BMJ Open

Improving institutional childbirth services in rural southern Tanzania: The healthcare workers' perspective

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2015-010317
Article Type:	Research
Date Submitted by the Author:	26-Oct-2015
Complete List of Authors:	Jaribu, Jennie; Swiss Tropical and Public Health Institute, Epidemiology and Public Health Penfold, Suzanne; London School of Hygiene & Tropical Medicine, Dept of Disease Control Manzi, F; Ifakara Health Institute Schellenberg, Joanna; London School of Hygiene & Tropical Medicine, Dept of Infectious Disease Epidemiology Pfeiffer, Constanze; Swiss Tropicla and Public Health Institute, Epidemiology and Public Health
Primary Subject Heading:	Qualitative research
Secondary Subject Heading:	Health services research
Keywords:	health workers perspectives, quality improvement, counseling, partograph

Improving institutional childbirth services in rural southern Tanzania: The healthcare workers' perspective

Jennie Jaribu[1, 2, 3], Suzanne Penfold[4], Fatuma Manzi[3], Joanna Schellenberg[4], Constanze Pfeiffer [1, 2]

[1]Swiss Tropical and Public Health Institute, Basel, Switzerland

[2]Basel University, Basel, Switzerland

[3]Ifakara Health Institute, Dar es Salaam, United Republic of Tanzania

[4]London School of Hygiene and Tropical Medicine, London, United Kingdom

Corresponding author name: Jennie Jaribu, email: jennie.jaribu@unibas.ch, full address: Swiss Tropical and Public Health Institute, Socinstrasse. 57, P.O.Box 4002 Basel, Switzerland Tel: +41 284 8600 Fax: Fax + 41 61 284 81 05

Suzanne Penfold: Department of Disease Control; London School of Hygiene and Tropical Medicine; London; United Kingdom

Fatuma Manzi: Health Systems Department; Ifakara Health Institute; Dar es Salaam; United Republic of Tanzania

Joanna Schellenberg: Department of Disease Control and Department of Infectious Disease Epidemiology; London School of Hygiene and Tropical Medicine; London; United Kingdom

Constanze Pfeiffer: Department of Epidemiology and Public Health; Swiss Tropical and Public Health Institute;Basel; Switzerland

Keywords: health workers perspectives, quality improvement, couselling, partograph

Word count: Abstract 270. Main text 4383

ABSTRACT

Objective: To describe health workers' perceptions of a quality improvement (QI) intervention that focused on improving institutional childbirth services in primary health facilities in Southern Tanzania.

Design: A qualitative design was applied using in-depth interviews with health workers.

Setting: This study involved the Ruangwa District Reproductive and Child Health Department, eleven dispensaries and two health centers in rural southern Tanzania.

Participants: Four Clinical Officers, five Nurses and six Medical Attendants from different health facilities were interviewed.

Results: The healthcare providers reported that the QI intervention improved their skills, capacity and confidence in providing counseling and use of partograph during labour. The face to face QI workshops, used as a platform to refresh their knowledge on maternal and newborn health and QI methods, facilitated peer learning, networking and standardization of care provision. The onsite follow up visits were favored by healthcare providers because they gave the opportunity to get immediate help, learn how to perform tasks in practice and be reminded of what they had learnt. Implementation of parallel interventions focusing on similar indicators was mentioned as a challenge that led to duplication of work in terms of data collection and reporting. District supervisors involved in the intervention showed interest in taking over the implementation; however, funding remained a major obstacle.

Conclusion:

Health care workers highlighted the potential of using a QI approach to improve maternal and newborn health in rural settings. QI programs need careful coordination at district level in order to reduce duplication of data. The active involvement of national, regional, district and community levels in the implementation of QI interventions might contribute to long term improvements in healthcare.

Strengths and Limitations of the study

Strength:

- This study provides in-depth understanding of healthcare workers experiences regarding the implementation of an innovative QI intervention
- It highlights benefits as well as challenges related to the implementation of the QI intervention and thus allows for important insights not only for scientists but also policy makers and practitioners

Limitations

- The small number of participants and the specific geographical focus limits the generalizability of the results
- The results might have been influenced by the researcher's personal biases and idiosyncrasies

INTRODUCTION

Antenatal care and childbirth services in Tanzania

Tanzania faces multiple problems in delivering essential healthcare interventions like antenatal or childbirth care services.[1-3] About 96% of pregnant women in Tanzania attend antenatal care (ANC) services at least once during their pregnancy.[4-8] Despite this high utilization, the quality of preventive diagnostic and treatment services during ANC, and childbirth services are still poor.[9-13]. [14-16]Low quality of care in service delivery contributes to high maternal and neonatal mortality rates.[17-20]Intrinsic factors contributing to the low quality of care include poor infrastructure, lack of skilled personnel, lack of an enabling environment for human resources and missing technical know-how for providing essential healthcare services.[21-23] Extrinsic factors include lack of funds and political commitment, lack of community participation in health related issues, and cultural beliefs. Context-specific customs, norms and beliefs play a major role in influencing healthcare seeking behaviour, especially in rural communities.[24-26]

Quality of Care

The Institute of Medicine defined quality of care 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.[27] According to the Institute of Medicine six main core needs are essential for quality of care (Table 1).[28]

Donabedian suggested that inferences in the quality of care could be grouped in three categories: “structure”, “process” and “outcome”.[28] “Structure” refers to the setting where care occurs. “Process” includes what is actually done in giving and receiving care. “Outcome” covers the effects of care on health.[28 ,29] In African settings a central issue for low health systems performance may be the relative neglect of health-care processes.[29] Building on these observations, a QI intervention was implemented in rural southern Tanzania

aiming at improving the process of delivering antenatal and childbirth services taking into consideration three core quality needs; patient centeredness, effectiveness and safety.

Table 1: Core needs for quality in health care

Safety: avoiding injuries to patients from the care that is intended to help them.
Effectiveness: providing services based on scientific knowledge to all who could benefit, and refraining from providing services to those not likely to benefit.
Patient-centred: providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions.
Timely: reducing waits and sometimes harmful delays for both those who receive and those who give care.
Efficiency: avoiding waste, including waste of equipment, supplies, ideas, and energy.
Equitable: providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status

Source: Institute of Medicine; Crossing the quality chasm: A new health system for the 21st century

A growing number of healthcare QI interventions are implemented worldwide. However, few studies in low-income settings have used a qualitative approach to ascertain the perceptions of implementers. The present study aimed at closing this gap: we used in-depth interviews with health workers at various levels in the health system to explore their perception of the QI intervention and challenges in implementation.

METHODS

Improving Newborn Survival in Southern Tanzania: Quality Improvement Intervention (INSIST QI)

The intervention was implemented under the umbrella of the "Improving Newborn Survival in Southern Tanzania" (INSIST) project.[30] The project developed two strategies: one focusing on communities, the other one targeting the health facilities. The community-based newborn care strategy involved community volunteers visiting women and their families at home, branded in Swahili as "Mtunze Mtoto Mchanga" ("Protect the Newborn"). Key messages focused on hygiene during delivery, immediate and exclusive breastfeeding, and identification and extra care for babies born small because of low birth weight or prematurity.[30-32]

The health facility based strategy built on a QI approach known as the "Collaborative Improvement Model".[33] The strategy comprised of forming QI teams from different health facilities in order to create a collaborative network that aimed at working together to achieve common goals. The QI teams were formed by a minimum of two health workers (health facility QI team) and one community representative. The community representatives were selected by the health staff and community members. They included traditional birth attendants, village leaders or community volunteers. The QI teams were responsible for testing and implementing changes and were coached and mentored by a district QI mentor. An initial pilot phase was conducted in 4 health facilities in Mtwara Rural district, before the

work described here, which included every primary care facility in Ruangwa district. The district QI mentor was selected by the Council Health Management Team (CHMT) and trained by project staff on QI methods. A variety of QI methods were used to initiate the Plan-Do-Act-Study cycles (PDSA), which formed the basis of the QI intervention. These included: identifying gaps in clinical care processes (process mapping and root cause analysis), prioritizing problems to be solved (Pareto chart and setting improvement aims) and using data to inform the improvement process (run charts, testing and implementing ideas that bring about improvement).[33-37]

The QI teams, QI mentor and district Reproductive and Child Health Coordinator met periodically at workshops to ensure familiarity with the above mentioned QI tools, to participate in refresher trainings on maternal and neonatal care services, to share their experiences, and to learn from each other. Between these workshops the QI teams had activity periods where they practiced what they had learned. Four to six weeks after each workshop, the QI teams received coaching and mentoring at on-site follow up visits from the project staff and the QI mentor. During the visits they obtained assistance on the maternal and neonatal problems they wanted to improve, and application of QI methods. Furthermore, they were encouraged to assess their own work using data they had generated and to develop new ideas for improvement.

The intervention centred on two improvement objectives selected during QI workshops by the participating healthcare providers. The first aimed at increasing health facility deliveries through counselling on birth preparedness and pregnancy danger signs. The assumption was that improving the quality of counselling will increase the knowledge and understanding of pregnant women and allow them to make informed decisions to utilize health facilities for care, including for delivery of their newborn babies. The second topic aimed at improving the quality of facility deliveries by using partographs.[31-33] A partograph is a graphic display of the progress of labour, which helps skilled birth attendants to recognize emerging difficulties

and take action according to a clinical management protocol.[1] The overall health facility deliveries improved by 46 % from a median of 110 to 161 deliveries per month in a collaborative of 23 health facilities from February 2010 to June 2011. The target was to achieve a median of 220 deliveries per month. The partograph use improved by approximately 50 percentage points from a median of 10% to 57% in all the 23 health facilities in the same time period.

Study setting

At the time of the study, Ruangwa district, located in Lindi region, Southern Tanzania (Figure 1), had an estimated population of 124'000 people with 89 registered villages.[38] It was served by twenty-four functional health facilities, one district hospital, two health centers and 21 dispensaries.[38] The QI intervention focused on dispensaries and health centers because they are the main access point for maternal and child health services in rural areas.[6] The health facilities were staffed primarily by clinical officers, nurses and medical attendants. Table 2 provides an overview of their roles and responsibilities. Each health facility offered a range of services with dispensaries having fewer services and staff compared to health centers.

Table 2: Description of health care provider cadres' roles and responsibilities

Healthcare worker cadre	Level of training	Roles and responsibilities
Clinical Officer	3 years Diploma	• Identify and treat common diseases and perform minor surgery • Participate in the planning and implementation of basic health services • Keep records of equipment and tools for offering services • Keep records, prepare and provide implementation report • Supervise performance of subordinate health staff
Nurse	3 years Diploma	• Provide nursing care to all clients in the catchment area served by their facility. • Collect vital health statistics. • Direct and supervise subordinate nurses. • Provide counseling • Provide services to patients at home. • Provide preventive and childbirth services
Medical Attendant	1 year Certificate	• Clean equipment , wards and surrounding environment • Help patients with disabilities to use toilet and shower • To feed patients who need support • Take patient samples to the laboratory for testing and monitor results • Prepare materials for cleaning and close wounds • Follow up patients' medication requirements from drug store.

Source: Human Resource Development Circular No. 1 of 2009 scheme of service for health worker cadres under the Ministry of Health and Social Welfare

Data collection and analysis

Qualitative data using in-depth interviews were collected in March 2013 by the INSIST QI project coordinator (JJ). Data were collected using a multi-level approach: RCH Coordinator and QI mentor at district level, and Clinical Officers, Nurse Midwives and Medical Attendants at health facility level. Out of 23 health facilities that participated in the QI intervention, RCH staff from 18 health facilities were available for interviews. Among them,

staff from 5 facilities were selected for pre-testing the interview guides because of their accessibility and proximity to Ruangwa town. Building on the pre-test, interview guides were carefully revised. One staff member from each of the 13 remaining health facilities and two representatives from the district level were purposely selected for the interview because they were the main implementers of antenatal and child birth services. Three types of interview guides were used: (1) for the QI team members as implementers, (2) for the QI mentor as facilitator, and (3) for the RCH Coordinator as supervisor. The interview guides considered topics and activities covered during the implementation of the intervention and were designed to elicit the perceptions of the study participants.

A set of ten open-ended questions and additional relevant prompts were developed. The tools were designed in English and translated into Swahili. The translation of local terms was cross-checked with experts working in the field. The health workers were interviewed at their place of work, and the interviews took on average forty five minutes to one hour. Interviews were audio taped and transcribed verbatim. Data were analyzed using content analysis,[39] with the assistance of MAXQDA version 11 software. All transcripts were analyzed in order to identify meanings and patterns related to the QI intervention and its influence on antenatal care service provision. Emerging themes were coded building on discussions within the interdisciplinary project team. In addition, the first author kept a research diary in which personal observations were noted during follow up visits. Data from these observations complemented the findings from the in-depth interviews and allowed for triangulation and a deeper understanding of the context.

Ethical considerations

The QI intervention formed part of the INSIST project that received ethical clearance through the National Institute of Medical Research Tanzania (NIMR/HQ/R.8c/Vol II/177), Institutional Review Board of IHI (IHRDC/ IRB/No: A 350), and the London School of

Hygiene and Tropical Medicine (LSHTM Reference No A358-5316). INSIST is registered on clinicaltrials.gov (NCT01022788). Written informed consent from participants was obtained before the interview and interviews were conducted in an environment where confidentially was maintained.

RESULTS

Table 3 presents characteristics of the study participants; among the 15 respondents 60% were female, 40% were Medical Attendants, 33% Nurses and 27% Clinical Officers. Their age ranged from early 20's to late 50's with the majority in their 30s and 40s.

Table 3: Characteristics of the study participants in terms of cadre, and sex

Cadre	Gender	Position in INSIST
Nurse	Male	QI mentor
Nurse	Female	RCH coordinator
Nurse	Female	QI team member
Nurse	Female	QI team member
Nurse Midwife	Female	QI team member
Medical Attendant	Female	QI team member
Medical Attendant	Female	QI team member
Medical Attendant	Female	QI team member
Medical Attendant	Female	QI team member
Medical Attendant	Female	QI team member
Medical Attendant	Male	QI team member
Clinical Officer	Female	QI team member
Clinical Officer	Male	QI team member
Clinical Officer	Male	QI team member
Clinical Officer	Female	QI team member

Three major thematic areas emerged during data analysis: (1) reflections about the QI process, (2) the contribution of the QI component regarding capacity building, and (3) challenges related to the QI intervention.

QI process

PDSA cycles

Upon probing during the interviews nine of the 15 respondents (one clinical officer, four nurses and four medical attendants) could remember some of the key aspects of PDSA process.

"We were looking for the root cause, why women do not come to deliver in health facility and then prepared a work plan for women to come to deliver in the facility"

Nurse, from a health center

A medical attendant explaining a PDSA and QI process,

"My [QI] plan will be this, I will implement this, I will study it this way, and I will decide later on how it will be. Therefore everyone was doing this at their own health facilities. This was very helpful to plan our work and even the graphs we used to draw to assess our situation, it worked very well".

Medical Attendant, from a dispensary

Two respondents (one clinical officer and one nurse officer) reported using it in other aspects of their work.

"I used it to improve family planning because we had a lot of underage and student pregnancies; we set a goal to reach 500 clients (new, old and defectors) we conducted health education about family planning to women. After a month we analyzed our data and we reached 600 clients"

Clinical Officer, from a dispensary

QI workshops

All 15 respondents reported the QI workshops gave an opportunity to learn from, help and remind each other about technical issues. One clinical officer, two medical attendants and one nurse midwife reported that the workshops enabled them to offer standardized care, at least in terms of the messages provided during counseling and partograph use.

"The community thought the changes are only implemented in our facility, but whenever different people meet and discuss, those who went to other facilities say the same thing. So they realized it's all over not only here, we did not create our own thing".

Medical Attendant, from a dispensary

The onsite follow up visits

14 respondents found the onsite follow up visits useful to remind them of what was learnt during the workshop, provide practical assistance, and to use their data to make informed decisions. The coaching and mentoring visits were regarded as being more important than the workshops because the respondents felt appreciated and noticed. Two providers commented that other programs had promised to come for supervision after trainings; however, they never did so. Five health workers perceived the follow up visits to be regular and focused. Seven respondents said the QI follow up visits differ from CHMT supervision, mentioning that CHMT are sharp tempered, don't come regularly, do not solve problems and cover many things at the same time.

"The follow up was not like fighting; you just explained and reminded us. Not like the one we receive from the district when someone addresses you with anger because they have a university degree".

Clinical Officer, from a dispensary

"Even if there will be no more workshops, it's better to visit us in our health facilities, then you realize what are our problems and help us. In addition, it motivates us, knowing that our work is seen and appreciated".

Medical Attendant, from a dispensary

"CHMT visits differ with what you were doing. You targeted specific topics. However, the CHMT when they come, they just look in general, "have you measured children"? "Yes". "Have you delivered babies"? "Yes". "What is going on here?" "Do you give vaccination"? "Yes". "No gas available"? "Yes". Aah OK. That's it".

Medical Attendant, from a dispensary

The QI mentor explained how the INSIST QI and the CHMT worked in synergy to improve service delivery.

"The follow up visits assisted the CHMT to know which health facility had shortage of equipment or supplies because we used to note facilities with problems during follow up visits. Then inform the CHMT that the following facility do not have delivery bed or weighing scale and the CHMT follow it up and supply the requirements. For example, they supplied delivery bed, fridge and weighing scale to [Facility name] after we notified them".

Nurse, from the district level

Capacity building

Partograph

Partograph refresher training was useful for all respondents, those who learnt it as part of their professional training (such as the clinical officers and nurse midwives) and those who never

had previous training (such as medical attendants). Prior to the QI training the medical attendants did not know how to fill the partograph. Three clinical officers also acknowledged that the partograph training improved their understanding on how to fill partograph. The nurse midwives seemed to be more competent compared to the other cadres.

"I did not know how to use partograph at all, I am a Medical Attendant, when I finished school and started working, I was just told to deliver women. However, I have never used a partograph until we learnt it in this project".

Medical Attendant, from a dispensary

"Partograph [training] managed to remind us to monitor women in labour, and helped us to detect women who had prolonged labour or obstructed labour and made us take appropriate decision".

Nurse, from a health center

Seven respondents reported that the intervention helped to improve referral of women in labor.

"That emphasis of telling healthcare providers to refer pregnant women who have poor progress in labor has increased number of referral cases from dispensaries to district hospital. We have an ambulance, therefore when they call for it; it comes to pick up patients. And these referrals were based on induction from partograph if the labour is not progressing well".

Nurse, from the district level

However, one respondent reported challenges in using it in a resource poor setting.

"In times of power cut we cannot use partograph, we can't see. We use a torch to deliver the woman".

Nurse, from a health center

Counseling

Birth preparedness and pregnancy danger signs counseling are important in order to avoid delay in deciding to seek care and delay in reaching the health facility.[40] as part of intervention health workers counselled women with their relatives and kept records about their counselling activities. Thirteen health care workers reported that they appreciated providing counseling during ANC and some emphasized differences before and after the counseling sessions in terms of increasing health facility deliveries.

"Before we started a lot of women were delivering at home but I think it's because we did not provide appropriate counselling, after learning in the workshop and your follow ups in the facilities. Now we are providing counselling to women and their husbands at antenatal clinic and they come to deliver in the facility".

Medical Attendant, from a dispensary

"We knew about danger signs and birth plan counselling. However, when you came and emphasised its importance, then we realized aah! This is important; you know we were not used to emphasize it during health education".

Nurse, from a health center

However, despite these counseling services cultural beliefs still play a major role in decision making at family level especially in situations when families viewed the health problems as spiritual rather than physical in nature, influenced by their traditional understandings of disease etiologies.[25 ,41] A medical attendant highlighted this in her narrative below:

"A young teenage couple came and reported "This is the second week we are not sleeping, my wife has difficulty in breathing as you taught us in danger signs". When I checked her, her hemoglobin level was 5g/dl. I asked him, how much money do you have? And he said "500Tzs"; I asked him, did I not tell you about preparing for emergency you will need to save money? He said, "You told us but at home, they are preparing a traditional dance for her to chase away evil spirits, we sneaked out". I had to call an ambulance and referred them to the district hospital, there she received 3 units of blood transfusion and her pregnancy is still young".

Medical Attendant, from a dispensary

Challenges

Apart from the already well known challenges such as lack of skilled personnel, functional infrastructure, equipment and supplies;[14 ,21 ,42] the health care workers mentioned implementation of similar interventions as a major challenge to them.

Interaction with other interventions

At the time INSIST implemented its QI component other interventions such as "Mtunze Mtoto Mchanga" (INSIST community arm) and the "Clinton Health Access Initiative" (CHAI),[43] were implemented at the same time. Seven healthcare providers reported that both these interventions aimed at increasing health facility deliveries. This brought some confusion to healthcare workers and made them question whether there was sufficient harmonization of activities among different stakeholders. In addition, being involved in similar interventions was challenging to frontline workers in terms of time and data collection. In all these interventions they needed to collect data and provide reports on top of their routine work leading to duplication of effort. The confusion they felt about interventions

was evident when respondents were asked to describe the present QI intervention during the in-depth interviews. Several respondents referred to other interventions. Four healthcare workers, for instance, highlighted the role of incentives linked to the CHAI intervention.

"The community proposed a lot of things such as bicycle to go around with, registers, exercise books and uniforms for the volunteers, very nice things were given".

Clinical Officer, from a dispensary

"The things we did together and that with *CHAI* were all related because you all had one task of improving mother and newborn, that is why I am confusing them. For example *CHAI* was providing wraps (locally known khanga), soap and nappies as incentive to women who gave birth in the health facility and *INSIST community arm* was teaching the same things".

Clinical Officer, from a dispensary

Sustainability

Building on the positive responses and influence of the QI intervention, the issue of continuation, however, is not decided by the healthcare workers' even if they want to. The CHMT decides on interventions to be implemented at district level based on their planning and budget in the Council Comprehensive Health Plan (CCHP). However, the reproductive and child health activities have less priority compared to others such as HIV/AIDS or malaria. [44] The respondent summarized these district level challenges as follows:

"It was good bringing facilities together, learning from each other, but its continuation is a problem[...]. We need to put it in the budget, but when you put it, during quarterly meetings it does not pass. They say the money is not enough, very

few RCH activities get approved [...]. Last year they approved only outreach services"".

Nurse, from district level

DISCUSSION

We found the QI intervention improved health workers capacity, skills and performance in birth preparedness and pregnancy danger signs counselling and partograph use. In addition, they favoured the onsite follow up visits over workshops, because it gave them the opportunity to learn and solve problems. Not all study participants could remember important details of the QI approach used, 21 months after their last learning session. Duplication of work was mentioned as one of challenge due to different projects intervening in similar areas and the lack of sustainability of the intervention despite potential for improving health care process delivery.

Similar findings were reported by a study in Rwanda rural health centres,[45] that QI activities built confidence and capacity of health workers and that the mentorship visits were more supportive than classical district management supervision. In Ruangwa, Tanzania we found health care workers were struggling to distinguish QI process that facilitated the outcomes and the maternal and newborn interventions such as facility deliveries and counselling. This is similar to a study at Ethiopia where by the QI team leaders could not distinguish between the QI strategy and the maternal and newborn intervention trainings.[46] Rowe et al. conclude in their review on quality improvement approaches that multi-faceted interventions (e.g. trainings and supervision) are more likely to improve performance, and that supervision with feedback was more effective than single interventions.[47] This was also reported by the health care providers in our study. Most of the healthcare providers involved in the INSIST QI intervention had no previous knowledge of QI methods. However, they were motivated to engage in the intervention as they saw changes in improvement indicators taking place as a result of their efforts without using any additional resources. In line with

other studies, regular data collection and continuous analysis of data quality during on site follow up visits helped to build local data management capacity and to strengthen local information systems.[48] However, at the same time the risk of duplicating work for frontline health workers was identified as a challenge.[49] This finding highlights the need to harmonize interventions. A study in South Africa reported harmonization by involving various different stakeholders and creating a strong network. This network comprised of non-governmental organizations, district departments and the South African National Department of Health. By doing so they reduced duplication of work, lack of coordination and thus dilution of the intervention effects.[50] In Tanzania many quality improvement strategies are donor funded and donor driven projects focusing on HIV/AIDS leading to HIV specific quality improvement strategies that are not easily applicable in other fields especially in terms of resources and competing interest of the implementers.[49] However, there is a need to integrate QI interventions in the whole health system including the maternal and newborn services. The Tanzania Ministry of Health and Social Welfare recognized the importance of building a culture of quality and institutionalizing QI approaches in the healthcare system in general, through engaging the regions and districts. District councils should continuously invest in QI activities and integrate these in the CCHP to ensure sustainability.[49] These suggestions have not yet been implemented, therefore at the moment the sustainability of QI efforts remains one of the main challenges. In line with Bardfield et al. it is argued that the sustainability of QI interventions requires development of government systems and execution of processes essential to building national QI frameworks, promote country ownership and infuse a culture of QI to build capacity at the local, regional and national levels.[51] As much as the positive effects of the INSIST QI intervention are encouraging, the long-term effects are as yet unclear.

Limitations

The role of the project implementer as the interviewer might have influenced the way healthcare providers responded. However, the interviewer was aware of this and dealt with it in a sensitive manner. In addition, the contextual knowledge of the project implementer could also be seen as advantageous. Due to limited resources in this study we did not ask opinions of pregnant women or community members. Their information and that of health workers who did not participate would have provided useful additional insights. The evaluation was done in March 2013, and the project activities ended in June 2011, hence the results could be affected by recall bias. This was evident as some providers tended to remember activities of more recent projects. The selection of healthcare providers was restricted to those who actively participated in the QI intervention. The small number of participants and the specific geographical focus limits the generalizability of the results. However, the inputs identified add to the knowledge of implementing QI studies in rural settings and results could apply to other similar settings.

Conclusion and Recommendations

The need to improve the quality of care in maternal and newborn health in resource limited countries is clear. Health care workers clearly highlighted the potential of the problem-solving quality improvement intervention presented here to improve maternal and newborn health. However, health systems capacity at district level to sustain this type of intervention is still challenging. Both sustainability and harmonization of maternal and neonatal interventions aiming at quality improvement need to be addressed in order to avoid duplication of work and the development of parallel systems.

ACKNOWLEDGEMENTS

We thank all healthcare providers and district level supervisors at Ruangwa districts for their participation, hard work and dedication to improve the quality of care. In addition, we would like to thank the staff of the Ifakara Health Institute – Mtwara Branch for all their support and contributions.

CONTRIBUTORSHIP STATEMENT

All authors contributed substantially to the conception, design of the work, analysis and interpretation of data for the work. The first author drafted the work and all the co-authors revised it critically for important intellectual content. All authors provided final approval of the version to be published. And agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

COMPETING INTEREST

No competing interest declared.

FUNDING

This work was supported by the Bill & Melinda Gates Foundation through the Saving Newborn Lives Program of Save the Children, the Laerdal Foundation and UNICEF. The funders had no role in the design and conduct of the study; in the collection, analysis and interpretation of the data; or in the preparation, review, or approval of the manuscript.

DATA SHARING STATEMENT

The data sharing is not applicable.

REFERENCES

1. Ollerhead E, Osrin D. Barriers to and incentives for achieving partograph use in obstetric practice in low- and middle-income countries: a systematic review. *BMC Pregnancy Childbirth* 2014;14

2. Blank A, Prytherch H, Kaltschmidt J, et al. "Quality of prenatal and maternal care: bridging the know-do gap" (QUALMAT study): an electronic clinical decision support system for rural Sub-Saharan Africa. *BMC Med Inform Decis Mak* 2013;13:44-44

3. Twum-Danso NAY, Akanlu GB, Osafo E, et al. A nationwide quality improvement project to accelerate Ghana's progress toward Millennium Development Goal Four: design and implementation progress. *Int J Qual Health Care* 2012

4. National Bureau of Statistics (NBS) [Tanzania], Macro I. Tanzania Demographic and Health Survey 2010. Dar es Salaam, Tanzania: NBS and ICF Macro., 2011.
5. Pembe AB, Urassa DP, Carlstedt A, et al. Rural Tanzanian women's awareness of danger signs of obstetric complications. *BMC Pregnancy Childbirth* 2009;9:12

6. Rockers P, Wilson M, Mbaruku G, et al. Source of Antenatal Care Influences Facility Delivery in Rural Tanzania: A Population-Based Study. *Matern Child Health J* 2009;13(6):879-85

7. Spangler S, Bloom S. Use of biomedical obstetric care in rural Tanzania: the role of social and material inequalities. *Soc Sci Med* 2010;71:760 - 68

8. Mpembeni R, Killewo J, Leshabari M, et al. Use pattern of maternal health services and determinants of skilled care during delivery in Southern Tanzania: implications for achievement of MDG-5 targets. *BMC Pregnancy Childbirth* 2007;7:29

9. Kyei NNA, Chansa C, Gabrysch S. Quality of antenatal care in Zambia: a national assessment. *BMC Pregnancy Childbirth* 2012;12:151-51

10. Majrooh MA, Hasnain S, Akram J, et al. Coverage and Quality of Antenatal Care Provided at Primary Health Care Facilities in the 'Punjab' Province of 'Pakistan'. *PLoS One* 2014;9(11):e113390

11. Duysburgh E, Zhang WH, Ye M, et al. Quality of antenatal and childbirth care in selected rural health facilities in Burkina Faso, Ghana and Tanzania: similar finding. *Trop Med Int Health* 2013;18:534-47

12. Gross K, Schellenberg J, Kessy F, et al. Antenatal care in practice: an exploratory study in antenatal care clinics in the Kilombero Valley, south-eastern Tanzania. *BMC Pregnancy Childbirth* 2011;11(1):36

13. Pembe AB, Carlstedt A, Urassa DP, et al. Quality of antenatal care in rural Tanzania: counselling on pregnancy danger signs. *BMC Pregnancy Childbirth* 2010;10:35

14. Hanson C, Ronsmans C, Penfold S, et al. Health system support for childbirth care in Southern Tanzania: results from a health facility census. *BMC Res Notes* 2013;6(435)

15. Spangler SA. Assessing skilled birth attendants and emergency obstetric care in rural Tanzania: the inadequacy of using global standards and indicators to measure local realities. *Reprod Health Matters* 2012;20:133-41

16. Bhutta ZA, Das JK, Bahl R, et al. Can available interventions end preventable deaths in mothers, newborn babies, and stillbirths, and at what cost? *The Lancet* 2014;384(9940):347-70

17. United Republic of Tanzania, Ministry of Health and Social Welfare. Women and children first. Countdown to ending preventable maternal, newborn and child deaths in Tanzania: Ministry of Health and Social Welfare,, 2014.

18. van den Broek NR, Graham WJ. Quality of care for maternal and newborn health: the neglected agenda. *BJOG* 2009;116:18-21

19. Darmstadt GL, Kinney MV, Chopra M, et al. Who has been caring for the baby? *The Lancet* 2014;384(9938):174-88

20. Austin A, Langer A, Salam R, et al. Approaches to improve the quality of maternal and newborn health care: an overview of the evidence. *Reproductive Health* 2014;11(Suppl 2):S1

21. Penfold S, Shamba D, Hanson C, et al. Staff experiences of providing maternity services in rural southern Tanzania - a focus on equipment, drug and supply issues. *BMC Health Serv Res* 2013;13(1):61

22. Nesbitt RC, Lohela TJ, Manu A, et al. Quality along the continuum: A health facility assessment of intrapartum and postnatal care in Ghana. *PLoS One* 2013;8(11)

23. United Republic of Tanzania: Ministry of Health and Social Welfare. The National Road Map Strategic Plan To Accelerate Reduction of Maternal, Newborn and Child Deaths in Tanzania 2008-2015: *Sharpened One Plan* 2014

24. Haws R, Mashasi I, Mrisho M, et al. "These are not good things for other people to know": how rural Tanzanian women's experiences of pregnancy loss and early neonatal death may impact survey data quality. *Soc Sci Med* 2010;71:1764 - 72

25. Mrisho M, Schellenberg D, Manzi F, et al. Neonatal deaths in rural southern Tanzania: care-seeking and causes of death. *ISRN Pediatr* 2012;2012:953401

26. Kyomuhendo GB. Low Use of Rural Maternity Services in Uganda: Impact of Women's Status, Traditional Beliefs and Limited Resources. *Reprod Health Matters* 2003;11(21):16-26

27. Institute of Medicine. Medicare: A Strategy for Quality Assurance, Volume I. Washington, DC: The National Academies Press, 1990.

28. Institute of Medicine. Crossing the quality chasm: A new health system for the 21st century, 2001.

29. Heiby J. The use of modern quality improvement approaches to strengthen African health systems: a 5-year agenda. *Int J Qual Health Care* 2014

30. Borghi J, Cousens S, Hamisi Y, et al. STUDY PROTOCOL: Improving newborn survival in rural southern Tanzania: a cluster-randomised trial to evaluate the impact of a

scaleable package of interventions at community level with health system strengthening. 2013

31. Penfold S, Manzi F, Mkumbo E, et al. Effect of home-based counselling on newborn care practices in southern Tanzania one year after implementation: a cluster-randomised controlled trial. *BMC Pediatr* 2014;14(1):187

32. Hanson C, Manzi F, Mkumbo E, et al. Effectiveness of a Home-Based Counselling Strategy on Neonatal Care and Survival: A Cluster-Randomised Trial in Six Districts of Rural Southern Tanzania. *PLoS Med* 2015;12(9):e1001881

33. Institute for Healthcare Improvement. The Breakthrough Series: IHI's Collaborative Model for Achieving Breakthrough Improvement. IHI Innovation Series white paper. Boston: Institute for Healthcare Improvement, 2003.
34. USAID Health Care Improvement Project. The Improvement Collaborative: An Approach to Rapidly Improve Health Care and Scale Up Quality Services. Bethesda, Maryland: USAID Health Care Improvement Project., 2008.
35. Kilo CM. A Framework for Collaborative Improvement: Lessons from the Institute for Healthcare Improvement's Breakthrough Series. *Qual Manag Health Care* 1998.

36. Benneyan J.C, Lloyd R.C, Plsek P.E. Statistical process control as a tool for research and healthcare improvement. *Qual Saf Health Care* 2003:458-64

37. Gerald J. Langley, Ronald Moen, Kevin M. Nolan, et al. The Improvement Guide: A Practical Approach to Enhancing Organizational Performance, 2nd Edition. 2nd ed. A Wiley Imprint: Jossey Bass Wiley, 2009.
38. Ruangwa District Council. Council Comprehensive Health Plan, 2012 -2013.
39. Graneheim UH, Lundman B. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Educ Today* 2004;24(2):105-12

40. Thaddeus S, Maine D. Too far to walk: maternal mortality in context. *Soc Sci Med* 1994;38(8):1091-110

41. Bohren M, Hunter E, Munthe-Kaas H, et al. Facilitators and barriers to facility-based delivery in low- and middle-income countries: a qualitative evidence synthesis. *Reproductive Health* 2014;11(1):71

42. Mselle L, Moland K, Mvungi A, et al. Why give birth in health facility? Users' and providers' accounts of poor quality of birth care in Tanzania. *BMC Health Serv Res* 2013;13:174

43. Clinton Foundation. Eliminating Mother to Child Transmission Secondary Eliminating Mother to Child Transmission 2013. https://www.clintonfoundation.org/our-work/clinton-health-access-initiative/programs/eliminating-mother-child-transmission.
44. Lawn JE, Kerber K, Enweronu-Laryea C, et al. Newborn survival in low resource settings,are we delivering? *BJOG* 2009.;116 Suppl 1:49-59

45. Manzi A, Magge H, Hedt-Gauthier B, et al. Clinical mentorship to improve pediatric quality of care at the health centers in rural Rwanda: a qualitative study of perceptions and acceptability of health care workers. *BMC Health Serv Res* 2014;14(1):275

46. Stover KE, Tesfaye S, Frew AH, et al. Building district-level capacity for continuous improvement in maternal and newborn health. *J Midwifery Womens Health* 2014;59 Suppl 1:S91-S100

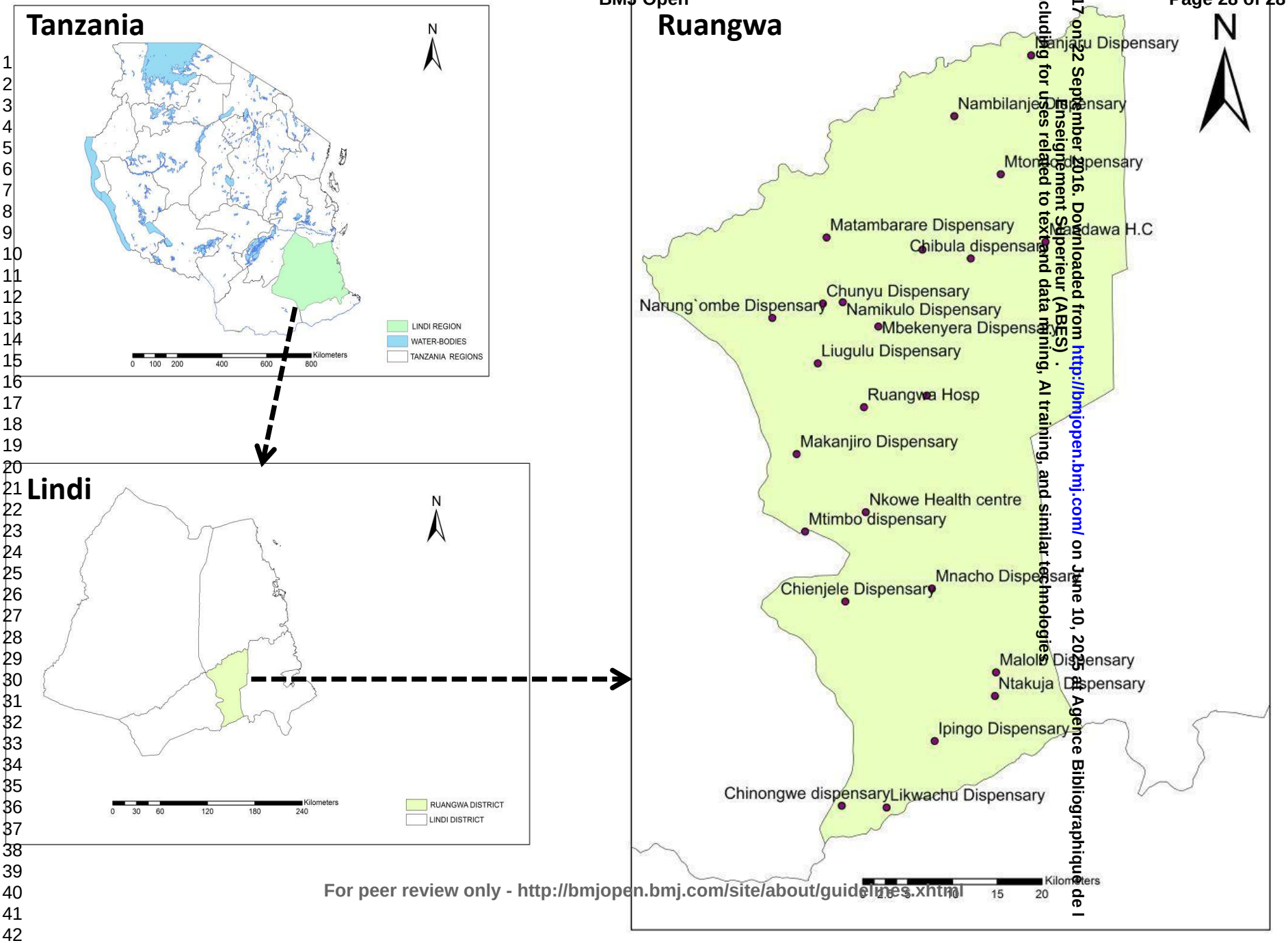
47. Rowe AK, de Savigny D, Lanata CF, et al. How can we achieve and maintain high-quality performance of health workers in low-resource settings. *Lancet* 2005;366(9490):1026-35

48. Boucar M, Hill K, Coly A, et al. Improving postpartum care for mothers and newborns in Niger and Mali: a case study of an integrated maternal and newborn improvement programme. *BJOG* 2014;121:127-33

49. Mwidunda PE, Eliakimu E. Creating a national culture of quality: the Tanzania experience. *AIDS* 2015;29 Suppl 2:S175-7

50. Mate KS, Ngubane G, Barker PM. A quality improvement model for the rapid scale-up of a program to prevent mother-to-child HIV transmission in South Africa. *Int J Qual Health Care* 2013;25:373-80

51. Bardfield J, Agins B, Akiyama M, et al. A quality improvement approach to capacity building in low- and middle-income countries. *AIDS* 2015;29:S179-S86



BMJ Open

Improving institutional childbirth services in rural southern Tanzania: a qualitative study of healthcare workers' perspective

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2015-010317.R1
Article Type:	Research
Date Submitted by the Author:	18-Apr-2016
Complete List of Authors:	Jaribu, Jennie; Swiss Tropical and Public Health Institute, Epidemiology and Public Health Penfold, Suzanne; London School of Hygiene & Tropical Medicine, Dept of Disease Control Manzi, F; Ifakara Health Institute Schellenberg, Joanna; London School of Hygiene & Tropical Medicine, Dept of Infectious Disease Epidemiology Pfeiffer, Constanze; Swiss Tropicla and Public Health Institute, Epidemiology and Public Health
Primary Subject Heading:	Qualitative research
Secondary Subject Heading:	Health services research
Keywords:	health workers perspectives, quality improvement, counseling, partograph

Improving institutional childbirth services in rural southern Tanzania: a qualitative study of healthcare workers' perspective

Jennie Jaribu[1, 2, 3], Suzanne Penfold[4], Fatuma Manzi[3], Joanna Schellenberg[4], Constanze Pfeiffer [1, 2]

[1]Swiss Tropical and Public Health Institute, Basel, Switzerland

[2]Basel University, Basel, Switzerland

[3]Ifakara Health Institute, Dar es Salaam, United Republic of Tanzania

[4]London School of Hygiene and Tropical Medicine, London, United Kingdom

Corresponding author name: Jennie Jaribu, email: jennie.jaribu@unibas.ch, full address: Swiss Tropical and Public Health Institute, Socinstrasse. 57, P.O. Box 4002 Basel, Switzerland Tel: +41 284 8600 Fax: Fax + 41 61 284 81 05

Suzanne Penfold: Department of Disease Control; London School of Hygiene and Tropical Medicine; London; United Kingdom

Fatuma Manzi: Health Systems Department; Ifakara Health Institute; Dar es Salaam; United Republic of Tanzania

Joanna Schellenberg: Department of Disease Control and Department of Infectious Disease Epidemiology; London School of Hygiene and Tropical Medicine; London; United Kingdom

Constanze Pfeiffer: Department of Epidemiology and Public Health; Swiss Tropical and Public Health Institute; Basel; Switzerland

Keywords: health workers perspectives, quality improvement, couselling, partograph

Word count: Abstract 270. Main text 4383

ABSTRACT

Objective: To describe health workers' perceptions of a quality improvement (QI) intervention that focused on improving institutional childbirth services in primary health facilities in Southern Tanzania.

Design: A qualitative design was applied using in-depth interviews with health workers.

Setting: This study involved the Ruangwa District Reproductive and Child Health Department, eleven dispensaries and two health centers in rural southern Tanzania.

Participants: Four Clinical Officers, five Nurses and six Medical Attendants from different health facilities were interviewed.

Results: The healthcare providers reported that the QI intervention improved their skills, capacity and confidence in providing counseling and use of partograph during labour. The face to face QI workshops, used as a platform to refresh their knowledge on maternal and newborn health and QI methods, facilitated peer learning, networking and standardization of care provision. The onsite follow up visits were favored by healthcare providers because they gave the opportunity to get immediate help, learn how to perform tasks in practice and be reminded of what they had learnt. Implementation of parallel interventions focusing on similar indicators was mentioned as a challenge that led to duplication of work in terms of data collection and reporting. District supervisors involved in the intervention showed interest in taking over the implementation; however, funding remained a major obstacle.

Conclusion: Health care workers highlighted the usefulness of applying a QI approach to improve maternal and newborn health in rural settings. QI programs need careful coordination at district level in order to reduce duplication of data.

Strengths and Limitations of the study

Strength:

- This study provides in-depth understanding of healthcare workers experiences regarding the implementation of an innovative QI intervention
  It highlights benefits as well as challenges related to the implementation of the QI intervention and thus allows for important insights not only for scientists but also policy makers and practitioners

Limitations

- The small number of participants and the specific geographical focus limits the generalizability of the results
- The results might have been influenced by the researcher's personal biases and idiosyncrasies

INTRODUCTION

Antenatal care and childbirth services in Tanzania

Tanzania faces multiple problems in delivering essential healthcare interventions like antenatal or childbirth services.[1-4] About 96% of pregnant women in Tanzania attend antenatal care (ANC) services at least once during their pregnancy.[5-9] Despite this high utilization, the quality of preventive diagnostic and treatment services during ANC, and childbirth services are still poor.[3 ,10-12] Low quality of care in service delivery contributes to high maternal and neonatal mortality rates.[13-16]Intrinsic factors contributing to the low quality of care include poor infrastructure, lack of skilled personnel, lack of an enabling environment for human resources and missing technical know-how for providing essential healthcare services.[2 ,11 ,17] Extrinsic factors include lack of funds and political commitment, lack of community participation in health related issues, and cultural beliefs. Context-specific customs, norms and beliefs play a major role in influencing healthcare seeking behaviour, especially in rural communities.[18 ,19]

Quality of Care

The Institute of Medicine defined quality of care 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.[20] According to the Institute of Medicine six main core needs are essential for quality of care (Table 1).[21]

Donabedian suggested that inferences in the quality of care could be grouped in three categories: “structure”, “process” and “outcome”.[21] “Structure” refers to the setting where care occurs. [1] “Process” includes what is actually done in giving and receiving care. [22 ,23] “Outcome” covers the effects of care on health.[21 ,24] In African settings a central issue for low health systems performance may be the relative neglect of health-care processes.[24] Building on these observations, a QI intervention was implemented in rural southern Tanzania

aiming at improving the process of delivering antenatal and childbirth services taking into consideration three core quality needs; patient centeredness, effectiveness and safety.

Table 1: Core needs for quality in health care

Safety: avoiding injuries to patients from the care that is intended to help them.
Effectiveness: providing services based on scientific knowledge to all who could benefit, and refraining from providing services to those not likely to benefit.
Patient-centred: providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions.
Timely: reducing waits and sometimes harmful delays for both those who receive and those who give care.
Efficiency: avoiding waste, including waste of equipment, supplies, ideas, and energy.
Equitable: providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status

Source: Institute of Medicine; Crossing the quality chasm: A new health system for the 21st century

Improving Newborn Survival in Southern Tanzania: Quality Improvement Intervention (INSIST QI)

The intervention was implemented under the umbrella of the "Improving Newborn Survival in Southern Tanzania" (INSIST) project.[25] The quality improvement (QI) intervention used the QI approach known as the "Collaborative Quality Improvement Model".[26] The strategy comprised of forming QI teams from different health facilities in order to create a collaborative network that aimed at working together to achieve common goals. Twenty three QI teams, one team per health facility, were formed each comprising a minimum of two health workers (health facility QI team) and one community representative in Ruangwa district. The community representatives were selected by the health staff and community members. They included traditional birth attendants, village leaders or community volunteers.

The QI teams were responsible for testing and implementing changes and were coached and mentored by a district QI mentor. An initial pilot phase was conducted in 4 health facilities in Mtwara Rural district. Refer to Table 2 for clear project timeline. The district QI mentor was selected by the Council Health Management Team (CHMT) and trained by project staff on QI methods. A variety of QI methods were used to initiate the Plan-Do-Act-Study cycles (PDSA), which formed the basis of the QI intervention. These included: identifying gaps in clinical care processes (process mapping and root cause analysis) and prioritizing problems to be solved using a Pareto chart[27]. This is a combined bar and line chart with the bars showing individual values in descending order and the line showing the cumulative total. The purpose of the Pareto chart is to highlight the most important points among a (typically large) set of factors. Thus it assists at identifying priorities[27]. Data was used to inform the improvement process presented in form of run charts.[26 ,28-31]

The QI teams, QI mentor and district Reproductive and Child Health Coordinator met every three to five months in a series of 5 iterative workshops to ensure familiarity with the above mentioned QI tools, to participate in refresher trainings on maternal and neonatal care services, to share their experiences, and to learn from each other. Between these workshops the QI teams had activity periods where they practiced what they had learned. Four to six weeks after each workshop, the QI teams received coaching and mentoring at on-site follow up visits from the project staff and the QI mentor. During the visits they obtained assistance on the maternal and neonatal problems they wanted to improve, and application of QI methods. Furthermore, they were encouraged to assess their own work using data they had generated and to develop new ideas for improvement.

The intervention centred on two improvement objectives selected during QI workshops by the participating healthcare providers. The first aimed at increasing health facility deliveries through counselling on birth preparedness and pregnancy danger signs. The assumption was that improving the quality of counselling will increase the knowledge and understanding of

pregnant women and allow them to make informed decisions to utilize health facilities for care, including for delivery of their newborn babies. This is important in order to avoid delay in deciding to seek care and delay in reaching the health facility.[32] The second topic aimed at improving the quality of facility deliveries by using partographs. [31-33] A partograph is a graphic display of the progress of labour, which helps skilled birth attendants to recognize emerging difficulties and take action according to a clinical management protocol. [1] The overall health facility deliveries improved by 46 % from a median of 110 to 161 deliveries per month in a collaborative of 23 health facilities from February 2010 to June 2011. The target was to achieve a median of 220 deliveries per month. The partograph use improved by approximately 50 percentage points from a median of 10% to 57% in all the 23 health facilities in the same time period.

Justification of the QI improvement topics

When we started the project many of the health facilities in Ruangwa had very low to no deliveries in up to 6 consecutive months. As a project our original aim was to improve neonatal services. Based on the data, there was no or little number of neonates available in health facilities. Therefore, when we performed fishbone and Pareto charts, the main idea which came up was lack of women delivering in health facility. And this became our area of focus, to improve women knowledge through counselling and later improve the services they receive

Table 2: Project timeline

	2009	2010												2011					
Activities	Jun - Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Pilot (Mtwara Rural)																			
Start of Project (Ruangwa)																			
Workshop																			
Follow visits																			
Activity period																			
End of project																			

A growing number of healthcare QI interventions are implemented worldwide; increasing number of studies in low-income settings have used qualitative approaches to learn about perceptions and experiences of QI implementers [33-35]. The present study aimed at adding evidence by conducting a qualitative study in a rural setting we used in-depth interviews with health workers at various levels in the health system to explore their perception of the QI intervention and to identify facilitators and barriers in relation to the QI implementation.

METHODS

Study setting

At the time of the study, Ruangwa district, located in Lindi region, Southern Tanzania (Figure 1), had an estimated population of 124'000 people with 89 registered villages.[36] It was served by twenty-four functional health facilities, one district hospital, two health centers and 21 dispensaries.[36] The QI intervention focused on dispensaries and health centers

because they are the main access point for maternal and child health services in rural areas.[7] The health facilities were staffed primarily by clinical officers, nurses and medical attendants. Table 3 provides an overview of their roles and responsibilities. Each health facility offered a range of services with dispensaries having fewer services and staff compared to health centers.

Table 3: Description of health care provider cadres' roles and responsibilities

Healthcare worker cadre	Level of training	Roles and responsibilities
Clinical Officer	3 years Diploma	• Identify and treat common diseases and perform minor surgeries • Participate in the planning and implementation of basic health services • Keep records of equipment and tools for offering services • Keep records, prepare and provide implementation report • Supervise performance of subordinate health staff
Nurse	3 years Diploma	• Provide nursing care to all clients in the catchment area served by their facility. • Collect vital health statistics. • Direct and supervise subordinate nurses. • Provide counseling • Provide services to patients at home. • Provide preventive and childbirth services
Medical Attendant	1-year Certificate	• Clean equipments, wards and surrounding environment • Help patients with disabilities to use toilet and shower • To feed patients who need support • Take patient samples to the laboratory for testing and monitor results • Prepare materials for cleaning and close wounds • Follow up patients' medication requirements from drug store.

Source: Human Resource Development Circular No. 1 of 2009 scheme of service for health worker cadres under the Tanzania Ministry of Health and Social Welfare

Data collection and analysis

Qualitative data using in-depth interviews were collected in March 2013 by the INSIST QI project coordinator (JJ), a female medical doctor from Tanzania.

Data were collected using a multi-level approach: RCH Coordinator and QI mentor at district level, and Clinical Officers, Nurse Midwives and Medical Attendants at health facility level. Out of 23 health facilities that participated in the QI intervention, RCH staff from 18 health facilities were available for interviews and 5 were not available because they were attending training outside the district. Among the available staff, health workers from 5 facilities were selected for pre-testing the interview guides because of their accessibility and proximity to Ruangwa town. Building on the pre-test, interview guides were carefully revised. One staff member from each of the 13 remaining health facilities and two representatives from the district level were purposely selected for the interview because they were the main implementers of antenatal and child birth services. Three types of interview guides were developed based on the role played by each member: (1) for the QI team members as implementers, (2) for the QI mentor as facilitator, and (3) for the RCH Coordinator as supervisor. The questions were focused on how the intervention was conducted i.e. the QI process and structure and the maternal health topics (interview guides are attached in the supplementary). The interview guides considered topics and activities covered during the implementation of the intervention and were designed to elicit the perceptions of the study participants.

A set of ten open-ended questions and additional relevant prompts were developed. The tools were designed in English and translated into Swahili. The translation of local terms was cross-checked with experts working in the field. The health workers were interviewed at their place of work, and the interviews took on average forty five minutes to one hour. Interviews were audio taped and transcribed verbatim. Data were analyzed using content analysis [37] focusing on how the QI intervention was structured (PDSA cycle approach, face to face

workshops, follow-up visits). In maternal and newborn health, we looked at the birth preparedness couselling and pregnancy danger signs, health facility deliveries and partograph use. Furthermore, we wanted to know about challenges and sustainability plans for the QI work. All transcripts were analyzed with the assistance of MAXQDA software version 11, in order to identify meanings and patterns related to the QI intervention and its influence on antenatal care service provision. Emerging themes were coded building on discussions within the interdisciplinary project team. Three major thematic areas emerged during data analysis: (1) reflections about the QI process, (2) the contribution of the QI component regarding capacity building, and (3) challenges related to the QI intervention. In addition, the first author kept a research diary in which personal observations were noted during follow up visits. Data from these observations complemented the findings from the in-depth interviews and allowed for triangulation and a deeper understanding of the context.

Ethical considerations

The QI intervention formed part of the INSIST project that received ethical clearance through the National Institute of Medical Research Tanzania (NIMR/HQ/R.8c/Vol II/177), Institutional Review Board of IHI (IHRDC/ IRB/No: A 350), and the London School of Hygiene and Tropical Medicine (LSHTM Reference No A358-5316). INSIST is registered on clinicaltrials.gov (NCT01022788). Written informed consent from participants was obtained before the interview and interviews were conducted in an environment where confidentially was maintained.

RESULTS

The study engaged 15 respondents, among them 11were female, 6 were Medical Attendants, 5 Nurses and 4 Clinical Officers. Their age ranged from early 20's to late 50's with the majority in their 30s and 40s.

QI process

PDSA cycles

Upon probing during the interviews nine of the 15 respondents (one clinical officer, four nurses and four medical attendants) could remember some of the key aspects of PDSA process.

"We were looking for the root cause, why women do not come to deliver in health facility and then prepared a work plan for women to come to deliver in the facility"

Nurse, from a health center

A medical attendant explaining a PDSA and QI process,

"My [QI] plan will be this, I will implement this, I will study it this way, and I will decide later on how it will be. Therefore, everyone was doing this at their own health facilities. This was very helpful to plan our work and even the graphs we used to draw to assess our situation, it worked very well".

Medical Attendant, from a dispensary

Two respondents (one clinical officer and one nurse officer) reported using it in other aspects of their work.

"I used it to improve family planning because we had a lot of underage and student pregnancies; we set a goal to reach 500 clients (new, old and defectors) we conducted health education about family planning to women. After a month we analyzed our data and we reached 600 clients"

Clinical Officer, from a dispensary

QI workshops

All 15 respondents reported the QI workshops gave an opportunity to learn from, help and remind each other about technical issues. One clinical officer, two medical attendants and one nurse midwife reported that the workshops enabled them to offer standardized care, at least in terms of the messages provided during counseling and partograph use.

"The community thought the changes are only implemented in our facility, but whenever different people meet and discuss, those who went to other facilities say the same thing. So they realized it's all over not only here, we did not create our own thing".

Medical Attendant, from a dispensary

Follow up visits

14 respondents found the onsite follow up visits useful to remind them of what was learnt during the workshop, provide practical assistance, and to use their data to make informed decisions. The coaching and mentoring visits were regarded as being more important than the workshops because the respondents felt appreciated and noticed. Two providers commented that other programs had promised to come for supervision after trainings; however, they never did so. Five health workers perceived the follow up visits to be regular and focused. Seven respondents said the QI follow up visits differ from CHMT supervision, mentioning that CHMT are sharp tempered, don't come regularly, do not solve problems and cover many things at the same time.

"The follow up was not like fighting; you just explained and reminded us. Not like the one we receive from the district when someone addresses you with anger because they have a university degree".

Clinical Officer, from a dispensary

"Even if there will be no more workshops, it's better to visit us in our health facilities, then you realize what are our problems and help us. In addition, it motivates us, knowing that our work is seen and appreciated".

Medical Attendant, from a dispensary

"CHMT visits differ with what you were doing. You targeted specific topics. However, the CHMT when they come, they just look in general, "have you measured children"? "Yes". "Have you delivered babies"? "Yes". "What is going on here?" "Do you give vaccination"? "Yes". "No gas available"? "Yes". Aah OK. That's it".

Medical Attendant, from a dispensary

The QI mentor explained how the INSIST QI and the CHMT worked in synergy to improve service delivery.

"The follow up visits assisted the CHMT to know which health facility had shortage of equipment or supplies because we used to note facilities with problems during follow up visits. Then inform the CHMT that the following facility do not have delivery bed or weighing scale and the CHMT follow it up and supply the requirements. For example, they supplied delivery bed, fridge and weighing scale to [Facility name] after we notified them".

Nurse, from the district level

Partograph training

Partograph refresher training was useful for all respondents, those who learnt it as part of their professional training (such as the clinical officers and nurse midwives) and those who never had previous training (such as medical attendants). Prior to the QI training the medical attendants did not know how to fill the partograph. Three clinical officers also acknowledged that the partograph training improved their understanding on how to fill partograph. The nurse midwives seemed to be more competent compared to the other cadres.

"I did not know how to use partograph at all, I am a Medical Attendant, when I finished school and started working, I was just told to deliver women. However, I have never used a partograph until we learnt it in this project".

Medical Attendant, from a dispensary

"Partograph [training] managed to remind us to monitor women in labour, and helped us to detect women who had prolonged labour or obstructed labour and made us take appropriate decision".

Nurse, from a health center

Seven respondents reported that the intervention helped to improve referral of women in labor.

"That emphasis of telling healthcare providers to refer pregnant women who have poor progress in labor has increased number of referral cases from dispensaries to district hospital. We have an ambulance, therefore when they call for it; it comes to pick up patients. And these referrals were based on induction from partograph if the labour is not progressing well".

Nurse, from the district level

However, one respondent reported challenges in using it in a resource poor setting.

"In times of power cut we cannot use partograph, we can't see. We use a torch to deliver the woman".

Nurse, from a health center

Birth preparedness and pregnancy danger signs counseling

Thirteen health care workers reported that they appreciated providing counseling during ANC and some emphasized differences before and after the counseling sessions in terms of increasing health facility deliveries.

"Before we started a lot of women were delivering at home but I think it's because we did not provide appropriate counselling, after learning in the workshop and your follow ups in the facilities. Now we are providing counselling to women and their husbands at antenatal clinic and they come to deliver in the facility".

Medical Attendant, from a dispensary

"We knew about danger signs and birth plan counselling. However, when you came and emphasised its importance, then we realized aah! This is important; you know we were not used to emphasize it during health education".

Nurse, from a health center

However, despite these counseling services cultural beliefs still play a major role in decision making at family level especially in situations when families viewed the health problems as spiritual rather than physical in nature, influenced by their traditional understandings of disease etiologies. A medical attendant highlighted this in her narrative below:

"A young teenage couple came and reported "This is the second week we are not sleeping, my wife has difficulty in breathing as you taught us in danger signs". When I checked her, her hemoglobin level was 5g/dl. I asked him, how much money do you have? And he said "500Tzs"; I asked him, did I not tell you about preparing for emergency you will need to save money? He said, "You told us but at home, they are preparing a traditional dance for her to chase away evil spirits, we sneaked out". I had to call an ambulance and referred them to the district hospital, there she received 3 units of blood transfusion and her pregnancy is still young".

Medical Attendant, from a dispensary

Challenges faced during the intervention

The health care workers mentioned implementation of similar interventions as a major challenge to them, leading to duplication of work.

Duplication of efforts

At the time INSIST implemented its QI component other interventions such as "Mtunze Mtoto Mchanga" (INSIST community arm) and the "Clinton Health Access Initiative" (CHAI),[38] were implemented at the same time. Seven healthcare providers reported that both these interventions aimed at increasing health facility deliveries. This brought some confusion to healthcare workers and made them question whether there was sufficient harmonization of activities among different stakeholders. In addition, being involved in similar interventions was challenging to frontline workers in terms of time and data collection. In all these interventions they needed to collect data and provide reports on top of their routine work leading to duplication of effort. The confusion they felt about interventions was evident when respondents were asked to describe the present QI intervention during the

in-depth interviews. Several respondents referred to other interventions. Four healthcare workers, for instance, highlighted the role of incentives linked to the CHAI intervention.

"The community proposed a lot of things such as bicycle to go around with, registers, exercise books and uniforms for the volunteers, very nice things were given".

Clinical Officer, from a dispensary

"The things we did together and that with *CHAI* were all related because you all had one task of improving mother and newborn, that is why I am confusing them. For example *CHAI* was providing wraps (locally known khanga), soap and nappies as incentive to women who gave birth in the health facility and *INSIST community arm* was teaching the same things".

Clinical Officer, from a dispensary

Sustainability of the intervention

Building on the positive responses and influence of the QI intervention, the issue of continuation, however, is not decided by the healthcare workers' even if they want to. The CHMT decides on interventions to be implemented at district level based on their planning and budget in the Council Comprehensive Health Plan (CCHP). However, the reproductive and child health activities have less priority compared to others such as HIV/AIDS or malaria. [39] The respondent summarized these district level challenges as follows:

"It was good bringing facilities together, learning from each other, but its continuation is a problem[...]. We need to put it in the budget, but when you put it, during quarterly meetings it does not pass. They say the money is not enough, very few RCH activities get approved [...]. Last year they approved only outreach services".

Nurse, from district level

DISCUSSION

We found health workers' perception suggested that the QI intervention improved their capacity, their counseling skills for birth preparedness and pregnancy danger signs as well as the use of the partograph the QI intervention improved health workers capacity, skills and performance in birth preparedness and pregnancy danger signs counselling and partograph use. In addition, they favoured the onsite follow up visits over workshops, because it gave them the opportunity to learn and solve problems. Not all study participants could remember important details of the QI approach used, 21 months after their last learning session. Duplication of work was mentioned as one of challenge due to different projects intervening in similar areas and the lack of sustainability of the intervention despite potential for improving health care process delivery. Similar findings were reported by a study in Rwanda rural health centres,[40] that QI activities built confidence and capacity of health workers and that the mentorship visits were more supportive than classical district management supervision. Rowe et al. conclude in their review on quality improvement approaches that multi-faceted interventions (e.g. trainings and supervision) are more likely to improve performance, and that supervision with feedback was more effective than single interventions.[41] This was also reported by the health care providers in our study. Most of the healthcare providers involved in the INSIST QI intervention had no previous knowledge of QI methods. However, they were motivated to engage in the intervention as they saw changes in improvement indicators taking place as a result of their efforts without using any additional resources. [23] However, at the same time the risk of duplicating work for frontline health workers was identified as a challenge.[42] This finding highlights the need to harmonize interventions. A study in South Africa reported harmonization by involving various different stakeholders and creating a strong network. This network comprised of non-governmental organizations, district departments and the South African National Department of Health. By doing so they reduced duplication of work, lack of coordination and thus

dilution of the intervention effects.[43] In Tanzania many QI strategies are donor funded and donor driven projects focusing on HIV/AIDS leading to HIV specific quality improvement strategies that are not easily applicable in other fields especially in terms of resources and competing interest of the implementers.[42] However, there is a need to integrate QI interventions in the whole health system including the maternal and newborn services. The Tanzania Ministry of Health and Social Welfare recognized the importance of building a culture of quality and institutionalizing QI approaches in the healthcare system in general, through engaging the regions and districts. District councils should continuously invest in QI activities and integrate these in the CCHP to ensure sustainability.[42] These suggestions have not yet been implemented, therefore at the moment the sustainability of QI efforts remains one of the main challenges. In line with Bardfield et al. it is argued that the sustainability of QI interventions requires development of government systems and execution of processes essential to building national QI frameworks, promote country ownership and infuse a culture of QI to build capacity at the local, regional and national levels.[44] As much as the positive effects of the INSIST QI intervention are encouraging, the long-term effects are as yet unclear.

Limitations

The role of the project implementer as the interviewer might have influenced the way healthcare providers responded and might have felt obliged to highlight successes. However, the interviewer was aware of this and spoke with the respondents openly about her two roles prior to the interview. In addition, she dealt with it by encouraging the respondents to be open and sharing their positive as well as negative experiences. In addition, the contextual knowledge of the project implementer in terms of the culture, language and health systems could be advantageous.

Due to limited resources in this study we did not ask opinions of pregnant women or community members. Their information and that of health workers who did not participate would have provided useful additional insights. The evaluation was done in March 2013, and the project activities ended in June 2011, hence the results could be affected by recall bias. This was evident as some providers tended to remember activities of more recent projects. The selection of healthcare providers was restricted to those who actively participated in the QI intervention. The small number of participants and the specific geographical focus limits the generalizability of the results. However, the inputs identified add to the knowledge of implementing QI studies in rural settings and results could apply to other similar settings.

We started to conduct our study in Ruangwa district with an idea of spreading to all six INSIST study sites. However, due to limited funding we could only conduct the QI intervention in Ruangwa district. We chose to start with Ruangwa because it is the smallest among the six study districts and we wanted keep on learning about QI implementation. We focused on lower-level health facilities because from our experience of working on this area, many QI intervention studies are conducted at district hospital, not giving opportunity to the lower facilities which cater for people more closely than the district hospital.

Even though we used facilities near Ruangwa town for pretesting, however, all the facilities are in rural areas and therefore, there is not much difference in terms of the context and qualifications of the healthcare providers and they all had same QI exposure.

Conclusion and Recommendations

The findings suggest that the applied quality improvement intervention contributed to improving the quality of care of maternal and newborn health services in Southern Tanzania. by using. Health care workers clearly highlighted the potential of the problem-solving quality improvement intervention presented here to improve maternal and newborn health. However,

health systems capacity at district level to sustain this type of intervention is still challenging. Both sustainability and harmonization of maternal and neonatal interventions aiming at quality improvement need to be addressed in order to avoid duplication of work and the development of parallel systems.

ACKNOWLEDGEMENTS

We thank all healthcare providers and district level supervisors at Ruangwa districts for their participation, hard work and dedication to improve the quality of care. In addition, we would like to thank the staff of the Ifakara Health Institute – Mtwara Branch for all their support and contributions.

CONTRIBUTORSHIP STATEMENT

All authors contributed substantially to the conception, design of the work, analysis and interpretation of data for the work. The first author drafted the work and all the co-authors revised it critically for important intellectual content. All authors provided final approval of the version to be published. And agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

COMPETING INTEREST

No competing interest declared.

FUNDING

This work was supported by the Bill & Melinda Gates Foundation through the Saving Newborn Lives Program of Save the Children, the Laerdal Foundation and UNICEF. The

funders had no role in the design and conduct of the study; in the collection, analysis and interpretation of the data; or in the preparation, review, or approval of the manuscript.

DATA SHARING STATEMENT

The data sharing is not applicable.

REFERENCES

1. Blank A, Prytherch H, Kaltschmidt J, et al. "Quality of prenatal and maternal care: bridging the know-do gap" (QUALMAT study): an electronic clinical decision support system for rural Sub-Saharan Africa. *BMC Med Inform Decis Mak* 2013;13:44-44

2. Penfold S, Shamba D, Hanson C, et al. Staff experiences of providing maternity services in rural southern Tanzania - a focus on equipment, drug and supply issues. *BMC Health Serv Res* 2013;13(1):61

3. Gross K, Schellenberg J, Kessy F, et al. Antenatal care in practice: an exploratory study in antenatal care clinics in the Kilombero Valley, south-eastern Tanzania. *BMC Pregnancy Childbirth* 2011;11(1):36

4. Pembe AB, Carlstedt A, Urassa DP, et al. Quality of antenatal care in rural Tanzania: counselling on pregnancy danger signs. *BMC Pregnancy Childbirth* 2010;10:35

5. National Bureau of Statistics (NBS) [Tanzania], Macro I. Tanzania Demographic and Health Survey 2010. Dar es Salaam, Tanzania: NBS and ICF Macro., 2011.

6. Pembe AB, Urassa DP, Carlstedt A, et al. Rural Tanzanian women's awareness of danger signs of obstetric complications. *BMC Pregnancy Childbirth* 2009;9:12

7. Rockers P, Wilson M, Mbaruku G, et al. Source of Antenatal Care Influences Facility Delivery in Rural Tanzania: A Population-Based Study. *Matern Child Health J* 2009;13(6):879-85

8. Spangler S, Bloom S. Use of biomedical obstetric care in rural Tanzania: the role of social and material inequalities. *Soc Sci Med* 2010;71:760 - 68

9. Mpembeni R, Killewo J, Leshabari M, et al. Use pattern of maternal health services and determinants of skilled care during delivery in Southern Tanzania: implications for achievement of MDG-5 targets. *BMC Pregnancy Childbirth* 2007;7:29

10. Duysburgh E, Zhang WH, Ye M, et al. Quality of antenatal and childbirth care in selected rural health facilities in Burkina Faso, Ghana and Tanzania: similar finding. *Trop Med Int Health* 2013;18:534-47

11. Hanson C, Ronsmans C, Penfold S, et al. Health system support for childbirth care in Southern Tanzania: results from a health facility census. *BMC Res Notes* 2013;6(435)

12. Spangler SA. Assessing skilled birth attendants and emergency obstetric care in rural Tanzania: the inadequacy of using global standards and indicators to measure local realities. *Reprod Health Matters* 2012;20:133-41

13. United Republic of Tanzania, Ministry of Health and Social Welfare. Women and children first. Countdown to ending preventable maternal, newborn and child deaths in Tanzania: Ministry of Health and Social Welfare,, 2014.

14. van den Broek NR, Graham WJ. Quality of care for maternal and newborn health: the neglected agenda. *BJOG* 2009;116:18-21

15. Darmstadt GL, Kinney MV, Chopra M, et al. Who has been caring for the baby? *The Lancet* 2014;384(9938):174-88

16. Austin A, Langer A, Salam RA, et al. Approaches to improve the quality of maternal and newborn health care: an overview of the evidence. *Reprod Health* 2014;11 Suppl 2(Suppl 2):S1

17. United Republic of Tanzania: Ministry of Health and Social Welfare. The National Road Map Strategic Plan To Accelerate Reduction of Maternal, Newborn and Child Deaths in Tanzania 2008-2015: *Sharpened One Plan* 2014

18. Haws R, Mashasi I, Mrisho M, et al. "These are not good things for other people to know": how rural Tanzanian women's experiences of pregnancy loss and early neonatal death may impact survey data quality. *Soc Sci Med* 2010;71:1764 - 72

19. Mrisho M, Schellenberg D, Manzi F, et al. Neonatal deaths in rural southern Tanzania: care-seeking and causes of death. *ISRN Pediatr* 2012;2012:953401

20. Institute of Medicine. Medicare: A Strategy for Quality Assurance, Volume I. Washington, DC: The National Academies Press, 1990.
21. Institute of Medicine. Crossing the quality chasm: A new health system for the 21st century, 2001.
22. Berman J, Nkabane EL, Malope S, et al. Developing a hospital quality improvement initiative in Lesotho. *Int J Health Care Qual Assur* 2012;27:15-24

23. Boucar M, Hill K, Coly A, et al. Improving postpartum care for mothers and newborns in Niger and Mali: a case study of an integrated maternal and newborn improvement programme. *BJOG* 2014;121:127-33

24. Heiby J. The use of modern quality improvement approaches to strengthen African health systems: a 5-year agenda. *Int J Qual Health Care* 2014

25. Borghi J, Cousens S, Hamisi Y, et al. STUDY PROTOCOL: Improving newborn survival in rural southern Tanzania: a cluster-randomised trial to evaluate the impact of a scaleable package of interventions at community level with health system strengthening. 2013

26. Institute for Healthcare Improvement. The Breakthrough Series: IHI's Collaborative Model for Achieving Breakthrough Improvement. IHI Innovation Series white paper. Boston: Institute for Healthcare Improvement, 2003.
27. Institute for Healthcare Improvement. Pareto Diagram. Secondary Pareto Diagram 2016. http://www.ihi.org/resources/Pages/Tools/ParetoDiagram.aspx.
28. USAID Health Care Improvement Project. The Improvement Collaborative: An Approach to Rapidly Improve Health Care and Scale Up Quality Services. Bethesda, Maryland: USAID Health Care Improvement Project., 2008.
29. Kilo CM. A Framework for Collaborative Improvement: Lessons from the Institute for Healthcare Improvement's Breakthrough Series. *Qual Manag Health Care* 1998.

30. Benneyan J.C, Lloyd R.C, Plsek P.E. Statistical process control as a tool for research and healthcare improvement. *Qual Saf Health Care* 2003:458-64

31. Gerald J. Langley, Ronald Moen, Kevin M. Nolan, et al. The Improvement Guide: A Practical Approach to Enhancing Organizational Performance, 2nd Edition. 2nd ed. A Wiley Imprint: Jossey Bass Wiley, 2009.

32. Thaddeus S, Maine D. Too far to walk: maternal mortality in context. *Soc Sci Med* 1994;38(8):1091-110

33. Alhassan RK, Spieker N, Ostenberg P, et al. Association between health worker motivation and healthcare quality efforts in Ghana. *Hum Resour Health* 2013;11

34. Afari H, Hirschhorn LR, Michaelis A, et al. Quality improvement in emergency obstetric referrals: qualitative study of provider perspectives in Assin North District, Ghana. *BMJ Open* 2014;4(5):e005052

35. Puchalski Ritchie LM, van Lettow M, Barnsley J, et al. Lay Health Workers experience of a tailored knowledge translation intervention to improve job skills and knowledge: a qualitative study in Zomba district Malawi. *BMC Med Educ* 2016;16(1):1-8

36. Ruangwa District Council. Council Comprehensive Health Plan, 2012 -2013.

37. Graneheim UH, Lundman B. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Educ Today* 2004;24(2):105-12

38. Clinton Foundation. Eliminating Mother to Child Transmission Secondary Eliminating Mother to Child Transmission 2013. https://www.clintonfoundation.org/our-work/clinton-health-access-initiative/programs/eliminating-mother-child-transmission.

39. Lawn JE, Kerber K, Enweronu-Laryea C, et al. Newborn survival in low resource settings,are we delivering? *BJOG* 2009.;116 Suppl 1:49-59

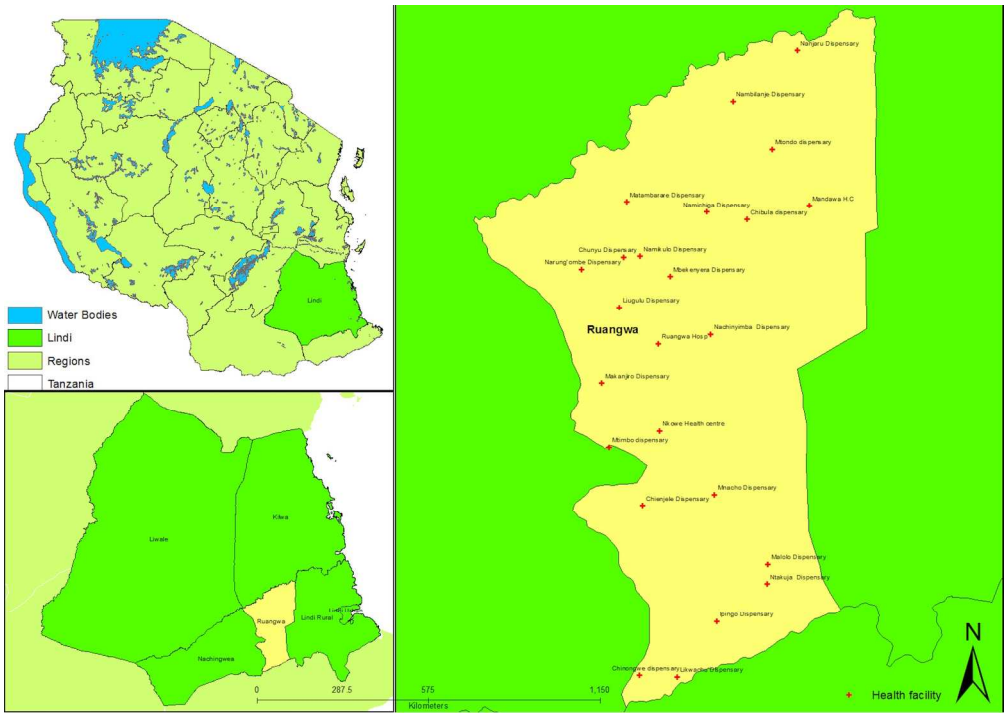
40. Manzi A, Magge H, Hedt-Gauthier B, et al. Clinical mentorship to improve pediatric quality of care at the health centers in rural Rwanda: a qualitative study of perceptions and acceptability of health care workers. *BMC Health Serv Res* 2014;14(1):275

41. Rowe AK, de Savigny D, Lanata CF, et al. How can we achieve and maintain high-quality performance of health workers in low-resource settings. *Lancet* 2005;366(9490):1026-35

42. Mwidunda PE, Eliakimu E. Creating a national culture of quality: the Tanzania experience. *AIDS* 2015;29 Suppl 2:S175-7

43. Mate KS, Ngubane G, Barker PM. A quality improvement model for the rapid scale-up of a program to prevent mother-to-child HIV transmission in South Africa. *Int J Qual Health Care* 2013;25:373-80

44. Bardfield J, Agins B, Akiyama M, et al. A quality improvement approach to capacity building in low- and middle-income countries. *AIDS* 2015;29 Suppl 2:S179-86



Map of Tanzania, Lindi and Ruangwa showing study sites
At the time of the study, Ruan
197x139mm (300 x 300 DPI)

Interview Guide

Improving institutional childbirth services in rural southern Tanzania: The healthcare workers' perspective

ID:
Interview date:
Interview start:
Interview end:

Socio-demographic information of participant

1. Place of residence:
2. Ethnicity:
3. Religion:
4. Education:
5. Main occupation:
6. Age:
7. Number of QI sessions attended:

---

1. What do you understand by the term "quality improvement in maternal and neonatal health"?

2. Do you remember key issues we discussed during our meetings (the learning sessions) in order to improve the quality of care for pregnant women and newborns? If yes, could you please explain them (Probe: use of PDSA cycle, use data, generate change ideas, follow up visits, maternal or newborn topics).

3. What do you think about the learning sessions? What did you like about it? What could be improved?

4. Do you remember key activities we did together during follow up visits in order to improve the quality of care for pregnant women and newborns? (Probe: look at data, process data and outcome, revise PDSA, revise what we learnt during LS, plot graphs, discuss change ideas)

5. Which activity worked best during the QI implementation? Can you explain why?

6. Which activity did not work during the QI implementation? Can you explain why?

7. Can you remember the change ideas (activities) you agreed on to implement in order to improve maternal and neonatal health services? (Probe: giving individual birth plan and complication preparedness counselling to all pregnant women attending ANC clinic, use of information brochure, keeping a register, attending village meetings, male involvement in counselling).

8. Did you manage to implement some of these change ideas? If yes, which ones?
   Do you continue them? If yes, why? If no, why not?
   Did the activities improve the quality of care for pregant women and newborns in your facility? If yes, how? If no, why not? Please give examples.

9. During the implementation of your change ideas or QI activities were there any challenges you faced? What kind of challenges? Did you overcome them? How?

10. During the implementation of your QI activities or change ideas did you need any extra support from the district, project or your collegues? If yes, from whom? What kind of support did you need? Did you get it?

11. Were you able to apply the PDSA cycle to improve other types of services? If yes, can you give an example? If no, why not?

12. Were you able to transfer the knowledge about it to anyone else?

13. Has the service provision at your health facility/ies changed after participating in this project?

14. How could the QI intervention be improved? Can you give examples?

15. Do you have anything you would like to add?

16. Would you like to ask me any questions?

Additional question for the RCH ccordinator

What was your contribution during the implemention of the QI activities?

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

YOU MUST PROVIDE A RESPONSE FOR ALL ITEMS. ENTER N/A IF NOT APPLICABLE

No. Item	Guide questions/description	Reported on Page #
Domain 1: Research team and reflexivity		
Personal Characteristics		
1. Inter viewer/facilitator	Which author/s conducted the inter view or focus group?	Methods, page 11
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	Methods, page 13
3. Occupation	What was their occupation at the time of the study?	Methods, page 11
4. Gender	Was the researcher male or female?	Methods, page 11
5. Experience and training	What experience or training did the researcher have?	Methods, page 13
Relationship with participants		
6. Relationship established	Was a relationship established prior to study commencement?	Methods, page13
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	Methods, page 13
8. Interviewer characteristics	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	Limitation of the study, page24&25
Domain 2: study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Methods, page 12
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Methods, page 11&12
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Methods, page 12
12. Sample size	How many participants were in the study?	Methods, page 12
13. Non-participation	How many people refused to participate or dropped out? Reasons?	Methods, page 12
Setting		

14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Methods, page 12
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	N/A
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	N/A
Data collection		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Methods, page 12
18. Repeat interviews	Were repeat inter views carried out? If yes, how many?	N/A
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	Methods, page 12
20. Field notes	Were field notes made during and/or after the inter view or focus group?	Methods, page 13
21. Duration	What was the duration of the inter views or focus group?	Methods, page 12
22. Data saturation	Was data saturation discussed?	N/A
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	N/A
Domain 3: analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	Methods, page 12
25. Description of the coding tree	Did authors provide a description of the coding tree?	Methods, page 13
26. Derivation of themes	Were themes identified in advance or derived from the data?	Methods, page 13
27. Software	What software, if applicable, was used to manage the data?	MaxQDA
28. Participant checking	Did participants provide feedback on the findings?	N/A
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Results, page15-21
30. Data and findings consistent	Was there consistency between the data presented and the findings?	Relationship to existing knowledge
31. Clarity of major themes	Were major themes clearly presented in the findings?	Results, page15-21
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Results, page 21