48
Group discussions	7	7
CENTRAL MOH LEVEL		
Individual MOH staff	7	5

* Observations include women who should be screened, but the number of cases for case management was too small to be analyzed.

C. Analysis

All data were verified before being entered in SPSS. All analysis was conducted in SPSS, STATA, and Excel. Indicators of competency, engagement, and collaboration were created from responses on individual elements.

QI competency: Data on QI competency were collected at an individual level, based on a three-point scale for each of 14 QI tasks: unable to perform the QI task, able to perform but with some difficulties, and able to perform the task without problem. Although competency was measured at an individual level, not every QI team member needs to be able to carry out all tasks, as long as someone on the team is able to do so. To gain a more general understanding of competency at a team level, the ability to perform QI tasks was converted into a score on a scale of 28 points (14 QI tasks) for each QI team member by assigning 2 points for the ability to perform a task without difficulty, 1 point for the ability to perform a task with some difficulty, and 0 points if unable to perform the task. The overall mean level of performance for a team was arrived at by aggregating across all members of a team.

Engagement: QI team members were asked about the level of engagement relative to their job and relative to their QI team, using 23- and 20-item scales, respectively. Individual scores of engagement were calculated by converting items on a 5-point Likert agreement scale to total scores of 115 and 100. They were then averaged at the site level to obtain a mean team employee engagement score and mean team QI engagement score.

Team collaboration: Individual QI team members were asked about the level of collaboration in their teams using a 9-item scale with a point Likert agreement scale. Individual scores of collaboration were calculated by converting the 9 items and the 5 Likert agreement options to obtain a total score of 45 possible points. Individual team members' scores were then averaged at the site level to obtain a mean team collaboration score.

III. The Intervention: Developing an Institutionalization Change Package

This section describes the process and content of that change package and the plan for its dissemination and use.

A. The Process

In August 2009, HCI and the MOH Directorate for Health Care Organization organized two back-to-back workshops to present and discuss the findings from the June 2009 survey related to the status of institutionalization of the EONC results and QI. The first workshop brought together an “expert group” of 25 individuals from all levels of the health system who had intensive experience in the implementation of Niger’s EONC collaborative and were very familiar with the issues of institutionalization of QI in the Niger health system. After seeing the results of the 2009 survey, this group developed a first draft of the *Institutionalization Change Package*.

The second workshop included about 50 key stakeholders: in addition to the expert group, all eight Regional Health Directors, the Department heads for Health Care Organization and Statistics and Epidemic Response, the head of the unit coordinating implementation of the Health Sector Strategic Plan, and several partners. The presentation on the degree of institutionalization of better care practices and QI implementation sparked a lively debate among Ministry of Health staff about how to maintain gains achieved in the reduction of post-partum hemorrhage and improvement in the quality of EONC services. They reviewed and improved upon the work of the expert group and discussed how the results of the workshop – the change package – should be disseminated and implemented.

Finally, a smaller working group of central level experts (Head of the QI Division, Head of the Maternal and Child Health Division, Head of the Information Systems Division) and the HCI team met in September 2009 to finalize the institutionalization change package document.

B. The Package (Objectives and Change Concepts)

The objectives of the institutionalization change package are listed in Box 3. The change package was developed around these objectives. For each objective, the change package laid out input, process, and results indicators to measure achievement of the objective, specific change concepts relevant to that objective, and practical change ideas that could be implemented to achieve the objective. Appendix I contains an illustrative example for one of the objectives, for the regional level. The institutionalization change package document also contains lessons learned from the EONC and previous QI experiences, summarized results of the 2009 survey, implementation steps for the institutionalization change package for each level of the system, and the full description of indicators, change concepts and change ideas per objective.

Box 3: Improvement objectives of the Niger institutionalization change package

Overall Objective: To institutionalize quality improvement in the Niger health system: i.e., assuring an acceptable level of quality of care provided in health facilities, by implementing and maintaining quality improvement as an integral and sustainable part of the health system, woven into daily activities. This process will require support from higher levels of the system through implementation and maintenance of specific activities.

Specific objectives:

1. Sustain gains in quality of essential obstetric and newborn care delivered to the population and its related QI activities
2. Ensure availability at health facility level of the necessary elements for quality health care in targeted domains
3. Strengthen implementation of QI activities at health facilities in targeted domains
4. Strengthen (technical and organizational) capacity of higher levels of the health system to provide adequate support to health facilities
5. Create an enabling political and strategic environment for implementation of QI at all levels of the health system

C. MOH Plans to Implement the Package

The contents of the change package were shared through regional meetings in October 2009. The MOH and HCI developed objectives and messages for dissemination and articulated the planning activities that would need to take place at each level of the system (which were then incorporated into the change package document). The MOH then organized three teams and carried out visits to each of the regions. These regional workshops, financed by HCI, were held in October 2009 in all eight Regional Public Health Departments and brought together the Regional Directors of Health and their deputies, the Heads of Reproductive Health and Information Systems, the QI focal person, the Directors of the regional level maternities, and the District Health Management Officer that resided in the regional capital. This somewhat restricted group was then tasked with using the next opportunity of a gathering of a larger regional audience to more widely disseminate the messages about the planning activities and the content of the institutionalization change package.

IV. RESULTS

This section presents a longitudinal picture of performance and institutionalization factors for the 20 sampled sites participating in the EONC collaborative in Niger. Table 4 presents a comparison of these 20 sites with full group of 52 sites that participated in the EONC collaborative.

Table 4: Comparison of type of facility between sample and all participating collaborative sites

Type of facility	20 Sample Sites	All 52 collaborative sites
National referral maternities	2 (10%)	2 (4%)
Regional referral maternities	3 (15%)	4 (8%)
District hospitals	12 (60%)	21 (40%)
Integrated health centers	3 (15%)	25 (48%)

Although the two surveys sampled the same sites, districts and regions, there was no way to ensure that the same individuals were interviewed or observed in both the 2009 and 2010 surveys, especially given the high MOH staff mobility in Niger.

Table 5 presents a comparison of sample sizes for specific types of staff in the two surveys and also indicates the high turnover of staff, particularly at district and regional levels. Staff turnover at the site level was about 20% (20% of those interviewed had been at the site for less than 1 year). The turnover at the district level in 2009 was even higher, with more than half of the respondents there less than 1 year; turnover at the district level in 2010 was about a third. Rates at regional level were slightly lower at 43% in 2009 and 21% in 2010.

Table 5: Comparison of samples between 2009 and 2010 surveys

Characteristic	2009 survey	2010 survey
Individuals interviewed at site level	N=90	N=83
Physicians	3%	1%
Nurses	21%	12%
Midwives	72%	84%
Other	3%	2%
Median years at site; % < 2 years ; % < 1 year	4; 24%; 18%	4; 29%; 22%
Median years on QI team; % < 2 years	2; 42%	2; 37%
DHMT members interviewed	N=45	N=40
Physicians	36%	20%
Midwives	0%	8%
Managers	29%	20%
Public health	15%	35%
Other	0%	18%
Percent < 2 years on DHMT; < 1 year	61%; 52%	46%; 33%
RHMT members interviewed	N=42	N=48
Physicians	12%	3%
Midwives	2%	5%
Nurses	5%	5%
Managers	19%	18%
Public health	14%	53%
Other	48%	15%
Percent < 2 years on RHMT; < 1 year	48%; 43%	33%; 21%
National level	N=8	N=5
Individuals interviewed	Director, MCH; Head, Reproductive health; Head, M&E; Head Epi Surveillance; Programmer; Head, Personnel Administration; Director, Human Resources; Head, QA Dept.	Secretary General; Head, QA Dept., Director, MCH; Head, Reproductive Health; Head, Personnel Administration

The presentation of results will follow the framework presented in Figure 1, examining the desired outcomes of institutionalization—maintaining gains in quality of care, continued implementation of QI activities at site level, and continued QI support from higher levels of the system—and whether the enabling environment exists for those outcomes to continue over time.

A. Maintaining the Gains in the Quality of EONC Care

A key measure of success in institutionalization of QI is the ability to maintain gains achieved over time. This study allows us to examine over a period of four years the quality of care provided and the implementation of effective changes leading to those results.

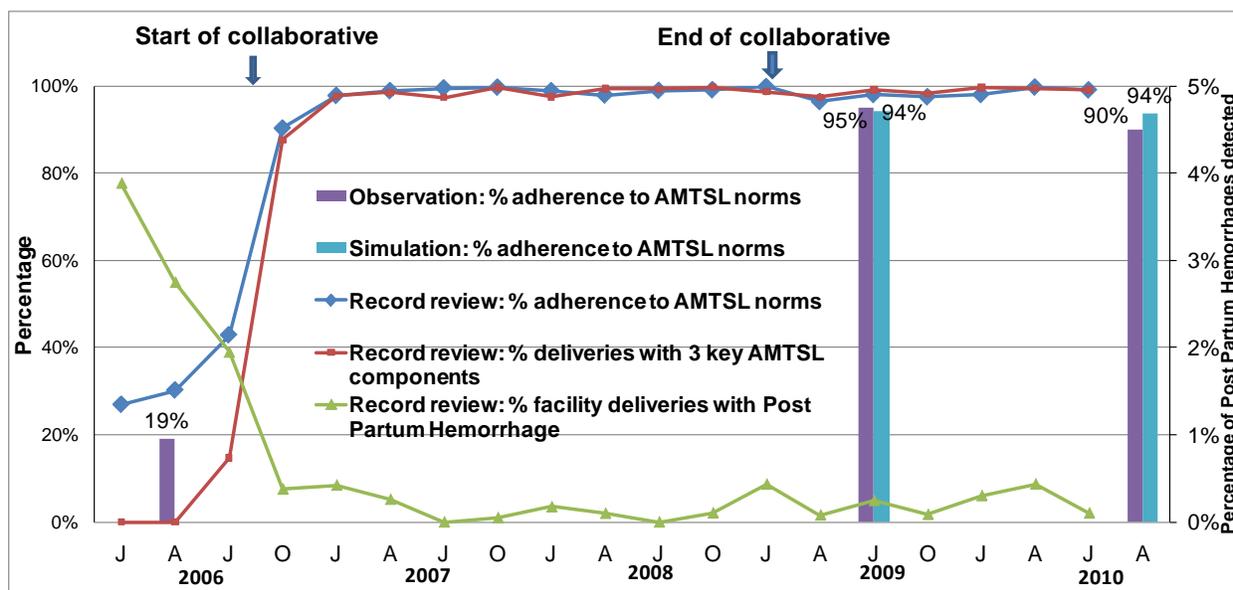
1. Quality of care provided

The EONC collaborative teams monitored a series of indicators reflecting the quality of services provided (according to norms) and post-partum hemorrhage rates (see Box 1). The next several figures present these indicator results (based on data extracted from the clinical records), supplemented by data obtained through observation of care and simulation with a mannequin, from a 2006 collaborative baseline survey, and the two institutionalization surveys in 2009 and 2010.

AMTSL

Figure 2 presents these results for active management of the third stage of labor and post-partum hemorrhage. Both baseline survey observation data and results from self-monitoring of teams indicated low levels of compliance with AMTSL standards at the start of the collaborative, at less than 30%. These data indicate that the gains in adherence to AMTSL norms and compliance with the three key AMTSL tasks achieved in 2006 were maintained at levels of 90% and higher, both during the active phase of the collaborative (through 2008), but also up to 20 months post-collaborative – for up to 46 months of data. These results from data extracted from clinical records were confirmed by observation and simulation—data which showed that performance was still in the 90-95% range.

Figure 2: Maintaining gains in quality of care and outcomes for active management of the third stage of labor (AMTSL) – January 2006-April 2010 in 20 sites in 7 regions of Niger

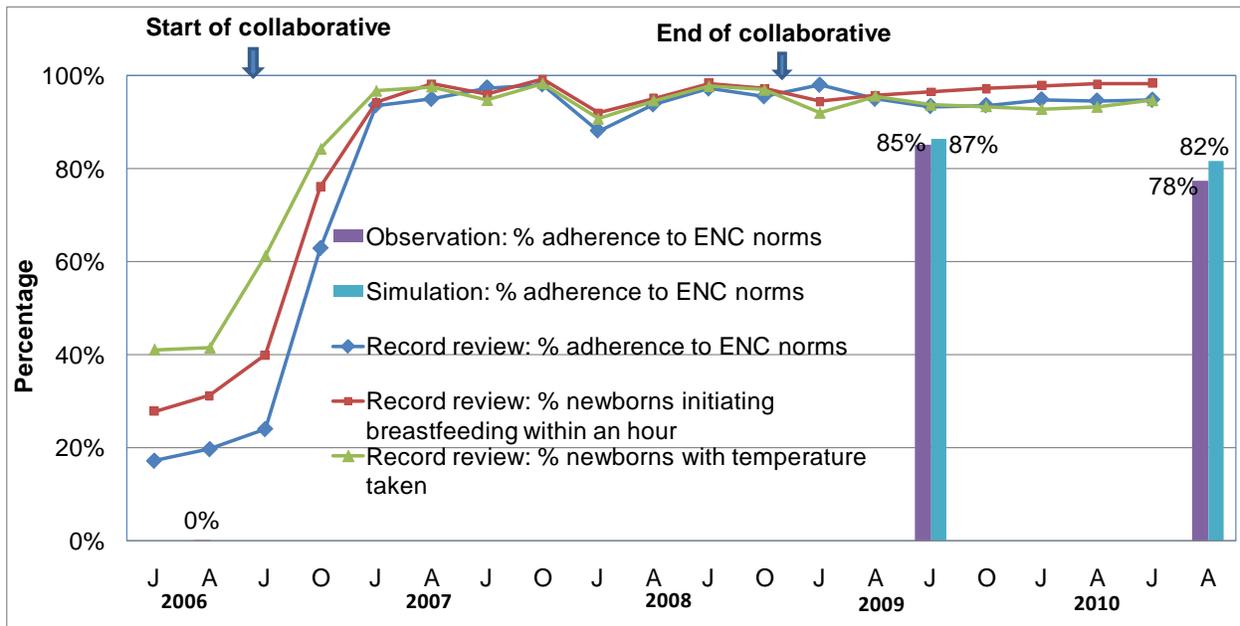


Immediate newborn care

Similar patterns are seen in Figure 3 for newborn care: the baseline survey showed no cases of compliance with standards, followed by a rapid rise in compliance with newborn standards in 2006. However, performance of newborn care has been more difficult to maintain above 95%, as seen by the

variations over time. Observation and simulation data do not reach the same levels as those found from clinical record review. During observations and simulations in the 2010 survey, specific tasks not implemented included administration of eye ointment (due at least in part to stock-outs), taking the newborn's temperature, and keeping the newborn warm.

Figure 3: Maintaining gains in quality of care for essential newborn care (ENC) – January 2006-April 2010 in 20 sites in 7 regions of Niger



Case management of pre-eclampsia and eclampsia

Figure 4 presents data on compliance with case management norms for pre-eclampsia and eclampsia. This area of intervention started in 2008 and only had seven months of improvement activity before the collaborative ended due to funding limitations. Baseline survey observations of case management revealed no cases managed in compliance with standards. The number of observations at the 2010 survey was too small to analyze. Here again, patterns of rapid improvement are seen and appear to be maintained over time at about 80%—a level slightly lower than those for AMTSL and essential newborn care. Specific tasks that were problematic included evaluation of gestational age, testing for proteinuria, and taking blood pressure (in part due to lack of equipment). The number of observations of actual case management of pre-eclampsia and eclampsia was very small, due to the limited number of observations of antenatal care.

2. Implementation of effective operational changes for achieving adherence to EONC norms

One of the major products of the EONC collaborative was a set of operational changes that had been shown to facilitate achievement and maintenance of results. Figure 5 for EONC I (AMTSL and ENC) and Figure 6 for EONC II (case management of pre-eclampsia and eclampsia) present the average percentage of key operational changes that QI teams implemented to achieve the results seen in Figures 2-4, organized into four change categories: changes related to human resources, changes related to inputs, changes related to clinical care processes, and changes related to organization of services. The percentages presented in Figure 5 (total of 24 operational changes) and Figure 6 (16 operational changes) are the averages across all changes in that category and across all sites.

Figure 4: Maintaining gains in quality of care for management of pre-eclampsia and eclampsia – January 2006-April 2010 in 20 sites in 7 Regions of Niger

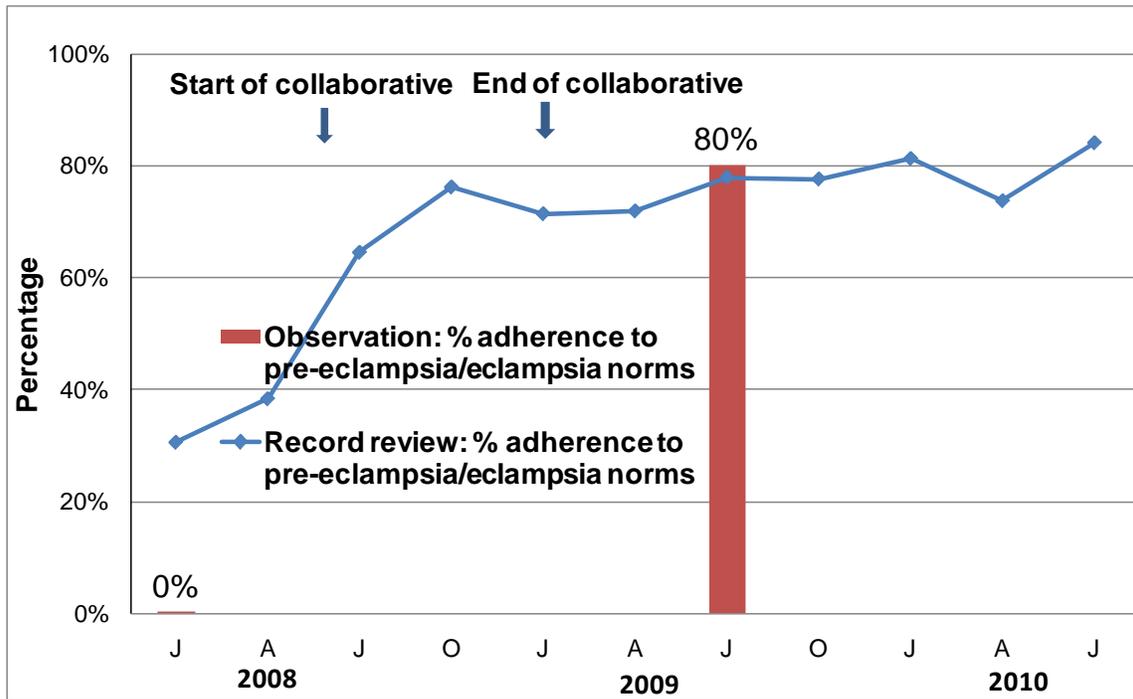


Figure 5: Implementation of operational changes over time in EONC I – average number of changes implemented in the category across sites (n=20 sites)

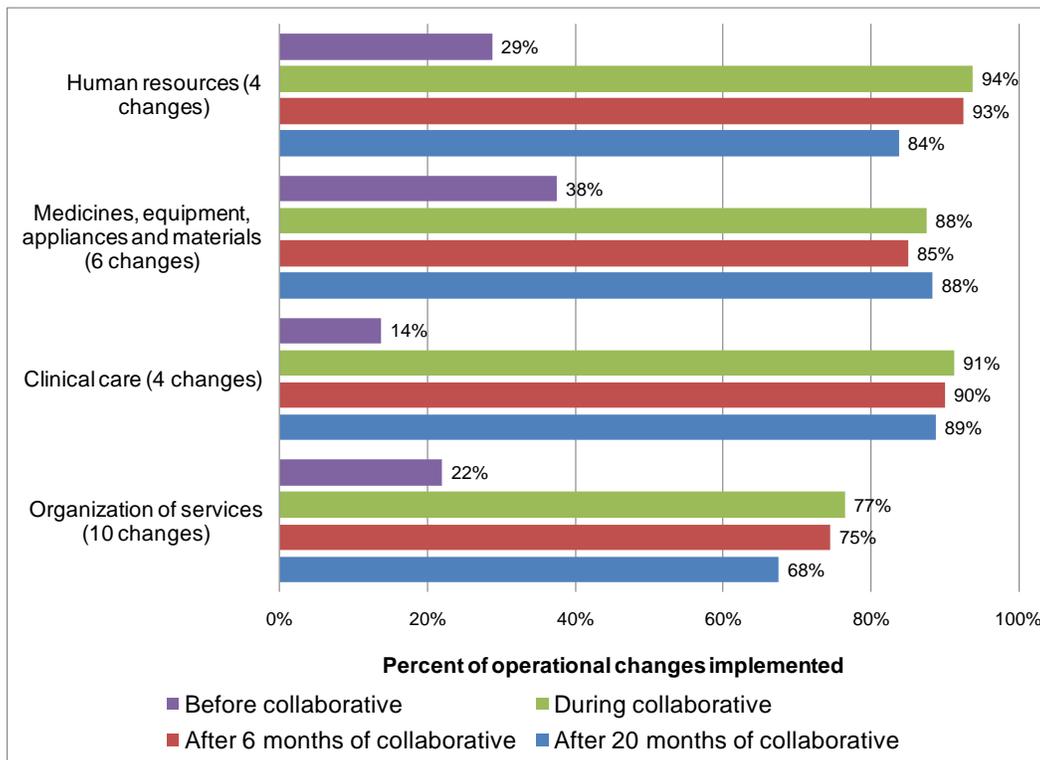
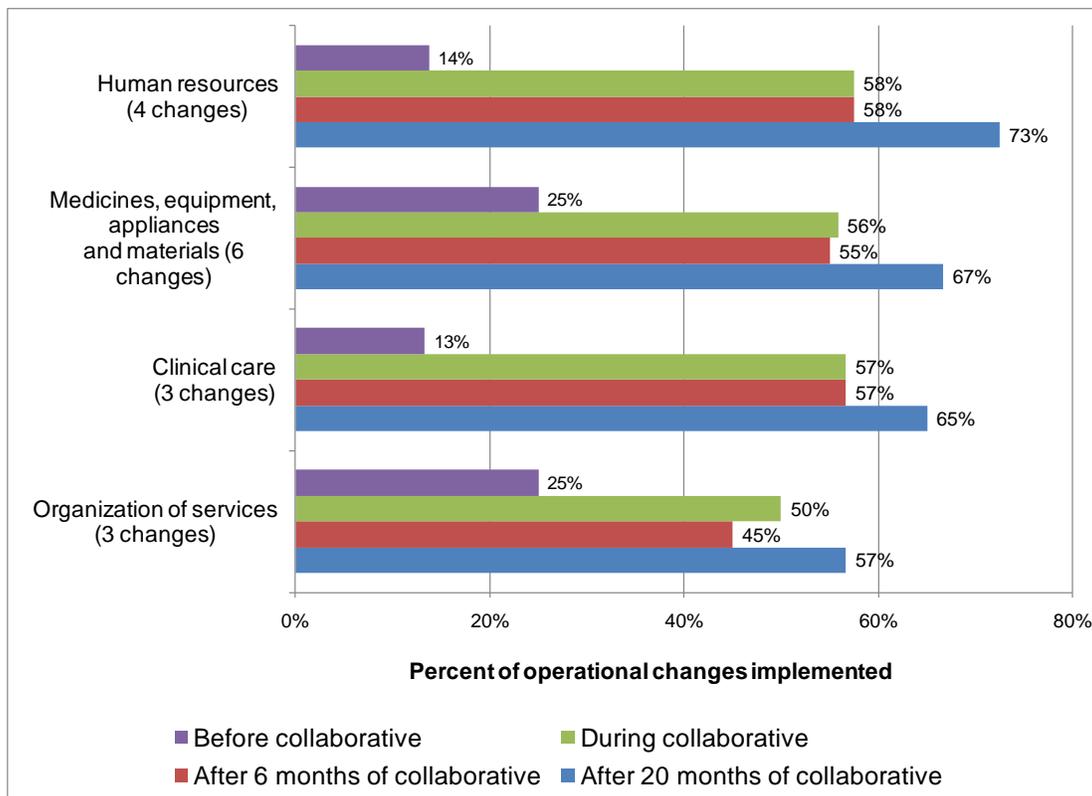


Figure 5 shows a significant increase in implementation of these changes from the pre-collaborative period to the collaborative period, and implementation of these changes generally continued over time, even at 20 months post-collaborative. The four human resource changes included job aids, observation of practice, debriefing after training events, and regular review of partographs after the evening shift. The six input changes related to ensuring availability in the delivery room of essential medicines and supplies. The four clinical care changes included adding AMTSL items to the partograph, integrated care for mother and newborn, extension of post partum surveillance, and increased length of stay after delivery. The 10 changes related to service organization included creating a place for newborn surveillance, ensuring patient privacy during delivery (through screens or other mechanisms), organizing the delivery room for integrated care, organizing regular cleaning of the delivery room, designating a midwife in charge of the delivery room, and assignment of qualified staff to evaluate mother/newborn at discharge. Changes that seemed to fall off in implementation over time were observation of practice, designating a midwife to be in charge of the delivery room, and assignment of qualified staff to evaluate the mother and newborn at discharge.

Figure 6: Implementation of operational changes over time in EONC II (n=20 sites)



For EONC II, the collaborative teams had less time to test changes and share ideas than in EONC I, and the effects can be seen in Figure 6, where generally we see highest values in the 58-73% range, compared to those of 68-94% for EONC I shown in Figure 5. However, in contrast to EONC I, we see that among EONC II teams, more changes were implemented over time: in the 20 months post-collaborative, more changes were being implemented than in earlier periods, indicating that QI teams were still working on how to provide high quality case management of pre-eclampsia and eclampsia. The types of changes implemented for EONC II were: 1) four human resources changes, including on-the-job training, job aids, verification of client card completion; 2) six inputs changes, including improving stocks of urine sticks, blood pressure cuffs, and magnesium sulphate; 3) three clinical content changes, including systematic assessment of all pregnant women in antenatal, delivery and post-partum care and

adopting a new classification for hypertension; and 4) three organization of care changes: systematic lab exams for those with severe pre-eclampsia or eclampsia, redeployment of staff and reallocation of tasks, and creation of on-call teams of qualified providers. Although the overall percentages are lower for EONC II, the percentages have increased in all categories in the period after the collaborative. Changes that were most frequently implemented in the last post-collaborative period were: on-the-job training and job aids, ensuring availability of blood pressure cuffs and anti-hypertensive drugs, modifying existing forms to ensure documentation, and redeployment of health staff. It should be noted that the collaborative activities were ended somewhat abruptly and teams were still fully engaged in making improvements when technical assistance support ended.

3. Enabling environment for EONC care delivery

The ability to maintain gains in quality of care over time is also dependent on having the resources in place to provide that level of care. Table 6 presents the availability of drugs, supplies, and trained personnel at the different points of data collection. There appears to be a relatively steady supply of key inputs for AMTSL and ENC, but more problems with supplies for management of pre-eclampsia and eclampsia. In 2010, only one site reported problems with oxytocin for AMTSL, and no site reported problems for magnesium sulphate. However, other key inputs were frequently missing: eye ointment for newborn care, adult scale, urinary strips for testing proteinuria, calcium gluconate, adrenaline, and hydralazine for management of pre-eclampsia and eclampsia.

During the collaborative, using an on-site training approach, all existing staff at sites received practical training in the clinical care package, with validation of skills. However, over time, staff mobility has eroded this coverage with formal training. For AMTSL/ENC, by 2009 only 71% of current staff had received formal training. Given that staff turnover is probably close to 20% per year (see Table 5), the fact that the percentage of staff formally trained had remained somewhat stable between 2009 and 2010 is due in part to efforts that the MOH took, using other sources of funding, to organize several ATMSL/ENC trainings. While the drop to 71% for formally trained staff for EONC I reflects a change since 2006 when initial training occurred, the drop in proportion of staff trained in pre-eclampsia and eclampsia (EONC II) to 63% is more dramatic, since this occurred within the space of one year (training occurred in June 2008 and the survey was conducted in June 2009). It should be noted that many of those trained for this phase of the collaborative were contractual workers (not civil servants), and turnover is especially high in this group.

Table 6: Continuing availability of key inputs for EONC (average across 20 sites: 19 EONC I and 12 EONC II sites)

Key Input (aggregated mean values for sites)	< 2006 <i>Before collaborative (EONC I)</i>	2006-2008 <i>During collaborative</i>	2009 <i>6 months post collaborative</i>	2010 <i>20 months post collaborative</i>
% of key EONC I drugs and supplies	58%	95%	93%	94%
% of key EONC II drugs and supplies	49%	78%	75%	75%
% of providers formally trained in EONC I		<i>All on site at time of training</i>	71%	70%
% of providers formally trained in EONC II		<i>All on site at time of training</i>	63%	64%

B. Status of Institutionalization of Quality Improvement at the Site Level

Institutionalization of QI would be reflected in continuing implementation of some improvement activities and application of the range of QI activities to new domains or new problematic areas of care.

1. Ongoing implementation of key QI activities

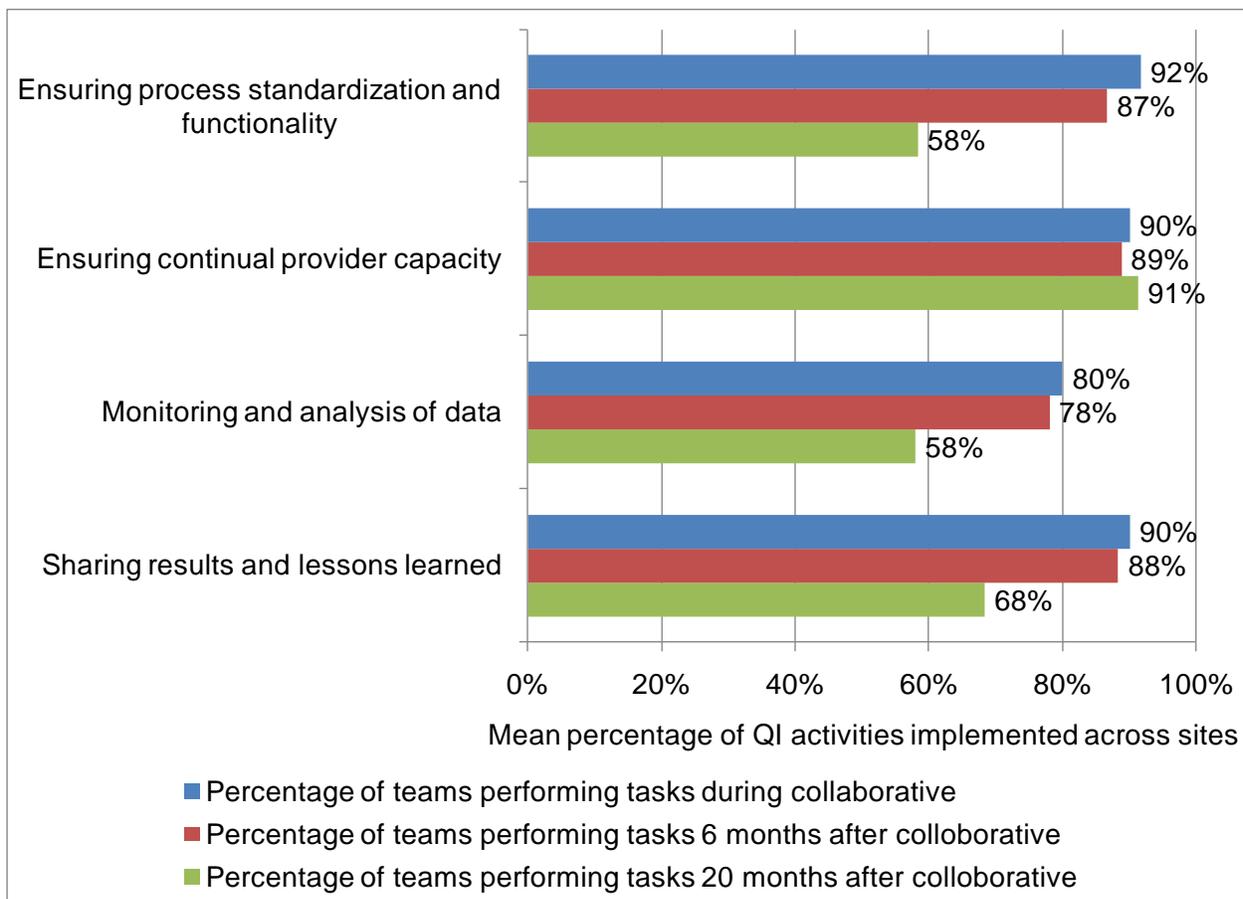
In measuring ongoing QI implementation related to EONC, we focused on a limited set of tasks that could be expected to be implemented over time, even once good results had been achieved. For

example, QI tasks related to testing changes were not considered to be essential when high levels of compliance with norms had been maintained over years. However certain tasks were considered essential to sustain gains over time: ensuring that: 1) a standardized functional process of care is maintained, 2) staff competency is maintained, 3) results continue to be monitored, and 4) results and lessons learned continue to be shared.

Figure 7 presents the mean percentage of essential QI activities being implemented across sites for the following periods: during the collaborative, at six months post collaborative (June 2009), and at 20 months post collaborative (August 2010). While most activities continued to be implemented six months post collaborative, there was a significant drop in QI activities at 20 months post collaborative for each category, with the exception of ensuring continual provider capacity. Specific tasks that declined appreciably in each category were:

- 1) ensuring process standardization: continuing to refer to process diagram and meeting with providers to discuss process implementation;
- 2) monitoring and data analysis: while indicators continued to be calculated, data were not graphed, annotated or interpreted as frequently;
- 3) sharing results and lessons learned: all activities—transmission to higher levels, discussing results with other site providers, and sharing results with other sites.

Figure 7: Implementation of QI activities over time: mean percentage across sites and activities (n=20 sites)



2. Application of QI to a new domain

If QI were institutionalized, one would expect to see sites applying their QI skills and competencies to new areas, especially when gains in quality of care in the original domain have been maintained over time. Of the 20 sites participating in this study, 12 sites (60%) made efforts to improve care in another domain than was addressed by the EONC collaborative, as seen in Table 7. These efforts at improvement were initiated both in 2009 and 2010, and new domains were addressed in national, regional, and district hospitals as well as peripheral maternities. The most frequent area for applying new QI efforts was prevention of mother-to-child transmission of HIV (5 sites); other new areas included immunizations, prenatal care, malaria, human resources, and nutritional services, which were each addressed by 1-2 sites.

Table 7: Applying QI to a new domain

Implementing QI activities in a new domain	National and regional sites (n=5)	District hospitals (n=12)	Integrated health centers (n=3)	All sites (n=20)
Ever applied to a new domain	3 (60%)	7 (58%)	2 (66%)	12 (60%)
In 2009	3	5	1	9
In 2010	2	5	2	9
Both 2009 and 2010	2	3	1	6

In applying QI to a new domain, one would expect teams to carry out the full range of QI activities, including analyzing their processes and testing changes to see if they yield improvement. Upon examining the specific QI activities implemented by these 9 teams in 2010, it is seen that all teams defined the problem and developed improvement objectives; most (6/9) developed action plans, trained providers, and tested changes; but very few teams (1-3/9) used a process diagram to focus their efforts. Almost all (8/9) followed some kind of indicator, but fewer (5-6/9) graphed the data, annotated their time series charts, and interpreted the findings. Almost all (8/9) transmitted their results to higher levels and discussed results with providers at their facility.

3. Enabling environment for quality improvement

There can be several possible explanatory factors at team level for why sites may or may not be continuing to implement QI activities over time: team stability, QI competency, team engagement, and team collaboration. Table 8 presents results on these possible explanatory factors from both the 2009 and 2010 surveys. Generally, we see little difference in any of these scores between 2009 and 2010, with the exception of QI competency at team level. There was little difference in the percentage of individual team members who can carry out all tasks. While the percentage of teams that had all the QI competencies present somewhere in the team dropped from 90% of teams to 55% of teams, average scores (accounting for varying levels of comfort: can do without difficulty—2 points; can do with difficulty—1 point; and cannot do—0 points) did not change much, at a mean value of 17.2 (out of 28 possible points) and 17.7 in 2010.

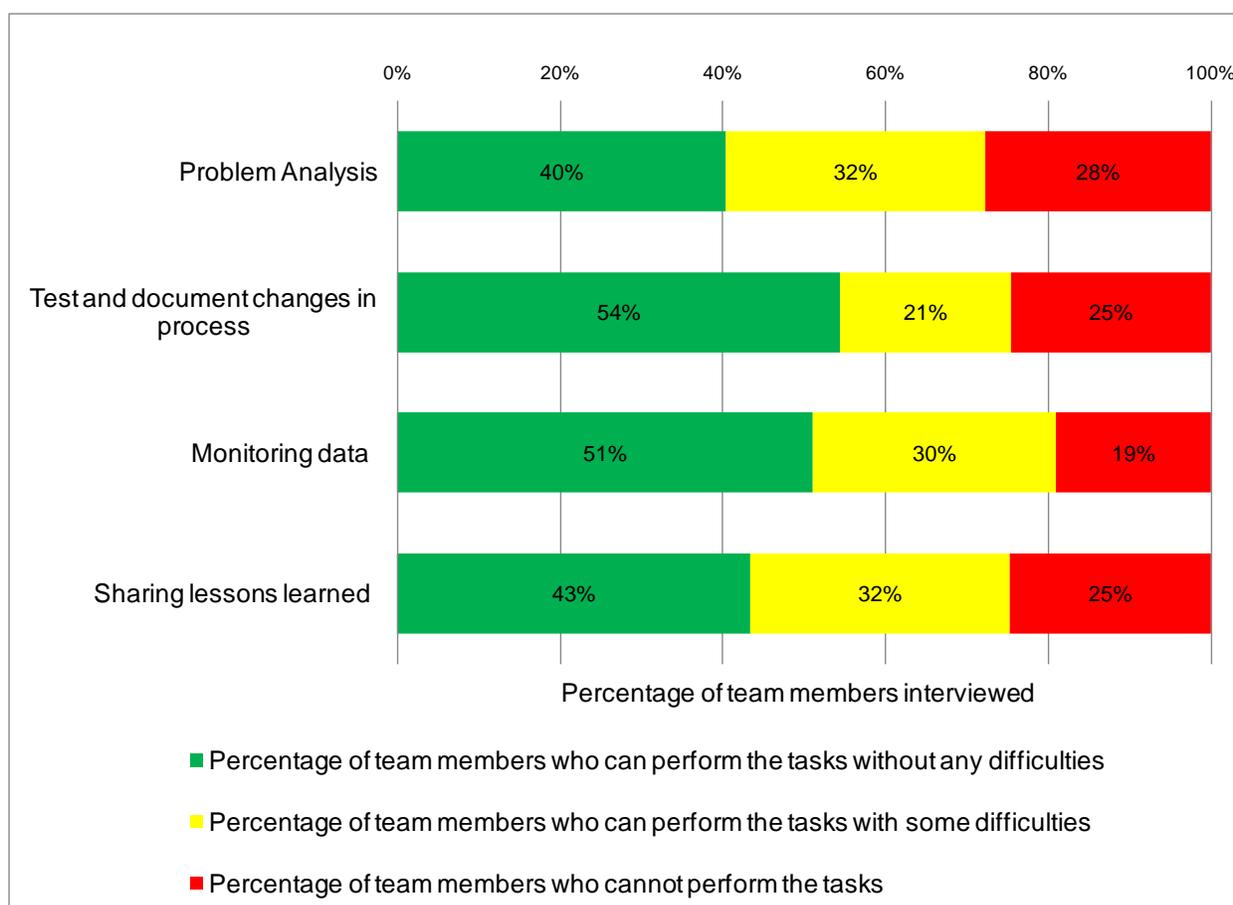
Team competency: The team competency measure consists of 14 QI tasks that QI team members would need to use during the active collaborative phase. Figure 8 presents a breakdown of competency by QI task category for the 2010 data, and shows that only 40-54% of individual QI team members interviewed were confident in their ability to perform tasks in these categories without difficulties, and 19-28% did not feel able to perform them at all. Some of the tasks that current team members felt less confident about were tasks related to the intensive testing and sharing phases of the collaborative (carrying out a Plan-Do-Study-Act or PDSA cycle and debriefing the other members of the QI team after a learning session), but other tasks (such as selecting a sample of records for analyzing indicators) is an essential ongoing QI task. Tasks for which more than 50% of all interviewed team members expressed confidence in their ability included: lead a QI team meeting, write QI team meeting minutes, document changes that have been implemented, and calculate indicator values.

Table 8: Factors in the enabling environment that can affect QI implementation at 6 months and 20 months post collaborative (n=20 sites)

Measure of enabling environment	2009 6 months post collaborative	2010 20 months post collaborative
Percentage of original members retained in QI team	59%	N/A*
Percentage of new members in the QI team	34%	N/A*
Percentage of current members competent in all QI tasks	28%	31%
Percentage of teams with competence in all tasks	90%	55%
Mean team QI competence score (out of 28 possible points)	17.2	17.7
Mean team collaboration score (out of 45 possible points)	35.1	36.1
Mean team member engagement score (out of 5 possible points)	3.7	3.8
Mean team member engagement score (out of 5 possible points)	3.6	3.6

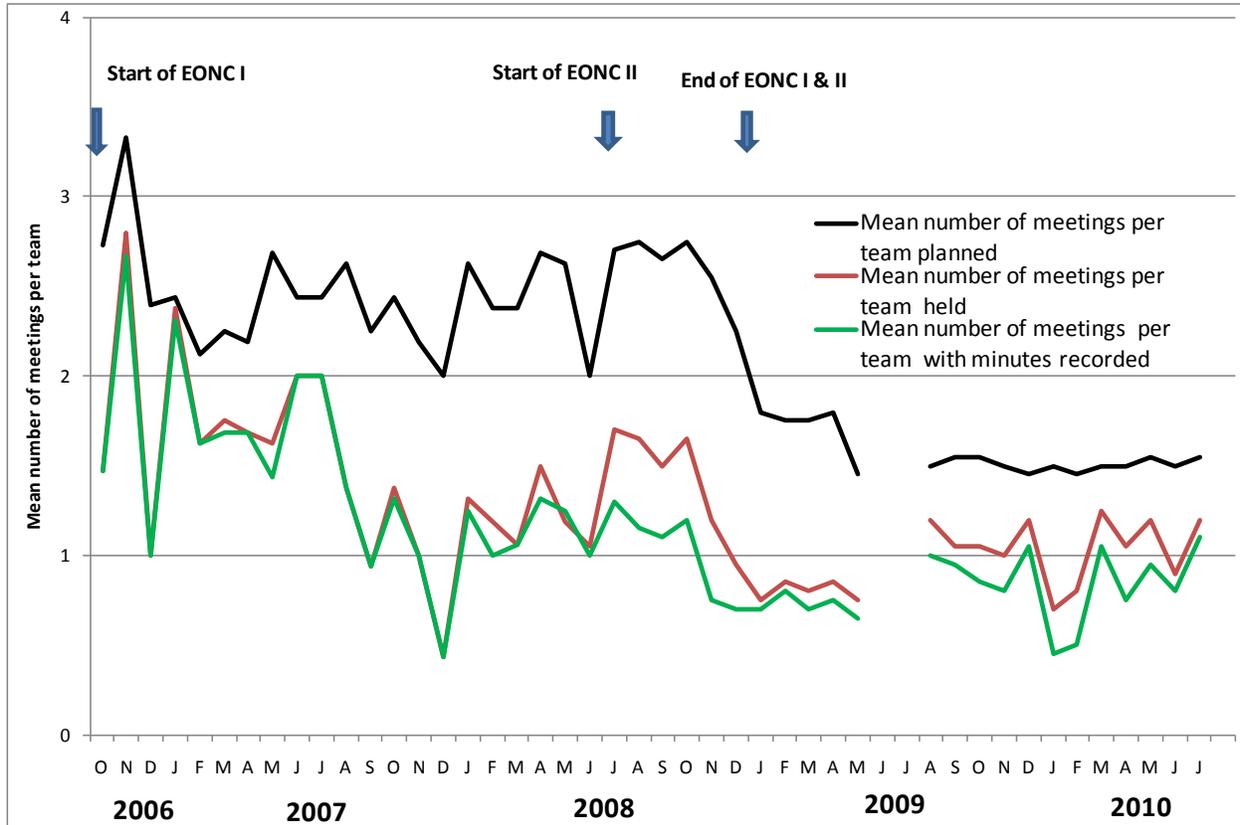
*The data from the 2010 survey are deemed to be unreliable, as the number of original team members drops over time, knowledge of who was originally on the team was lost.

Figure 8: Competency of QI team members 20 months post collaborative broken down by tasks (n=83 QI team members)



Frequency of team meetings: One sign of team dynamism is frequency of team meetings, although it is not expected that QI teams would continue to meet as often over time, especially when they have achieved their goals. Figure 9 shows the mean number of meetings planned, held, and held with minutes recorded per month, across the 20 teams from 2006-2010.⁵ While teams appeared to start actively planning and carrying out meetings at the beginning of the collaborative, the percentage of planned meetings held dropped after about six months, to approximately once a month. Another spike occurred with the beginning of the EONC II activities, where teams participating in that collaborative became active again. With the end of collaborative activities at the end of 2008, the number of meetings declined again.

Figure 9: Mean number of QI team meetings per month per team (n=20 sites)



There is a rise in meetings after August 2009, and Table 9 shows how this has evolved over time by different type of site (EONC I and EONC II). An earlier analysis of the 2009 survey data indicated that EONC II sites were the ones primarily continuing to meeting in early 2009, while non-EONC II sites had mostly stopped meeting completely. In the first six months post collaborative (2009 survey), 63% of those teams participating only in EONC I had no meetings, whereas those involved in EONC II met at least monthly if not more often (Boucar et al., 2011). However, the 2009 increase in meetings seen for EONC II was not sustained, as seen in Table 9: by 2010, the number of meetings is either similar or lower in EONC II sites than in EONC I sites.

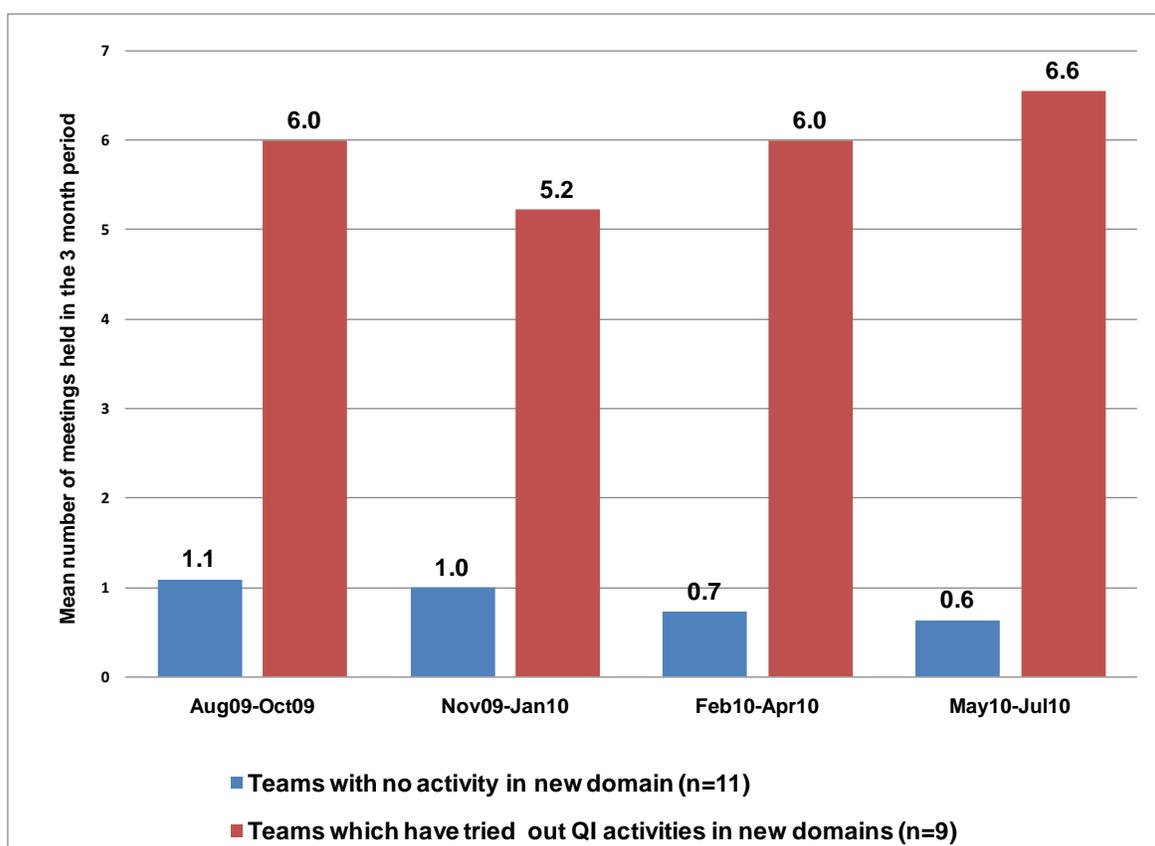
⁵ The break in data for June and July was due to a fault in the data collection instruments for the 2010 collaborative which did not fill the gap between the two surveys.

Table 9: Mean number of meetings (range) conducted in a three-month interval (n=20 sites)

	EONC I (n=8)	EONC II (n=2)	EONC I & II (n=10)	Overall (n=20)
Aug 09-Oct 09	4.6 (0-12)	3.5 (0-7)	2.2 (0-10)	3.3 (0-12)
Nov 09-Jan 10	3.8 (0-12)	2 (0-4)	2.4 (0-11)	2.9 (0-12)
Feb 10-Apr 10	4.5 (0-13)	3.5 (0-7)	1.9 (0-8)	3.1 (0-13)
May 10-Jul 10	3.6 (0-12)	3.5 (0-7)	3 (0-8)	3.3 (0-12)

However, there is a positive association between meeting frequency and the application of QI to a new domain (see Figure 10): those teams having embarked on a new area have approximately six times as many meetings as those who have not done so, and this pattern is fairly stable over the 12 months of August 2009-July 2010.

Figure 10: Comparison of number of QI team meetings held by teams which have ventured into new domains and those that have not ventured (n=20 sites)



4. Integration of QI into hospital annual action plans

Following the workshops to develop the institutionalization change package, meetings were organized in each region to present the package and discuss its implementation at regional, district, and site levels. While a dissemination meeting was organized in each region, attendance focused mainly on the Regional Health Management Team, with a few district and site representatives present. These were informational meetings and did not focus specifically on follow-up tasks and assigning responsibility for action. Of the 20 sites that were surveyed in 2010, only four had received information about the change package.

Of the 20 sites in the sample, only the regional and central level hospitals do their own annual action plans. Table 10 presents, for the five relevant sites, how many of the 15 QI activities that they were expected to incorporate into their action plans were actually planned, financed, and implemented as of August 2010. The activities they were presumed to have incorporated were: baseline evaluation of quality, ensuring availability of protocols and job aids, training in QI and clinical content, evaluating implementation of institutionalization change package, coaching, equipment maintenance, coordination meetings, participation in learning sessions, visits among sites, supporting QI teams, capacity building for coaches and QI team leaders, and motivating QI teams. Across these five hospitals, of the 75 possible opportunities (5 sites x 15 activities), about 20% (15/75) of these possible activities were incorporated into the annual action plans of these hospitals, of which 73% (11/15) were financed. All activities with financing (11/11) were actually implemented.

Table 10: QI-related actions (15) to be planned for and financed in annual action plan and whether they were executed by site

Site	QI RELATED ACTIONS TO BE INTEGRATED INTO ANNUAL PLANS (n=15)		
	Included in annual action plans	With financing	Actually implemented (August 2010)
Central Referral Maternity	4	4	4
Regional Hospital Dosso	3	3	3
Regional Referral Maternity Tahoua	2	0	0
Regional Hospital Maradi	3	1	1
Regional Hospital Diffa	3	3	3
Total	15	11	11

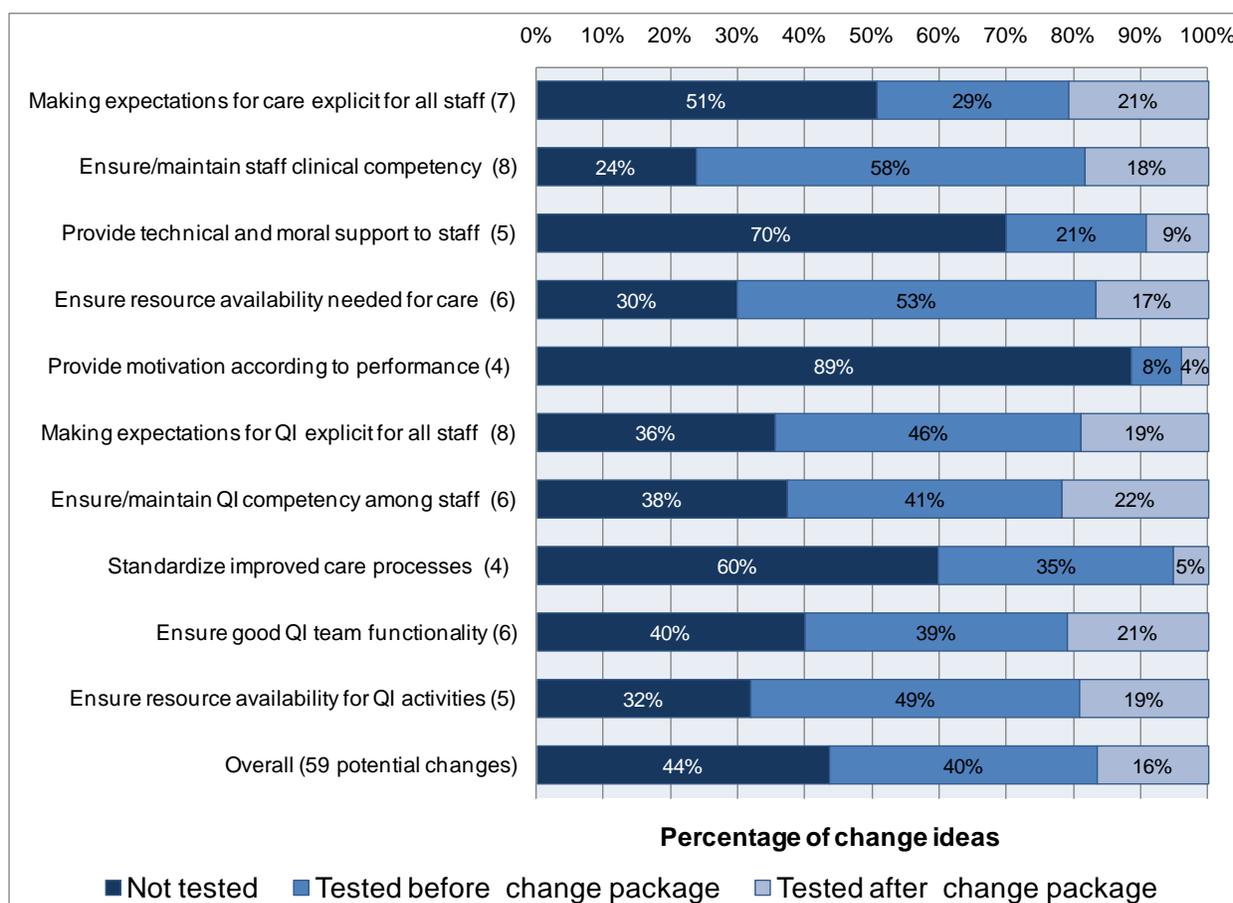
5. Implementation of site level aspects of the institutionalization change package

The institutionalization change package included 59 specific change ideas that may or may not require additional resources but that would contribute to the achievement of the institutionalization change package's objectives. Several sites were already implementing some of these changes prior to November 2009, when the change package was disseminated. Figure 11 presents results from all 20 sites (regardless of whether they develop a separate annual action plan or not) on specific change ideas grouped within 10 change concepts. Implementation of specific change ideas was categorized as "never implemented," "implemented before the change package dissemination" (i.e., during or just post collaborative), or "implemented after the change package dissemination."

As can be seen, across the 20 sites, on average, 56% of change ideas were being implemented, but with the majority having been implemented prior to the change package dissemination. The change concepts that were most frequently implemented in these 20 sites were: ensuring clinical and QI competency and ensuring resource availability. Those least frequently implemented were related to staff motivation, internal technical and moral support, and standardization of care processes. The 2010 survey asked whether sites had used the PDSA cycle in testing any of these changes, and none had done so.

There was some variation across sites in terms of testing change ideas after the change package dissemination. Some sites had been particularly active in implementing various change ideas before November 2009: seven sites had implemented more than half of these changes prior to November 2009, with four sites implementing more than three-quarters of them and four sites implementing fewer than half of the changes. Ten of 20 sites were inactive in the period post-change package dissemination, implementing two or less changes (of 59) in that period. Two sites (district hospitals in Konni and Doutchi) were particularly active post dissemination and had tested more than half of the changes listed.

Figure 11: Implementation of the tested change package (n=20 sites)



C. QI Support from Higher Levels of the System: District, Regional and Central Levels

Maintenance of gains in quality of care and continued implementation of QI at the site level often depends on the support provided from higher levels of the system. This support comes in many forms, including coaching, capacity building, creating or maintaining mechanisms for sharing ideas across sites, developing new domains for improvement focus, supporting dissemination of clinical norms, and spreading changes to new sites. This section discusses the levels of support being provided over time from district, regional, and central levels.

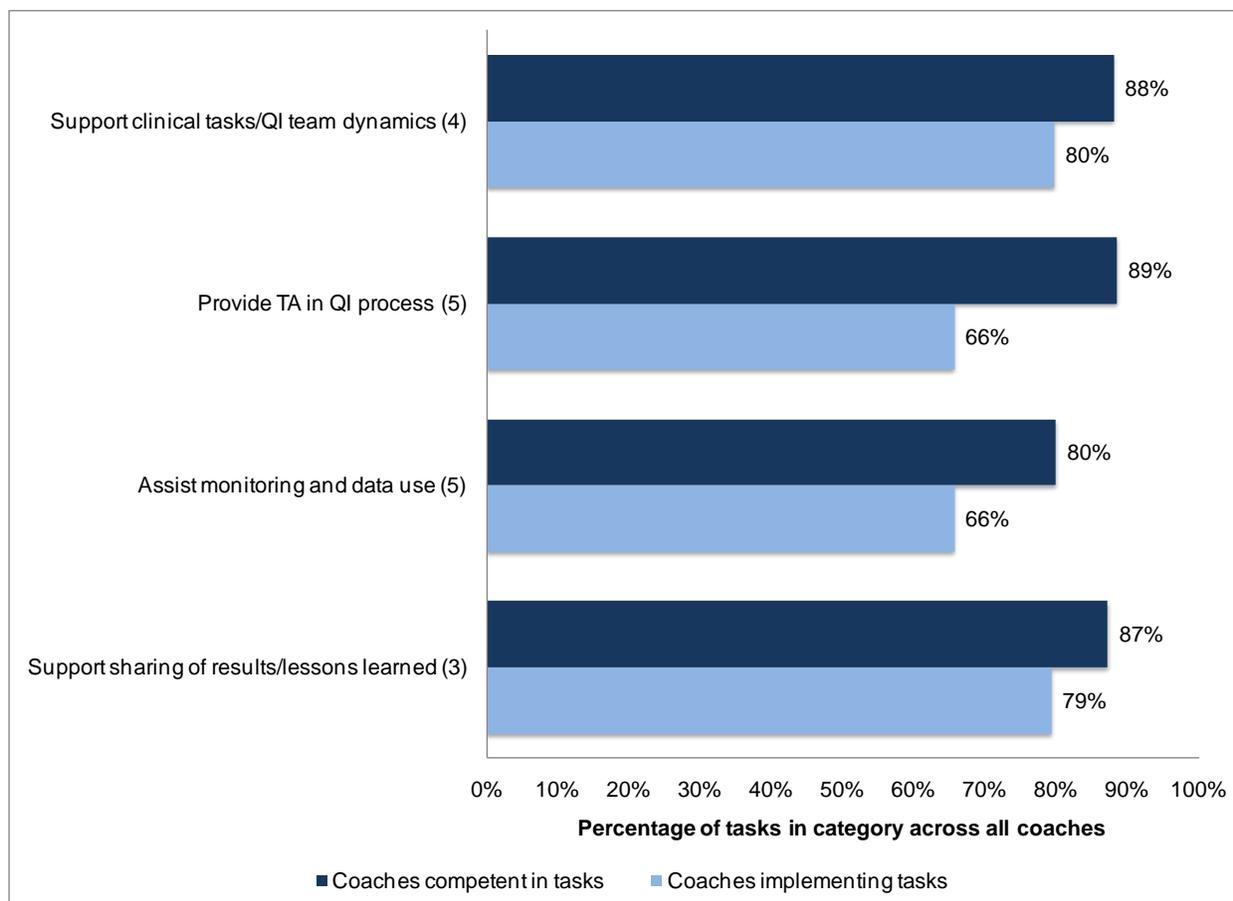
1. Implementation of coaching

The active phase of the EONC collaborative included a QI coaching strategy that encompassed both clinical and QI activities and used both external coaches (coming from the national or regional level) and internal coaches (individual members of QI teams that had been given additional training in coaching techniques). The internal coaching strategy was developed to address the difficulty of ensuring adequate coaching across the vast geographical expanse of the seven regions of Niger. The coaches were often themselves active QI team members at national and regional maternities, who then provided coaching to other sites.

No specific data were available on the intensity of coaching activities during the active phase of the collaborative or during the six months post collaborative, and it should be noted that the sample of coaches interviewed in 2009 (13) and 2010 (21) was not completely the same. There was very little variation in the specific activities that coaches reported doing in the 2009 survey and the 2010 survey.

Figure 12 presents results from the 21 coaches interviewed in 2010, both on their perceived competency in specific types of coaching tasks and whether they had implemented that task in any coaching visits after November 2009. Perceived competency remains high among these coaches. Lower levels of implementation were seen in developing and using process diagrams, graphing time series charts, annotating them, and sharing results from other teams. These patterns are similar to those seen in Figure 7 (QI among site teams).

Figure 12: QI coach competency and activity level at 20 months post collaborative, August 2010 (n=21 coaches)



2. District, regional and central level implementation of QI support activities

DHMTs, RHMTs, and central level Ministry of Health staff have key roles to play in supporting QI at the site level. We measured implementation of QI support activities in two categories of tasks:

- **Activities specifically related to supporting the EONC collaborative:** participating in developing a change package, providing training in the clinical and QI aspects of EONC, providing external coaching, organizing and/or participating in learning sessions or sharing opportunities, sharing collaborative results at national fora, applying the collaborative approach to another domain, and scaling up EONC/QI to other sites.
- **Activities related to more general support for QI:** providing training in QI, sharing successes of QI, advocating for support for QI, mobilizing resources for QI, revising norms, analyzing data on quality for decision making, following up on use of quality data for decision making by others, strengthening partnerships for QI, and supporting implementation of QI.

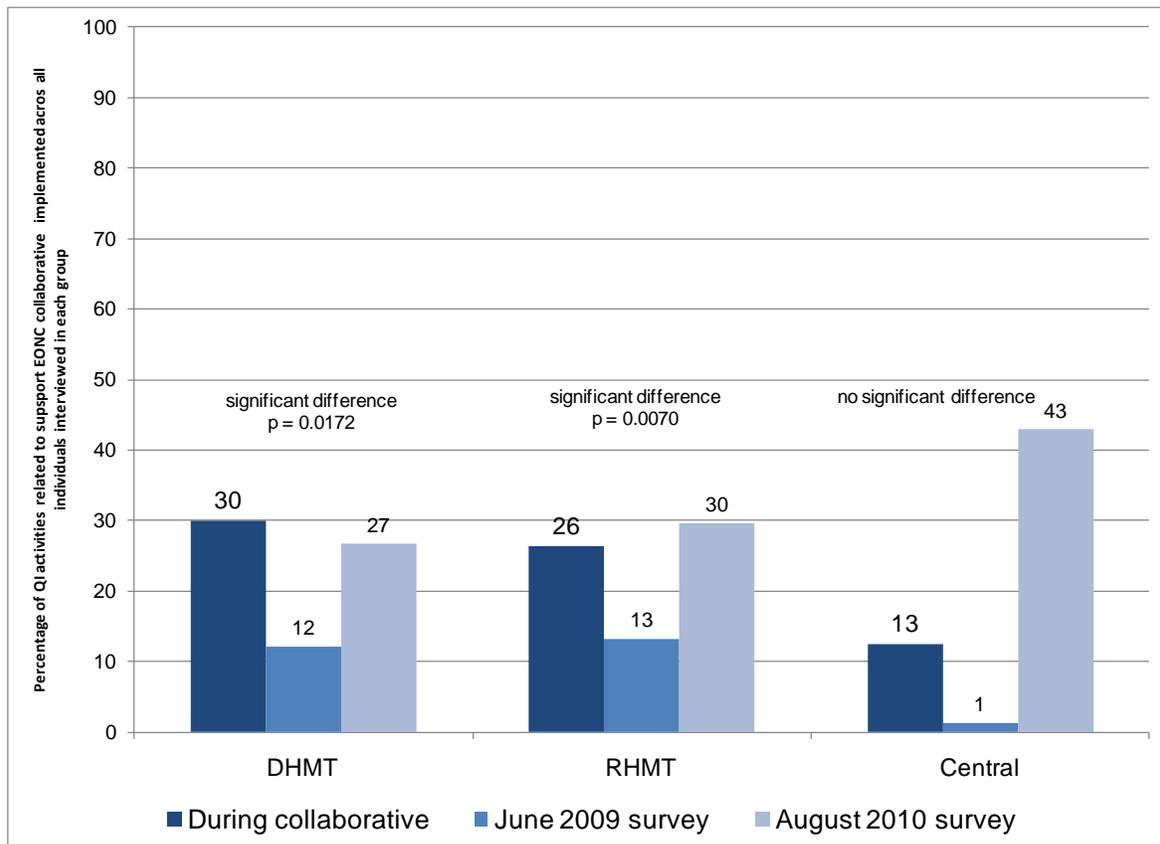
Figure 13 presents a comparison of QI implementation related to the EONC collaborative activities during, at six months post, and 20 months post collaborative. While it should be noted that those interviewed in 2009 (providing information on implementation both during and six months post collaborative) may not be the same individuals interviewed in 2010, there is a statistically significant difference in the number of activities implemented at 20 months post collaborative, compared to six months post collaborative, at both DHMT and RHMT levels, and a similar pattern is seen for the central level, although the sample size is too small to detect significance.

For DHMT members, those activities more frequently implemented in 2010 included: providing training in QI (over half the DHMT staff interviewed), organizing and participating in learning sessions or sharing opportunities, and spreading learning from the EONC collaborative and QI to new sites. Increases in QI competencies between 2009 and 2010 reflect some of these changes – district staff had higher perceived competencies in QI training, developing/revising norms, and support and monitoring of QI.

RHMT members more frequently implemented QI collaborative activities, such as designing a change package, providing EONC clinical training and training in QI, and spreading EONC to new areas. Perceived capacity increased from 2009 to 2010 for especially for developing/revising norms, and also for sharing results and experiences.

Major differences in responses at the central level between 2009 and 2010 were related primarily to the involvement of two individual respondents in the range of activities; almost everyone engaged in sharing results and experience among QI teams.

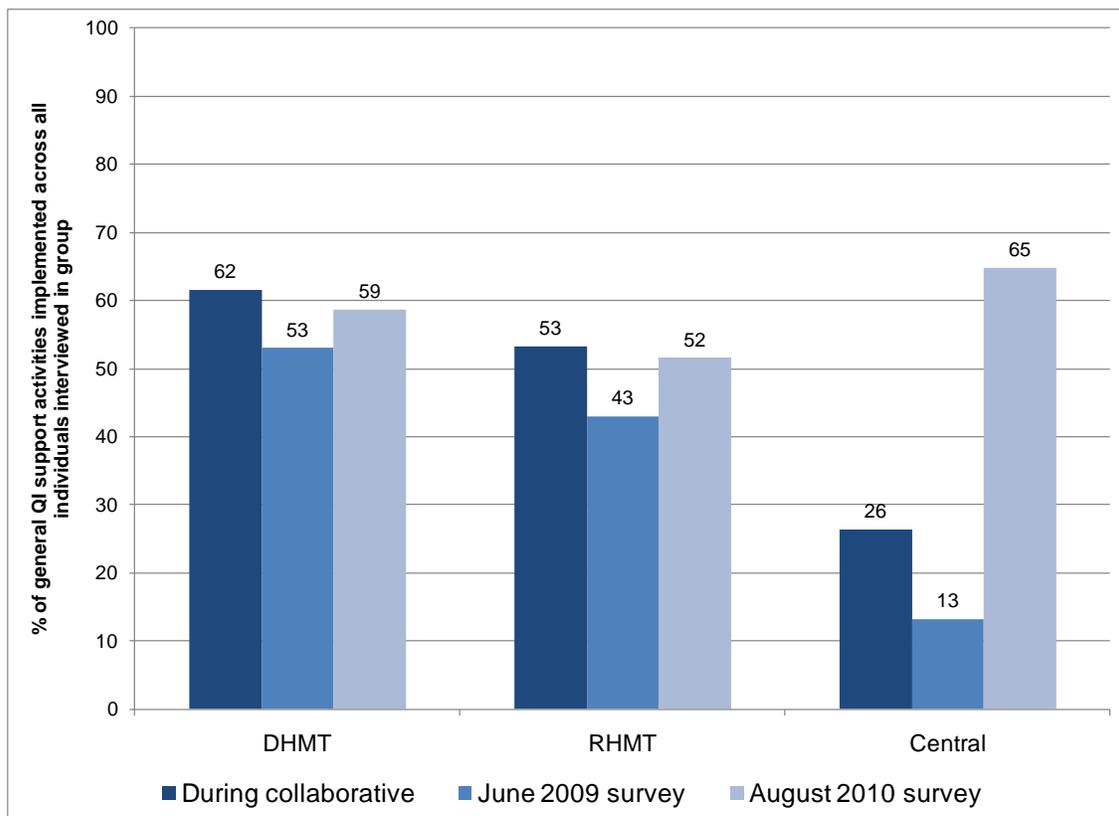
Figure 13: Percentage of QI tasks related to EONC collaborative implemented by DHMT, RHMT, and central level staff interviewed (DHMT: 2009–42; 2010–40; RHMT: 2009–45; 2010–48; Central: 2009–8; 2010–5)



Detailed review of these results indicate that in eight of the 12 districts, one or two management team staff members were very active during the collaborative involved, being involved in six or more activities. In 2009, only two districts at least one person very active, but this increased to five districts in 2010. These active districts in 2010 fall within three regions: Maradi, Niamey, and Tahoua. In some cases, activity level of the regions corresponded with those at district level, but other regional management teams continued to be active even while their DHMTs were not: Dosso and Tillabéri regions were very engaged in collaborative type activities in 2010, including organizing learning sessions/sharing opportunities and expanding EONC to new sites.

Figure 14 presents results for the more general QI support activities. Here, no significant differences were seen among the three time periods at district, regional, or central levels. Although there appears to be an increase in 2010, the sample size is too small to detect significant differences. It should be noted that the percentages of general QI support activities implemented at district and regional levels are higher—about double those for specific collaborative support activities.

Figure 14: Percentage of general QI support activities implemented by DHMT, RHMT, and central level staff interviewed (DHMT: 2009–42; 2010–40; RHMT: 2009–45; 2010–48; Central: 2009–8; 2010–5)



3. District, regional, and central level training, mobility, and perceived QI competency

As at the QI team level, several factors may explain why DHMT, RHMT, and central level staff continued or failed to continue to implement QI activities over time, particularly perceived QI competency and staff mobility.

District Health Management Teams: Of the 40 DHMT members interviewed across the 12 districts in 2010, 58% reported having experience and/or having been trained in QI, with some having

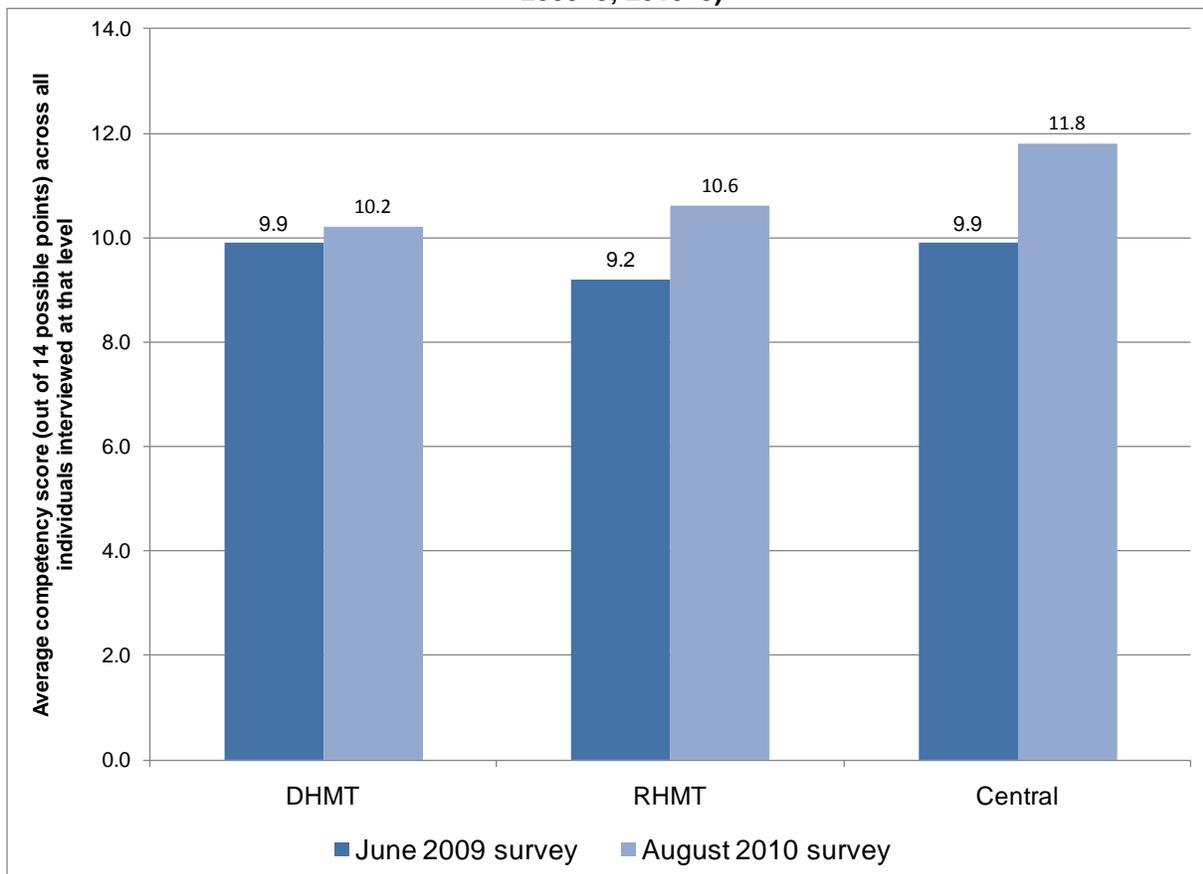
taken part in QI in the Tahoua region in the 1990s. This is an increase from the results of the 2009 survey, in which 42% of DHMT members interviewed reported having received any training in QI.

To be able to support the clinical improvements, each DHMT should have at least one member with appropriate clinical skills (training in the technical area) to provide support. The DHMT is composed of both clinical and non-clinical staff, such as epidemiologists, managers, and public health technicians. In the 2010 survey, clinical personnel were interviewed (midwife and/or physician) in 10 of 12 districts: three of these DHMTs had at least one person who had been trained in AMTSL/ENC, three in pre-eclampsia and eclampsia, and six in emergency obstetric care.

Regional Health Management Teams: No information is available from the 2009 survey on QI training among RHMT members, but 75% of those interviewed in 2010 reported having received some kind of QI training. Clinical training in AMTSL/ENC, PEE, or emergency obstetric care was also low at the regional level for clinical staff interviewed: of the 14 clinical staff interviewed, only two had received training in AMTSL/ENC, two in PEE, and one in emergency obstetrical care.

Figure 15 presents the competency scores in 2009 and 2010 for the seven QI support tasks, based on self-reported competency of individual respondents interviewed. These seven tasks include: training others in QI, developing/revising norms, identifying new domains for improvement, developing initial change packages and indicators, expanding QI to new sites, supporting/monitoring quality of performance, and sharing results/experiences among QI teams. Respondents rated themselves on each of these tasks based on a scale of 0 (cannot perform), 1 (can perform with help from others), or 2 (can perform without difficulties).

Figure 15: Mean competency score for the 7 QI tasks 6 months (2009) and 20 months post collaborative (2010) interviewed (DHMT: 2009–42; 2010–40; RHMT: 2009–45; 2010–48; Central: 2009–8; 2010–5)



The average score represented about 62-84% competency, and there were no significant differences between 2009 and 2010. Across the seven tasks, an average of 50% of DHMT respondents in 2009 felt they could perform the task without difficulties; 58% in 2010. These numbers were similar for RHMT and central level staff: 48% of RHMT staff felt they could perform the task without difficulty in 2009 and 51% in 2010; for central level staff, the corresponding figures were 41% in 2009 and 71% in 2010. It should be noted that the number of respondents from the central level was very small and the sample of individuals interviewed played different roles.

However, it should be noted that while overall scores did not change much, there were some large changes (increases and decreases) between 2009 and 2010 within districts and regions. Six districts experienced an average perceived competency increase of 2.3 tasks (28% increase), while four districts decreased by 1.7 tasks (21% decrease) and two districts experienced no changes. At the regional level, five regions recorded an average increase in 2.9 tasks (36%), while the other two regions had an average decrease of 1.3 tasks (16%).

4. Integration of QI into district, regional, and central level annual action plans

Of the 12 districts covered in the study, DHMT staff at only four districts reported receiving any information about the institutionalization change package: Tillabéri, Gaweze, Iléla, and Madaoua. It should be noted that two of the four are in the Tahoua Region. There was significant turnover of staff between November 2009 and August 2010, so it is possible that the number may have been higher. However, the dissemination activity had a limited audience, and it appears that little follow-up for wider dissemination was done.

The institutionalization change package outlined QI activities to be included in annual action plans for each level of the system. Annual action plans are finalized in the last quarter of the calendar year for the coming year. Table 11 presents the extent to which the district, regional, and central levels incorporated key QI activities into annual action plans for 2010. It shows that these levels had only limited implementation (16%-23%) of QI activities in 2010, although there still remained five months in the year to implement activities at the time of the survey. Moreover, the districts and regions did not receive any funds for these activities until May 2010.

Table 11: QI activities included in annual action plans that were financed and executed at district, regional, and central levels

	Included in annual action plan	With financing organized	Actually implemented (to-date)
District (n=12)			
Percent of 15 activities	27%	21%	16%
Percent of those planned		77%	58%
Range	1-8	0-8	0-5
Region (n=7)			
Percent of 17 activities	40%	31%	23%
Percent of those planned		77%	56%
Range	5-10	1-9	1-8
Central level (n=1)			
Percent of 17 activities	41%	35%	18%
Percent of those planned		85%	43%

The central and regional levels were more active or successful in getting QI activities into their plans than were the districts, but not all districts were aware of the institutionalization change package during the planning period. However, across all districts, regions, and the central level, when an activity was incorporated into the annual action plan, it tended to get financing. The majority (77-85%) of respondents reported having financing organized for planned QI activities; moreover, all QI activities may not have actually required financing.

QI activities most frequently included in district plans were: maintenance of equipment, coordinating meetings for QI, study tours to other regions, and ensuring site level QI teams had QI tools. Districts accessed a variety of sources of funding for these activities: UNICEF, Save the Children, Belgian cooperation, UNFPA, their own district funds, and community financing funds. Four districts were most active in planning – Maradi region: Tessaoua and Aguié; Tahoua region: Konni, and Niamey region: Gaweye. For implementation, the most active districts were Tessaoua (Maradi), Gaweye (Niamey) and Filingué (Tillabéri). These districts also had at least one person still active in at least six of the nine QI collaborative activities and also had the highest levels of average QI competencies.

At regional level, the most common QI activities incorporated into regional action plans were: coaching, ensuring inputs, conducting training in QI and clinical norms, equipment maintenance, organizing opportunities for shared learning, and capacity building of coaches. Funding sources were mainly community financing and Funding Support for the Niger's Health Development Program (PAPDS). Six of the seven regions planned coaching visits, and five actually carried out at least one coaching visit. The most active regions were Tahoua, Tillabéri, Maradi and Niamey, both for planning and execution. These correspond to the regions containing the most active districts as well.

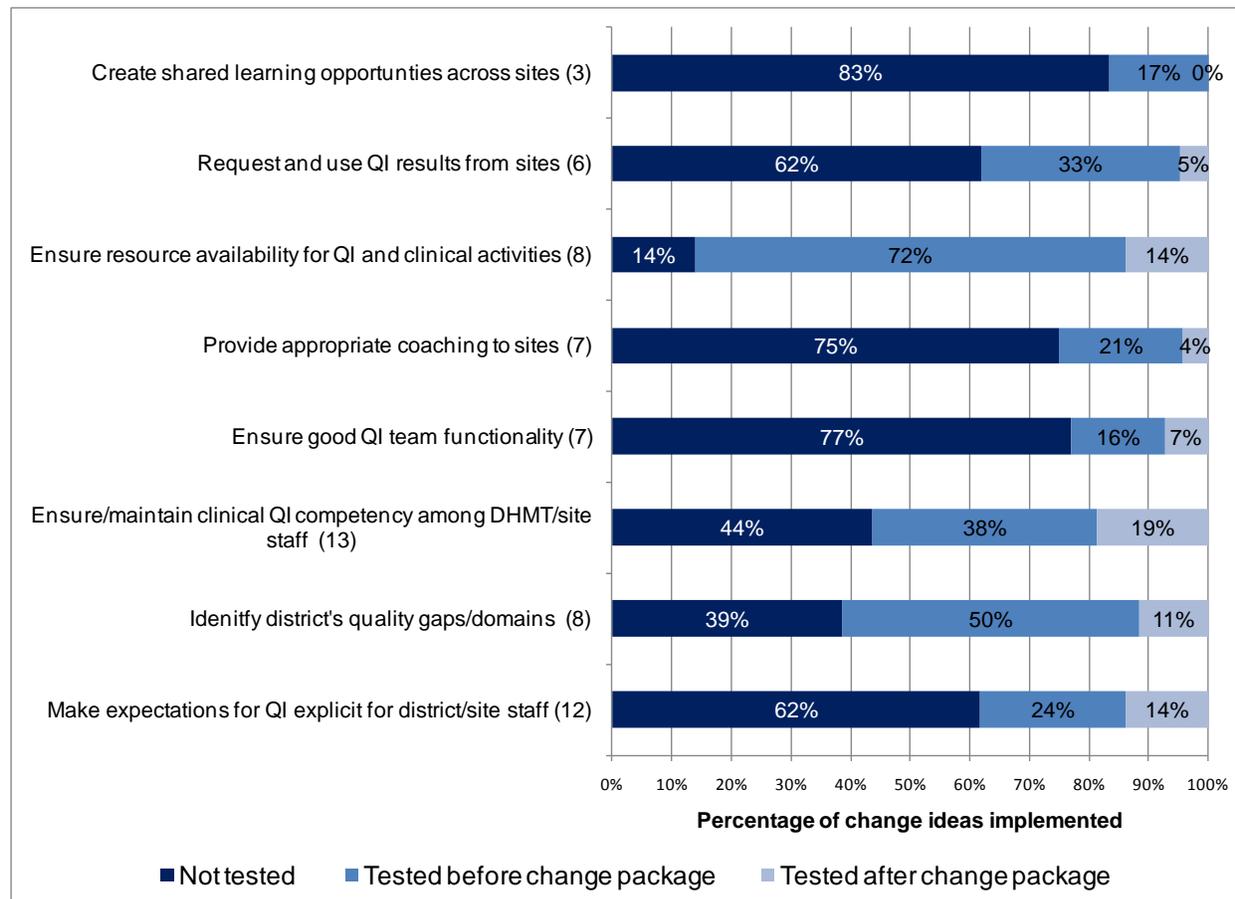
At national level, the annual action plan included dissemination of the institutionalization change package and monitoring of its implementation, validating and disseminating norms, developing national and regional training of trainers for QI, training central directorates in QI, and training trainers at health personnel training centers. The Maternal and Child Health Division obtained UNICEF financing to train 13 national trainers in EONC and 20 providers in four regions in AMTSL/ENC and to participate in coaching.

5. Implementation of the institutionalization change package at district, regional, and central levels

The institutionalization change package included a series of specific change ideas that could be tested at each level, organized under specific change concepts. This section outlines how many of those change ideas had ever been implemented, either before the change package been disseminated or after change package dissemination.

District Health Management Team: The institutionalization change package included 68 possible change ideas for the district level to strengthen quality care and QI implementation over time, categorized within 10 change concepts (grouping of change ideas around fundamental change categories). As seen in Figure 16, few change ideas have been implemented since the introduction of the institutionalization change package, averaging only 11% across all change categories. Changes within certain change concepts have been very infrequently implemented by districts, such as ensuring QI team functionality, providing coaching, or creating opportunities for sharing. Others had been frequently implemented before November 2009, such as ensuring resources for QI and clinical activities, identifying gaps in quality, and to some degree in some districts, requesting and using QI results and ensuring clinical and QI competency. One district was particularly active in the post change package period (Mainé Soroa), and this district had a significant increase in QI competency between 2009 and 2010, and five districts were particularly active before the change package was introduced (Madaoua, Konni, Doutchi, Filingué, and Tessaoua). Two of these districts (Madaoua and Konni) participated in the Human Resource collaborative in Tahoua region, Doutchi lost a large amount of its QI competency between 2009 and 2010, while Tessaoua and Filingué regained competencies.

Figure 16: Change ideas implemented at the district level (n=68 ideas for each district; 12 districts)



Regional Health Management Team: For the RHMT, there were 73 specific changes in eight change categories, as shown in Figure 17. At regional level, we see slightly more implementation of institutionalization change ideas, both before and after the introduction of institutionalization change package. Without regard to when, regions were most active in coaching and ensuring the functionality of QI teams, ensuring QI and clinical competency, and clarifying gaps in quality. Regions were also more active post institutionalization change package in making QI expectations explicit and clarifying gaps than were the districts. Diffa was the most active region in the post change package period, implementing 52% of all change ideas in that period. Regardless of period when changes were implemented, Tahoua and Tillabéri were the most active regions, having implemented 75% and 67%, respectively, even before the institutionalization change package was introduced.

Central level MOH: The institutionalization change package included 42 change ideas for the central level, with implementation shown in Figure 18. The main parts of the Ministry of Health involved in these activities include: the Secretary General, the Health Care Organization Department, the Human Resources Division, and the Maternal and Child Health Division. Some areas for changes showed little or no overall progress: motivation, sharing opportunities, resource availability, and requesting and using results data. A few areas demonstrated active efforts after the institutionalization change package was developed: integrating EONC into training, integrating QI into discussions at coordination meetings, and ensuring that best practices are scaled up.

Figure 17: Change ideas implemented at the regional level (n=73 ideas for each region; 7 regions)

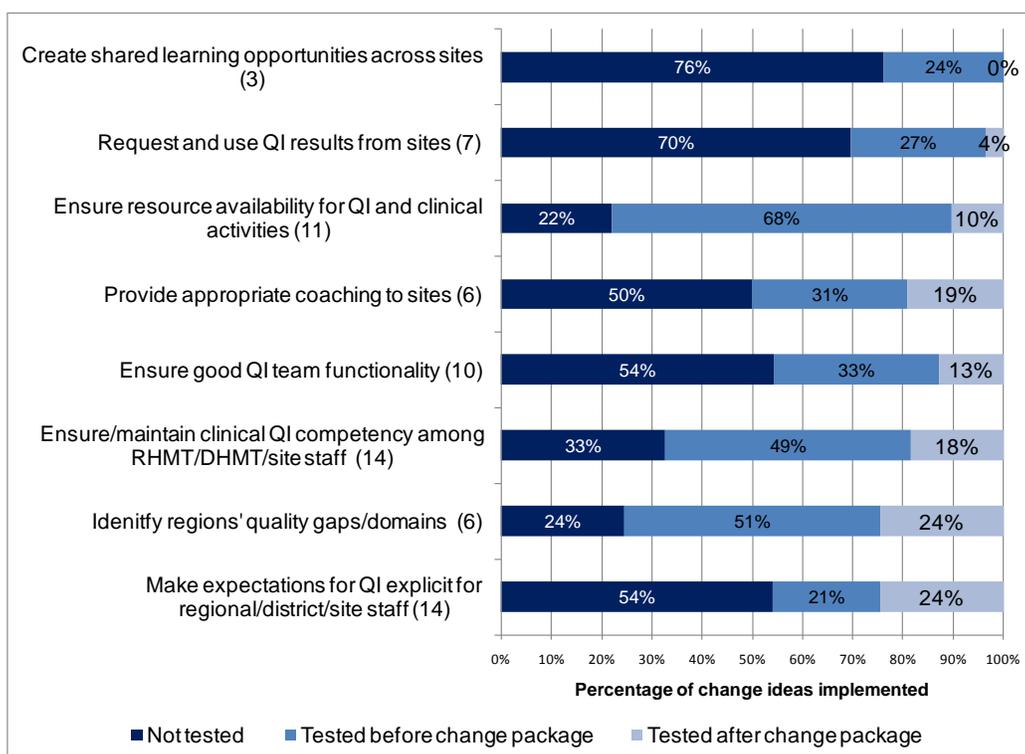
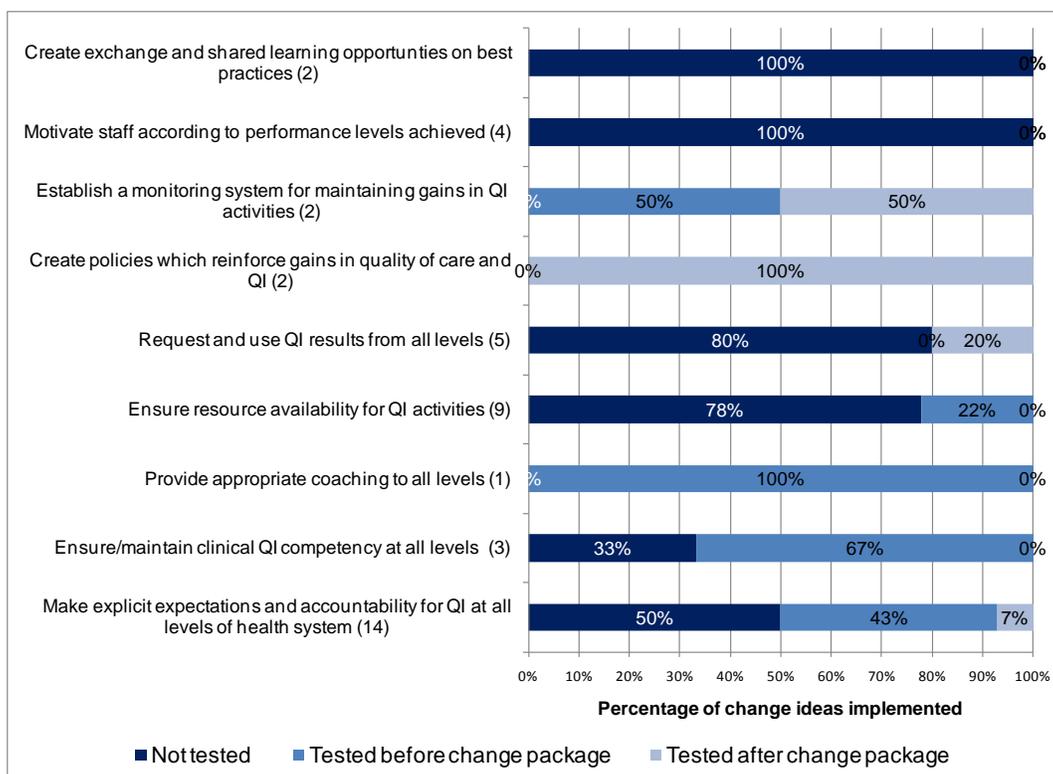


Figure 18: Change ideas implemented at the central level (n=42 change ideas)



One of the more frequent QI support activities was training. Table 12 below summarizes some of the trainings initiated by the MOH and regions to expand clinical and QI capacity.

Table 12: Capacity-building events supported in the post-collaborative period based on materials developed during the collaborative

Training topic	Year	Level involved	Numbers trained	Financing
Coaching	2009	National and regional	13	WHO
Trainers - EONC I/ QI	2009	Private paramedical training institutions	30	Internal Institute budget
PHI	2009	3 regions	45	UNICEF
QI		Regional level private facilities		
Trainers - EONC I/II	2010	4 regions	80	UNICEF
Trainers - EONC I	2009	MOH/MCH for 6 regions	21	UNICEF
EONC I	2009	Urban Commune of Niamey	14	Basket Funds
Refresher EONC I	2010	Tahoua	33	HCI (HR collaborative)
EONC I	2010	Tillabéri	20	Basket Funds
EONC II	2010	Tillabéri	20	Basket Funds
Emergency Obstetric Care	2009	5 regions	305	UN*, NGO
	2010	7 regions	276	UN**, Basket Funds, NGO

* UNFPA, UNICEF, WHO

** UNDP, UNICEF, WHO, UNFPA

D. Factors Facilitating and Hindering Institutionalization in Niger

Respondents at all levels – site, district, region and central level – were asked about their thoughts and aspirations for maintaining gains in quality and institutionalization of QI. Table 13 compiles major responses related to facilitating and inhibiting factors, what else should have been done, and recommendations for strengthening institutionalization. What stands out in these responses is how much they mirror the content of the institutionalization change package, even though many of the respondents had not seen it.

Table 13: Perceptions of institutionalization from different levels of the system

	Sites	DHMT	RHMT	MOH
Factors facilitating institutionalization	<ul style="list-style-type: none"> - Posting job aids on norms - Having already participated in QI (demonstration site) - Dynamic coaches - Continuing to hold QI team meetings - Engage and motivate staff - Support and inputs from DHMT - Continuous training of staff 	<ul style="list-style-type: none"> - Support from partners - DHMT and site staff engagement - Resource availability - Training of staff - Continuing learning sessions 	<ul style="list-style-type: none"> - Being a QI pilot site - Support from coaches and the RHMT - Existence of best practices - Training of staff - Inclusion of QI in supervision visits 	<ul style="list-style-type: none"> - Including QI as a priority in action plans
Factors inhibiting institutionalization	<ul style="list-style-type: none"> - Staff mobility/movement - Lack of involvement of DHMT - Insufficient internal coaching - Lack of cohesion - Lack of feedback from superiors - Abandonment of QI team meetings - Not having been informed about the institutionalization change package 	<ul style="list-style-type: none"> - Lack of timely availability of institutionalization change package - Lack of funds for activities - Lack of monitoring and follow-up from national level - Staff mobility/movement - Lack of involvement of DHMT - Extensive workload for DHMT 	<ul style="list-style-type: none"> - Inadequate coaching due to extensive workload of coaches - Lack of resources - Lack of leadership from the central level - Lack of timely availability of the institutionalization change package 	<ul style="list-style-type: none"> - Weak involvement of leaders at regional and sub-regional level - Lack of resources
What should have happened	<ul style="list-style-type: none"> - Regular supply of key inputs - QI training for all staff - Administrative support - Training of coaches - Timely dissemination of institutionalization change package 		<ul style="list-style-type: none"> - Greater involvement from the central level - Training of national level coaches - Training of staff - Timely dissemination of institutionalization change package 	<ul style="list-style-type: none"> - Financial support to cover all regions for coaching
Recommendations	<ul style="list-style-type: none"> - Better support for key resources - Include midwives in developing annual action plans - Provide feedback and information to others at sites - Include QI into annual action plans at all levels - Train staff in clinical norms and QI - Develop systems for motivating staff 	<ul style="list-style-type: none"> - Continued coaching support - Partner support for spread - Train DHMT in EONC - Train DHMT in coaching - Written assignment of a specific person as the QI focal point on the DHMT - Sharing opportunities across regions - Develop a system for motivating staff 	<ul style="list-style-type: none"> - The MOH shows real ownership and commitment for QI - Integrate QI activities into the new Health Development Plan (2015) - Establish and train QI teams - Strengthen the pool of national and regional coaches 	<ul style="list-style-type: none"> - Integrate QI activities into the new Health Development Plan (2015)

V. DISCUSSION

This study of institutionalization of QI within the Niger health system is one of the few studies that examine the complex process of integrating QI into the fabric of everyday operations of managing and delivering health services. Niger's long experience with innovative approaches to QI, starting in the early 1990s, has provided an excellent testing ground for institutionalization. Niger's health system has suffered from many of the weaknesses of other African health systems: meager financing, weak leadership and accountability, poor logistical systems, and rigid human resource management systems. Yet, within this context, 52 health care facilities, representing 67 % of country's hospitals and 12 % of its peripheral maternities, have been able to improve care provided to pregnant women and newborns, and have, for the most part, maintained this level of quality for more than a year and a half after any external QI technical support was provided, and even when the collaborative was forced to end somewhat abruptly. This study sought to assess the potential of the current system to maintain this level of care over even longer periods of time and to expand the application of QI to other health services, in order to provide excellent care for all the needs of the population.

Quality of care and outcomes: This longitudinal study collected data on a sample of 20 of these 52 sites, as well as from their respective district and regional health management teams, and from relevant divisions at the central level MOH. Data on quality of care and PPH indicate that EONC practices have become an integral part of care delivery in these 20 facilities: the pooled mean across all 20 sites show maintenance of compliance with EONC standards at above 80% for AMTSL and ENC for all of the 46 months of observation, even 20 months after all technical support to the collaborative had ended. Results for management of pre-eclampsia and eclampsia, care practices introduced only in June 2008, have attained 80% but have tended to waiver between 70% and 85%. These results, particularly for AMTSL and ENC, surpass the mean values reported in Franco and Marquez's study (2011) of 27 collaboratives in 12 countries, which found that collaborative sites were able, on average, to continuously maintain care above 80% compliance with standards for 13.5 out of 19.5 months of observation, or 69% of the time.

Some key factors that contribute to sites' ability to maintain these results over time include continued orientation of new staff to procedures and norms and continued implementation of operational changes to ensure availability of key inputs. These organizational practices appear to have not only born fruit during the collaborative, but also in the 20 months post collaborative where availability of key inputs has, for the most part, remained stable.

Although these overall results present an optimistic picture, it should be noted that some aspects of essential newborn care and management of pre-eclampsia and eclampsia have not seen the same levels of stability as AMTSL. Moreover, observations of newborn care delivery at 20 months post collaborative indicate that some practices are starting to deteriorate—taking the newborn's temperature and keeping the newborn warm—neither of which require regular supply of medications to adhere to standards. Although not quantitatively measured in this study, the role of clinical coaches (pediatric and obstetric experts from referral facilities) has diminished, as administrative supervisors without clinical expertise have taken over supervision; this fact may explain some reductions in adherence for some clinical practices.

It should also be noted that while the MOH and regions has continued to organize funding and implementation of training, the practical component of these trainings is not always so strong. Many of those who participated in the three-week emergency obstetric care training program remarked that they preferred both the practical approach used in training provided through the EONC collaborative and the fact that introduction of technical content was spread over time (i.e., AMTSL/newborn care and then later PEE).

Quality improvement: Some QI tasks continue to be implemented, even 20 months after the end of the collaborative, particularly those activities related to ongoing staff capacity building and calculation of indicators. Other QI tasks have experienced some deterioration in implementation. Since clinical results have shown maintenance of gains, it may be that sites no longer see the need to regularly meet to discuss their results, graph their data, or annotate time series charts.

Sixty percent of sites sampled did attempt to apply their QI skills to new areas, and while we do not have the data to judge the quality of that application, sites demonstrated both independent initiative to improve care in other areas and a willingness to apply the QI skills they gained in the EONC collaborative. Teams applying QI to a new domain continued to hold QI team meetings frequently, while those who did not apply QI to a new area stopped meeting altogether. This begs the question of whether teams should be expected to continue to meet when the improvements have been maintained, and whether they should be expected to take on new topic areas.

Factors affecting institutionalization at the site level: A previous in-depth examination of the 2009 survey data (Boucar et al., 2011) indicated a strong correlation between retention of team members at the site and perceived competency. Staff mobility risks eroding capacity to do QI well over time, especially if there are no efforts to build QI capacity among those newly arriving at the site. In both the 2009 and 2010 surveys, about 20% of staff at sites had been there less than one year, and over a third of QI team members less than two years. The percentage of teams with all necessary QI skills dropped from 90% in 2009 to 55% in 2010, with competency scores hovering at about 60%. The weakest areas of staff competency were problem analysis and sharing lessons learned/results; these are skills new staff arriving after the end of the collaborative would not have had the opportunity to experience.

Factors affecting institutionalization of QI support at management levels: Staff turnover at the management levels was much higher than at site level. In the 12 districts participating in the study, the average percentage of DHMT members interviewed who had been there less than 2 years was over 60% in 2009 and 46% in 2010. Turnover was slightly lower at regional level: 48% of RHMT members interviewed had been there less than two years at the 2009 survey, and one third in the 2010 survey. In contrast to this mobility and risk of competency loss, levels of participation in collaborative-type QI activities and general QI support activities taking place by DHMT and RHMT members in late 2009-2010. We also see slightly higher (although not significant) competency levels, even though there was a great deal of staff mobility at these levels: 33% of DHMT members and 21% of RHMT members had been in the district or region less than one year in the 2010 survey. This could be explained, at least partially, by the increase in the number of DHMT and RHMT staff reporting having either QI training or QI experience – in other words, staff mobility may have worked in favor of transferring in those with QI capacity. It should be noted that during the 1990's, USAID supported a significant QI intervention in one region of Niger, and these individuals have since spread to various parts of the country.

Several regions were notably more active in terms of performing QI support activities in the collaborative phase and in the post collaborative phase. Two of these regions (Tahoua and Tillabéri) demonstrated their leadership in incorporating QI into their way of working even during the collaborative phase: they had leaders who were engaged, influential, and convinced of the added value of QI. Three other regions (Diffa, Maradi, and Zinder) demonstrated their engagement in QI in the post change package phase.

At central level, the most effective leadership was provided by those who had practical experience in QI when they had served at district or regional levels earlier: they were either witnesses to or actors in the demonstrated value of QI.

Institutionalization activities: Following the 2009 survey, key stakeholders from site, district, regional and national level crafted a deliberate institutionalization change package, which was designed to structure positive actions to strengthen the ongoing ability of sites, districts, regions and the central

level to maintain EONC gains in quality of care and outcomes, generate improvements in other areas of care, and provide support to these efforts from higher levels of the system. Regrettably, the process for disseminating the contents of the change package was too minimal to be effective, and few at the site and district levels were aware of its contents. Many respondents of the 2010 survey remarked that if they had known about the change package, they would have done more. Yet, the contents of the change package resonated with MOH staff at all levels. At the site level, on average, only 20% of the 15 institutionalization activities to be included in actions plans for 2010 were included, although, of these, 73% had already been implemented by August 2010. Rates of inclusion of institutionalization activities into annual action plans was higher at the regional and national levels, hovering around 40%, while at the district level the average was 27%. In all cases, about three-quarters of these activities had financing organized. Examination of change ideas included in the institutionalization change package indicate that, at site level, slightly more than half had ever been implemented, but less than a quarter of those were implemented after the change package had been disseminated. However, there were several patterns: for implementation of these change ideas, two sites had done little before 2009 and continued to do little; two had done little before but implemented about 30% after 2009; two sites implemented about two-thirds after 2009; six sites had implemented more than half before 2009; and the rest were more evenly distributed in their implementation. At the district level, about half of the change ideas had ever been implemented, but of those implemented, only a quarter were implemented in the period after the change package had been developed and most of those in a single district (Mainé Soroa). At the regional level, three regions had done little; two had implemented two-thirds or more before 2009; and one had made significant efforts, implementing over half the ideas since the change package was disseminated (Diffa).

Limitations: This study was an in-depth longitudinal study of institutionalization of better care practices and QI. Because the units of analysis for this study were health facilities, DHMTs, RHMTs, and the central level, the sampling universe itself was small. A decision was made in the design to go for depth rather than a larger sample of all 52 sites. The original design included dividing the sample into intervention and control sites, which meant that even the total universe (52 sites) would have been small for statistical analysis. However, because all regional directors were engaged in the development of the institutionalization change package, it was not possible to limit implementation of the change package to only some sites, districts, or regions, and all sites, districts and regions were theoretically exposed to the change package.

For measures of quality of care, data presented were self-assessed measures of compliance with standards. These data have two possible validity issues: the accuracy and completeness of the clinical record from which data were abstracted, and the accuracy of the abstraction process itself. The latter was the subject of a small study conducted with results from the 2009 survey where parallel results were abstracted by the expert data collectors, and results showed generally acceptable levels of validity (Mohan et al. 2011). It should be noted that indicator data were collected on a sample of client records and did not account for provider, whereas the observation and simulation data reflected a sample of providers.

VI. CONCLUSIONS AND RECOMMENDATIONS

The experiences of Niger and other countries in quality improvement over the years indicate that QI cannot simply be “taught” in a generic workshop setting, nor can it flourish without technical support and the integration of QI initiatives into the micro and macro aspects of the health system (Silimperi et al. 2002; Legros et al. 2002; Bouchet et al. 2002). Sustaining gains in quality of care and institutionalizing QI into the fabric of health care delivery requires simultaneous efforts at both the strategic policy level and in the priority activities of the system.

The experience of Niger offers some key lessons and some key insights into the institutionalization process. The 20 sites included in the study had benefitted significantly from the EONC improvement collaborative activities, which provided both clinical and QI skills, coaching support, and opportunities to share results and effective changes. These benefits are reflected in the consistently high levels of compliance with EONC standards (verified through external chart review and direct observation of care) at these 20 sites.

While this study did not have the power to test hypotheses, the study has shed some light on certain assumptions about collaborative improvement and its contribution to institutionalization. While the collaborative itself is not a permanent activity or structure to be institutionalized, participation in collaborative activities can facilitate institutionalization of gains and sustainability of results. Below are some key assumptions about this contribution and what evidence this study has put forth:

1. *Participating in a collaborative will build technical and organizational capacity to maintain gains in quality over time* – The collaborative experience has generated some of this capacity, but staff mobility and lack of clear leadership have allowed some deterioration of this capacity.
2. *Participating in a collaborative will build QI skills needed to maintain quality of care* – At the site level, quality of care for EONC has successfully been maintained so far, but QI capacity deteriorates over time.
3. *Conducting QI on one technical area builds skills to apply QI to another technical area* – Evidence from this study indicates that the willingness to apply QI to other domains does exist, although the quality of that application is not known.
4. *A minimum set of QI activities (less than those implemented as part of a collaborative) can maintain gains in quality of care* – The results from these 20 sites indicate that ensuring orientation of new staff and at least on-site clinical mentoring, and ongoing measurement of indicators contributes significantly to maintenance of gains, even if many of the other QI activities and team meetings are no longer taking place. However, the longer term effects of staff mobility on quality of care are not known, in the absence of active teams to ensure maintenance of gains.
5. *Hospital management, district/region and national level actors have specific QI roles to play to ensure maintenance of gains in quality and continued practice of QI* – While the sample is small for any multivariate analysis, respondents at all levels either praised support they received from higher levels or decried the lack of it.

If institutionalization of quality improvement is defined as “establish[ing] and maintain[ing] QI as an integral, sustainable part of a health system or organization, woven into the fabric of daily activities and routine” (Silimperi et al. 2002), we see emerging evidence of this: more than half of these sites, without direction or a collaborative framework, took the initiative to apply their QI skills to other topics. Yet, at the same time, we see some of the rigor of the QI process waning, particularly related to data analysis and interpretation (graphing and annotating time series charts) at 20 months post-collaborative. The ability to continue to address quality issues will be dependent on sustained QI capacity at the site level, sufficient QI support from higher levels, and an overall supportive environment (culture of quality) throughout the health system.

The Ministry of Health has recognized the value of quality improvement and the need to take steps to expand and consolidate gains. The National Strategic Plan for Quality Assurance 2009-2013 (MOH-Niger, 2008) lays the policy framework for QI. Following the dissemination of results of the 2009 institutionalization survey, the Ministry of Health has outlined some bold steps to rectify the gaps with the development of the institutionalization change package. However, lack of adequate dissemination of the change package has most probably hampered progress. The results from the 2010 survey have made this clear, and the Ministry has most recently established a high-level QI task force to oversee the spread of best practices related to pediatric care, essential obstetric and newborn care, and human

resources management, as well as QI. The availability of information on the extent of institutionalization has been decisive for the movement at the national level to take action.

Results from this study have helped in understanding the determinants of institutionalization and health system obstacles to achieving it. The extent of implementation of the change package highlights what can happen without direction and leadership from above, and qualitative responses focused on the need to know the contents of the institutionalization change package, a stronger policy framework, more leadership, and greater QI capacity building. Those regions that were most active in QI were also those having implemented more of the change package contents (even if it was before 2009). Further actions can be taken to strengthen institutionalization in the following areas:

Quality integrated into policy and action:

- Mainstream quality improvement objectives into health systems objectives at national, regional and district levels, and ensure they are evaluated
- Raise awareness of staff at all levels of both the Ministry's policy and strategies related to QI and the content of the institutionalization change package

Clear roles and responsibilities for QI and actions for institutionalization:

- Create the environment that supports leadership for quality (as displayed in some of the more innovative and active regions)
- Ensure staff clarity and accountability at all levels on roles and responsibilities related to QI
- Ensure staff at all levels have the capacity to carry out these roles in QI, especially those at the DHMT and RHMT, as they will be the key to building capacity at site level
- Continue to monitor results of institutionalization over time (making use of the tools from this study and the indicators in the institutionalization change package)

Defining sustainable mechanisms for ongoing QI implementation:

- Clearly define and evaluate the objectives and mechanisms for integrating QI into ongoing activities, such as coaching into supervision, sharing of lessons and results during coordination meetings, and monitoring quality of care into routine data reporting
- Make decentralized levels responsible and accountable for defining their quality objectives, identifying gaps, assisting sites to implement structured QI approaches, even collaborative improvement where appropriate.

Niger's experiences with collaborative improvement highlight the advantages of this method for rapidly achieving significant improvements, and which appear to be sustainable over time. However, the collaborative is not intended to be a long-term strategy: it is not the collaborative that should be institutionalized. Rather, the improvement collaborative is an approach to rapidly generate better care practices that can be spread for wider scale impact. However, the groundwork for institutionalization of QI can and should be laid during collaborative improvement, but this must be done consciously: creating the policy basis, the QI support capacity, and clear expectations about QI activities that are there for the long haul, and continuously monitoring how well these are functioning so actions can be taken to strengthen them where needed.

Time has shown that just providing generic QI training is not sufficient to generate, much less sustain, QI initiatives. Ownership and engagement in QI requires more than just QI competency—it requires actual practical implementation, support by those who have experience, and ongoing measurement vis-à-vis the objectives set. The EONC collaborative furnished this practical experience for a large cadre of health professionals in Niger. Now is the time to strengthen the policy framework, the accountability for quality at all levels of the system, and the knowledge and mechanisms to institutionalize QI at all levels of the system in Niger.

Quality does not exist by chance: it is the result of the combined efforts of many individuals who know what they need to do, who have organized themselves to be able to do it, and who are supported in those actions by those above them. Quality should not be the responsibility of a project or an external organization but rather of the health system itself. Institutionalizing these efforts will require leadership from the central level to define, pilot, resource, monitor, and evaluate both capacities and actions to operationalize QI within the health system, to maintain gains achieved, and to create new gains in other domains. This becomes especially important in low and middle-income countries like Niger, where public provision of health care plays an important role.

This study has shed light on areas and key factors for institutionalizing QI, but has not answered all the questions. As the Ministry of Health in Niger continues down its path to integrate QI into the system, further research and evaluation will help illuminate successes, areas for improvement, important factors to keep in mind, and additional areas at risk. While the institutionalization change package was not truly tested yet, it provides a framework for action, based on successful application in some regions, and innovations for areas not yet tried. The cumulative impact of consistent application of this institutionalization framework will help to create and sustain a critical mass of health system actors imbued of a culture of quality that can apply QI methods to improve all areas of care.

REFERENCES

- Boucar M, Franco, LM, Jennings L, Mohan D, Sabou D, Saley Z. 2011. How do quality improvement teams function after an improvement intervention ends? A description of team performance after the end of an obstetric and newborn QI initiative in Niger. *Research and Evaluation Report*. Published by the USAID Health Care Improvement Project. Bethesda, MD: University Research Co., LLC (URC).
- Bouchet B, Francisco M, and Ovretveit J. 2002. The Zambian Quality Assurance Project: successes and challenges. *Int J Qual Health Care* 14: 89-95.
- Chin MH, Kirchoff AC, Schlotthauer AE, Graber JE, Brown SE, Rimington A, Drum ML, Schaefer CT, Heuer LJ, Huang ES, Shook ME, Tang H, Casalino LP. 2008. Sustaining quality improvement in community health centers: perceptions of leaders and staff. *J Ambul Care Manage* 31(4):319-329.
- Filippi V, Ronsmans C, Campbell OMR, Graham WJ, Mills A, Borghi J, Koblinsky M, Osrin D. 2006. Maternal health in poor countries: the broader context and a call for action. *The Lancet Maternal Survival Series* 386:1535-1541.
- Franco LM and Marquez L. 2011. Effectiveness of collaborative improvement: evidence from 27 applications in 12 less developed and middle-income countries. *BMJ Quality and Safety in Healthcare* doi:10.1136/bmjqs.2010.044388.
- HCI (USAID Health Care Improvement Project). 2009. Health workforce activity: Engaging health workers to improve performance, productivity, and retention. Available at: <http://www.hciproject.org/node/1226>.
- Legros S, Massoud R and Urroz O. 2002. The Chilean legacies in health care quality. *Int J Qual Health Care* 14: 83-88.
- Ministry of Public Health, Department of Health Services Organization. October 2008. *Plan Stratégique Nationale d'Assurance de Qualité en Santé – 2009-2013*.
- Mohan D, Franco LM, Sabou D, Boucar M, Saley Z, Broughton E. 2011. Validity of QI team self-assessment in Niger's EONC Collaborative: Comparison of data from external record review, observation, and simulation. *Research and Evaluation Report*. Published by the USAID Health Care Improvement Project. Bethesda, MD: University Research Co., LLC (URC).
- Silimperi D, Franco LM, Veldhuyzen van Zanten T, MacAulay C. 2002. A framework for institutionalizing quality assurance. *Int J Qual Health Care* 14: 67-73.
- Stevens DM, Proser M. 2009. Federally Qualified Health Centers: An Investment to Meet the Challenge of Chronic Disease Management. *Progress in Community Health Partnerships: Research, Education, and Action* 3.3:191-193.
- UNICEF. 2008. The State of the World's Children 2009: <http://www.unicef.org/sowc09/docs/SOWC09-FullReport-EN.pdf>.

Appendix I: Excerpt from the Institutionalization Change Package

Objective 4 : Strengthen (technical and organizational) capacity of the Regional Health Management Team to provide adequate support to health facilities

Input indicators		Process indicators		Results indicators	
1.	% of Regional Health Management Team (RHMT) members with all necessary QI competencies (QI concepts, coaching, monitoring)	3.	% coaching visits planned and executed	5.	% of sites which have a functional QI team (stable, active and dynamic)
2.	% of RHMT members with all necessary clinical/technical competencies in the priority health domain chosen for improvement	4.	% of QI support activities carried out by the RHMT (advocacy and resource mobilization, organization of fora for sharing, initiation or strengthening of systems for motivation for quality, continual search for strengthening quality	6.	% of sites, district and regional staff who have all necessary QI competencies
				7.	% of sites implementing at least 80% of their QI activities
Change Concept		Specific Change Ideas			
A. Make expectations and accountability explicit for quality improvement of health care at regional, district and health facility level		<ul style="list-style-type: none"> - Describe QI activities that should take place at a health facility - Set performance objectives for QI activities - Discus/ communicate QI norms to all in the region (through coordinating meetings, supervision, posters) - Officially name QI focal persons in the region - Outline responsibilities for QI focal persons for the region - Advocate for QI activities - Mobilize resources for QI activities - Instruct DHMTs and referral maternities to formalize QI teams and performance objectives - Create stocks of QI team tools and distribute to health facilities - Organize sharing meetings between QI teams in the region - Inform DHMTs and referral maternities of rewards/sanctions related to achieving performance objectives - Evaluate DHMT and referral maternity performance objectives quarterly - Engage in an improvement process for all gaps identified - Transmit reports of QI activities regularly to central level 			
B. Highlight domains where gaps in quality of care occur at health facilities in the region		<ul style="list-style-type: none"> - Conduct a baseline assessment of quality of care in the region - Identify the quality gaps for identify health priorities - Identify priority health domains targeted for improvement - Discuss/communicate improvement areas in each health facility - Describe expected norms for each improvement area - Set objectives for each improvement area - Engage in an improvement process for each gap in quality 			

Change Concept	Specific Change Ideas
C. Ensure and maintain competency for clinical norms and QI concepts for health facility, district and regional personnel	<ul style="list-style-type: none"> - Put in place and explain case management protocols for targeted areas for improvement - Produce and distribute job aids for clinical norms and QI activities - Integrate sessions on QI into thematic training (malaria, tuberculosis, etc). - Identify priority areas for capacity building - Identify health workers needing capacity building - Integrate capacity building into the Annual Action Plans - Develop themes for continuing training for QI and clinical norms - Evaluate providers every quarter through supervision and coaching - Strengthen leadership at each health facility - Clarify roles of leaders and coaches - Strengthen capacity of coaches and leaders - Institute post training follow-up - Assign responsibility to coaches for on-going training in QI - Update all staff on clinical norms and QI concepts
D. Ensure good QI team functionality	<ul style="list-style-type: none"> - Integrate follow-up of QI activities into Supervision Checklists (integrated program supervision) - Include QI activities into the templates for presentations at all Coordination Meetings - Establish and disseminate criteria for QI team functionality - Ensure that all teams have QI team tools they need - Establish capacity to archive QI efforts at regional level - Identify criteria for rewarding best QI teams - Evaluate QI team functionality quarterly - Reward best teams annually - Officially notify QI teams of composition and expected performance - Propose a list of best regional teams to reward to the MOH
E. Provide technical and moral support (appropriate coaching) to district health teams and health facilities	<ul style="list-style-type: none"> - Plan QI team coaching activities in the Annual Action Plan - Integrate follow-up of QI activities into Supervision Checklists (integrated program supervision) - Insert follow-up of QI activities into job descriptions for RHMT members - Record congratulations to sites based on performance in the supervision notebook - Evaluate coaching activities quarterly
F. Guarantee resources needed for health care in priority domains and for QI activities	<ul style="list-style-type: none"> - Ensure preventive maintenance of all essential equipment on a 4 monthly basis - Ensure repairs on all essential equipment as needed by any means - Create a list of essential resources for care (material, equipment, drugs, forms, trained personnel) - Inventory available resources in all storage areas - Identify needed resources for the areas for improvement selected - Plan for resource needs in Annual Action Plan - Advocate with partners to provide needed resources - Keep stock forms up to date - Order needed drugs and supplies in a timely manner and supply health facilities according to their needs - Ensure 4 monthly preventive maintenance of essential equipment

Change Concept	Specific Change Ideas
G. Demand and use results from QI efforts that come from districts and health facilities	<ul style="list-style-type: none"> - Request each site to send their improvement results from the previous quarter by the 10th of the first month of the following quarter - Create and analyze graphs of monitoring data from QI team improvement efforts by the 20th day of the first month of the following quarter - Provide quarterly feedback (notices, newspapers, ...) of results - Disseminate the results of QI efforts each quarter by all available methods (notices, newspapers, meetings) - Transmit results quarterly to the central MOH - Make use of coaching synthesis reports quarterly - Share best practices at all opportunities for changing and exchange (coordination meetings, etc.) - Spread best practices to new sites
H. Create opportunities for exchange and shared learning of better care practices among health care structures in the region	<ul style="list-style-type: none"> - Insert QI activities into the presentation template for Coordination Meetings - Insert QI efforts into presentation templates for coordination meetings for vertical programs - Organize study tours among sites in the Region at least once a year

USAID HEALTH CARE IMPROVEMENT PROJECT

University Research Co., LLC
7200 Wisconsin Avenue, Suite 600
Bethesda, MD 20814

Tel: (301) 654-8338

Fax: (301) 941-8427

www.hciproject.org