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## Integrating community outreach into a quality improvement project to promote maternal and child health in Ghana

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### Abstract

Quality improvement (QI) is used to promote and strengthen maternal and child health services in middle and low-income countries. Very little research has examined community-level factors beyond the confines of health facilities that create demand for health services and influence health outcomes. We examined the role of community outreach in the context of Project Fives Alive!, a QI project aimed at improving maternal and under-5 outcomes in Ghana. Qualitative case studies of QI teams across 6 regions of Ghana were conducted. We analyzed the data using narrative and thematic techniques. QI team members used two distinct outreach approaches: community-level outreach, including health promotion and education efforts through group activities and mass media communication; and direct outreach, including one-on-one interpersonal activities between health workers and pregnant women and/or mothers of children under-5. Specific barriers to community outreach included structural, cultural, and QI team-level factors. QI efforts in both rural and urban settings should consider including context-specific community outreach activities

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Competing interests

The authors declare that there are no competing interests.

to develop ties with communities and address barriers to health services. Sustaining community outreach as part of QI efforts will require improving infrastructure, strengthening QI teams, and ongoing collaboration with community members.

### Keywords

quality improvement; community outreach; maternal and child health; health service utilization; qualitative research methods; Ghana

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### Introduction

Quality improvement (QI) refers to a set of strategies to improve processes of care, including system effectiveness, patient outcomes and population health (Batalden & Davidoff, 2007; McLaughlin, 2004). Riley and colleagues (2010) define QI in the context of public health as “a continuous and ongoing effort to achieve measurable improvements in the efficiency, effectiveness, performance, accountability, outcomes, and other indicators of quality in services or processes which achieve equity and improve the health of the community” (p. 6). This definition reflects how QI can be applied to individual facilities such as hospitals and clinics, as well as larger health systems.

A typical quality improvement initiative examines an internal process, such as patient flow through an outpatient clinic, identifies the multiple steps involved in patient flow, and examines bottlenecks and other problems that may lead to less than optimal clinic flow. Improvement strategies usually involve process changes and modifications. Essentially, process changes are internal, and based largely on a closed system understanding of the process. In most of the published QI literature in high-income countries, the focus is on strategies implemented in hospitals (Cohen et al., 2008; Schoen et al., 2004).

Stemming from the World Health Organization’s (WHO) call to use QI to improve care for children in hospitals in 2001, several African countries launched hospital-based QI initiatives to improve the quality of pediatric care to reduce infant and child mortality (Campbell et al., 2008; English et al., 2009; WHO, 2001). More recently, the WHO (2007) recognized QI as critical to promoting efficiency in health services delivery and improved health outcomes. Accordingly, QI methods have increasingly been implemented in the health systems of low- and middle-income countries (LMICs) (Sifrim, Barker, & Mate, 2014) to improve processes and outcomes related to maternal and child health and infectious diseases, including HIV (Althabe et al., 2008; Barker et al., 2007; Franco & Marquez, 2011). Research in LMICs has shown QI can be used to improve health services delivery by promoting quality in health facility management, assessing gaps in service delivery, and identifying and implementing change measures (Altherton, Mbekem, & Nyalusi, 1999; Bradley et al., 2008; Mohammadi, Mohammadi, Hedges, Zohrabi, & Ameli, 2007; Rowe et al., 2010). Moreover, these studies indicate that health professionals can be equipped to enhance the capacity of health systems to provide efficient care using QI principles. Recent findings from a QI project in Malawi demonstrate the importance of combining both facility and community engagement components, such as community mobilization through women’s groups, to reduce newborn mortality (Colbourn et al., 2013).

Certain international organizations have promoted greater community involvement in QI strategies in LMICs, such as community members managing accountability, oversight, and mobilization of local resources (Björkman & Svensson, 2009; Brinkerhoff 2011; Bradley et al., 2012; Peters 2002). Examples of organizational-level application of QI include the US Agency for International Development's (USAID) Health Care Improvement Project and Applying Science to Strengthen and Improve Systems project and Save the Children's Partnership Defined Quality Initiative (USAID, 2011; USAID, 2014a; USAID, 2014b; Save the Children, 2012; Tawfik, Segall, Necochea, & Jacobs, 2010).

Despite the push to integrate community involvement in QI strategies in LMICs understanding of how this approach may strengthen the outcomes of QI efforts is sparse. We conducted a qualitative case study to examine how community outreach was integrated into a facility-based QI initiative in Ghana called Project Fives Alive! (PFA). PFA aims to assist Ghana's health system to accelerate the achievement of Millennium Development Goal (MDG) #4, a 67% reduction in under-five child mortality, and MDG #5, a 75% reduction in maternal mortality, by 2015 to promote maternal and child health in Ghana. We identify specific community outreach approaches, describe how QI teams in PFA used QI strategies to strengthen such community-based initiatives, and identify challenges to effective and sustained engagement with communities. We consider the implications of these findings for future integrated QI efforts in low-to-middle income countries.

## Methods

### Study setting and intervention design

PFA is a national-level QI project aimed at reducing maternal and child mortality in Ghana (Twum-Danso et al., 2012). PFA applies QI methods and tools in the public and faith-based health systems in Ghana to improve the continuum of care from pregnancy through age five. Based on the Institute for Healthcare Improvement Collaborative Model for Achieving Breakthrough Performance (Institute for Healthcare Improvement, 2003) facility and sub-district-level teams of individual or multiple health facilities were formed and trained in QI techniques through a series of regional learning sessions. QI teams developed and tested change ideas, including health education through community radio broadcasts, community engagement and education at public gatherings, home visits to pregnant women and mothers to encourage them to seek facility-based care, and triaging system to ensure early treatment for severely ill pregnant women and children under 5. Data-driven decision making is a central component of PFA and guides the iterative nature of the project. The project has been implemented in three waves in different regions and types of health facilities in both the public and faith-based health systems. Wave one consisted of 25 QI teams composed of health centers and 2 QI teams based at hospitals, and wave two included 30 hospital-based QI teams and 220 sub-district QI teams, all in Northern Ghana. Wave three included 9 hospital QI teams in the South. The fourth wave of implementation, which includes scale-up to 80% of the remaining public sector hospitals, is currently underway.

In the context of QI projects throughout the world, PFA is unique in that community outreach was explicitly included as part of the overall QI strategy. The design of the PFA intervention uses a "driver diagram", a structured, multi-level logic chart (Langley et al.,

2009; National Health Service, 2013) to identify the key proximal determinants, or primary drivers, of improved survival. “Delay in seeking care” is one of the three hypothesized primary drivers of improved outcomes (Ahorlu, Koram, Ahorlu, De Savigny, & Weiss, 2006). The hypothesized secondary drivers of “delay in seeking care” reside within the community. Specific community-level drivers identified through project development and early implementation included a lack of awareness of health services, insufficient finances and/or insurance, transportation obstacles, and unattractiveness of health services (Twum-Danso et al., 2012). To address these and other community issues, the project designed and implemented community-focused initiatives as part of the QI effort. These included community education, community stakeholder meetings, engagement with traditional birth attendants, and follow-up visits with mothers.

The value of QI efforts in the implementation of community-focused initiatives included the project’s promotion of team-based approaches in both sub districts and hospitals, to iteratively test and implement change ideas within communities. Problems related to health services provision were evaluated using health facility data. Also, the use of data enabled evaluation of the effectiveness of the change ideas, which were cyclically developed to address such problems. Successful change ideas were subsequently adapted and continually evaluated to identify areas for further improvement.

### Design and sample

We used a qualitative case study approach to elicit study participants’ accounts of how community outreach strategies were integrated with QI processes at their facilities. We purposively sampled 12 facility-based QI teams as cases based on input from PFA project officers: 9 covering the three Regions in the north of the country, and 3 covering Regions in the south. The 9 teams in the north were part of the first two waves of PFA implementation and included QI teams composed of multiple types of health facilities (i.e. rural health clinics, community health planning services compounds, health centers, and hospitals) in rural and urban settings and the third, which included only hospitals in urban areas. Project officers identified QI teams that were high-functioning and achieving their project goals as well as teams that were low-functioning and low-achieving in order to include a range of experiences in our sample. The term “functioning” refers to how well team members interact, communicate, and address problems. “Achieving” refers to the actual outcomes produced by QI teams. Due to the fact that community outreach was integrated as a core activity of all QI teams in PFA, we found that both high and low functioning/achieving teams described using community outreach strategies. When appropriate, we do identify relevant differences that may be related to the functioning/achievement of the team, in particular in the section on team-related barriers.

Each case study (CS) included individual interviews with QI team members (e.g. community health nurses [CHNs], midwives, and health facility managers) and facility observations. A single QI team could represent 1 facility, in the case of hospitals, or several facilities, in the case of rural sub-districts. To obtain information from teams whose members experienced different levels of exposure to QI principles, we purposively selected QI team members who had participated in at least one PFA-sponsored learning session as

well as those who had not had any formal exposure to PFA QI methodology. The total sample included 53 interviews, ranging from 2 to 6 per team (Table 1).

### Data collection

We used semi-structured interview guides that included open-ended questions and probes about participants' experiences, opinions, and perceptions about the QI process at their facility (Patton, 1990). While there was one core guide, it was tailored with specific questions for learning session participants, nonparticipants, and managers. Each participant was asked to describe how QI teams engaged with communities, the role of community leaders and partners in facilitating QI goals, and barriers to successful community outreach. The responses to the questions about community engagement and outreach are the focus of this analysis. In addition to the interviews, we conducted structured observations in each participating facility. Facility observations were documented using a structured form and unstructured observations, to determine the facilities capacity to provide maternal and child services. Data were collected during May through September in 2011. All interviews were conducted in English, audio recorded, and transcribed verbatim.

### Data analysis

We used an iterative approach to data analysis in which we engaged with both individual and case-level (i.e., team-level) data. First, we read and prepared an analytic summary for each individual interview (Sandelowski, 1995). These individual summaries were then used to prepare a global case summary (i.e., the team level), which also drew from facility observations to provide context (Yin, 2009). Second, we reviewed a sub-sample of 4 cases (17 interviews) to develop a preliminary thematic coding scheme related to community outreach in PFA. The first author applied these codes to all interview transcripts using Atlas.ti 7.0 software during which we continued to refine and add additional codes. We then reviewed code outputs and developed code summaries and analytic matrices (Miles & Huberman, 1994). The code summaries captured specific examples of community outreach activities. The matrices enabled comparison among individual participants and cases.

## Results

We identified two distinct community outreach approaches used by QI teams: community-level outreach and direct outreach. Community-level outreach activities included large-scale health promotion and education efforts through community activities and mass media. Direct outreach included one-on-one activities between health workers and women. For each approach, we discuss the specific strategies used, the significance of establishing rapport with communities, and the roles of community members in facilitating community involvement. Lastly, we explore challenges to community outreach experienced by QI teams.

### Community-level outreach

Participants described using community-level outreach activities to raise community awareness about maternal and child health services and to cultivate community involvement in QI activities. Such gatherings took place in *durbars* (traditional community gatherings

involving chiefs and elders), religious assemblies, and activities in marketplaces. At these gatherings, health workers provided information on the continuum of healthcare services available for pregnant women, and the importance of antenatal and postnatal care and skilled attendance during delivery. As described by a CHN from CS7:

We organize meetings and durbars and we tell them... just come and the first time, if you come ...we have some injections we will give you to protect your baby, but if you don't come and come late, maybe even the malaria drugs you will not take them and that will affect your baby.

The CHN's comments represent health workers' efforts in the community to encourage timely visits to health facilities among women and children.

Active involvement of community leaders was an integral aspect of community-level outreach. QI teams began the process of community-level outreach by first seeking consent, advice, and logistical assistance from community gatekeepers, including chiefs, elders, and religious leaders. A CHN from CS6 indicated that community chiefs played an essential role in identifying communities where community education activities were necessary:

We called our chiefs, we sat down with them and then we asked them to choose some particular community that was not coming early to register. So we had about five communities out of the twelve and we were able to take care of them. We went from the different communities to sit with the chiefs again to see how best they can take care of these women who fail to come to register.

Community outreach fostered a variety of interrelated activities requiring the input of community chiefs and elders who informed the selection of target communities and identified specific women in need of care. Community leaders were actively engaged in identifying appropriate venues for gatherings and inviting community members.

QI team members further indicated that community-level outreach activities provided an important means of process evaluation whereby community members could provide input on how to improve health services utilization. Thus, community members informed QI goals themselves. A CS12 senior nursing officer explained,

The community too we have - we organize a durbar... Yeah, for them to give us their grievances, what they think should be done, what they think we should not do.

As noted above, *durbars* became venues for community members to provide feedback and to offer their perspectives on the efforts to promote maternal and child health. Public interactions between community members and health workers also created rapport between the two groups. Participants indicated that community members felt their opinions were valued because they were allowed to express their views, which encouraged active participation and dialogue.

Hospital-based QI teams (CS 10, 11, and 12) used radio to deliver health education to a large audience, especially in more remote communities that were difficult to reach by health workers. A CS11 biostatistics technical officer explained that women who sought care at the hospital mentioned that these messages were influential in motivating women to avoid

delaying care. Moreover, community members could call in with questions during radio broadcasts. Like the *durbars* that allowed for dialogue with communities, radio outreach also became an interactive forum that helped address public concerns and questions about accessing health services, and enabled women to make informed decisions about seeking care.

There was widespread use of community-level outreach within the framework of the PFA QI approach because it allowed QI teams to work with community leaders to evaluate community needs and provide community members with relevant health information. These community-focused strategies were evaluated through systematic data gathering and monitoring processes to assess whether the interventions affected performance of a set of outcomes and processes that were being tracked by the QI teams. Findings from a quantitative evaluation of wave one demonstrated a decrease in mean mortality from the pre-intervention to post-intervention periods for neonates (2.5/1000 to 0.9/1000) and infants (3.56/1000 to 2.3/1000), as well as an increase in mean skilled delivery (55.9 to 64.7%) (Singh et al 2013). These statistics are descriptive presentations of the mean in outcomes from pre to post intervention phases. QI teams could also assess whether there were noticeable increases in health services use (e.g. attendance at a clinic) among women and children in the targeted communities following community-level outreach efforts. Participants explained that QI data monitoring enabled them to further refine community-level outreach efforts to locations with higher maternal and infant mortality, and lower rates of health services use.

### Direct outreach

In addition to community outreach, participants described engaging in direct outreach through one-on-one interactions with pregnant women, mothers of newborns, and occasionally, family members. As part of the community-based QI strategy, health workers visited women's homes, enabling health workers to tailor their health education efforts. A CHN from CS8 described direct outreach in the following way:

And also, home visits. We increase their home visits... and also we try to do defaulter tracing [visit with women who fail to return to the health facility for a follow-up visit]... We try to correct mothers who don't come for weigh in sessions, and tell them what their weigh in session is for, like the importance of CWC [Child Wellness Clinic], or ANC.

Health workers identified women who could benefit from maternal health services, particularly those who had not followed up on appointments or who had not initiated care with the formal health system. This direct outreach was facilitated by partnerships with community volunteers and traditional birth attendants (TBAs).

Community volunteers, in collaboration with TBAs, registered women in their early stages of pregnancy, monitored their pregnancy, and encouraged them to seek facility-based care and delivery by a skilled health professional, such as a doctor, nurse, or midwife. A CHN from CS4 noted that community volunteers' record keeping efforts ensured that pregnant women who were unlikely to seek facility-based care were connected to health workers,

who could visit with them to provide basic care and encourage them to seek further care. Additionally, health workers used facility records to identify women who failed to return for further care after visiting the health facilities for neonatal or postnatal care. This enabled the workers to follow-up with particularly at-risk women, through the assistance of volunteers and TBAs. For example, a CS6 manager noted:

If an ANC mother hasn't come for ANC, you trace her to her house and find out why. Advise her to come for antenatal care. The same thing to a postnatal mother and we encourage the mothers to come to the facility and deliver.

Besides encouraging women seek facility-based care, health workers also mentioned that they provided basic care to women during their home visits. QI teams that were highly engaged with communities from the beginning were able to rapidly address women's concerns, highlighting the importance of establishing relationships with community leaders and taking advantage of the synergistic relationship between community-level outreach and direct outreach. Participants indicated that direct outreach also enabled health workers to establish rapport with women and their families.

The use of data to inform decision-making is a key tenet in QI programs, and this data-based approach was applied in the direct outreach efforts to engage community members. Singh et al.'s (2013) evaluation of wave 1 of PFA indicated that direct outreach efforts to encourage women's use of ANC and PNC services were associated with improvements in use of such services. For example, measures to identify and register women in the early stages of their pregnancy were strongly associated with overall increase in skilled delivery ( $\beta=1.36$ ,  $p=.07$ ). Also, facility and home checks to provide PNC (e.g. Day 1–2) and to encourage new mothers to seek further facility-based care were significantly associated with an increase in the proportion of underweight infants attending child wellness clinics ( $\beta=0.10$ ,  $p<.10$ ).

### **Barriers to community outreach**

While participants provided many examples of successful community outreach activities, and emphasized the importance of this outreach for their QI work, they also described challenges to community engagement at the structural, cultural, and QI team levels.

### **Structural barriers**

One of the most salient barriers to community engagement was the distance between health facilities and communities. Fuel shortages and lack of vehicles limited the number of visits that health workers could make. Even when vehicles and fuel were available, poor road conditions or lack of roads made transportation extremely difficult. A manager from CS12 noted that health improvements at the hospital were tempered by the limited capacity of health workers to reach distant communities:

...but here we had a constraint which the areas [where] the deaths are coming from are not from our district, they come from other places where we have to use boats...



Geographic obstacles, including impassable rivers, created another barrier to community outreach. Likewise, individuals from these communities delayed seeking care because they could only travel to the health facilities on days when transportation was available.

Seasonal issues also posed problems for community outreach. The famine seasons often resulted in rural migration of individuals from affected communities. Pregnant women who traveled during this season tended to move during their pregnancy or shortly after giving birth. Thus, seasonal migration made it difficult for health workers to maintain constant contact with the women. Another obstacle to outreach was the common practice of women spending a significant portion of their time on farms because of the demands of agricultural labor during the rainy seasons. Hence, being home for the health workers' visits was not always something women prioritized.

Several participants, especially from low functioning/achieving teams, indicated that the structural barriers prevented them from being able to engage with communities through their outreach. In contrast, certain high functioning/achieving teams were able to work with communities to improve access to health facilities. A CHN from CS1 described how her QI team, a high functioning/achieving, worked with one community that lacked access to an ambulance for emergency transport to form a community group to resolve transportation barriers. As part of the QI process the community in conjunction with the team identified a barrier and mobilized available community resources to aid pregnant women in accessing facility-based care, including use of the local Catholic Church's pick-up truck.

### **Cultural barriers**

Local traditions sometimes posed barriers to improving service use. Some traditions prohibited pregnant women from disclosing their pregnancy until their second trimester. This created a barrier to identifying and engaging with women early in their pregnancies, which is a goal of PFA. Another local tradition required that newborns be not exposed to the public before the seventh day after birth. Study participants explained that traditional birth ceremonies had to be performed before the infants were allowed in public, which meant that some infants were unable to receive postnatal care at home or in facilities in the first week after birth. However, certain participants indicated that through their home visits they were able to attend to the infants on the seventh day of birth.

### **QI team barriers**

QI activities were carried out in a team-based environment. In some instances, participants described team-based challenges that prevented them from successfully implementing community outreach QI activities. These challenges were due to poor team dynamics such as lack of team cohesion, motivation, and poor leadership.

Geographic dispersion of QI team members posed another obstacle to carrying out QI outreach activities. In some instances, sub-district QI teams consisted of individuals from multiple health facilities. These teams tended to be located in remote sub-districts. This created difficulties for some teams to meet regularly and to share information and coordinate community outreach activities. Additional team-related challenges to community outreach

included staff turnover and transfers. A CHN from CS7 provided an illustration based on her own experiences:

The staff transfers change the way the team worked, especially in my case. When I came from a different sub-district to this place I didn't know much about what their QI team was doing... if they transfer one [staff member] they brought a new one also from a different district, not even the same district. So she might not know what is happening as of now.

Participants from CS7 recognized the need to orient new staff to sub-district procedures and, in particular, to their community outreach activities. Along with other QI team participants, CS7 participants acknowledged the need to better integrate staff members into the process of using QI methods, such as data monitoring in their community outreach activities. They noted that this could be accomplished by sharing QI-related information with the staff.

## Discussion

Our study highlights the use of community outreach in the context of a QI strategy to improve maternal and child health outcomes. Study participants described using two distinct community outreach approaches, community-wide outreach and direct outreach, to promote the use of facility-based care among women and children and address barriers to accessing services. By engaging with community members outside of the health facilities, QI team members were able to directly promote health services use among women and children, increase awareness of services, and identify and follow up with women and children in need of care. A key underlying theme throughout participants' discussions of community outreach was the importance of developing rapport and partnerships with community leaders to gain access to communities and to develop collaborations.

Community-wide outreach in PFA may be contextualized within the framework of community building, which emphasizes ways in which community members are involved in the process of change (Blackwell & Colmenar, 2000). These outreach strategies entailed developing partnerships with community leaders to gain access to the communities and collaborating with community volunteers and TBAs to inform community members about the importance of maternal and child health services. Previous studies indicate that community participation and mobilization efforts, mainly through women's groups, significantly influence maternal and child health outcomes (Lewycka et al., 2013; Tripathy et al., 2010). Direct outreach entailed one-on-one interactions with pregnant women, mothers of newborns, and family members to provide health education and support. Taken together, these community-wide and direct outreach approaches sought to facilitate empowerment, which enables individuals to collectively transform or address issues of relevance to their wellbeing (De Vos, 2009; Minkler, Wallerstein, & Wilson, 1997; Prost et al., 2013). Study participants perceived that the community outreach activities empowered women to seek out maternal and child health services by improving access to information and understanding of their health needs, providing support to overcome barriers to care, and building relationships with health care workers. The encouraging findings from the evaluation of wave 1 of PFA, in particular with regard to the influence of direct outreach activities, suggest the potential effectiveness of integrating community outreach into facility-

based QI efforts (Singh et al 2013). Future research should further explore the specific influence of community-wide outreach efforts.

In our analysis, we also found the important role of the QI teams in the community outreach process. Teams that were successful in their community outreach efforts tended to be a cohesive group of individuals who collaborated effectively with community stakeholders and helped link volunteers and TBAs to facility-based health services. QI teams that experienced more challenges in their community outreach activities, or who simply did not engage as much with communities, tended to lack leadership and direction. Notably, some of these teams consisted of individuals from different health facilities, and thus had limited interactions and communication.

In addition to these team-level challenges, QI team members also identified cultural and structural barriers to community engagement. The synergistic impact of these barriers reflects an ecological system perspective, which requires an integrated, multi-level response (McLeroy, Bibeau, Steckler, & Glanz, 1988; Stokols, Grzywacz, McMahan, & Phillips, 2003). To elaborate, addressing cultural barriers such as traditional beliefs that result in delayed postnatal care seeking would have to be simultaneously implemented along with solutions for structural level challenges like transportation and access to difficult to reach communities. Further community engagement beyond outreach may be one way to work with multiple stakeholders to develop context-appropriate responses to promote the wellbeing of mothers and children.

An outgrowth of the PFA community outreach efforts was the creation of a community-based referral strategy that aims to directly address the barriers to facility-based care described in this study. In this strategy, principles from QI are applied to the formation of community-based referral networks, consisting of community stakeholders and members, who work with facility-based QI teams to develop and test solutions to the multiple barriers to access to health facilities for pregnant women. The mixed-methods evaluation of this community-referral network initiative, which is currently being implemented, will provide critical insights for future efforts to integrate community engagement into QI efforts and how to apply QI principles in community settings.

Our study's limitations include the focus on QI team members as the sole source of information. Community members, leaders, and other partners could provide a richer understanding of the relationship between QI efforts and community engagement and should be included in future studies to provide a broader context for the findings and enhance transferability. While our sampling approach aimed to provide examples of both high and low functioning and achieving teams, there were several other strata, including wave of implementation, team composition, type of facilities, which made each case a unique entity. We were not able to make concrete determinations about community outreach experiences based on the functioning and achievement category of teams. Addressing this limitation would require expanding the sample within each wave of implementation, which was not feasible in our study.

## Conclusion

Our findings describe how QI teams used community outreach as a key component of PFA. By conceptualizing communities as key drivers of PFA outcomes when the project was designed, a space was created for integrating community outreach activities together with facility-based activities. The strategies described in this paper reflect the importance of involving communities in QI efforts in Ghana and other LMIC countries in efforts to improve maternal and child health outcomes. Building on the community outreach efforts, subsequent formation of community referral networks has expanded the role of communities in the PFA QI process of improving health services delivery. QI efforts in both rural and urban settings should consider including context-specific community outreach activities to develop ties with communities and address barriers to health services. Sustaining community outreach in QI efforts will require improving infrastructure, strengthening QI teams, and ongoing and expanded collaboration with community members.

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**Table 1**

QI team members and types of facilities

Cases	Wave	Functioning (F)/ Achieving (A)	Facility types	Number of Participants (n=53)
1	1 & 2	High A/ High F	Ghana Health Services (1 health center & 1 Community Health Planning Services)	4
2	1 & 2	Low F/ Low A	Ghana Health Services (1 Rural Community Health center and 1 Community Health Planning Services)	2
3	1	High F/ High A	National Catholic Health Services Health Center; 3 Ghana Health Services Community Health Planning Services	6
4	2	Low F/ Low A	Ghana Health Services (1 Clinic & 2 Community Health Planning Services)	5
5	2	Low F/ Low A	Presbyterian Health Center; Ghana Health Services (3 Health Centers & 1 Community Health Planning Services)	3
6	2	Low A/ Low A	National Catholic Health Services Health Center; 2 Ghana Health Services Community Health Planning Services	4
7	1	High F/ High A	National Catholic Health Services Health Center; Ghana Health Services Community Health Planning Services	4
8	2	High F/ High A	Presbyterian hospital	6
9	2	High F/ High A	Ghana Health Services Health Center	2
10	3	High F/Low A	National Catholic Health Services hospital	7
11	3	High F/Low A	National Catholic Health Services hospital	5
12	3	High F/Low A or High F/High A	National Catholic Health Services hospital	5