



PARTICIPATORY COMMUNITY QUALITY IMPROVEMENT (PCQI)

– A PROCESS EVALUATION OF WHAT IS WORKING AND WHAT CAN BE IMPROVED



**Technical paper describing the findings from a mixed methods evaluation
May 2013
L10K**



Table of Contents

- LIST OF TABLES iii
- LIST OF FIGURES..... iv
- LIST OF ABBREVIATIONS v
- 1. BACKGROUND AND RATIONALE..... 1
- 2. METHODOLOGY 6
- 3. RESULTS 12
- 4. DISCUSSION 24
- 5. STUDY LIMITATIONS 30
- 6. RECOMMENDATIONS 32
- REFERENCES 36
- APPENDIX A – LIST OF INTERVIEWS CONDUCTED (LOCATION OR TYPE)..... 41
- APPENDIX B – QUESTIONNAIRES..... 42
- APPENDIX C - SUMMARY HMIS AND HFA DATA..... 47
- APPENDIX D – SUMMARY OF RECOMMENDATIONS..... 50

LIST OF TABLES

TABLE 1: SUMMARY DATA COLLECTION AND ANALYSIS TABLE 7

TABLE 2: KEY INFORMANT GROUPS INCLUDED IN THE EVALUATION 8

TABLE 3: HEALTHCARE UTILIZATION INDICATORS INCLUDED IN THE EVALUATION.. 11

TABLE 4: RUN CHART RULES 12

TABLE 5: KEY THEMES EMERGING FROM THE QUALITATIVE INTERVIEW DATA .. 13

TABLE 6: PRE- AND POST-INTERVENTION HFA RESULTS 20

TABLE 7: INDEPENDENT SAMPLES T-TEST RESULTS FOR SERVICE UTILIZATION
INDICATORS 21

LIST OF FIGURES

FIGURE 1: CHANGES IN CHILDHOOD AND MATERNAL MORTALITY IN ETHIOPIA, 1996-2011	1
FIGURE 2: STRUCTURE OF A PRIMARY HEALTH CARE UNIT	3
FIGURE 3: STRUCTURE OF THE FMOH HEALTH DEVELOPMENT ARMY	3
FIGURE 4: MAP OF ETHIOPIA HIGHLIGHTING L10K-SUPPORTED WOREDAS AND REGIONS.....	4
FIGURE 5: QUALITATIVE DATA ANALYSIS	9
FIGURE 6: RUN CHARTS FOR THE FIVE KEY SERVICE UTILIZATION INDICATORS ...	22

LIST OF ABBREVIATIONS

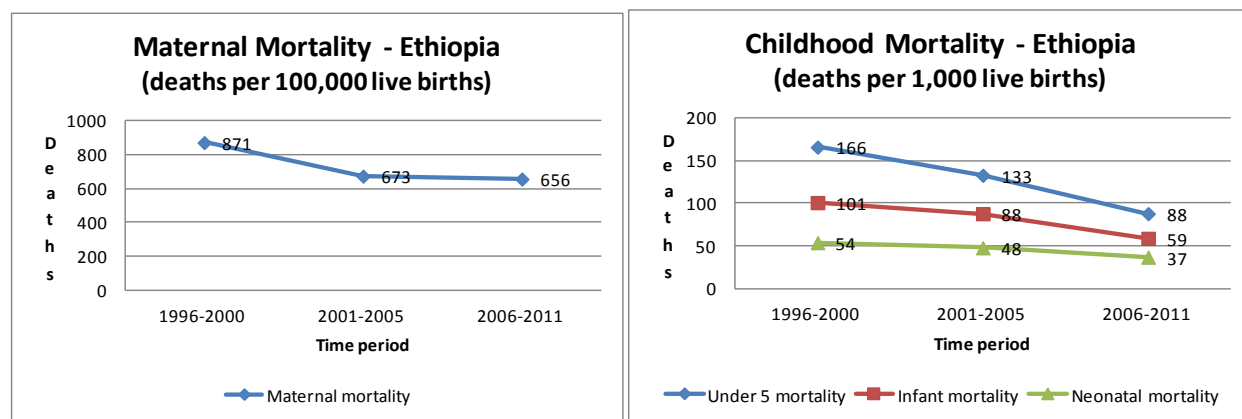
ANC	Antenatal care
CAQDAS	Computer assisted qualitative data analysis software
DHS	Demographic and Health Survey
FMOH	Federal Ministry of Health
Gates	The Bill and Melinda Gates Foundation
GoE	Government of Ethiopia
HC	Health center
HDA	Health Development Army
HEW	Health extension worker
HFA	Health facility assessment
HMIS	Health management information system
HSDP	Health Sector Development Programme
IOM	Institute of Medicine
IRB	Institutional review board
JSI	JSI Research & Training Institute, Inc.
L10K	What it Takes to Reach the Last Ten Kilometers
MDG	Millennium development goal
MNH	Maternal and neonatal health
PCQI	Participatory Community Quality Improvement
PDQ	Partnership Defined Quality
PHCU	Primary health care unit
PNC	Postnatal care
QI	Quality improvement
RQ	Research question
SNNP	Southern Nations, Nationalities, and Peoples
TT	Tetanus toxoid
USA	United States of America
USAID	United States Agency for International Development

1. BACKGROUND AND RATIONALE

1.1 Maternal, Neonatal and Childhood Mortality

As the Millennium Development Goal (MDG) enters its twilight years, Ethiopia appears to be on track to meet the fourth goal (MDG4)– reducing childhood mortality by two-thirds, with a specific sub-goal (MDG4.2) aimed at reducing infant mortality.(1) However, limited progress has been made in reducing maternal mortality,¹ and consequently MDG5, aimed at reducing maternal mortality by three quarters,(3) is likely unobtainable for Ethiopia. **Figure 1**, below illustrates the gains made in neonatal, infant, and child mortality², and the relatively little change that has been seen in maternal mortality Ethiopia over the past close to 20 years.

Figure 1: Changes in Childhood and Maternal Mortality in Ethiopia, Five Year averages 1996 – 2011 Based on Ethiopia Demographic and Health (DHS) data (3)



Ethiopia is not unusual in the trends illustrated above. Worldwide, little progress has been made towards MDG5, although figures vary significantly by region. In regions such as Latin America and South East Asia, maternal mortality has dropped by 30% (between 1990 and 2005), while in Sub-Saharan Africa, where maternal mortality is highest, no significant change has been observed.(4) The reasons for the rapid decline in maternal mortality in some regions of the world are complex and vary from one country to another, but include declines in fertility rates, better access to emergency obstetric care and to skilled birth attendants, and long term investments in training and supervision of midwives and referral hospitals.(5) Infant and childhood mortality rates have decreased more substantially, with 28% fewer children under the age of five dying (per 1,000) in 2008 as compared to 1990.(6,7) Children in Sub-Saharan Africa are most likely to die during the neonatal and infant period, and this region of the world has shown the least amount of progress in reducing neonatal mortality.(7)

¹ Maternal mortality refers to the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes(2)

² Neonatal or newborn mortality refers to a death that occurs within the first 28 days of life, while infant mortality and child mortality refer to a death occurring within the first one and five years of life, respectively.

The major direct causes of maternal morbidity and mortality include hemorrhage, infection, high blood pressure (eclampsia), unsafe abortion, and obstructed labor.(8) As evidenced by the significant reductions in maternal mortality in the industrialized world, many of these causes can be prevented through access to simple but quality health care services.(3) One proven method of effectively decreasing maternal mortality is through delivery with a skilled birth attendant.(4,9) This indicator is so closely associated with maternal mortality, that it is often used to track progress towards MDG5 (decreased maternal mortality).(10) Similarly, neonatal mortality can be reduced through the use of highly cost-effective interventions that can relatively easily be made available at the community level.(7) These include early post-natal visits, exclusive breastfeeding, clean cord care, and case management of neonatal infections. (7)

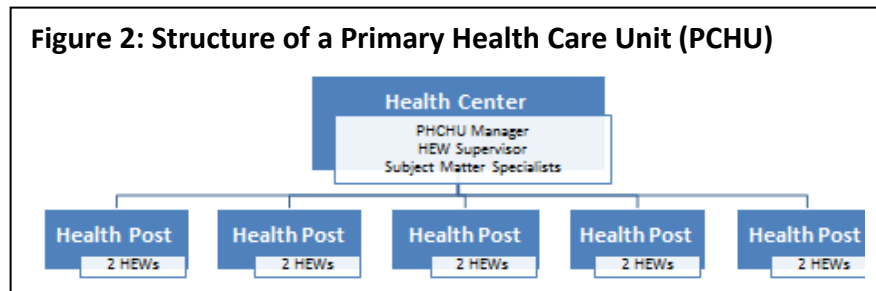
There are huge variations in the risk of maternal and neonatal mortality both among and within nations. Women living in low income countries account for 98% of all maternal deaths, with women and infants in Sub-Saharan Africa facing the greatest risks.(3,7) This discrepancy in maternal mortality between low and high income countries is widely believed to be the “largest discrepancy of all public-health statistics”.(5) Similarly, children in Sub-Saharan Africa are 18 times more likely to die before their fifth birthday than those in developed countries (1 in 143 compared with 1 in 8, respectively).(7) Intra-country discrepancies are also significant. There is a strong correlation between maternal and neonatal mortality and: (a) poverty, (b) lack of access to healthcare, and (c) living in a rural setting.(5,7,11) These three factors are often interrelated, and are common in Sub-Saharan Africa, and across Ethiopia. For example, pooled estimates for maternal deaths in rural versus urban sub-Saharan Africa suggest that 447 women in urban areas, compared with 640 women in rural areas die for every 100,000 live births.(5)

According to the 2011 Ethiopia Demographic and Health Survey (DHS),(12) approximately 59 infants in Ethiopia die per 1,000 live births. Of these, 52% die during the first month of life, the neonatal period. Further, the maternal mortality ratio is 676 deaths per 100,000 live births. Of all the deliveries in that occur in Ethiopia, it is estimated that only 10% take place under the care of a skilled birth attendant, despite the fact that utilizing skilled birth attendants has proven to be a cost-effective way to reduce maternal and neonatal mortality.(9,13) Therefore, it is highly likely that if the demand for, and access to quality maternal and newborn health services in Ethiopia increased, the maternal, neonatal, and infant mortality rates would decrease substantially.(7)

1.2 Addressing Maternal, Neonatal and Child Mortality in Ethiopia

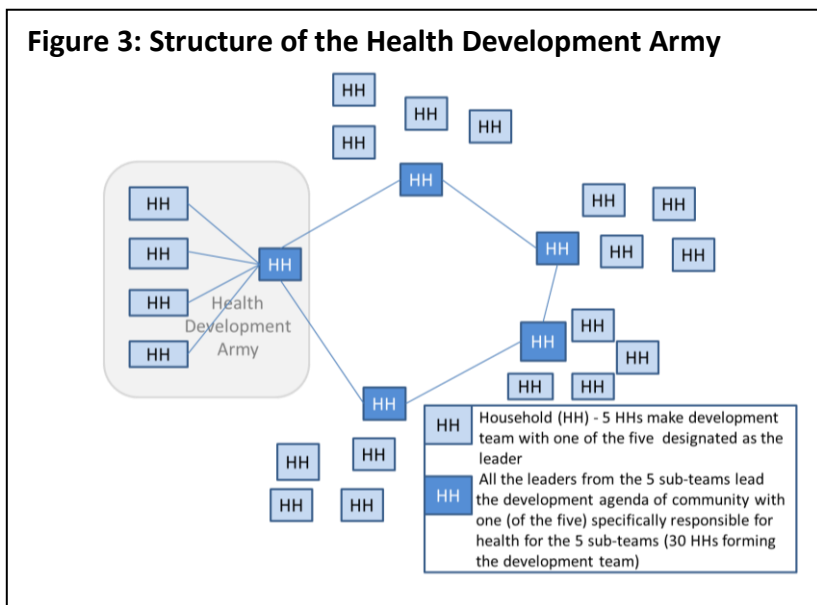
The Government of Ethiopia (GoE) is to be commended on its intense efforts to improve health care, particularly maternal, newborn and child health care. Ethiopia is currently on track to meet MDG4 largely as a result of the efforts of the Government of Ethiopia (GoE) and specifically the Federal Ministry of Health (FMOH). Unfortunately, however, despite strong efforts by the government, maternal mortality rates (MDG5) have remained high. (16) The FMOH’s current (2010-2015) Health Sector Development Programme IV (HSDP-IV), its predecessors, and the National Health Plan provide a comprehensive and impressive framework for improving health.(15) Included in this framework is a great priority on extending health services to the community, especially for pregnant women and their children (MDGs 4 and 5). To this end, the FMOH developed a Health Extension Worker (HEW) program in 2003. These government-paid community health workers are stationed at health posts, the smallest health facility within the government health system. Each health post serves a population of approximately 3,000 to 5,000 people, or one *kebele*, and should be staffed by two HEWs. The HEWs are expected to spend less than 20% of their time in health posts, and more than 80% of their time providing community outreach services.(15). A collection of five of these health posts refer to a larger

health center, and together form a health unit (**Figure 2**). Health centers have inpatient capacity, are staffed with approximately 20 staff, and serve a population of about 25,000 people in rural areas. These centers also serve as the referral and training center for HEWs and their health posts.



To date, this government system has shown great potential as an effective means of expanding coverage of maternal, newborn, and child health services.(16) However, the focus of this system has primarily been on scaling up the availability and coverage of the HEWs, more than on ensuring that high quality services are provided. There are currently more than 33,000 HEWs trained and deployed, reaching approximately 90% of the population.(15) Despite the laudable efforts on the part of the GoE, there is still a lack of confidence in the HEWs on the part of some communities. This is due to a combination of factors including the generally young age of the HEWs, their focus on preventative rather than curative care, and in some cases, poor HEW skills.

In 2011, the FMOH introduced yet another community health initiative, known as Health Development Armies (HDAs). The HDAs are designed to bring the work of the HEWs deeper into the community in an organized manner to improve health, education and agriculture outcomes. A team of five families, each with one leader, are combined with five other such teams to make up one HDA (see Figure 3). The leaders of each team (five of them) form the HDA leadership committee, each of whom has a different responsibility, one being health.(17,18)



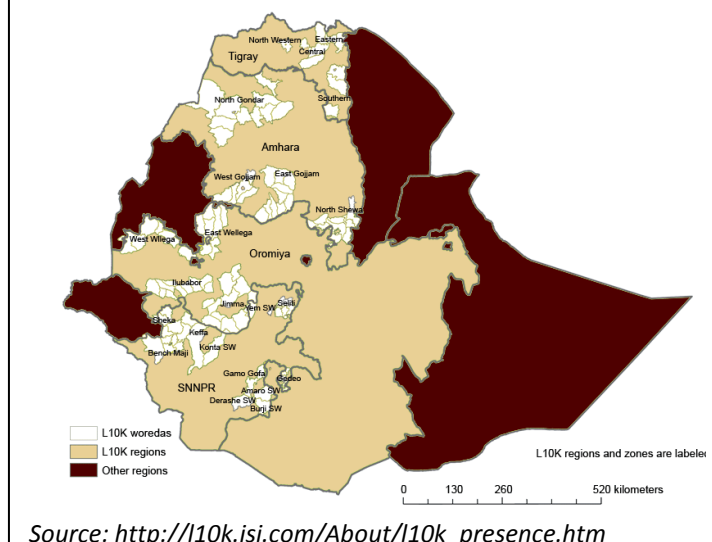
The Bill and Melinda Gates Foundation (Gates)-funded, JSI Research & Training Institute, Inc. (JSI)-implemented “What it Takes to Reach the Last 10 Kilometers” (L10K) project is designed to assist the government in both increasing the reach of health extension workers and health units, and in improving the quality of the services provided.

The map in Figure 4, outlines the regions of Ethiopia where L10K was working at the time of the evaluation³. One approach that is being used by L10K is a Participatory Community Quality

³ The geographic scope of L10K has expanded since this evaluation was conducted

Improvement (PCQI) approach, in which the community and health workers are involved in defining, monitoring, and improving the quality of services. Through the PCQI approach, community members, with the guidance of a facilitator (a community member who is usually a teacher or farmer), meet to identify and discuss issues related to quality of health care. Similarly, but separately, HEWs meet to discuss their issues related to quality of care. These meetings are called ‘exploring quality’ meetings. Community members and HEWs then come together to discuss issues raised by both groups, and together identify solutions. This meeting is referred to as the ‘bridging the gap’ meeting or workshop. Following this, a QI team is established to help ensure that the planned solutions are followed up on, and to help spread public health messages to the community. Review meetings are held at the woreda level to discuss progress.

Figure 4: Map of Ethiopia Highlighting L10K-supported Woredas and Regions



1.3 Quality and Quality Improvement (QI)

From a biomedical perspective, such as The Institute of Medicine (IOM), quality healthcare can be defined as: “The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge”.(19) As illustrated in this definition, quality healthcare is traditionally defined by health researchers and professionals. While few would deny that evidence based services that improve health outcomes are important aspects of quality care, the IOM’s definition, consistent with the majority of western medical definitions, is biased toward the healthcare provider rather than the patient, and therefore may well miss, or underestimate the importance of patient-defined aspects of quality health care. In contrast to the IOM definition above, patients list a different set of priorities when asked what constitutes quality health care. In a study of hospital patients, confidence and trust in providers as well as being treated with respect and dignity were identified as the most important aspects of quality health care.(20) Similarly, other studies have identified good access to care and being respected as critical.(21) In addition to patient-provider differences in the definition of quality, urban-rural differences exist in how quality health care is defined. One major difference is the greater focus on access to care in a rural setting. (22)

In the low resource settings, there is a paucity of literature on patient-defined quality, potentially because healthcare is less consumer-driven. A qualitative study conducted in two rural communities in Guinea identified criteria that communities use to judge the quality of primary health care. (23) They found that the general public in these two rural African communities were “very sensitive to aspects of the interpersonal relations they have with professionals and the technical quality of the care provided”. These differences in the priority components of quality depending on who is defining quality, highlight the fact that quality, and therefore quality improvement is subjective. While the health care community

has a responsibility to strive to provide the most technically sound services, ensuring that the patient's perspective is heard and respected is of at least equal, if not greater importance.

In recent years, and particularly following the 2013 Global Maternal Health Conference in Arusha, Tanzania, the term “respectful care” emerged as an important driver of maternal health, and is beginning to be recognized as a core component of comprehensive quality care.(24,25) Key international maternal health organizations such as the Maternal Task Force and the White Ribbon Alliance, (26,27) have recently developed advocacy and practice tools, such as The Respectful Maternity Care Charter: The Universal Rights of Childbearing Women, which includes international declarations and conventions which affirm women's rights to respectful maternity care. The words of the Maternal Task Force (26) best capture the notion of respectful care, as well as its link to other key aspects of access to and quality of maternal care identified by women in resource poor settings:

“The importance of high quality interpersonal care has increasingly been recognized as a priority in the global maternal health field, particularly the role of poor interpersonal care in discouraging women from seeking skilled birth assistance at health facilities. While factors such as inadequate transportation, prohibitively high service costs, and lack of awareness have frequently been considered the most important barriers to women seeking facility-based delivery services, perceptions of quality of care—including poor provider attitudes, lack of provider communication skills, and cultural insensitivity - - may be an equally important barrier” (Respectful Maternity Care, Maternal Task Force, 2013).(26)

To address issues relating to the quality of health care provided, a number of quality improvement (QI) approaches have been developed. One such approach is the PCQI approach, or process. PCQI recognizes the importance of the patient or, in this case, the community, as well as health care workers in defining and then working to improve the quality of care – as defined by these two key stakeholders. The premise of the approach is that community members, with the guidance of a facilitator (a community member who is usually a teacher or farmer), meet to identify and discuss issues related to quality of health care. Similarly, but separately, HEWs meet to discuss their issues related to quality of care. These meetings are called ‘exploring quality’ meetings. Community members and HEWs then come together to discuss issues raised by both groups, and together identify solutions. This meeting is referred to as the ‘bridging the gap’ meeting or workshop. Following this, a QI team is established to help ensure that the planned solutions are followed up on, and to help spread public health messages to the community. Review meetings are held at the woreda level to discuss progress.

PCQI is based on the Partnership Defined Quality (PDQ) approach that was developed by Save the Children in 1996, and is now being implemented in a number of countries around the world.(28–30) This is one of a number of quality improvement approaches that have been used to improve maternal, neonatal and child health services in low income countries. Quality improvement in healthcare can be defined as “ a cyclical process of measuring a performance gap, understanding the causes of the gap; testing, planning and implementing interventions to close the gap; studying the effects of the interventions; and planning additional corrective actions in response”.(31)

Like the PDQ model on which PCQI is based, a number of other QI approaches explicitly focus on engaging communities in the quality improvement process.(28,32–34) It is anticipated that over time, the implementation of these approaches will continue to converge due to shared experiences across projects, and adaptations made to fit local contexts. For this reason, although the current assessment

focuses on the PCQI approach, the findings and recommendations from the assessment may be of use to governments and public health professionals implementing other MNH quality improvement approaches, especially those that include both a community and a health facility perspective.

1.4 The Purpose of this Evaluation

L10K is in the process of revising and improving the PCQI approach for scale up, most immediately to include entire PHCUs (i.e., expanding the focus to include health centers and the approximately five health posts that are affiliated with the center). A mixed methods evaluation of the PCQI approach was conducted by JSI in 2012 to assess what is working well, and how the approach can be improved and scaled up. The purpose of the evaluation was to guide the expansion and revision of the PCQI approach, and to provide information to the project, the donor, the GoE, and the broader public health community on how best to implement a community quality improvement approach in a resource poor environment such as rural Ethiopia.

2. METHODS

2.1 Key research questions

The goal of this evaluation was to answer the following key questions:

- 1. What aspects of the PCQI approach are working, and what implementation changes are recommended?*
- 2. Does the PCQI approach to quality improvement improve service quality at rural health posts?*
- 3. Does the PCQI approach to quality improvement improve utilization of key MNH services?*

A mixed methods approach was used to answer these questions, in which qualitative and quantitative methods were used in a complementary fashion.⁽⁴⁰⁾ Much of the evaluation was qualitative, focusing primarily on interviews with stakeholders involved in the PCQI process. In addition, quantitative data was collected on key health care indicators, and on the quality of services provided at the facilities that are using the PCQI approach. The findings of the evaluation provide valuable information to help understand what is working and what is perceived to be challenging or a barrier to implementation of the PCQI approach, as well as to provide recommendations and lessons learned to the GoE, the Gates Foundation, the L10K project, and the broader public health community.

2.2 Overall design and study population

The evaluation consisted of two major components of data collection: a) qualitative interviews with key stakeholders currently involved with the process, and b) quantitative data collected from health facilities in sampled kebeles. The quantitative data included both routine health care utilization data from sampled health facilities, and quality improvement data from health facility assessments (HFAs) collected from these same facilities. Each of these components will be elaborated on in the following pages. Ethical approval was granted by the Boston University Institutional Review Board (IRB).

The study was conducted in six kebeles in Oromia region, five kebeles in Amhara region and four kebeles each in Southern Nations, Nationalities and Peoples (SNNP) region and Tigray region. Please refer back to Figure 3 for a map of these regions, and to Appendix A for a list of study participants. These communities represented each of the 14 woredas were L10K is implementing the PCQI approach. Within each woreda, at least one kebele was purposefully sampled based on its adequate ability to implement PCQI. Within these purposively sampled kebeles, Woreda Health Officials, Tier I grantees (local implementing partner organizations with whom JSI works to implement the PCQI approach), kebele leaders, HEWs, QI team members, and community members were questioned through semi-structured in-depth interviews. A total of 107 interviews were conducted. All interviews were reviewed, with 53 interviews analyzed in-depth.

Quantitative data were also collected from facilities in each participating kebele to assess for changes in quality and utilization of services over time. As the PCQI process is being implemented as part of a Gates-funded project aimed to assess the success of innovative approaches, the health facilities included in the process were selected based on their current functioning status and motivation to participate – i.e., the selection was not random, and favored the higher functioning health posts. The limitations associated with the lack of a comparison group are discussed further in the Study Limitations section. **Table 1** provides a summary of the data collection and analysis that were used to answer the three research questions. Details on each of these are provided in the following sections.

Table 1: Summary Data Collection and Analysis Table			
Research question	Programmatic questions	Data source	Data type [analysis]
What aspects of the PCQI approach are working, and what implementation changes are recommended?	<ul style="list-style-type: none"> - What is working about the current PCQI approach? - What are the gaps in the current way that PCQI is being implemented? In what specific ways are the community benefitting from PCQI? - How can we improve the PCQI process? - How can we motivate health extension workers and HC staff to be well engaged in PCQI? - How specifically can we involve staff from the PHCU/HCs in the PCQI process? - How can we simplify the PCQI process? 	Questionnaires with woreda staff, kebele representatives, HEWs, Tier I grantees, L10K central staff, QI team members, and community members	Qualitative [inductive coding]
Does the PCQI approach to quality improvement improve service quality at rural health posts?	<ul style="list-style-type: none"> - Are HFA scores changing? 	Pre- and post-intervention HFAs	Quantitative [t-test and Mann-Whitney U- test]

Does the PCQI approach to QI improve utilization of key MNH services?	- Are service statistics from key MNH indicators (from HMIS data) changing?	pre- and post - intervention service utilization data from the HMIS	Quantitative [run charts and t-test]
---	---	---	--

2.3 Qualitative data collection and analysis

Semi-structured interviews were the primary data source used to answer the first research question, **“What aspects of the approach are working, and what implementation changes are recommended?”** In order to provide recommendations to the GoE, the Gates Foundation and the L10K project, information was collected from key informants to gather information on what is perceived to be working, what challenges have been faced, and what lessons have been learned. These questions also inquired about the perceived “burden” of implementing the PCQI process on health workers and community members, which shed light on the sustainability of the approach beyond the life of the L10K project.

In-person interviews were conducted with key informants involved in the PCQI approach using semi-structured questionnaires. A list of the key informant groups is found in **Table 2**, and **Appendix A** provides a complete list of specific interviews conducted in which kebeles and woredas. English translations of the interview guides can be found for these informants in **Appendix B**. The interviews were conducted and transcribed in Amharic, Tigrigna and Oromifa, the main local languages in the study regions of Ethiopia, and the completed interviews were then translated back into English for analysis. To prevent interviewer bias, the qualitative interviews were conducted by JSI staff involved with a separate project, funded by UNICEF. Where feasible, interviews were conducted by a pair of interviewers, with one interviewer asking the questions, and the other recording the answers. The transcribed questionnaires were then translated into English and sent to me for analysis.

Table 2: Key Informant Groups included in the In-depth Analysis (n=53)	
Key Informant group	Number of interviews per group
L10K central and regional staff	5
Tier I Grantee staff in PCQI woredas	4
Woreda health officials	8
HEWs working in PCQI kebeles	8
Kebele administration and PCQI facilitators	8
QI team members	8
Select community members at large	8

Prior to formal data collection, two rounds of piloting were conducted. First, following initial design of the questionnaires, members of the L10K evaluation team traveled to two rural woredas in Ethiopia (one in Northern Tigray region, and one in SNNP region) where PCQI is being implemented. Interviews with key informant groups were conducted to pilot the data collection instruments. Attempts were made to conduct the interviews in both high and low functioning kebeles, but the quality and richness of the data collected from the low functioning kebeles was very poor. In some kebeles, meetings were not able to be scheduled with kebele managers, or the evaluators needed to wait as long as four hours to hold these meetings. When evaluators were able to meet with key informants such as kebele managers, their responses to our questions were very brief, and external factors that are common in most kebeles,

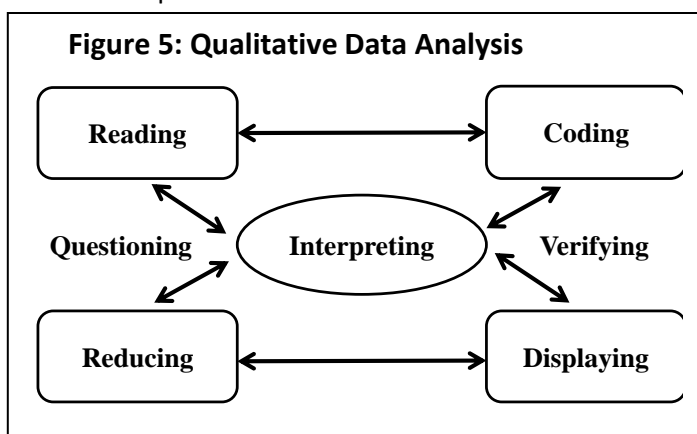
such as inconsistent supply or lack of electricity in the health posts were blamed for the poor functioning of the PCQI approach, and of health services in general. Approximately 21 of the 90 (23%) PCQI kebeles are considered to be low functioning. This prompted the decision to focus the evaluation on higher functioning kebeles. Based on this initial pilot, the methodology and questionnaires were revised and a second phase of piloting was conducted in Amharic in L10K-supported kebeles where PCQI is not being implemented. This second pilot prompted a few additional changes were made to the instrument.

Data collectors, who are JSI staff employed by a separate UNICEF-funded component of L10K, and who had previous experience with qualitative data collection, participated in a one-day data collection training. This training was conducted in Amharic, and was led by a senior L10K staff member and member of the evaluation team. The training included modules on the importance of gaining consent, use of the tool, how to ask qualitative questions, and to probe for greater depth of answers, as well as the importance of writing down all points raised by the interviewee in a word-for-word manner. In addition, the data collectors participated in mock interviews using the semi-structured guides.

The interviews were analyzed in two phases, using Nvivo software. First, 53 interviews, representing two woredas and two kebeles (and their associated HEWs, QI teams, and community representatives) in each of the four implementing regions, as well as the interviews from the Tier I grantees, regional offices, and L10K central office were coded and analyzed in depth using Nvivo software (see **Table 2**). Grounded theory methodology was used to help develop an understanding and a theory as to what is and is not working about the PCQI approach.(41,42) At this point, saturation and predictability were thought to have been reached because no new themes or ideas had appeared during the last more than ten interviews. In the second phase, the additional interviews were read to identify any new themes, and to ensure that the same themes were appearing in the interviews from these additional woredas. Data analysis followed the iterative process outlined in **Figure 5**, adapted from Huberman and Miles (1994) and Ulin et al. (2005),(42,43) Specifically, the interview data were first uploaded into NVivo. The 53 interviews were then read to gain familiarity with the content. Then, during a second reading, sections of each interview were highlighted under emerging themes. At this stage, themes that eventually ended up being merged were kept separate. For example, comments about whether or not HEWs were consistently available to provide services at their health posts were kept separate from comments related to community access to health posts.

In some instances, this approach precipitated the merging of themes. In these cases, the thematically coded sections of the interview transcripts were reviewed in Nvivo to determine the appropriateness of the merging. For example, it was determined that the comments relating to the availability of HEWs at their health posts resulted in a lack of access to health services at the health post, and therefore fit

within the broader thematic area of access to services. This reducing was done using Nvivo, and then reviewed using the sticky notes and their refined descriptions. Once the final themes had been identified, tallies of the frequency of each theme by interview type were conducted using Excel. Sorting and filtering functions were utilized to further analyze the data and identify regional differences as well as differences among groups such as HEWs, community members, or Woreda Health Officials.



Deviant case analysis was also conducted to check the validity and generality of the emerging themes.(44) This helped me to better understand the prevalence of concepts described by participants, and to identify differing opinions and responses.

2.4 Quantitative data collection and analyses

Quality improvement data from health facility assessments (HFAs) were used to help answer the second research question, ***“Does the PCQI approach to quality improvement improve service quality at rural health posts?”*** Specifically, this research question assessed changes in the quality of services offered at health posts, as measured through a health facility assessment (HFA). In low resource settings, HFAs are a well-established method of assessing the quality of health services. (45–50) While there is generally standardization of HFAs within a project or possibly a government system, there is little standardization of the assessments *across* countries or projects. Health facility assessments can include an assessment of the clinical skills of health care staff and/or an assessment of the available supplies and equipment at the health facility.(50)

Health facility assessments are usually conducted by government officials, such as Woreda Health Officials, or by more senior project staff as a method of assessing and improving quality. For example, if a district health supervisor, or a regional L10K supervisor conducts a HFA at a clinic and finds that the clinic does not have a station set up for regular hand washing by staff, the supervisor can then discuss this issue with the health workers, and if possible, help procure the necessary materials such as soap and a bucket for hand washing. Such assessments, including the ones used by L10K and this evaluation include questions about the following aspects of a small health facility: availability of supplies, condition of the health facility, and patient wait times. The use of L10K senior staff to conduct the HFAs has the potential to introduce a bias into the study, however, because these staff were involved in all assessments, both pre- and post- intervention, and because the staff are not directly involved with or responsible for the PCQI process, such a bias is unlikely to be significant.

Health facility assessments were conducted by L10K in the health facilities prior to the start of PCQI implementation (2009-2010), as part of the routine monitoring of the health facilities. In order to make comparisons over time, the same HFA tool was used during the data collection process for this current evaluation (January, 2012) in 16 health facilities in the sampled kebeles. Scores from the baseline and end-line HFAs were compiled in Excel, and summed scores for each component were analyzed comparing baseline and endline scored, and using a statistical tool appropriate for the type of data within the component (e.g., rank scores verses continuous data).

Two-tailed repeated measures *t*-tests and Mann-Whitney U-tests ($p < 0.05$) were used to compare the pre- and post-intervention availability of equipment on the 16 HFAs. Service provision components were collected as part of the HFA, but in more than 50% of the assessments, this data field was left blank, making this section of the assessment unusable. The equipment availability section listed 18 core pieces of equipment that should be present in a health post, and the health post received a point for each piece of equipment that was present and functional. The total equipment score for each facility was used in the pre- and post-intervention repeat measures *t*-test. The questions relating to the condition of the facilities (specifically, the condition of the floor and walls, the smell of the facility, and the availability and condition of the furniture) were scored on a scale of 1-4, where a score of 1 is best. The pre- and post-intervention scores were summed for the four domains of the condition of the facility

(i.e. floors, walls, smell, and furniture), because each component alone was of limited relevance. The combined scores were then analyzed using a two-tailed Mann-Whitney U test.

Health care utilization data from sampled

facilities: Analysis of these data were used to help to answer the third research question, *“Does the PCQI approach to quality improvement improve utilization of key MNH services?”* This question was addressed using health service utilization statistics for key maternal and newborn indicators (see **Table 3**). These routine health information data were collected as part of GoE’s Health Management Information System (HMIS), and were abstracted from the health facilities within each sampled kebele. Data were collected from health posts on each of the following key maternal and neonatal health indicators: antenatal care visits (ANC), delivery by a HEW (safe and clean delivery), tetanus toxoid (TT1 and TT2), and postnatal care (PNC) visits. Delivery with a HEW does not constitute delivery with a skilled birth attendant. The HEWs have, however undergone basic training on delivery, and therefore in

Table 3: Healthcare Utilization Indicators included in the Evaluation	
Indicator	Abbreviation
At least one antenatal care (ANC) visit	ANC1
Delivery attended by a health care worker (HEW)	Safe and clean delivery
First postnatal care (PNC) visit	PNC1
Number of pregnant women who received one dose of tetanus toxoid (TT)	TT1
Number of pregnant women who received 2 doses of TT	TT2

Ethiopia, delivery with this cadre of health worker is termed “safe and clean delivery”. While morbidity and mortality outcomes of deliveries with HEWs as compared with skilled birth attendants have not been rigorously studied or published on, it has been suggested in the literature that HEWs can effectively provide hygienic deliveries for uncomplicated pregnancies, active management of third stage of labor (AMTSL), and immediate post-partum care to the mother and neonate.(51)

These data were collected retrospectively from the 12 months prior to implementation of PCQI (baseline) and the period of 12 months after implementation began, and were analyzed in two ways. First, a 2-tailed independent samples t-test was used to assess differences in service utilization between the 12 months prior to the initiation of PCQI, and the 12 months after PCQI. Service utilization statistics from each health post were averaged across each of the four health regions for each health indicator. The data set contained 48 data points pre-intervention, and 48 post-intervention. Pooling the data decreased the degrees of freedom which resulted in a more conservative analysis. Homoscedasticity cannot be tested for in Excel, however, t-tests can be run one of two ways: either assuming that equal variance across the two statistical groups exists (homoscedasticity), or assuming that the variance between the two groups do not have equal variance (heteroscedasticity). The tests were run twice, once assuming homoscedasticity, and then again assuming heteroscedasticity, and the results were found to be the same to two decimal places.

In addition, run charts were used to analyze the data over time. Run charts, and related control charts provide a graphical display of data over time. Progress on each utilization indicator was compared using run chart rules against the median of the data during the baseline period, which in this case was the 12 month period prior to the initiation of PCQI. The median is used instead of the mean for two reasons: a) it is not influenced by extreme data points and b) it is the point at which half the data points are expected to be above and half below, which allows use of the run chart rules.(52) Time series data for

each service utilization indicator were then plotted, and the standard run chart rules (53) using an α error of $p < 0.05$ (53) were applied (see **Table 4**)

Table 4: Run Chart Rules

The three probability-based rules below are used to objectively analyze a run chart for evidence of nonrandom patterns in the data, based on $p < 0.05$.

Shift: Six or more consecutive points above or below the median

Trend: Five or more consecutively increasing or decreasing points

Run: a series of points in a row that do not cross the median (use a critical value table to determine how many is non-random)

3. RESULTS

3.1 Research question one: What aspects of the PCQI approach are working, and what implementation changes are recommended?

When asked what aspects of the PCQI approach are working and what challenges are being faced, interview respondents identified a number of key themes, listed in Table 5. The findings are organized first by whether the themes was predominantly referring to an aspect of PCQI that was working or an aspect that was challenging and/or was recommended to change, and then by frequency of response (highest to lowest). Each of these is described below, and discussed in the following *Discussion* section. These themes were classified as key because they appeared in at least ten interviews, with at least one interview being from each of the four regions.

Table 5: Key Themes Emerging from the Qualitative Interview Data

Key theme	Total interviews with each theme (n=53)		Number (percent) of interviews by key informant group	
	Number	(percent)	Community members (n=24)*	Health care implementers (n=29)**
Benefits of PCQI				
- Awareness of/access to health services	35	(66%)	16 (67%)	19 (66%)
- Community empowerment/ownership	32	(60%)	15 (63%)	17 (59%)
- Respectful care and the relationship between HEWs and their community	21	(40%)	12 (50%)	9 (31%)
- Promotion of healthy behaviors	11	(21%)	7 (29%)	4 (14%)
- HEW skill-level and confidence	10	(19%)	1 (4%)	9 (31%)
Challenges of and recommendations for PCQI				
- Support, supervision, and technical quality	34	(64%)	12 (67%)	22 (76%)
- Integration of PCQI into government systems	26	(49%)	8 (33%)	18 (62%)
- Availability of resources such as supplies and transportation	25	(47%)	9 (38%)	16 (55%)
- Scaling up of PCQI to include entire PHCUs	24	(45%)	7 (29%)	17 (59%)
- Recruitment and retention of PCQI facilitators	20	(38%)	5 (21%)	15 (52%)

*includes community members at large, kebele administrators, and QI team members

**includes Woreda Health Officials, and regional and central L10K staff

Benefits of PCQI

Awareness of/access to health services: One of the goals of the PCQI process is to increase community awareness of health problems and available health services, and to facilitate the use of healthy behaviors and health services. In 33 (62%) of interviews, participants reported that access to health services was perceived to have increased, while in 7 (13%), access was still reported to be a problem. In the cases where access had increased, interviewees attributed the change to a variety of factors, including the provision of materials and labor by communities to improve the facilities and house the HEWs, as well as the increased accountability demanded by community members, and an increased sense of responsibility by HEWs. In the majority of

communities, HEWs were reported to be more available for services both in the health posts and through home visits, while in a select few communities, there were complaints about absenteeism among HEWs. These complaints were primarily voiced in Oromia (seven times), but were also seen in Tigray (once) and Amhara (once).

“The quality is not that much, even though the community build[s a] house for the health extension workers, often they are not available.” (QI team member in Oromia)

The community’s understanding of the role of the HEWs and the services available from these health workers was also reported by community members, HEWs, kebele administrators, and QI teams to have increased through PCQI.

“We used to hide when HEWs come to visit, but now we know they visit us for our own benefit.” (Community member in Tigray)

This increased awareness was linked by interviewees to increased satisfaction with and use of services, both at health facilities and in people’s homes.

“QI teams register pregnant women at their locality and teach them to go to a health post for antenatal follow up.” (QI team in Tigray).

“Now they started calling us to attend delivery at home but earlier they wouldn’t even listen to our advice let alone deliver them.” (HEW in Oromia)

“Services at the health post are now as the community wants it. This increased women’s desire to go to the health posts.” (HEW in Amhara)

Community empowerment/ownership: In 32 interviews (60%) spanning all regions and types of interviewees, increased understanding of what a community can, and should expect from the health care system, and the roles and responsibilities that the community members can take in improving the health system. This was reported to have resulted in a greater sense of community empowerment and ownership of healthcare within the community. Statements such as “we are bringing change in our community” (QI team member in Amhara), and “in general, the community thinks [that a] health problem [in the community] is their problem” (HEW in Oromia) were echoed throughout the interviews.

“Previously we didn’t discuss in depth about health post problems, but now we give due focus for health posts.” (Woreda Health Officer in SNNP)

In at least one interview from each kebele, communities, community members and/or kebele administrators had rallied together to provide labor and supplies to make physical improvements, such as fixing health posts and repairing roads leading to them, and building houses for HEWs near the health posts so that the HEWs can provide emergency services (assistance during delivery) at any hour. Other community solutions included purchasing candles for light so that HEWs could provide emergency delivery services at night, and making stretchers to transport laboring women. Reports of such community contributions were observed in 24 (45%) different interviews.

“The program enables the community to support the health post by offering wood, stone, and labors for construction of health post’s fence. This also helped the community to take its own responsibilities.” (Community member in Oromia)

In three cases, primarily in Oromia (2), but also in Tigray (1), Tier 1 grantees, HEWs, kebele administrators and community members also reportedly advocated for themselves to Woreda Health Offices to increase supplies to health facilities, and these same interviewees reported that the woredas were often able to assist communities in meeting their goals.

“The community is playing a great role this time. They lobby the woreda to supply materials to the health post in meetings”. (HEW in Oromia)

“The community starts to believe that the problems of its own must be worked out by itself.” (Tier 1 grantee in Oromia)

The degree to which all members of communities agree that they share some of the responsibility for health and health care issues cannot be fully determined from the interviews. However, this sentiment was expressed by community members in 15 (63%) of interviews: 6 (75%) interviews with community QI team members, 6 (75%) community leaders at the kebele level, and 3 (38%) community interviews. These changes that communities have brought about themselves, by contributing labor, small amounts of money, or supplies to improve health facilities; and advocating to the woreda for medicines and other supplies were considered by interviewees at the community and health administration levels to be a success of the approach.

Relationship between HEWs and community/respectful

care: As a result of the PCQI process, the relationship between community members and HEWs was reported by 21 respondents (40%) across all regions to have improved.

Interviewees from all types of participants except L10K central office reported that the level of respect between health workers and community members had been low prior to the introduction of PCQI, and that through the PCQI process, respect has mutually increased. In addition, data from 38% of community interviews suggested that community members felt that they could trust the HEWs more, and similarly, HEWs seemed to treat patients better following the initiation of PCQI.

“The acceptance of HEWs is increased by creating an awareness on the perception related [to] the HEW’s ability in providing delivery services”. (Woreda Health Officer in Oromia)

“In the past, [the] community used to get mistreated when they go to the health facility... now they treat us with care, give us treatment and appointment dates. We go back for our follow up visits on these dates”. (Community member in Amhara)

“The implementation of PCQI helps the community to recognize and respect HEWs’ job.” (Woreda Health Officer in Oromia)

Select quotations on PCQI - in the words of interviewees

“Now they started calling us to attend delivery at home but earlier they wouldn’t even listen to our advice let alone deliver them”. (HEW in Oromia)

“In the past community used to get mistreated when they go to the health facility... now they treat us with care, give us treatment and appointment dates. We go back for our follow up visits on these dates”. (Community member in Amhara)

“All of us have been trained on delivery. In the past when a pregnant woman had hemorrhaging, we got so horrified that we didn’t know what to do. Now we are trained in the use [of] misoprostol to treat women with bleeding”. (HEW in SNNP)

However, in five interviews (9%), including one interview with community members, the level of respect between HEWs and community members remains low.

“Delivery service is being given at health centers when we compare it with the past there are improvements but, the service still needs improvement. [For example,] mothers give birth while waiting for a health professional. And, they don’t treat us well.” (Community member in Amhara)

Promotion of healthy behaviors: It was reported that health practices, especially for newborns had improved in the majority of kebeles where interviews were conducted. Eleven interviews (21%), spanning all four regions, and specifically community representatives, HEWs, QI team members, kebele administrators, and Woreda Health Officials reported improved health practices. For example, the following practices were identified by community members in Amhara region:

- We used to wash newborns right away, now we wait 24 hours
- We didn’t tie chords before, now we are tying chords
- We do not throw away the colostrums
- They give us a [misoprostol] tablet after giving birth
- They visited me three times after I gave birth
- We do not give butter for the newborn
- HEWs taught me about breastfeeding and told me to eat properly

Interviewees attributed changes to increased knowledge and shifts in community norms as a result of greater interaction between community members and both HEWs and QI teams. Quantitative data to substantiate these reports will not be available until the L10K endline household survey.

HEW skill-level and confidence: One issue identified by 10 interviewees (19%) across the four regions, including three HEWs, three regional L10K offices, two Woreda Health Officials, one Tier I grantee, and one kebele administrator was a dearth of skills and self-confidence by the HEWs at the start of the PCQI process. Participants reported (and the L10K team verified) that as a result of this skills gap identified through PCQI, HEWs participated in a ten day practical training through which they received both training on safe and clean deliveries, and also practical experience delivering babies with a midwife. This training was in addition to the month-long *Safe and Clean Delivery* training that all HEWs in Ethiopia receive as part of their standard training.

Administrators and HEWs in most communities felt that this additional training had been a very worthwhile endeavor in terms of increasing both skills and confidence of HEWs. One key aspect of this additional training was its’ practical nature. HEWs were trained at busy health centers, where they were given the opportunity to work with midwives on actually delivering babies.

“All of us have been trained on delivery. In the past when a pregnant woman had hemorrhaging, we got so horrified that we didn’t know what to do. Now we are train[ed] on the use [of] misoprostol to treat women with bleeding.” (HEW in SNNP)

Challenges of and recommendations for PCQI

Support, supervision, and technical quality: The most common request made by participants (64%) was for more technical support and supervisory visits. In interviews with different service providers and

administrators, 76% of interviewees highlighted this need for an increased focus on technical quality as part of the PCQI approach, compared with 12 (50%) of community members. Checklists were suggested as one way to provide more structured support to HEWs and health posts, and to facilitate the identification of problems by community members.

“The issue of quality should be included in the checklist that the health center staff take with them to provide support to health posts.” Regional L10K office in SNNP)

Also, the move to expand PCQI to include health centers and their health posts, and the GoE policy mandating that health center staff support HEWs and health posts provides an excellent opportunity to increase the focus on quality. However, study participants requested increased technical support from L10K to ensure that health center staff are effective in their support to health posts and HEWs.

At present, quality issues have been focused on maternal and neonatal health. It was recommended by some, especially at the Woreda Health Office level, that the scope of the quality discussions be broadened to include other health areas such as nutrition and HIV. Under the current system, a new topic is introduced approximately every quarter. This was thought by central and regional L10K staff to limit the amount of follow-up improvements that the QI Team could make. Therefore, while it was recommended that the topics covered be expanded, some participants suggested that the frequency with which the topics are changed should be decreased.

Integration of PCQI into government systems: Twenty six (49%) participants identified challenges or recommendations about better integration of the PCQI approach into existing GoE systems. It was recommended by interviewees from QI teams, HEWs, Woreda Health Offices, and the regional L10K offices that ‘bridging the gap’ meetings be held at the health center. For example, the regional L10K office in Amhara suggested that “bridging the gap meetings should be conducted at the health center in the presence of representatives from the community and health post staff.” Interviewees also suggested that a representative from the health center should also be present at the quarterly review meetings held at the Woreda Health Office. If necessary, transportation should be provided for the attending health center staff.

For sustainability and efficiency reasons, another recommendation identified by kebele administrators, Tier I grantees and regional L10K offices in Tigray, Oromia and SNNP regions was to integrate the QI team with the GoE’s health development army (HDA), or one-to-five ratio teams (referring to the one HDA member serving five households). Please refer back to **Figure 3** for details.

“The future of the QI team is doubtful. Hence, it should be merged in the one-to five-ratio teams and there should be a way that the two teams will be able to take part in the monthly review meetings to discuss issues.” (Regional L10K Office in SNNP)

Conflicting priorities, such as overlapping meetings, for the Woreda Health Officers was repeatedly identified as a challenge with PCQI meetings.

“In order to avoid overlapping meetings, it will helpful if there is a district planning about the time of the meetings.” (Kebele administrator in Oromia)

In response to this, it is recommended that findings from the PCQI approach be integrated into existing woreda meetings to minimize overlapping meetings and to give PCQI more priority. Including additional attendees in the woreda-level meetings was also proposed. Specifically, other woreda officials, such as those responsible for women’s affairs or infectious diseases, health center staff, and members of the community QI teams could be invited to select woreda review meetings. A few respondents recommended inviting traditional birth attendants and pregnant women, as well as HEWs, to attend the

'bridging the gap' meetings to increase interaction among these groups and health center staff were recommended by a few interviewees.

Some woreda and Tier 1 implementing partners discussed the challenge of scaling up the PCQI approach to kebeles and PHCUs that were not functioning effectively. They, as well as some regional L10K staff highlighted the importance of obtaining "buy in" from the kebele manager as a key factor influencing the success of PCQI in a given kebele. Others (at the woreda and regional level) identified a need for increased resources (human and financial) to be channeled to lower functioning health posts and centers to help them improve. In contrast, the Central L10K office suggested that work must be done to make health posts and centers functional prior to implementing the PCQI process:

"Those selected health posts and health centers must be functional and [be able to] carry out the work well." (Central L10K Office)

Beyond health and administrative integration, it was recommended by two study participants that religious leaders and 'idirs' be included in the PCQI process, potentially through involvement in the quality improvement team. Idirs are community insurance groups that finance funerals.

Availability of resources such as supplies and transportation: Inadequate resources at health facilities and transportation to facilities were identified in 25 (47%) of interviews. Interviewees from higher levels of PCQI implementation – central, regional and woreda-level participants had more criticisms about the availability of resources (16 interviewees, or 55%) than those at the community level (9 interviewees, or 38%). Participants identified facility-related shortages in drugs, medical supplies, electricity, water, and adequate space for treating patients and housing HEWs as challenges to the successfulness of the PCQI approach. In addition, in Amhara, Oromia, and SNNP, lack of transport to refer laboring women to a health facility was also a barrier to quality and a barrier to women accessing health posts. Further, in two communities, a lack of transportation for PCQI facilitators was thought to hinder the effectiveness of PCQI. Similarly, when asked about challenges that the PCQI process may face when scaled up to include health facilities, transportation issues for HEW supervisors and midwives from the health centers to travel to and from communities were identified by respondents from each of the four regions.

Finally, when asked how L10K could better support the PCQI approach, respondents from woredas, kebeles, and QI teams requested assistance procuring essential medicine and other supplies at health posts; payment, supplies (pens, notebooks) and transportation for PCQI facilitators; and more resources for PCQI meetings.

Scaling up PCQI to include entire PHCUs: The GoE has recently restructured the health system to create health units comprised of approximately five health posts and one health center (please refer back to **Figure 2** for details), called a PHCU. Because of this government push to integrate services within a PHCU, and because the PCQI approach is designed to work with the government health system, it is necessary for L10K to scale up the PCQI process to include all health posts and the health center within one PHCU. During the interviews, participants were asked to discuss potential benefits and challenges of this modification.

Twenty four interviewees (45%) commented on the scale-up of PCQI to include all health facilities and their catchment communities within a given PHCU. Of these, none thought that this was a bad idea, and 17 (26%) stated that it would strengthen health services, the relationship between health centers and

communities/health posts, or the PCQI approach. Specifically, it was anticipated that health center staff will gain a better understanding of the challenges faced by the community, while the community will get more exposure to the health center and develop relationships with health workers based at the health centers. As a typical example, a Woreda Health official in Amhara commented that scaling up PCQI to include entire PHCUs “will strengthen the relationship between the community and health center staff” and “will help [health center staff] to see the challenges the community faces up close.” Similarly, as the regional L10K office in Amhara noted, “it would be good if representatives from the community can visit the health center and its services ...inform the community [of what the health center can offer].”

One important benefit of involving health centers in the PCQI approach was so that health center staff can provide support and supervision to HEWs and health posts. This benefit was highlighted by interviewees from regional L10K offices, woreda and kebele administration, and HEWs. However, one concern raised was about the capacity of the health center staff to provide this support, and as a result, it was suggested by Woreda Health Officials, Tier I grantees, and regional L10K offices that L10K will need to provide additional technical support to health centers. In addition, the L10K central office, HEWs and Woreda Health officials noted that closer ties to health centers and a greater sense of responsibility for health posts by health centers should improve the supply of essential medicines and supplies for the health center to health posts.

“The process will get more credit and acceptance when the HC staff are involved in it. They can provide technical support and engage in the capacity building of HEWs. They can also work in improving supply and logistic flow to the health post.” (L10K central office)

A number of potential challenges were also identified by 14 different interviewees (26%). The major barrier identified was how to motivate health center staff to want to participate in community-level quality improvement, and to prioritize participation in PCQI, especially in areas where health centers are particularly busy or short staffed. One solution proposed by a Woreda Health office in Amhara was to ensure that the “health center [is] involve[d] in planning, implementation, and [PCQI] review meetings.” As well, as mentioned previously, transportation for health center staff to visit health posts, HEWs and community members was anticipated to be challenging unless health centers are provided with adequate transportation.

Recruitment and retention of PCQI facilitators: A component of the PCQI approach that was reported to be problematic across the four regions was the recruitment and retention of PCQI facilitators. Of the 20 interviewees that reported this issue 13 (70%) were at the regional (4), Woreda (5), Tier I (4), or central (1) level. PCQI facilitators were chosen from community leadership positions from sectors other than health, including teachers and development agents. This approach was designed to provide a diverse perspective to the PCQI process, but due to reports of conflicting priorities, a number of the facilitators have left their positions, or have frequently been absent from their facilitator duties. In addition, in some kebeles, it was noted that the facilitators lacked facilitation skills, and had little knowledge of the health sector.

“The problem with the project implementation [is that] facilitators are not health professionals, they do not have sufficient understanding of quality health services, in my opinion this creates a challenge.” (Regional L10K office in Tigray)

Some interview respondents also stated that providing more training opportunities for facilitators may help with retention. Recruiting facilitators from within the health sector was recommended by all interviewees where solutions were offered.

Additional findings worth noting: In addition to the key themes detailed above, some less common findings also deserve mention. These are highlighted because they provide additional richness or practical ways that the PCQI approach can be improved.

Two respondents recommended that the process be simplified so as to increase the effectiveness and sustainability of the PCQI approach. One interviewee reported that the process is too intensive, especially if it is to be scaled up. Recommendations on how the process could be simplified included having ‘exploring quality’ meetings at the kebele (rather than sub-kebele) level, as issues were thought to be similar across the whole kebele, and then conducting ‘bridging the gap’ meetings at the PHCU level. It was also recommended that the guidelines be simplified, and also revised to include the role of health center staff in the approach.

“The guidelines include too many things; they need to be simplified so that the work could be expanded to the woredas that we are engaged in.” (SNNP regional L10K Office)

One additional indication that the PCQI approach is valued, was a report that one or two Woreda administrations are, of their own volition, applying aspects of the PCQI approach to other services. The specific example given was the use of “explore quality” meetings concept for other non-health related services. In this way, aspects of the PCQI approach may be used in a variety of settings as a means to better engage community members.

3.2 Research question two: Does the PCQI approach to quality improvement improve service quality at rural health posts?

Health facility assessments (HFA) are often used as a proxy for measuring service quality in resource poor settings, yet these rarely address technical quality. The HFA used by L10K included the components of: availability of equipment, provision of services, and the condition of the facility. Due to the nature of these different components (parametric or not), a combined score on the HFA could not be calculated. **Table 6** outlines the statistical test used for each component, and their associated values. No change in scores from pre-intervention to post was detected for any of the components. Summary data used to calculate these statistics are found in **Appendix C**.

Table 6: Pre- and post-intervention HFA results (n=16)				
Component of the HFA	Statistical test used	Test value	Change in mean or median	p-value
Availability of equipment	Two-tailed repeat measures t-test	Mean (SD) pre-intervention = 10.25 (±3.19) Mean (SD) post-intervention = 9.81 (±3.25)	- 0.44	0.43
Condition of facility	Two-tailed Mann-Whitney U test	Median pre-intervention = 6.31 Median post-intervention = 4.75 Mann Whitney U = 108	- 1.56	1.0

From a patient, or community perspective, the PCQI approach was subjectively reported to have contributed to improved quality of health services, as defined by the community. Specifically, PCQI was reported to have increased the provision of “respectful care” as provided by health workers; subjectively increased the skills and confidence of HEWs; improved access to services by making HEWs more available for services, improving roads to facilities, and supplying stretchers to transport laboring women to health facilities; and through better relationships between HEWs and community members, subjectively increased the number of home visits proved by HEWs. Each of these findings was discussed in greater detail in research question one, above. These community-perceived improvements in quality were widely cited; however, they were not uniform across all communities interviewed, and in all communities further improvements in quality are needed. The nature of the improvements will need to be tailored to the gaps and priorities of each community.

3.3 Research question three: Does the PCQI approach to quality improvement improve utilization of key MNH services?

Service utilization data were collected for a period of 24 months from 16 health facilities across the four target regions. The study period (i.e., the 24 months) was the 12 months prior to the start of the intervention, and 12 months after the start of the intervention. The mean for each month was calculated across all facilities in each region, and a two-tailed paired t-test run on the resulting 48 pairs of service utilization data points. Using a p-value of <0.05 to test for significance, delivery with a health worker (safe and clean delivery) increased. In addition, a positive trend was seen in post natal care (PNC) visits. See **Table 7**. Summary data used to calculate these statistics are found in **Appendix C**.

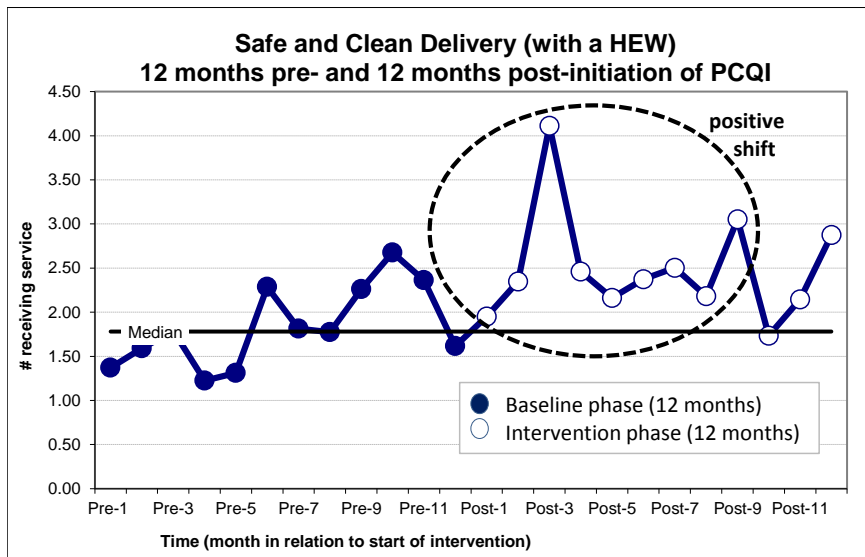
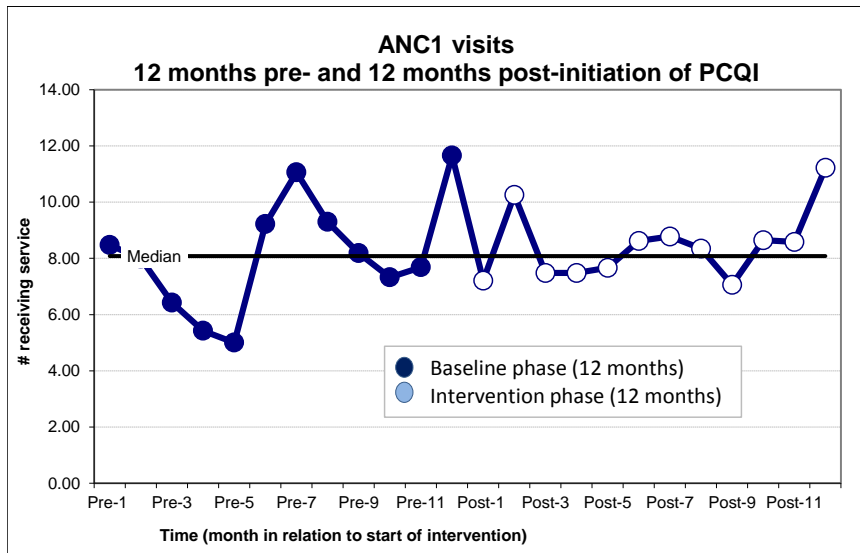
Table 7: Two-tailed independent samples t-test results for service utilization indicators (based on the mean number of each service provided by HEWs per month in 16 health facilities)				
Service provided in the health post (Indicator)	Mean (SD) pre-intervention	Mean (SD) post-intervention	Change in mean	p-value
ANC	8.15 (±4.25)	8.45 (±4.57)	+ 0.3	0.736
Safe and clean delivery	1.84 (±1.19)	2.50 (±1.92)	+ 0.65	0.048*
PNC1	5.18 (±2.73)	6.02 (±2.64)	+ 0.84	0.127
TT1	4.28 (±4.62)	3.10 (±2.50)	- 1.18	0.122
TT2	6.07 (±4.98)	5.55 (±4.64)	- 0.52	0.600

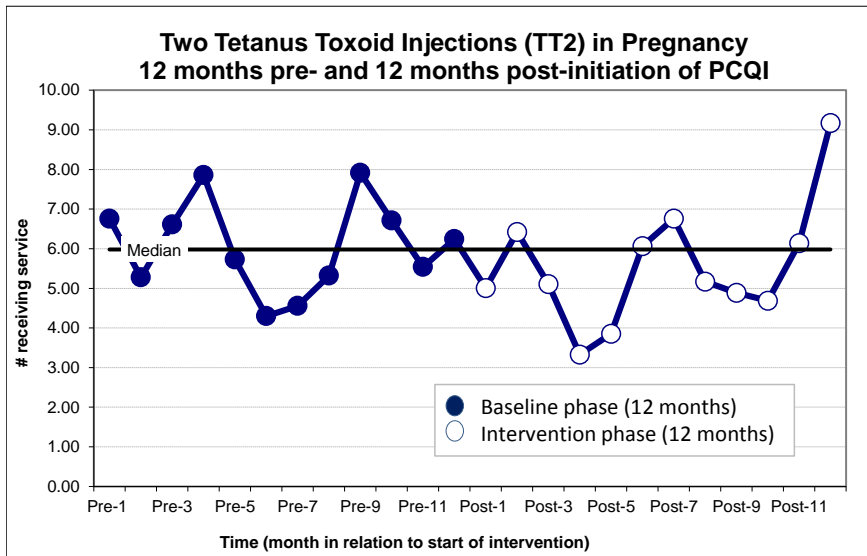
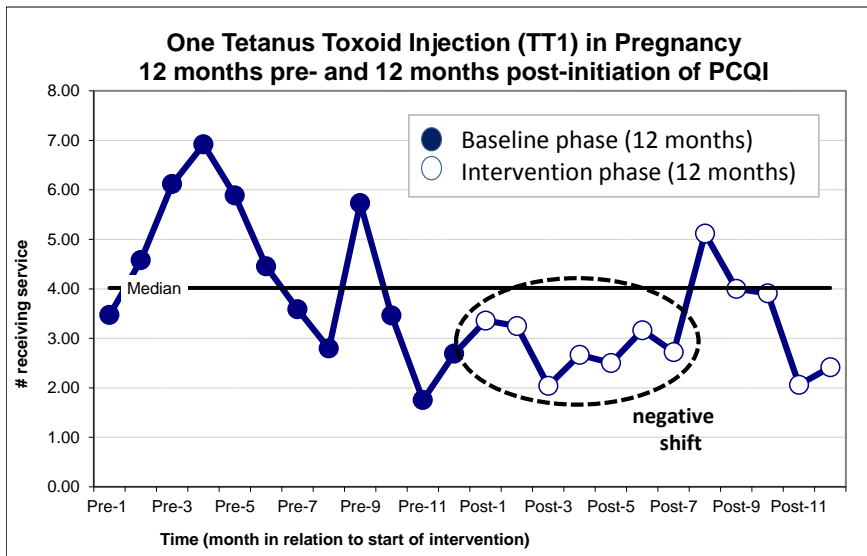
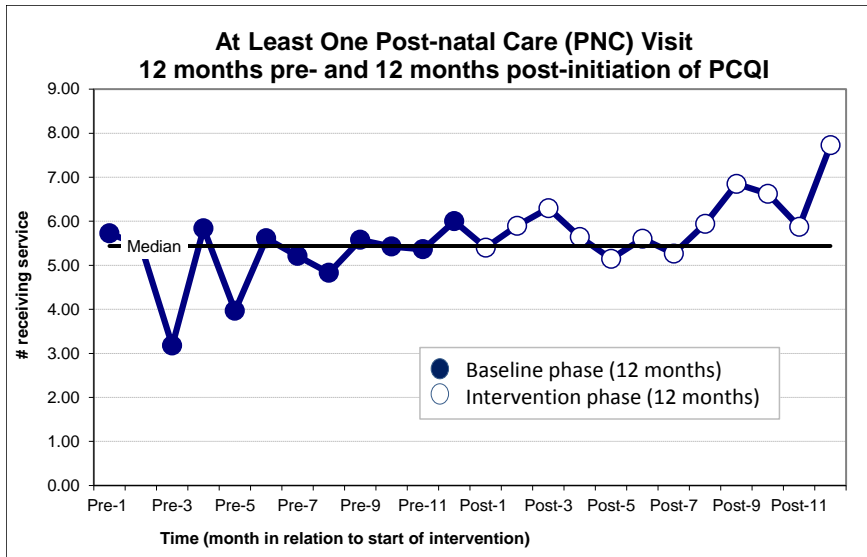
* Significant at the $p < 0.05$ level

In addition to t-tests, run charts were used to identify changes in service utilization before and after the start of the PCQI process. In order to detect a change using this quality improvement measurement technique, the number of utilization visits was plotted for of the 24 months for each service utilization

indicator. The median number of utilization visits during the 12 months prior to initiation of PCQI delivery was then calculated and added to the chart and a series of standard rules applied to determine if a significant change could be detected between the 12 months prior to the intervention, and the 12 months after the intervention. The run charts for each of the key MNH service utilization indicators can be found in **Figure 6** below. The circles on the run charts below highlight the significant findings.

Figure 6: Run Charts for the Five Key Service Utilization Indicators





The run charts plot the number of women receiving each health service per month. The data points for the 12 months prior to the start of the PCQI intervention are black, while the data points for the 12 months after the start of PCQI have a white fill. The median is calculated and plotted for the baseline period (i.e., the 12 months prior to PCQI). Once the data points were plotted, the run chart rules found in **Table 6** were applied.⁽⁵³⁾ Significant findings are illustrated with a dashed circle surrounding the data points meeting the run chart rule criteria, as well as an explanation of which rule was met. The run charts above suggest that safe and clean delivery with a HEW increased significantly,⁽⁵³⁾ while giving one tetanus toxoid (TT) injection during pregnancy was found to have decreased. No change from baseline was observed in ANC, PNC, and TT2 service utilization, although a positive trend was seen in PNC. These findings were consistent with the t-tests run on the same data, with the exception of the TT1 result.

4. DISCUSSION

4.1 Research question one: What aspects of the PCQI approach are working, and what implementation changes are recommended?

Benefits of PCQI

Traditional QI approaches have focused on improvements to technical quality. While this aspect is undoubtedly important, the findings of this study suggest that increasing community empowerment, respectful care, and access to services are also important components of QI, and can lead to increased service utilization.

Community empowerment: A key PCQI success identified by study participants was the degree to which community members were empowered to take ownership of health problems, and to improve health and health care in their communities. Having a voice in the quality of the services provided as well as a sense of responsibility for these services can be motivating to the community, and can be an effective and sustainable way to bring about change and increasing accountability.⁽⁵⁴⁾ This finding directly supports the GoE/FMOH’s national strategic plan (HSDP-IV), specifically the second strategic objective.⁽¹⁵⁾ As described on page 43 of the HSDP-IV,

“the expected outcome of the strategic objective is community empowerment for continuity and sustainability of health programmes. This will be implemented through community involvement in the administration and regulation of their respective local health facilities and community health interventions.” ⁽¹⁵⁾

Community-lead initiatives, such as improving roads to facilities and building shelters for HEWs so that they can be available for assisting in deliveries, were conducted in almost every sampled community. These local solutions reportedly lead to increased access to services, one of the first components of quality that usually needs to be addressed in rural communities.⁽²²⁾ In addition, solutions such as these that come from within a community are generally more sustainable than external solutions.^(55,56) As the GoE, L10K, or others look to expand or replicate the PCQI process, finding ways to facilitate this community ownership may prove to be pivotal in improving health care in a sustainable way.

Respectful care: A somewhat unexpected, but very timely result of the PCQI approach was its positive effect on the level of respect between HEWs and community members. Greater interaction through the PCQI process, coupled with the HEWs' improved skills and greater confidence in their abilities seems to have contributed to a strengthening of the relationship between health workers and community members, and to a greater awareness of and trust in the HEWs service provision. These collective improvements are consistent with the notion of 'respectful care', a characteristic of care that is drawing increasing attention and is likely to play a growing role in service quality and improving service utilization.(25) Although unanticipated, this finding is consistent with previous studies from around the world determining what patients value in health care,(21,22,57) and suggests that the aspects of PCQI that led to this increase in respectful care should be replicated. Further, the finding that the level of respect was reportedly low prior to initiation of PCQI suggests that even in kebeles where PCQI is not being implemented, efforts should be made to increase dialogue and interactions among community members and HEWs.

The combination of increased respectful care and increased access to services through community solutions likely contributed to the positive outcome of increased use of a health worker during delivery. Causal links between these variables cannot be made due to the lack of a control or comparison group; however, these data do suggest a positive association.

Challenges of and recommendations for PCQI

Support, supervision, and technical quality: One of the primary goals of the PCQI process is to give the community a voice in deciding what constitutes quality. However, as illustrated by the widespread requests for increased focus on technical support and quality, the PCQI process may be focusing too much on the 'softer' aspects of quality, and not enough on the more technical aspects. It is recommended that the PCQI approach include a greater focus on increasing technical quality, and the scale-up of PCQI to include health centers provides an opportunity to increase this focus through technical input and supportive supervision by center staff.

In order to be effective, supportive supervision systems need to be established, including the consistent use of standard checklists; the use of schedules outlining the timing and frequency of the visits; and feedback and reporting from the visit to supervisees and to technical and managerial staff responsible for the quality of services provided (for example, at the Woreda level).

Integration of PCQI into Government Systems: In addition to providing an opportunity to increase technical support, there are a number of other benefits of scaling up PCQI to the PHCU level. First, just as PCQI empowered communities and HEWs with a sense of ownership and responsibility for health care issues, and helped to improve the relationship between these two groups, the PCQI approach will likely strengthen the relationship between staff at health centers and health posts within a given PHCU, and create a sense of ownership of issues and solutions by the PHCU. One practical benefit of this increased communication and shared responsibility is that it may facilitate the flow of commodities from the health center to health posts, thereby decreasing stock-outs at the health post level.

Second, the issue of poor recruitment and retention of PCQI facilitators can be addressed by using health center staff as facilitators. Health center staff have the technical and medical knowledge necessary to guide the PCQI process, and would likely have a greater interest in improving health

services than most teachers or development agents (the current PCQI facilitators). In addition, with the GoE's new focus on PHCUs, health center staff are expected to interact with HEWs and to oversee the work done at health posts. Therefore, integrating health center staff into the PCQI process may be an effective way to operationalize their expanded role overseeing the health posts.

As identified by interviewees, a key challenge with PCQI scale up to PHCUs will be determining how best to motivate health center staff, and to set up the process in a way that health centers feel that PCQI is benefitting them. This issue may be somewhat mitigated by working within the GoE health planning structures and systems, as it will be in the job description of some health center staff to support HEWs, and PCQI will provide an avenue to give this support. Increased technical support and motivation are the focus of the key recommendations in the following Recommendations section.

Another way that the PCQI approach could be better integrated into existing FMOH structures is by utilizing the newly developed Health Development Armies (HDAs). As described in the Background and Rationale section, HDAs are community mobilization groups within each community. Over the past year, there has been a strong push to activate these "armies" within communities, with the goal being to have every family organized into a HDA team. Integrating the PCQI QI team into the HDA structure may facilitate sustainability of the PCQI program, while adding more structure to the activities of the HDA. For example, the HDAs could meet to discuss community issues related to health and health care during 'exploring quality' meetings, and would be responsible for health promotion activities, as they are already mandated to do by the GoE.

Better integration of PCQI into Woreda administration structures and functions is also recommended, as their current participation in PCQI is reported to be limited in some kebeles by conflicting meetings and priorities. Therefore, a standing date, time, and agenda be set for the meetings, and where feasible, the PCQI meeting agenda should be integrated into a larger meeting. These modifications may help Woreda Health Officials to prioritize PCQI, and provide additional structure and efficiency to existing meetings. Finally, including QI team members in woreda-level meetings would help empower communities and shed more light on community concerns. Using merit-based criteria to decide which QI team members are able to attend these meetings could act as a motivator for QI teams, and will be discussed further in the Recommendations section.

Scaling up PCQI to lower functioning kebeles: Determining effective ways to scale-up PCQI to communities and health facilities that have weaker health care and administrative systems is a serious challenge. In higher functioning kebeles, PCQI has demonstrated its ability to motivate community members and health workers to make improvements to healthcare within their own community. The study findings, and the structure of Ethiopia society suggest that determining ways in which kebele leaders can be motivated to lead or at least support health care improvement efforts will be crucial to the success of PCQI in low functioning kebeles.

A tailored and targeted approach will likely be needed in each lower functioning kebele. An initial assessment can be used to determine ways in which both the community and the kebele administration will be motivated, and PCQI will then need to be framed within these motivating factors. For example, if the kebele administration is more concerned with crop production than health issues, framing PCQI as a means to keep community members healthy enough to tend to crops may be beneficial. Similarly, if health care issues are largely blamed on external factors such as lack of or disruptions in power or

water, framing PCQI as a means to increase community advocacy to the Woreda Health Office may help the approach gain some traction.

Resources: As expected, a number of interviewees identified resource shortages as a challenge. These shortages present a significant barrier to service utilization and quality of services. For example, women are unlikely to choose to go to a health facility if providers do not have the appropriate medicines and supplies, or if the health workers are not present at the facility when the services are needed.(58)

However, provision of these by external projects such as L10K may lead to at least two additional challenges. First, if health care administrators and workers are relying on external (to the government health system) handouts of medicines and supplies for PCQI to be successful, then it is unlikely that the approach will be scalable to a national level, or sustainable beyond the life of the project. Second, as described above, one of the benefits of the PCQI approach is its ability to empower communities and local governments to identify and implement solutions themselves. Such solutions are powerful, and are more likely to be maintained than if external groups, such as the L10K project, were to supply these resources. Through approaches like PCQI, confidence and advocacy skills can be built for local health care administrators, HEWs and community members, resulting in a more accountable system and helping to ensure that the required resources and supplies come from the appropriate sources within the health system. Therefore, a greater focus on teaching advocacy skills to communities, and recognizing the contributions that they are making to improved health care are recommended.

4.2 Research question two: Does the PCQI approach to QI improve service quality at rural health posts?

Quality from different perspectives

Determining whether or not service quality has increased depends on how service quality is defined, and by whom. As previously described, traditional QI approaches define QI as improvement in health outcomes and provision of evidence-based services.(19) Patients however, often have a different perspective. In addition to improved health outcomes, their perspective generally includes aspects pertaining to respectful care,(25,26) trust and confidence,(20) and access to services.(22) Interview findings suggest that these “softer” aspects of quality, including respectful care, trust and confidence, and access did improve through the use of the PCQI approach. However, verifying and quantifying these improvements is challenging. The finding that more women chose to deliver with a HEW after the initiation of PCQI suggests that these women did believe that the delivery services provided by the HEWs were respectful and accessible.(59,60) Additional studies are needed to test this hypothesis.

Health facility assessments

Health programs in low income countries, especially those focusing on more peripheral levels of the health system, such as health posts or centers, rely heavily on the use of health facility assessments to provide a proxy measure for quality.(45–50) The quality, comprehensiveness, and usefulness of these assessments vary greatly across countries and projects. Including direct observation of health care workers in the assessment provides richer data on the quality of care, enabling the technical provision of services to be compared to national or international standards. The trade-off, however, is that direct

observation, especially of specific skills such as delivering a baby, takes much longer and requires clinical skills by the assessor, and therefore cannot be done routinely in every health facility. (50) Alternative methods, especially for supervision of less frequent events (such as delivery), can be used in combination with direct observation. These include questionnaires for staff, role playing, and case studies.

In contrast, HFAs that focus solely on factors such as the physical condition of the facility and availability of supplies, as was done under the L10K project, can be done routinely as part of supportive supervision visits, but do not provide data on the technical quality of the services provided. A balance between what is feasible and what is useful is therefore needed, especially in rural, resource poor locations such as in the kebeles where the L10K project works.

The data collected from the L10K HFA proved to be of very limited use in assessing change in quality at health facilities. A number of the components included on the assessment were either not completed at all, or were attempted, but were so incomplete that the data could not be used. Further, most of the components included in the assessment were out of the control of the community or the HEWs, and therefore changes in these components were not expected.

Therefore, despite the increased resources needed to include direct observation on the HFA, it is recommended that PCQI include the use of a routine checklist, or HFA that focuses on both attributes and qualities of the health facility, and a simple observational component that addresses the competencies of the HEWs. This recommendation is in line with the overall recommendation to increase the focus of PCQI to include a greater focus on technical quality as well as aspects of respectful care, and will be discussed further in the following *Recommendations* section.

4.3 Research question three: Does the PCQI approach to quality improvement improve utilization of key MNH services?

Increase in delivery with a HEW

The increase in the number of women choosing to deliver with a trained health worker in PCQI-supported areas is very promising, especially in a country where maternal mortality is high and use of a skilled birth attendant is low.(12,61) While HEWs are technically not skilled birth attendants, they are trained in safe and clean delivery, and in areas where it is hard to reach a health center, women are encouraged to solicit the assistance of a HEW during labor and delivery.(51) Further, HEWs are provided with misoprostol to give to women during the third stage of labor.(51) This simple, lifesaving drug has been shown to significantly decrease post-partum hemorrhage, one of the largest causes of maternal deaths in low income countries.(8,62) Therefore, the increase in women choosing to deliver with a HEW in PCQI communities may significantly reduce maternal morbidity and mortality from post-partum hemorrhage through the use of misoprostol provided by the HEWs. As PCQI is scaled up to include health centers, the benefits of stronger relationships with, trust in, and more respectful care by health workers are likely to continue. Consequently, it is anticipated that the increases in deliveries with a health worker will also continue, and that in areas where skilled birth attendants are available, that women will choose to deliver with these professionals. This practice is encouraged by HEWs, the government health system, and the L10K project.

Utilization of ANC, PNC and TT injections

No significant increase in service utilization for ANC, PNC or TT injection use was found. While this is a negative result, research shows that these interventions are not as closely linked with decreases in maternal mortality (13) as delivery with a skilled birth attendant. Further, these services depend more heavily on external factors such as the supply of drugs and laboratory tests. Follow up discussions with L10K staff at the central and regional levels suggest that women may be choosing to go to health centers rather than health posts for some ANC visits, and if so, would likely receive their TT injection there. The structure of data flow within the Ethiopian health system is such that HEWs cannot currently track if a woman goes to a health center for ANC, and therefore these statistics would not have been captured in the health post data collected for this evaluation. Though not significant, the trend in PNC utilization data was positive. With a larger sample size, or the time lapse between the pre- and post-intervention measurements had been longer, a more conclusive finding for PNC may be seen.

Clinical significance of the service utilization findings

The scale of the changes observed in service utilization, even the significant increases seen in delivery with an HEW, are small because of the relatively small catchment area of each health post (approximately 5000 people), and the relative infrequency of a woman delivering a baby. Therefore, larger and more robust service utilization studies are needed to determine the public health relevance of service utilization changes observed in this study. However, especially in a country like Ethiopia where little change has been seen in maternal mortality over the life of the MDGs, the positive change seen in delivery with an HEW shows promise, and should precipitate further investigation.

The Use of Run Charts

The use of run charts is gaining popularity in quality improvement, both in the US, and in global health work.(52,53) The primary benefit of using run charts over t-tests in QI work, is that run charts maintain the time order of data, facilitating an understanding of how specific activities have influenced the outcomes.(53,63–65) In this way, run charts allow both visual and statistical way to understand if changes made to a process or system over time lead to improvements.(53,63) By contrast, t-tests collapse the data into one pre-intervention and one post-intervention score.

The results found using run charts were the same as those found using two-tailed t-tests, with the exception of TT1, which showed a downward, but not significant (at the $p < .05$ level) trend when analyzed using t-test, yet a significant decrease when analyzed with a run chart. There is no clear reason for this discrepancy, but the different way of averaging scores using t-tests versus run charts may have contributed. T-tests rely on arithmetic means, while run charts use median baseline scores which did not account for the large TT1 standard deviation, particularly around the pre-intervention TT1.

5. STUDY LIMITATIONS

As with any study, this evaluation has a number of limitations. Through early identification of these potential limitations, and the creation of mitigation plans to address them, it is hoped that the negative effects of these potential issues has been kept to a minimum.

5.1 Bias in qualitative interviews

A potential limitation of the qualitative data collection was the biased sample. The initial plan was to interview participants involved in the implementation of the PCQI approach both in kebeles where the approach was thought to be working well, and those kebeles where the approach was not working. However, during the initial pilot, we attempted to find and interview participants in lower functioning kebeles, but were either unable to locate the appropriate people (such as kebele administrators), or for potentially cultural reasons, were unable to gather sufficient data from these individuals. Following discussion with the L10K staff in Addis Ababa, it was decided to focus the study in higher functioning kebeles. However, this limitation was at least somewhat overcome through interviews with staff who oversee both higher and lower functioning kebeles, such as Woreda Health Officers, and regional L10K staff. During the pilot phase, these participants seemed to have a relatively good sense as to what some of the underlying differences were between the higher and lower functioning kebeles that fell within their purview.

As described previously, the purpose of the L10K project is to test innovative approaches in rural areas of Ethiopia, a “proof of concept” design. The goal is then to scale-up promising approaches. Therefore, finding out what is and is not working about the approach in high functioning facilities will be a valuable contribution to L10K, the Gates foundation and the GoE. However, in order to provide both L10K and the broader public health community in general with recommendations on how the approach can be scaled-up and sustained in lower functioning kebeles, a particular focus was placed on what is not working, and what recommendations key informants had to improve the process. Further studies may be needed during the scale-up process to determine what strategies end up being successful in facilitating lower functioning facilities to use the PCQI process.

5.2 Quality and sampling of quantitative data

The quality of the quantitative data, both the HFA data and the HMIS-based service utilization data are of questionable quality. Specifically, there are variations in the forms used to collect the data, as well as limited and variable training and supervision of data collection by health facility staff. Therefore, these data may be of limited use. To help compensate for this limitation, the data were only compared at an aggregate level so that individual variations within and between health facilities were lessened.

Further, only a limited number of topics were covered in the HFA, and those covered were measured in different ways (such as in minutes, versus four point scales, versus counts of pieces of available equipment). Consequently, each component needed to be analyzed separately. The quantitative portion of this evaluation is secondary to the qualitative component, if the findings from the HMIS data are not found to be useful to key audiences such as the project, the Gates foundation, or the GoE, the rest of the evaluation will still provide rich and useful information for these audiences, as well as for the broader public health community.

A further limitation of the quantitative data collection is the sampling of these data. Due to the design of the L10K project time, as well as time and financial limitations, quantitative data were collected from the same purposive sample as the qualitative data. The way that the L10K project was designed, kebeles were chosen to participate in the project due to their greater potential to succeed. Therefore, it would be next to impossible to find comparison kebeles who were functioning at a similar level. Consequently, comparisons were only be made over time, rather than against a comparison group, and changes seen in the quantitative data over time will not be able to be attributed to the PCQI approach. The purpose of the current study is therefore not to prove that PCQI can work in any rural, resource-poor setting in Ethiopia, but rather to help determine whether or not it is an appropriate model to use in functional rural health facilities. If it is deemed appropriate, and further recommendations on how to improve the approach are taken into consideration, the next stage of the PCQI work on L10K will be to scale up the approach to include lower functioning facilities as well. At that point, further evaluation will be needed to determine the effectiveness of the approach in a broader context. The plan, however, is to use the implementation and current evaluation of PCQI in higher functioning facilities currently involved in the project as learning sites for the project team, for staff from lower functioning facilities involved in potential future scale-up, and the broader public health community interested in ways to strengthen community quality improvement models such as PCQI.

The lack of participation/inclusion of staff from lower functioning kebeles may limit the generalizability of the study. However, the questions about what is not working about the PCQI approach were asked to woreda (district) officials overseeing lower functioning kebeles, which should provide valuable information about how the approach can be improved to better serve the needs of health workers and community members in lower functioning kebeles.

To help to counter the limitation of a lack of a comparison group, run charts, as well as aggregate-level repeat measures t-tests were used to compare pre- and post-test HMIS data. The use of run charts helped to identify specific times when significant changes take place in the data. In addition, efforts were made to identify external factors that may have influenced (positively or negatively) the outcome of the evaluation. The major significant finding, delivery with a HEW was found using both a t-test and the run charts, and, as described in the *discussion* section, is consistent with the findings from the qualitative analyses.

When the L10K project is nearing its completion in 2015, households in PCQI-implementation areas will be over-sampled during the endline evaluation to ensure that enough data are collected to rigorously assess for changes in health outcomes and service utilization outcomes. Similarly, these areas were oversampled in a previous L10K survey that will serve as a baseline for this end-line evaluation. Therefore, demonstrating quantitative changes in PCQI outcomes is of less importance to the project during the current evaluation.

6. RECOMMENDATIONS

6.1 Key recommendations

The three most salient recommendations emerging from the evaluation are: 1) to promote the notion of respectful care as a core component of QI and MCH program implementation; 2) to increase the PCQI focus on technical quality; and 3) to determine effective ways to motivate community members and leaders, health workers and administrators, and other PCQI implementers. In addition, a series of specific recommendations were given in response to details of the PCQI approach, and this evaluation. A summary of these can be found in **Appendix D**.

The first key recommendation emerging from this study is to promote the notion of respectful care as a component of QI, and of MCH program implementation.

A tenet central to the PCQI approach is its shift in who defines quality. This shift moves away from a traditional medical model, in which administrators and to a lesser extent, health care providers define quality, to a model in which the community and health care workers are given a voice in what quality health care means in their local setting. There are a number of benefits of this shift. First, as one would expect in more commercial service delivery sectors, the consumer of the service, in this case patients, are given a say in the way in which those services are provided. Again, like any other service, patients are far more likely to actually use the services if they are delivered in a manner that is satisfactory to them; and, since patients generally lack technical health knowledge, their focus tends to be on softer, more humanistic dimensions of health care provision. This may sound obvious, but it is at odds with the more traditional definition of quality that focuses solely on health outcomes and evidence-based practices.(19)

One of the aspects of quality that emerged most prominently from the evaluation data was the notion of respectful care, and was likely the result of a combination of factors, including increased interaction and communication among health workers and community members. Consistent with the literature, this theme was found to be very important to community members, and may well have contributed to women's increased choice to deliver with an HEW.

Therefore, health administrators and implementers who implementing maternal (and arguably all) health care programs are encouraged to include a focus on respectful care, whether they are utilizing a PCQI approach or not. Similarly, the notion of respectful care should be integrated into quality improvement programs, in addition to their focus on technical quality. This should begin in pre-service training for health workers (including HEWs, nurses, doctors, and midwives), and aspects of respectful care should be added to supervisory checklists. In addition, regular venues for increased communication among health workers and community members should be established as a way to increase dialogue, understanding, and ultimately respect within the health care delivery system.

The second key recommendation is to increase PCQI's focus on technical quality.

As PCQI is scaled-up, and as it is used by other projects or governments, it is recommended that more focus be placed on assessing and increasing technical quality, such as the skills and services provided by HEWs. While the PCQI approach is innovative in its inclusion of the community's perspective as an equal

voice in the quality discussion, and should be commended for its success at engaging community members in this dialogue, care needs to be taken to ensure that technical aspects of quality are not forgotten.

Community members, health workers, and administrators interviewed did not focus entirely on the “softer” aspects of quality care; rather, they were seeking a balance between technical quality and softer, more human aspects of quality. They repeatedly (in 64% of interviews) requested increased support and supervision with the process, and with the provision of care in general. To begin with, the PCQI approach to assessing technical quality needs to be strengthened. The current HFA is of little value in this effort, as it has a very limited focus and does not include direct observation of the clinical skills provided by HEWs. Standard checklists need to be developed, or if already available through the government system, then a system for routine supportive supervision visits using standard checklists needs to be developed and maintained. To be successful, this will likely require training, mentoring, and ongoing support to health center staff (HEW supervisors and possibly midwives). Improvements in such an assessment could be used as the basis for friendly competitions among health workers and communities.

Once adequate assessments of quality are being routinely conducted, the focus can expand to improving the technical quality gaps identified through these assessments. The approach to increasing technical support will need to be multifaceted and integrated within the existing health system. L10K should work with Woreda and Regional Health Officials to standardize checklists, and to try to ensure that there is a strong governmental push to have health center staff, especially HEW supervisors, and if possible, midwives routinely visit the HEWs in the communities. This push for increased support to and interaction with health posts is stipulated in the FMOH’s health programme (the HSDP IV).(15) Effective use of such checklists may require additional training and mentoring for health center staff.

During supportive supervision visits, supervisors should be providing on-going feedback and on-the-job training to HEWs, using the identification of an issue as a teaching moment for improvement. In addition, the reported success of the additional HEW practical training on safe and clean delivery that was provided in response to concerns raised through the PCQI process is a model worth replicating. HEWs reported that one of the key aspects of the training provided was the practical component in which they spent time with a midwife actually assisting with deliveries. Developing a stronger mentoring system through which HEWs can work more closely with midwives will help to further increase their technical skills, as well as their confidence in these skills. Further, in cases where similar technical gaps are seen across multiple sites, job aids and standard protocols for the provision of services should be developed and used. These standard checklists, protocols, or standards of care are being used more frequently around the world, including in sub-Saharan Africa.(66).

As PCQI is scaled up to include health centers, resources and focus will need to be placed on ensuring that care that is provided meets community and international standards of technical, accessible, and respectful care.

The third key recommendation is to determine effective ways to motivate community members and leaders, health workers and administrators, and other PCQI implementers.

The topic of motivation has emerged in a variety of places throughout the evaluation results and discussion. Motivation of health workers and PCQI implementers is critical to the success and sustainability of the approach, both as L10Ks engages lower functioning kebeles in quality improvement, and for continued use of the approach beyond the life of the L10K project.

Determining effective ways to engage administrators, health workers, and community members in lower functioning kebeles is a key challenge that L10K and other PCQI implementers face. A targeted and tailored approach in kebeles, health posts and health centers with low service utilization will be needed to determine ways in which to engage and motivate key stakeholders. In addition, as PCQI is being scaled up, if communities and health facilities are seen to be struggling with the implementation of PCQI, this same targeted and tailored approach may be needed.

Non-financial incentives offer a number of potential motivators.⁽⁶⁷⁾ For example, Regional or Woreda Health Officials could set up small competitions among groups (woredas, PHCUs, or kebeles) to see which groups can realize the greatest improvements in quality.^(67–69) These improvements can be measured against each group’s action plan. In addition, rewards such as certificates, access to additional trainings or meetings (such as the quarterly woreda meetings) can be given to members of kebeles where targets have been met. These targets need to be realistic, measurable, and appropriate to the goals of PCQI. A simple, transparent process of collecting and sharing data on progress towards targets is also important. This feedback could be incorporated into existing meetings, such as woreda quarterly review meetings.

An additional way to motivate community members and health workers at health posts and centers to sustain the approach, is to share data on key outputs and outcomes, such as service utilization data, so that the participants can decide for themselves if the approach is worth pursuing or not. For example, if simple graphs are posted on the walls of health clinics showing changes in utilization of services, and a positive trend is seen, motivation to continue has been shown to increase.⁽⁷⁰⁾ This technique is being scaled up in all L10K-supported facilities, and therefore can be integrated into the existing PCQI approach.

Offering learning visits to communities that have been successful at making improvements to their health care can be an effective motivator, and can offer a number of benefits. ⁽⁷¹⁾ It is motivating to the community or health facility hosting the visit, as it validates the success of their work, and acts as a motivator to continue to work to solve issues in their community. Similarly, the health workers or community members who are visiting are able to see how peers are dealing with challenges, and can adopt similar approaches in their own setting. This peer-to-peer “push” can be a more effective motivator than a top-down “push”.

6.2 In conclusion

In conclusion, although the true effectiveness of the PCQI approach, as defined by improvements in health outcomes, will not be determined until the L10K final evaluation in 2015, the findings of this study suggest that community members, health workers, administrators at the woreda and kebele levels, Tier I grantees (implementing partners), and L10K staff at the regional and national level felt that the PCQI approach was beneficial to communities. The findings suggest that perhaps the exact details of the approach are less important than the process of giving community members a chance to participate in QI discussions, and with health workers and local administrators, be responsible for finding solutions to quality issues.

Further, there is value in providing a venue for health workers and community members to establish stronger relationships and lines of communication, especially through the shared experience of solving quality issues together. In turn, these stronger relationships can facilitate more respectful care by HEWs. Longer term (beyond the 12 months post initiation of PCQI) may be needed to assess changes in other the utilization of health services, or perhaps changes may never be seen in other maternal health indicators, particularly if women are choosing to access ANC services at the health center rather than the health post. Research shows a stronger association between birthing with a skilled birth attendant and maternal survival than other indicators such as ANC visits.(13) Therefore, even if changes are not seen in indicators such as ANC or TT injections, a simple, community participation approach such as the PCQI process is worth pursuing, especially if it works within the government systems, and can include working with midwives or other skilled birth attendants (rather than just with HEWs who are have some, but not extensive training in deliveries).

Scaling up PCQI to include entire PHCUs has the potential to be significantly more beneficial, particularly if: a) the cultural shift to women delivering with a health worker can be extended to deliveries with a midwife at the health center, b) strategies can be employed to ensure that health center staff have the time, resources (including transportation), and motivation to interact with community members and provide technical support to HEWs.

REFERENCES

1. United Nations. MDG Monitor: MDG 4 Reducing Child Mortality [Internet]. 2012 [cited 2012 Mar 3]. Available from: <http://www.mdgmonitor.org/goal4.cfm>
2. WHO | Maternal mortality ratio (per 100 000 live births) [Internet]. WHO. [cited 2013 May 14]. Available from: <http://www.who.int/healthinfo/statistics/indmaternalmortality/en/>
3. United Nations Millennium Development Goals [Internet]. [cited 2010 Oct 8]. Available from: <http://www.un.org/millenniumgoals/>
4. United Nations. MDG5: Improving Maternal Health Fact Sheet [Internet]. EndPoverty 2015 Factsheets; 2008 [cited 2011 Aug 29]. Available from: <http://www.un.org/millenniumgoals/2008highlevel/pdf/newsroom/Goal%205%20FINAL.pdf>.
5. Ronsmans C, Graham WJ, on behalf of The Lancet Maternal Survival steering group. Maternal mortality: who, when, where and why. *The Lancet*. 2006;368:1189–200.
6. United Nations. MDG 4 Reduce Child Mortality. Fact Sheet [Internet]. End Poverty 2015; 2010 [cited 2012 Mar 3]. Available from: http://www.un.org/millenniumgoals/pdf/MDG_FS_4_EN.pdf
7. United Nations Children’s Fund. Levels and Trends in Child Mortality: Report 2011 [Internet]. 2011 [cited 2012 Mar 3]. Available from: http://www.childinfo.org/files/Child_Mortality_Report_2011.pdf
8. WHO | Maternal mortality Fact Sheet [Internet]. WHO. [cited 2012 Mar 5]. Available from: <http://www.who.int/mediacentre/factsheets/fs348/en/index.html>
9. Maine D. Detours and shortcuts on the road to maternal mortality. *The Lancet*. 2007;370:1380–2.
10. Bhutta ZA, Chopra M, Axelson H, Berman P, Boerma T, Bryce J, et al. Countdown to 2015 decade report (2000–10): taking stock of maternal, newborn, and child survival. *The Lancet*. 2010;375(9730):2032–44.
11. World Bank. Maternal Mortality at a Glance [Internet]. 2006 [cited 2011 Sep 3]. Available from: www.worldbank.org/hnp
12. Central Statistical Agency, Addis Ababa, Ethiopia and ICF International, Calverton, Maryland, USA. Ethiopia - Demographic and Health Survey 2011 [Internet]. 2012 [cited 2013 Mar 17]. Available from: <http://microdata.worldbank.org/index.php/catalog/1381>
13. Campbell DMR, Graham W, and group, on behalf of the Lancet Maternal Survival Series. Strategies for reducing maternal mortality: getting on with what works. *The Lancet*. 2006;368:1284–99.
14. UNstats | Millennium Indicators [Internet]. [cited 2013 Mar 14]. Available from: <http://mdgs.un.org/unsd/mdg/Data.aspx>
15. Federal Democratic Republic of Ethiopia Ministry of Health. Health Sector Development Programme IV 2010/11 – 2014/15. Addis Ababa; 2011.

16. Federal Ministry of Health. Health Extension Program in Ethiopia: Profile. 2007.
17. Abebe B. Ethiopia: Health Development Army - Decisive Factor for Sector Enhancement. All Africa [Internet]. Addis Ababa; 2012 [cited 2013 Mar 9]; Available from: <http://allafrica.com/stories/201210190200.html?page=2>
18. Donnelly J. Ethiopia gears up for more major health reforms. The Lancet. 2011 Jun;377(9781):1907–8.
19. Institute of Medicine. Crossing the Quality Chasm: The IOM Health Care Quality Initiative - Institute of Medicine [Internet]. [cited 2013 Mar 7]. Available from: <http://www.iom.edu/Global/News%20Announcements/Crossing-the-Quality-Chasm-The-IOM-Health-Care-Quality-Initiative.aspx>
20. Joffe S, Manocchia M, Weeks JC, Cleary PD. What do patients value in their hospital care? An empirical perspective on autonomy centred bioethics. J Med Ethics. 2003 Apr 1;29(2):103–8.
21. Elwyn G, Buetow S, Hibbard J, Wensing M. Respecting the subjective: quality measurement from the patient’s perspective. BMJ. 2007 Nov 17;335(7628):1021–2.
22. Institute of Medicine. Quality Through Collaboration: The Future of Rural Health Care [Internet]. Washington, D.C.: The National Academies Press; 2005 [cited 2013 Mar 7]. Available from: http://books.nap.edu/openbook.php?record_id=11140&page=2
23. Haddad S, Fournier P, Machouf N, Yatara F. What does quality mean to lay people? Community perceptions of primary health care services in Guinea. Social Science & Medicine. 1998 Aug;47(3):381–94.
24. Dickert NW, Kass NE. Understanding respect: learning from patients. J Med Ethics. 2009 Jul 1;35(7):419–23.
25. Langer A, Horton R, Chalamilla G. A manifesto for maternal health post-2015. The Lancet. 2013 Feb;381(9867):601–2.
26. Maternal Health Task Force. Respectful Maternity Care [Internet]. 2013 [cited 2013 Mar 14]. Available from: <http://maternalhealthtaskforce.org/respectful-care>
27. Respectful Maternity Care - The White Ribbon Alliance for Safe Motherhood [Internet]. White Ribbon Alliance. [cited 2013 Mar 17]. Available from: <http://www.whiteribbonalliance.org/index.cfm/the-issues/respectful-maternity-care/>
28. Rubardt L, Fagan M, Powers M. Partnership Defined Quality. A tool book for community and health provider collaboration for quality improvement. Save the Children/US; 2003.
29. Save the Children. Partnership Defined Quality Facilitation Guide [Internet]. 2004. Available from: http://www.coregroup.org/storage/documents/Diffusion_of_Innovation/Save_PDQ_Facil_Guide.pdf

30. The Social and Behavior Change Working Group at CORE and Save the Children. Maximizing the Effectiveness of Partnership Defined Quality. Technical Advisory Group Program Report; 2008.
31. Tawfik Y, Segall M, Necochea E, Jacobs T. Finding Common Ground: Harmonizing the Application of Different Quality Improvement Models in Maternal, Newborn and Child Health Programs. Technical Report. Published by the USAID Health Care Improvement Project. [Internet]. Bethesda, MD: University Research Co., LLC (URC).; 2010. Available from: http://www.coregroup.org/storage/documents/ME/Finding_common_ground.pdf
32. EngenderHealth. Client-Oriented, Provider- Efficient Services (COPE®) [Internet]. 2003 [cited 2012 Mar 6]. Available from: www.engenderhealth.org/pubs/quality/cope.php
33. Laumonier-Ickx L. The Fully Functional Service Delivery Point in Afghanistan: Results of First Six-Month Improvement Cycle. Management Sciences for Health; 2006.
34. BASICS III. Newborn Survival and Health [Internet]. 2009 [cited 2012 Mar 7]. Available from: http://www.basics.org/reports/FinalReport/Newborn-Final-Report_BASICS.pdf
35. Ahmen N, Alam M, Sultana F, Sayeed S, Pressman A, Powers M. Reaching the Unreachable: Barriers of the Poorest to Accessing NGO Healthcare. *J Health Popul Nutr.* 2006;24(4):456–66.
36. Saleh-Ramirez A, Velasquez C. Partnership Defined Quality: A tool for improving VCT/STI screening services. The 135th Annual Meeting of the APHA. 2007;149717.
37. Tapia M, Nafissatou D, Chery Y, Braud E. Involving youth in the development of youth-friendly services: Adaptation of the Partnership Defined Quality process in Haiti. The 135th Annual Meeting of the APHA. 2007;159792.
38. Sebikali B, Rabb M. Mobilized for quality: Community-provider partnerships foster increased use of reproductive health services in Rwanda. The 131st Annual Meeting of APHA. 2003;69317.
39. Powers M, Limbu N, Gallardo A, Pasha O, Lovich R. Effects on quality and use of services: Implementing the Partnership Defined Quality approach in Nepal. The 131st Annual Meeting of APHA. 2003;65680.
40. Palinkas LA, Aarons GA, Horwitz S, Chamberlain P, Hurlburt M, Landsverk J. Mixed Method Designs in Implementation Research. *Adm Policy Ment Health.* 2011 Jan 1;38(1):44–53.
41. Ulin P., Robinson ET, Tolley E. The Language and Logic of Qualitative Research. *Qualitative Methods in Public Health: A field guide for applied research.* San Fransisco, CA: Jossey-Bass; 2005. p. 18.
42. Ulin PR, Robinson ET, Tolley E. Qualitative Data Analysis. *Qualitative Methods in Public Health: A field guide for applied research.* San Fransisco, CA: Jossey-Bass; 2005. p. 139–69.
43. Huberman AM, Miles MB. Data management and analysis methods. *Handbook of Qualitative Research.* SAGE Publications; 1994. p. 429.
44. Jupp V. *The SAGE dictionary of social and cultural research methods.* London: SAGE; 2006.

45. Derose SF, Schuster MA, Fielding JE, Asch SM. Public Health Quality Measurement: Concepts and Challenges ¹. *Annu. Rev. Public. Health.* 2002 May;23(1):1–21.
46. Forsberg BC, Barros FC, Victora CG. Developing countries need more quality assurance: how health facility surveys can contribute. *Health Policy and Planning.* 1992;7:193–6.
47. Catacutan AR. The health service coverage of quality-certified primary health care units in Metro-Manila, the Philippines. *Health Policy and Planning.* 2005 Nov 17;21:65–74.
48. Mandal M, Purdin S, McGinn T. A study of health facilities: implications for reproductive health and HIV/AIDS programs in southern Sudan. *Int Q Community Health Educ.* 2005 2006;24(3):175–90.
49. Howe LD, Manu A, Tawiah-Agyemang C, Kirkwood BR, Hill Z. Developing a community-based neonatal care intervention: a health facility assessment to inform intervention design. *Paediatr Perinat Epidemiol.* 2011 Mar;25(2):192–200.
50. Toward a Framework and Indicators for Monitoring Roll Back Malaria - The Intolerable Burden of Malaria: A New Look at the Numbers - NCBI Bookshelf [Internet]. [cited 2013 Mar 29]. Available from: <http://www.ncbi.nlm.nih-gov.ezproxy.bu.edu/books/NBK2625/>
51. Koblinsky M, Tain F, Gaym A, Karim A, Carnell M, Tesfaye S. Responding to the maternal health care challenge: The Ethiopian Health Extension Program. *Ethiopian Journal of Health Development* [Internet]. 2010 [cited 2013 Mar 29];24(1). Available from: <http://www.ajol.info/index.php/ejhd/article/view/62951>
52. California Improvement Network. Using Run Charts [Internet]. 2009 [cited 2013 Mar 7]. Available from: <http://www.calquality.org/programs/clinicalcare/meteor/documents/6.2.1RunChartResources.pdf>
53. Perla R, Provost L, Murray S. The run chart: a simple analytical tool for learning from variation in healthcare processes. *BMJ Qual Saf.* 2011;20(1):46–51.
54. Taylor J, Blue I, Misan G. Approach to Sustainable Primary Health Care Service Delivery for Rural and Remote South Australia. *Australian Journal of Rural Health.* 2001;9(6):304–10.
55. Claeson M, Waldman RJ. The evolution of child health programmes in developing countries: from targeting diseases to targeting people. *Bulletin of the World Health Organization.* 2000 Jan;78(10):1234–45.
56. Macfarlane S, Racelis M, Muli-Muslime F. Public health in developing countries. *The Lancet.* 2000 Sep 2;356(9232):841–6.
57. Harrist AW, Thompson SD, Norris DJ. Defining Quality Child Care: Multiple Stakeholder Perspectives. *Early Education & Development.* 2007 Jun 18;18(2):305–36.
58. JSI. Getting Products to People: The JSI Framework for Integrated Supply Chain Management in Public Health [Internet]. 2012 [cited 2013 Apr 7]. Available from: <http://www.jsi.com/JSIInternet/Resources/publication/display.cfm?txtGeoArea=INTL&thisSection=Resources&thisSectionTitle=Resources&thisPage=publications&id=11907>

59. Fujita N, Perrin XR, Vodounon JA, Gozo MK, Matsumoto Y, Uchida S, et al. Humanised care and a change in practice in a hospital in Benin. *Midwifery*. 2012 Aug;28(4):481–8.
60. Behruzi R, Hatem M, Goulet L, Fraser W. The facilitating factors and barriers encountered in the adoption of a humanized birth care approach in a highly specialized university affiliated hospital. *BMC Women’s Health*. 2011;11(1):53.
61. World Bank. World dataBank [Internet]. World Development Indicators. 2011 [cited 2012 Mar 3]. Available from:
http://databank.worldbank.org/ddp/editReport?REQUEST_SOURCE=search&CNO=2&country=ETH&series=NY.GNP.PCAP.PP.CD~SP.POP.TOTL~NY.GDP.MKTP.CD~NY.GDP.MKTP.KD.ZG~SP.DYN.LE00.IN&period=YR2001~YR2002~YR2009~YR2010
62. Derman RJ, Kodkany BS, Goudar SS, Geller SE, Naik VA, Bellad M, et al. Oral misoprostol in preventing postpartum haemorrhage in resource-poor communities: a randomised controlled trial. *The Lancet*. 2006 Oct;368(9543):1248–53.
63. Kotagal M, Lee P, Habiyakare C, Dusabe R, Kanama P, Epino H, et al. Improving quality in resource poor settings: observational study from rural Rwanda. *BMJ*. 2009 Dec 5;339:1311–3.
64. Jain M, Miller L, King D, Berwick D. Decline in ICU adverse events, nosocomial infections and cost through a quality improvement initiative focusing on teamwork and culture change. *Quality & safety in health care*. 2006;15:235–9.
65. Neuhauser D, Diaz M. Quality Improvement research: are randomised trials necessary? *Qual Saf Health Care*. 2007;16:77–80.
66. DeRenzi B, Lesh N, Parikh T, Sims C, Maokla W, Chemba M, et al. E-imci: improving pediatric health care in low-income countries. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* [Internet]. New York, NY, USA: ACM; 2008 [cited 2013 Apr 9]. p. 753–62. Available from: <http://doi.acm.org/10.1145/1357054.1357174>
67. Mathauer I, Imhoff I. Health worker motivation in Africa: the role of non-financial incentives and human resource management tools. *Human Resources for Health*. 2006 Aug 29;4(1):24.
68. Franco LM, Bennett S, Kanfer R. Health sector reform and public sector health worker motivation: a conceptual framework. *Social Science & Medicine*. 2002 Apr;54(8):1255–66.
69. Weinberg RS, Jackson A. Competition and Extrinsic Rewards: Effect on Intrinsic Motivation and Attribution. *Research Quarterly*. 1979 Oct;50(3):494–502.
70. The Last Ten Kilometers Project (L10K). Changes in maternal, newborn and child health in 115 rural woredas of Amhara, Oromia, SNNP, and Tigray Regions of Ethiopia , 2008 – 2010 : Findings from the L10K baseline and midterm surveys. JSI Research & Training Institute, Inc.; 2012.
71. Denner J, Coyle K, Robin L, Banspach S. Integrating service learning into a curriculum to reduce health risks at alternative high schools. *Journal of School Health*. 2005;75(5):151–6.

APPENDIX A – LIST OF INTERVIEWS CONDUCTED (LOCATION OR TYPE)

Regional/ central office (n=5)	Tier 1 Grantee (n=12)	Woreda Health Officials (n=14)	Kebele administration (n=19)	QI team (n=19)	HEWs (n=19)	Community representatives (n=19)
Central L10K Office						
Tigray Regional L10K Office	Tier 1	Kola Tembien (KT)	KT Menji	KT Menji	KT Menji	KT Menji
			KT Mit Saewerki	KT Mit Saewerki	KT Mit Saewerki	KT Mit Saewerki
		Tahtay Koraro (TK)	TK Geter semema	TK Geter semema	TK Geter semema	TK Geter semema
			TK Adimenabir	TK Adimenabir	TK Adimenabir	TK Adimenabir
Amhara Regional L10K Office	Tier 1	Hulet Ejuenasie (HE)	HE Debreselam	HE Debreselam	HE Debreselam	HE Debreselam
	Tier 1	Denbia (D)	D Solje chilo	D Solje Gabebe	D Solje Gabebe	D Solje Gabebe
	Tier 1	Debecha (D)	D Yeshe boch	D Yeshe boch	D Yeshe boch	D Yeshe boch
		Siyadebir Enawayu (SE)	SE Dawo Komolcha	SE Dawo Komolcha	SE Dawo Komolcha	SE Dawo Komolcha
Oromia Regional L10K Office	Tier 1	Limu Kossa (LK)	LK Debelo	LK Debelo	LK Debelo	LK Debelo
	Tier 1	Alle Gore (AG)	AG	AG Gagibacheno	AG Gagibacheno	AG Gagibacheno
	Tier 1	Gutogida (G)	G Farinera	G Farinera	G Farinera	G Farinera
			G Loko	G Loko	G Loko	G Loko
	Tier 1	Nedjo (N)	N Qiltumekko	N Qiltumekko	N Qiltumekko	N Qiltumekko
		G/Gebo	G/Gebo	G/Gebo	G/Gebo	
SNNP Regional L10K Office	Tier 1	Silte (S)	S Agode	S Agode	S Agode	S Agode
	Tier 1	Dilla Zuria (DZ)	DZ Bulla	DZ Bulla	DZ Agode	DZ Bulla
	Tier 1	Chena (C)	C Koda	C Koda	C Koda	C Koda
	Tier 1	Yeki (Y)	Y Ermich	Y Ermich	Y Ermich	Y Ermich
Note: ■ indicates interviews that were coded during Phase 1 (detailed coding), n=53						

APPENDIX B – QUESTIONNAIRES

I. Questions to be asked at the Woreda Health Office

Please document who is present for the interview:

Region _____ woreda _____ Kebele _____

Woreda Health Officer (*circle*): Present Not present

Other woreda health staff (list titles): _____

PCQI coordinator.....

1. Can you describe, from your perspective, how the PCQI process is being implemented in this woreda?

Probes: try to determine if the woreda staff know about the process or not. How many health posts are participating in PCQI? Do woreda staffs ever attend PCQI events or meetings? If so, what events/meetings have they attended?

2. What is working about the PCQI approach?

2a. Do you feel that the PCQI approach has improved the quality of services? If so how?

2b. Do you feel that the PCQI approach has helped to improve the utilization of health services? If so how?

3. What suggestions do you have about how the PCQI approach could be improved? Probe for selection of kebeles, selection and training of facilitators, community orientation, explore quality meeting, 'bridging the gap' workshop, implementation, follow up and review meeting

4. In the coming year, the L10K Quality Improvement efforts will expand to include greater involvement at the health center level. In what specific ways would you like to see HC staff more involved in the quality of services provided at the HP and health center level?

4a. what additional challenges do you foresee with this expansion?

5. What resources are the woreda putting into implementing the PCQI approach? [Probe if necessary: money, time, transportation, other]

6. Does it feel like the investment in this approach is "worth it" (i.e. do you feel like the community feel like it is benefitting from the approach)?

7. How could L10K better support you in implementing the PCQI approach?

8. Is there anything else that you would like to say about the PCQI process?

II. Questions to be asked for facilitators, kebele chairperson and kebele managers

Please document who is present for the interview:

Kebele administrator (*circle*): Present Not present

Kebele manager (*circle*): Present Not present

PCQI kebele facilitators (*number present for interview*) _____

1. Please can you describe how PCQI is being implemented in your community?

Probes: Find out specifically about the ‘exploring quality’ meetings, ‘bridging the gap’ meetings: how often did they occur, who attended, were minutes taken? What actions have been taken following these meetings? Who was involved in the implementation and follow up?

2. What is working about the PCQI approach?

2a. Do you feel that the PCQI approach has improved the quality of services? If so how?

2b. Do you feel that the PCQI approach has helped to improve the utilization of health services? If so how?

3. What are the challenges in implementing PCQI? Probe for explore quality meeting, ‘bridging the gap’ work shop, implementation of action plan, follow up, monthly review meeting of QI team?

4. What suggestions do you have about how the PCQI approach could be improved? Probe for Explore quality meeting, ‘bridging the gap’ workshop, implementation of action plan, follow up and review meeting

5. What resources are the communities putting into implementing the PCQI approach? [Probe if necessary: money, time, transportation, other]

6. Does it feel like the investment in this approach is “worth it” (i.e. do you feel like the community feel like it is benefitting from the approach)?

7. How could L10K better support you in implementing the PCQI approach?

8. Is there anything else that you would like to say about the PCQI process?

III. Questions to be asked for Quality improvement team

Please document who is present for the interview:

QI team members (*number present for interview*) _____

1. Please can you describe how PCQI is being implemented in your community?

Probes: Find out specifically about the ‘exploring quality’ meetings, ‘bridging the gap’ meetings, What actions have been taken following these meetings? Who participated in implementing action plan, who was involved in the follow up?

2. Do you feel that the PCQI approach has improved the quality of services? If so how?

3. Do you feel that the PCQI approach has helped to improve the utilization of health services? If so how?

4. What suggestions do you have about how the PCQI approach could be improved? Probe for on whom and how the community participated in PCQI approach (assessment of the problems, 'bridging the gap' work shop, implementation, review meeting and follow up)
5. What resources are the communities putting into implementing the PCQI approach? [Probe if necessary: money, time, transportation, other]
6. Does it feel like the investment in this approach is "worth it" (i.e. do you feel like the community feel like it is benefitting from the approach)?
7. How could the woreda better support you in implementing the PCQI approach?
8. Is there anything else that you would like to say about the PCQI process?

IV. Questions to be asked of HEWS
--

Please document who is present for the interview:

HEWs (*number present for interview*) _____

1. Please can you describe how PCQI is being implemented in your community?
Probes: Find out specifically about the 'exploring quality' meetings, 'bridging the gap' meetings who attended, what actions have been taken following these meetings? ? Who participated in implementing action plan and who was involved in the follow up?
2. What is working about the PCQI approach?
 2a. Do you feel that the PCQI approach has improved the quality of services? If so how?
 2b. Do you feel that the PCQI approach has helped to improve the utilization of health services? If so, how?
3. What suggestions do you have about how the PCQI approach could be improved? Probe for Explore quality meeting, 'bridging the gap' workshop, implementation of action plan , follow up and review meeting
4. In the coming year, the L10K Quality Improvement efforts will expand to include greater involvement at the health center level. In what specific ways would you like to see HC staff more involved in the quality of services provided at the HP level?
 4a. what additional challenges do you foresee with this expansion?
5. What resources are the communities putting into implementing the PCQI approach? [Probe if necessary: money, time, transportation, other]
6. Does it feel like the investment in this approach is "worth it" (i.e. do you feel like the community feel like it is benefitting from the approach)?
7. How could L10K better support you in implementing the PCQI approach?
8. Is there anything else that you would like to say about the PCQI process?

V. Questions to be asked at Tier I level

Please document who is present for the interview:

Tier I regional coordinators (*number present for interview*) _____

Tier I woreda officers (*number present for interview*) _____

Other (*please list*) _____

1. What is working about the PCQI approach?
 - 1a. What do you feel about the tool, facilitators, training, explore quality meeting at sub kebeles, 'bridging the gap' workshop at a kebele level, action plan and implementation approaches
 - 1b. Do you feel that the PCQI approach has improved the quality of services? If so how?
 - 1c. Do you feel that the PCQI approach has helped to improve the utilization of health services? If so how?
2. What suggestions do you have about how the PCQI approach could be improved? (Tools, facilitators, explore quality, 'bridging the gap' workshop, implementation approaches, follow up and review meeting)?
3. In the coming year, the L10K Quality Improvement efforts will expand to include greater involvement at the health center level. In what specific ways would you like to see HC staff more involved in the quality of services provided at the HP level?
 - 3a. what additional challenges do you foresee with this expansion?
4. Does it feel like the investment in this approach is "worth it" (i.e. do you feel like the community feel like it is benefitting from the approach)?
5. How could L10K better support you in implementing the PCQI approach?
6. Is there anything else that you would like to say about the PCQI process?

VI. Questions to be asked at regional and central L10K levels

Please document who is present for the interview:

Regional L10K: Regional team _____

Central L10K: Technical team _____

M&E _____

1. What is working about the PCQI approach?
 - 1a. What do you feel about the PCQI (Tools, facilitators, explore quality , 'bridging the gap' workshop, implementation approaches ,follow up and review meeting)?
 - 1b. Do you feel that the PCQI approach has improved the quality of services? If so how?
 - 1c. Do you feel that the PCQI approach has helped to improve the utilization of health services? If so how?
2. What suggestions do you have about how the PCQI approach could be improved or what specific changes can be introduced to better implement PCQI? (tools, processes, implementation and monitoring approaches)?

3. In the coming year, the L10K Quality Improvement efforts will expand to include greater involvement at the health center level. In what specific ways would you like to see HC staff more involved in the quality of services provided at the HP level?
 - 3a. What additional challenges do you foresee with this expansion?
4. How could L10K better support in implementing the PCQI approach?
5. Is there anything else that you would like to say about the PCQI process?

APPENDIX C - SUMMARY HMIS AND HFA DATA

Summary HMIS Data from each region

Indicator:	ANC		Del		PNC1		TT1		TT2	
	pre	post	pre	post	pre	post	pre	post	pre	post
	12.50	4.25	1.75	5.00	11.50	6.00	1.75	2.00	1.75	1.75
	11.50	20.50	2.50	2.50	11.50	4.00	0.00	3.00	0.00	0.50
	5.50	6.00	2.75	2.25	3.50	5.00	0.00	1.00	1.50	1.75
	5.50	3.75	1.75	2.75	5.75	5.25	0.00	2.00	0.50	0.50
	5.00	5.00	1.75	3.25	2.75	3.75	0.00	1.00	0.50	0.75
	15.00	3.25	4.50	1.50	8.75	2.50	0.00	0.00	0.00	0.75
	10.25	5.00	3.50	2.75	4.25	3.25	0.00	0.75	1.00	1.25
	8.25	7.25	2.75	1.00	4.75	4.75	0.00	0.75	2.50	1.25
	8.50	7.75	3.50	2.75	4.75	9.00	3.25	0.50	2.75	0.75
	8.50	11.00	3.50	1.50	8.50	7.00	7.50	1.50	6.75	0.50
	10.25	10.00	3.50	2.50	6.00	7.50	0.00	0.75	2.00	1.75
	12.25	8.25	3.00	3.25	6.00	7.25	1.75	0.50	5.50	2.00
	3.60	2.00	0.33	0.80	1.20	2.60	4.80	1.43	4.20	1.67
	4.20	2.43	0.00	2.60	1.40	3.00	2.80	2.33	4.40	3.20
	1.40	4.00	0.33	2.00	1.40	2.80	4.80	0.83	3.80	0.80
	2.00	3.57	1.75	4.20	3.60	2.40	4.00	3.67	3.80	4.20
	2.00	6.14	1.50	1.80	1.60	4.17	2.20	3.50	4.00	1.80
	2.00	2.86	1.25	3.00	2.40	2.71	0.80	2.14	1.60	4.00
	2.67	6.86	0.75	1.40	3.40	2.29	1.67	3.14	2.17	3.50
	3.67	3.43	2.25	2.20	2.25	3.29	3.17	4.71	5.17	2.83
	3.83	2.57	2.25	1.60	1.75	2.00	2.17	3.00	2.00	2.00
	4.00	4.43	2.50	2.60	2.50	5.00	1.83	4.14	2.50	3.00
	4.50	3.17	2.25	2.75	4.75	1.50	4.00	3.00	3.67	1.80
	2.83	2.67	1.00	1.25	2.50	2.17	1.67	1.67	1.33	4.20
	10.00	12.00	3.00	2.00	2.00	5.00	5.33	2.00	16.67	9.00
	9.67	11.33	3.67	3.50	1.50	8.00	4.50	5.67	10.50	12.00
	13.00	14.33	3.67	12.00	0.00	8.00	3.67	5.33	12.33	7.67
	8.00	11.00	1.00	2.50	7.00	7.33	20.67	5.00	23.33	4.00
	6.50	13.33	2.00	2.00	4.50	5.67	5.33	2.50	13.00	8.67
	12.67	14.00	3.00	4.00	4.50	9.00	5.00	4.50	9.00	10.50

Summary HMIS Data from each region – *continued*

Indicator:	ANC		Del		PNC1		TT1		TT2	
	pre	post	pre	post	pre	post	pre	post	pre	post
	18.33	12.67	2.00	3.67	6.00	4.33	7.67	4.00	11.67	16.50
	15.67	13.33	1.50	4.33	4.50	8.33	4.00	10.00	7.00	8.00
	9.00	9.33	2.50	5.67	8.00	8.00	4.50	10.50	11.50	6.00
	11.00	9.67	3.50	2.33	4.50	7.00	2.50	6.00	11.00	9.50
	9.00	9.67	2.50	3.33	6.50	8.00	3.00	4.50	12.50	15.50
	16.33	21.50	1.67	5.00	8.50	11.00	6.33	7.50	12.33	20.00
	7.80	10.60	0.40	0.00	8.20	8.00	2.00	8.00	4.40	7.60
	6.60	6.80	0.20	0.80	7.40	8.60	11.00	2.00	6.20	10.00
	5.80	5.60	0.40	0.20	7.80	9.40	16.00	1.00	8.80	10.20
	6.20	11.60	0.40	0.40	7.00	7.60	3.00	0.00	3.80	4.60
	6.50	6.20	0.00	1.60	7.00	7.00	16.00	3.00	5.40	4.20
	7.20	14.40	0.40	1.00	6.80	8.20	12.00	6.00	6.60	9.00
	13.00	10.60	1.00	2.20	7.20	11.20	5.00	3.00	3.40	5.80
	9.60	9.40	0.60	1.20	7.80	7.40	4.00	5.00	6.60	8.60
	11.40	8.60	0.80	2.20	7.80	8.40	13.00	2.00	15.40	10.80
	5.80	9.50	1.20	0.50	6.20	7.50	2.00	4.00	6.60	5.75
	7.00	11.50	1.20	0.00	4.20	6.50	0.00	0.00	4.00	5.50
	15.20	12.50	0.80	2.00	7.00	10.50	1.00	0.00	5.80	10.50
MEAN	8.15	8.45	1.84	2.49	5.18	6.02	4.28	3.10	6.07	5.55
SD	4.25	4.57	1.19	1.92	2.73	2.64	4.62	2.50	4.98	4.64
df		47.00		47.00		47.00		47.00		47.00
ttest		0.34		2.03		1.55		1.57		0.53
prob		0.74		0.05		0.13		0.12		0.60

Summary HFA Data from each sampled health facility

Component:	Availability of equipment		Condition of facility	
	pre	post	pre	post
	16	13	6	4
	14	14	7	4
	11	11	8	6
	16	11	5	5
	9	11	5	5
	8	7	14	6
	8	7	8	4
	4	0	4	5
	10	10	4	5
	10	11	6	6
	12	10	4	5
	12	12	6	4
	8	8	7	5
	10	12	6	4
	8	10	5	4
	8	10	6	4
n	16	16	16	16
df	15	15	15	15
tvalue	0.81			
prob	0.43			
SD	3.19	3.25		
mean	10.25	9.8125		
median			6.3125	4.75
U1				108
U2				259
n1n2/2				128
s				26.533
Zq				4.9372

APPENDIX D – SUMMARY OF RECOMMENDATIONS

Summary of Recommendations	
Recommendation	Themes addressed by each recommendation
Promote respectful care at all health facilities and in all communities	Community empowerment/ ownership Respectful care Access to health services
Increase technical quality by: <ul style="list-style-type: none"> - Providing targeted, practical trainings - Increasing routine supportive supervision - Developing and using standard checklists and HFAs that include observation 	HEW skill-level and confidence Support, supervision, and technical quality Availability of resources Integration of PCQI into government systems Scaling up PCQI to entire PHCUs
Increase the focus on and use of strategies to motivate PCQI participants by: <ul style="list-style-type: none"> - Facilitating learning visits - Offering non-financial incentives as rewards for meeting targets (for example: competitions among groups, additional trainings and education, participation at woreda meetings) - Developing targeted approaches in low functioning kebeles to determine ways to engage and motivate key members of the kebele and community 	Community empowerment/ ownership Scaling up PCQI to entire PHCUs
Encourage continued and increased community ownership of health issues, and provide training on advocacy to community	Promote healthy behaviors Access to health services Availability of resources
Increase integration of PCQI into government systems through: <ul style="list-style-type: none"> - Engaging health center staff to: <ul style="list-style-type: none"> o Provide increased support and supervision o Act as PCQI facilitators o Encourage staff to visit the community - Promote greater collaboration with HDAs - Facilitate more buy-in from kebele staff and greater integration with Woreda and kebele administration 	Promote healthy behaviors HEW skill-level and confidence Access to health services Recruitment and retention of PCQI facilitators Integration of PCQI into government systems Scaling up PCQI to PHCUs Support, supervision, and technical quality
Explore innovative transportation options for communities	Access to health services Availability of resources

<p>Simplify the PCQI approach by:</p> <ul style="list-style-type: none">- Standardizing and using checklists- Standardizing meeting times and agenda, and integrating PCQI meetings into existing meetings- Changing PCQI topics less frequently- Integrating the PCQI process into existing meetings, processes and systems	<p>Support, supervision, and technical quality Integration of PCQI into government systems Scaling up PCQI to PHCUs</p>
---	---

L10K

The Last Ten Kilometers Project

Jen McCutcheon

