Sustaining Immunization Gains for All Communities in Ethiopia

Final Report of the RED-QI Sustainability Inquiry

Universal Immunization through Improving Family Health Services (UI-FHS) project in Ethiopia

July 2020

Acknowledgments

The UI-FHS project would like to extend a special thank you to the health and administrative staff in each of the woredas involved in the Sustainability Inquiry for their collaboration and dedication to strengthening the routine immunization system. We would also like to thank the Ethiopian Federal Ministry of Health for their support of the UI-FHS project and their commitment to improving the quality, access, and equity of immunization services to the women and children of Ethiopia. Many thanks goes to Joseph Petraglia and Disha Ali for leading the research and analysis of the Sustainability Inquiry. Lastly, we would like to acknowledge the work of our data collectors and our own UI-FHS staff for their dedication in creating this report.

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Cover photo: A health worker vaccinates a child at a routine immunization session in Somali region, Ethiopia. Credit: Natasha Kanagat/JSI

JSI exists to improve the health and well-being of underserved and vulnerable people and communities throughout the world, and to provide an environment where people of passion and commitment can pursue this cause.

CONTENTS

ACRONYMS

EPI	Expanded Program on Immunization
HC	Health center
HEW	Health extension worker
HP	Health post
HW	Health worker
JSI	JSI Research & Training Institute, Inc.
KIIs	Key informant interviews
MOH	Ministry of Health
PDSA	Plan-Do-Study-Act
QI	Quality improvement
QIT	Quality Improvement Team
RED	Reaching Every District
RED-QI	Reaching Every District using Quality Improvement
RI	Routine immunization
SNNPR	Southern Nations, Nationalities, and Peoples' Region
UI-FHS	Universal Immunization through Improving Family Health Services
WoHO	Woreda Health Office

INTRODUCTION

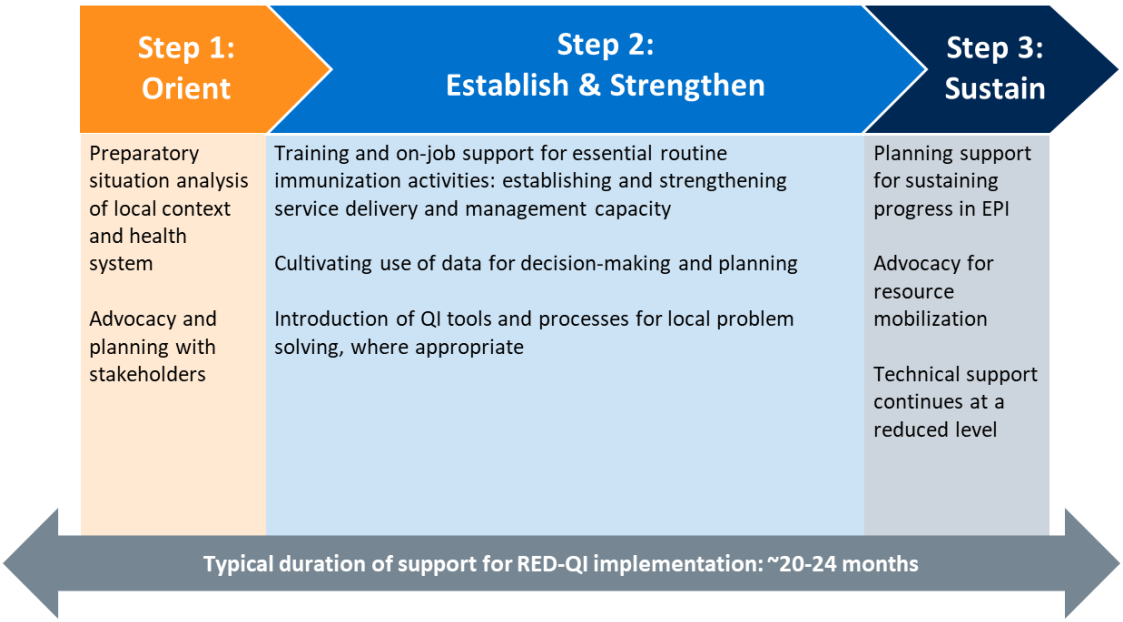
Project Background and Technical Approach

In 2011, the Bill & Melinda Gates Foundation awarded JSI Research & Training Institute, Inc. (JSI) the UI-FHS project to design and test an approach to reach universal immunization, with the ultimate goal of creating an effective, affordable, and sustainable model that could be implemented throughout Ethiopia.

To strengthen the operationalization of the national immunization strategy, Reaching Every District (RED)[1], JSI implemented the "RED-QI" approach, which applies quality improvement (QI) concepts and tools to RED processes, improving the ability of health personnel at district and health facility levels to address challenges in immunization service delivery. The approach supports district-level managers and frontline health workers to plan for service delivery, implement those plans, and monitor progress through the use of data and ongoing capacity building, such as supportive supervision. RED-QI aims to improve the ability of health workers (HWs) and managers to design their own solutions for reaching all target populations, particularly those that are underserved by immunization and other primary health care services.

In each *woreda* (district), the RED-QI approach was introduced through a three-step process, broadly summarized in Figure 1.

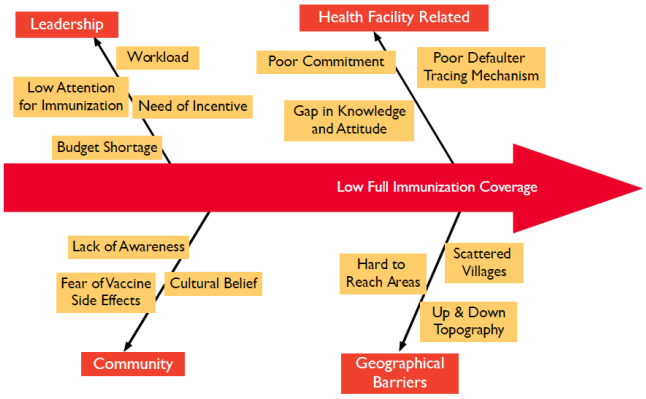
Figure 1: RED-QI Implementation at District Level



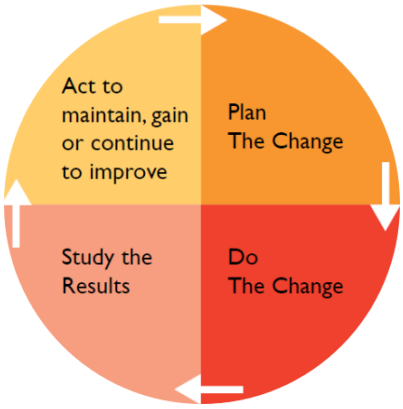
[1] The five components of Ethiopia's RED strategy are: planning and management of resources, reaching all eligible populations, engaging with communities, conducting supportive supervision, and monitoring and using data for action. Federal Democratic Republic of Ethiopia Ministry of Health. Reaching Every District (RED): A Guide to Increasing Immunization Coverage and Equity in Ethiopia. 2018 Edition.

Over the course of 20–24 months of technical assistance, RED-QI built health workers' capacity to identify, analyze, prioritize, and take action to address problems, using their own data and largely using locally available resources to address challenges. UI-FHS supported training and follow-up technical support to health staff at district and facility levels on using selected QI tools, including fishbone analysis to identify and pinpoint local problems and their root causes; and Plan-Do-Study-Act (PDSA) cycles to introduce, test, learn, and adopt solutions for routine immunization (see Figure 2). Staff trained on these methods[2] set up quality improvement teams (QITs) at their facilities—newly formed or revitalized from facility- or district-level working groups—to apply QI tools to solving local operational problems in routine immunization (RI). At the health facility level, community members made up a critical part of the working group. The use of QI tools was also incorporated into standard planning processes for immunization (i.e., microplanning) at the facility and district levels. Applying these QI tools and approaches increased health workers' ability to implement RED activities that strengthen the RI system, microplanning, supportive supervision, community engagement, and using data for decision-making.

Figure 2: Examples of QI Tools Used



A fishbone diagram/analysis is a way to visually diagram a problem's root causes. It allows teams to examine a problem deeply to address the root cause of a problem rather than focusing on symptoms.



A PDSA cycle is a team-based approach to problem solving that seeks to test changes or make improvements. A possible solution to a problem (a "change idea") is tested within a short period and measured to determine if improvements occurred.

After designing and testing RED-QI in three districts from 2011–2014, the UI-FHS project scaled the approach between 2014 and 2018, strategically introducing RED-QI in over 2,700 health facilities in 103 woredas across six regions. Two-thirds of the 103 woredas were in settings that have extremely limited infrastructure and health system capacity, with hard-to-reach areas and populations, including pastoralist communities who migrate seasonally with their livestock herds in search of grazing land and water.

Rationale for Inquiry

[2] More information on QI approaches used is available online: https://publications.jsi.com/JSIInternet/Inc/Common/_download_pub.cfm?id=23633&lid=3

The RED-QI approach resulted in immunization system improvements[3]. After RED-QI was implemented in varying health system and demographic contexts within Ethiopia over the course of several years, the Bill & Melinda Gates Foundation and Ethiopia's Federal Ministry of Health supported JSI to further investigate the benefits and sustainability of QI-enhanced approaches to RED in response to a changing implementation environment.

The overall objective was to clarify RED-QI features (identified by frontline providers, community representatives, and managers) that allow the Expanded Program on Immunization (EPI) to keep up with real-world shifts in the context of implementation; and to determine whether these elements of RED-QI were sustained upon the conclusion of direct technical support.

Specific objectives

The inquiry focused on these objectives:

1. Identifying elements of RED-QI that appear to be sustained up to the present time, along with the adaptations that made that possible.

2. Uncovering how the RED-QI approach strengthened management capacity and culture in UI-FHS project woredas (e.g., how QI tools/methods were used within the management process in health facilities).

3. Pinpointing the elements that need to be in place to sustain RED-QI's implementation capacity and ability to respond to circumstances through intentional adaptation; and to create the capacity and willingness to solve problems in response to new data and information.

METHODOLOGY

Inquiry Questions and Study Type

The overall question this inquiry sought to answer was:

What features of RED-QI have frontline providers, community representatives, and managers identified that enable the EPI to keep up with real-world shifts in the context of implementation; and are these elements sustainable upon the conclusion of direct technical support?

Inquiry sub-questions were:

[3] JSI, 2019. Reaching for Universal Immunization Coverage: Results and Program Recommendations from Combined Immunization Coverage and Serology Surveys in Three Woredas (districts) of Ethiopia in 2013 and 2016. Available at: http://mpffs6apl64314hd71fbb11y-wpengine.netdna-ssl.com/wp-content/uploads/2019/10/UI-FHS-CovSero-Brief_FINAL.pdf

- How do people on the frontline of RI—health extension workers (HEWs), health post (HP) and health center (HC) nurses, and current or former QIT representatives from the community—understand the added benefits of a QI approach to the RED strategy?
- How do those not on the frontline (e.g., EPI focal persons and Woreda Health Office [WoHO] heads) understand the added benefits of a QI approach to the RED strategy, and how does their understanding differ from the frontline HWs?
- Are RED-QI components and processes being sustained after the life of project at each health provision level, and what are the facilitating factors, strategies, and adaptations are used to sustain activities?
- What elements need to be in place to sustain RED-QI in terms of management structures, working conditions, staffing levels and capacities, practices, infrastructure, etc.?
- Do health workers believe that they have strengthened their adaptive capacity (ability to solve problems, stronger management skills, etc.) through having access to RED-QI tools and techniques?
- Fundamentally, how do WoHO, HC, and HP staff perceive the utility of the RED-QI approach, and are their perceptions borne out by performance measures?

To answer these questions, the inquiry relied primarily on qualitative research methods (key informant interviews, or KIIs), supplemented by record review taken from microplans, supervision reports, and meeting minutes of QITs.

Geographic Location and Selection Criteria

Six woredas from two regions were purposively selected for this inquiry: three woredas from Somali Region and three from the Southern Nations, Nationalities, and Peoples' Region (SNNPR). These two regions were selected because each represents critical dimensions of UI-FHS programming in Ethiopia.

Somali is one of the developing regional states in Ethiopia in which the selected woredas (Bablie, Harshin, and Kabribayah) are overwhelmingly pastoral, and regional health systems can be classified as weak. The selected SNNPR woredas (Bonke, Gena Bossa, and Sodo) include a mixed pastoral and agrarian population and have relatively stronger health systems in place.

The six woredas 1) implemented RED-QI activities at WoHO, HC, and HP levels of the health system over the course of approximately the same period; 2) were identified as RED-QI "doers" in terms of their relatively higher level of performance on immunization-specific supportive supervision checklists; and 3) ended direct UI-FHS technical assistance between May and September 2018, roughly 13–17 months prior to the inquiry.

KII and Sampling Frame

Key informants for this inquiry included three cadres of RED-QI participants: 1) management personnel (WoHO heads and EPI focal persons), 2) service providers (nurses and HEWs), and 3) community representatives on the QITs at the health post level. These key informants captured those working at a management level (with ability to view RED-QI through a systems lens), those involved in direct service delivery (responsible for incorporating RED-QI tools and approaches into their everyday work), and those engaged at the community level (to provide insight into their interactions with RED-QI and how the community perceives RED-QI in action). Fifty-four KIIs were conducted, 27 per region. Table 1 shows the number and type of respondents.

Table 1. KII Respondent Sample

Region	Woreda	WoHO	HC	HP	Total per woreda
Somali	Harshin	1	2	6	9
	Kabibayah	1	2	6	9
	Babile	1	2	6	9
Total per facility level (Somali)		3	6	18	Total regional KIIs = 27
SNNPR	Sodo	1	2	6	9
	Bonke	1	2	6	9
	Gena Bossa	1	2	6	9
Total per facility level (SNNPR)		3	6	18	Total regional KIIs = 27

Key: Management; Service Provider; QIT Community Representative

Data Collection

Eight qualified researchers conducted data collection for the inquiry. Data collectors underwent a two-day training on qualitative data collection methods, RED-QI, and project background; and a thorough review of all data collection tools. Data collectors were also provided with an extensive Field Guide Manual outlining key procedures for the inquiry. Immediately upon completion of training, the data collectors spent two days field testing the interview tools (in a non-study woreda) to assess the clarity of the questions, record the expected duration of the interviews, and practice using the guides to interview. Tools were revised based on team feedback after the field test.

Data collection was conducted over several weeks in October-November 2019 and split among four teams of two data collectors, with each team supervised by JSI/UI-FHS Addis Ababa office staff and international consultants. Interview guides were developed for interviews of various cadres and at levels of the health system, and were translated into two languages. Interviews were conducted in either the Amharic or Somali language; data collectors had native proficiency in the languages they used to conduct interviews. When documentation was available, record reviews at facilities were completed with relevant documents photographed.

Data Processing and Analysis

Data processing and analysis occurred in several stages. KIIs were audio recorded and transcribed to Word documents; translation to English occurred during transcription. At the end of each day of data collection, daily debriefs were conducted with team supervisors to discuss initial themes from the interviews, and to reflect on and refine interview skills and techniques. As initial interviews were transcribed, supervisors reviewed them and provided feedback on aspects needing more clarification and probing. Transcripts were imported into NVivo 12.

Upon preparing an initial set of codes based on the inquiry's objectives and guiding questions, an inductive content and thematic analysis approach identified emerging themes. A codebook with

definitions of codes was developed to provide coding guidance. Throughout the analysis, additional codes were constructed and broken out into sub-themes. Coders initially coded several of the same KIIs to align their understanding and agreement on thematic coding, and subsequently communicated closely throughout the analysis process for clarifications as needed.

Record reviews from facilities, when available, were catalogued and reviewed. Record reviews noted general trends and use of RED-QI tools; they did not serve to confirm or clarify information from specific KIIs, but rather, broadly confirmed thematic findings from KIIs.

Ethical Review

The sustainability inquiry was determined as exempt by the JSI Institutional Review Board (IRB) (OHRP IRB00009069 John Snow, Inc.). The basis of the exemption was CFR 46.101 (b) (2), which covers survey activities without identifiers or sensitive questions that could result in harm; no participants in the study were under 18 years of age.

All research was conducted in accordance with this approved submission. Personal or identifying information was not retained within the transcripts, which will be kept in a secure location. In addition, the SNNPR and Somali Regional Health Bureaus provided UI-FHS with letters of support permitting the project to visit health facilities and communities for data collection.

THEMATIC FINDINGS

Summary Findings:

- Key activities sustained included: **QITs, sites established for outreach sessions, defaulter tracking through community members, and microplanning.**
- Respondents in this inquiry viewed **QI as essential—though challenging—**because the approach enables stakeholders to examine and address problems in immunization in a context-appropriate manner.
- **Linking communities and health facilities** improved decision-making for immunization by leveraging community-specific knowledge to identify missed populations and strengthen service delivery.
- RED-QI led to **improvements in the effectiveness and reach** of immunization programs—**including in remote and nomadic areas**—and these have been sustained.

Examination of RED-QI as a Strategy to Strengthen the Immunization System

Context and challenges of the immunization program

Prior to JSI's technical support, HWs described very weak immunization systems. The remoteness of communities requires outreach and mobile service delivery strategies, but interview respondents repeatedly reported a lack of such sessions, contributing to low coverage and high dropout. A lack of access to basic resources within the health system manifested itself in several ways:

1) a shortage of fridges in health facilities to keep vaccines, which restricted the facilities' ability to easily provide regular services—particularly at the lowest level of the health system, and often in more remote areas;
2) logistical challenges in reaching remote communities, due to lack of transport/funds for transport, as well as difficult road conditions;
3) human resource constraints, including a very high workload and lack of remuneration for HEWs, though they were expected to carry out operationally challenging tasks, and
4) general lack of attention to and management of the EPI program.

Health workers also reported a shortage of basic reporting tools such as registers, tally sheets, and monitoring charts, and had little understanding of the necessity of reporting on immunization performance. Given the context and the many barriers to providing services, there was also a general lack of planning.

"There was also documentation problem especially information management was very poor; there was severe recording problem of the activities done. Due not filling of VRF (vaccine request form) on time, we didn't get vaccine drug supplies on time from higher level. The cold chain system of the vaccine was also not in according to the standard due to refrigerator problems. The refrigerator we had at that time was multi-purpose and overcrowded with other laboratory chemicals, antigens and rabies virus drugs and the like… The management of HEWs was also very poor. Most health extension workers do not go to work place and some of them reach at the level of forgetting their job. Just they considered providing vaccine one day within a month as routine immunization service. Health posts were almost closed. There was no integration within the facility… intra-facility linkage was very poor. Because of this there was high missed opportunities to immunize children who came to this facility for other services."

– SNNPR HC Staff

"I do have a colleague but I am working alone... She is on maternity leave for the second time. The population in our catchment is 3,800. It is very vast, and the topography is very tough, so additional HEWs should be employed."

– SNNPR HP HEW

HW respondents described challenges in communities, including lack of community awareness and misinformation or fear of side effects of immunization. There was also a general weakness in health system efforts to engage communities to address these challenges and increase awareness. Health workers reported that when caregivers did seek services, they also often faced logistical challenges such as long distance to services and lack of transport.

> **"[At] the time I have arrived in this health facility, there was low immunization coverage, poor involvement and utilization of the community on routine immunization, and poor knowledge of the community."**
>
> **– Somali HC Staff**

Challenges addressed through RED-QI

During implementation of RED-QI, staff at all levels and the community leveraged RED-QI tools and approaches to address their myriad challenges. Many respondents acknowledged improvement within the system and could articulate specific aspects that had improved.

- **Planning for and implementing immunization sessions designed to reach underserved populations:** Facilities planned more immunization sessions, including outreach, as a result of the improved microplanning process. Better outreach planning resulted in improved reach of services. Better planning also improved forecasting for vaccine needs, since woredas had a clearer idea of both the number of children they should be aiming to reach and how many sessions they should be holding. Overall, respondents acknowledged microplanning and mapping as a very important first step to addressing problems by having clear knowledge of target populations.

- **Community engagement:** Health workers' efforts to include the community in immunization service provision (facilitated by RED-QI tools and processes such as QITs and community input to microplanning) helped to build communities' understanding of vaccination and dispel fears, raise awareness and demand, identify remote communities to feed into planning that was fit for purpose (e.g., outreach, mobile), and improve defaulter tracing.
- **Collaborative problem solving between health workers and communities:** The QITs enabled health workers and community members to work together to proactively identify persistent problems and work through possible solutions. QITs were also integral to implementing the new solutions.
- **Use of data:** Health workers also saw value in improving data recording and using data on a more regular basis (e.g., in microplanning and tracking who had missed doses). Respondents noted overall better planning, monitoring, and use of data to make decisions.

"Previously I was the only person engaged in immunization program but now I have trained Health Development Army (HDA) and [we] work together. This helps to me focus on specific tasks and also improved my ability to actively participate in making changes to the program."

– SNNPR HP HEW

Use of QI to operationalize immunization service delivery

Broadly, incorporation of QI tools and processes into RED served to target, enhance, or otherwise push forward actions to improve the management and delivery of immunization. For example, the fishbone analysis QI tool was used during microplanning or other regular meetings to deeply examine root causes of problems to make changes to service delivery. Then, the QIT would help operationalize the new changes. As envisioned by the program design, QI was integrated into daily work and existing processes. This integration made it difficult for respondents to tease apart the specific effect of QI tools on immunization; it was not a standalone process, but rather, part of a holistic approach to improving immunization.

"I feel using RED-QI tools was helping us and improved the quality EPI service. For instance, RED-QI tools address follow up of the children who are taken first dose of routine immunization, but not come back the second dose of vaccination. These tools did a big job, because we now got knowledge: how can we use the QITs community representative to call all children who are not coming back to EPI service, and also we used this committee of community representative to raise community awareness. Another important job that RED-QI tools help us...monitoring chart was showing us if Penta3 and measles are low, then we search the root cause of these problems, and list the problems."

– Somali HC Staff

Although most respondents described a renewed focus on identifying problems in immunization and finding/testing new solutions, use of specific QI tools to facilitate this process (such as PDSA cycles or the fishbone diagram) was uneven across facilities. Some facilities routinely used the tools, often mentioning fishbone analysis/root cause analysis as tools or ways for identifying problems and finding local solutions. Other facilities reported using the tools for some time, but then stopping due to various disruptions including: staff changes, not fully understanding the tools/methods or finding them complex, or absence of further reinforcement by supervisors. However, in a few places where health workers had fully mastered the use of QI tools and processes, these skills helped them identify and solve problems in other technical areas.

Regardless of the degree to which specific QI tools and processes were used during any one activity, RED-QI as an approach overall engendered solutions to persistent challenges in reaching underserved populations. It improved the planning and arranging of fixed and—critically—outreach sessions; it successfully instituted mechanisms for tracing immunization defaulters or those entirely

left out; and it did so by involving community members, often through a QIT. Facilities used the RED-QI tools to identify persistent problems and develop solutions, which centered mainly on improving identification and reach of unimmunized or hard-to-reach children. HWs used the tools and their stronger relationship with communities to improve areas of underperformance by the health system, such as arranging appropriate outreach services, tracing children to reduce dropouts, and support for last-mile logistics.

Thus, RED-QI as a whole served to improve immunization, particularly for the underserved, and had some success leveraging QI tools/processes as a part of the means to that end.

Achievements in Immunization Service Delivery

Improved management and delivery of RI services

It was difficult to pinpoint improvements in specific management skills as a result of RED-QI, but there was evidence of general improvements in the management of the immunization program, which had initially been very weak. RED-QI improved service management by helping HWs identify challenges with the RI system in their service area, and offering a systematic approach for tackling them. Across all KIIs, it was clear that HWs and managers valued the contributions of RED-QI and the way it changed how they managed their work. They made data-driven decisions on specific aspects of managing the EPI program, such as targeting which health facilities are in need of extra support, managing the cold chain and vaccine supply requests, or identifying important issues to discuss during regular meetings.

> **"After the PDSA training, we added additional outreach sites. Previously there were only two: at health post and one outreach site at church level. Thanks to God there is no defaulters now and all newborns are getting vaccination."**
>
> **– SNNPR HP HEW**

Increased effectiveness of RI services

A key outcome of the RED-QI approach was the strengthened relationship between the community and health system—which in turn increased the reach of RI services. Across many interviews, respondents spoke of positive changes in the relationship and linkage between the health system and the community. This link was essential in enhancing community acceptance of immunization while increasing service uptake. Community members who were engaged in the QITs helped to align services to fit specific community needs. QIT members saw clear value in the QIT and in engaging in the health system, offering voluntary support in identifying and mapping communities, defaulter tracing, and mobilizing for outreach services to reach far-flung communities.

"As a member of QIT, I am happy when I see the community awareness is increased and children are vaccinated. The QIT hold meetings and discuss to identify problems and poor-performing health development armies. We work together with HEWs on awareness creation and mobilize the community during vaccination sessions as per the schedule."

– SNNPR QIT Member

"Distance does not have biggest effect now since the Health Extension Workers have addressed those unreachable areas with an outreach session, using Quality Improvement Team as mobilizers."

– SNNPR QIT Member

This strengthened community-facility partnership, facilitated by RED-QI tools and approaches, led to increased accountability for services by HWs. For example, one HW noted how he now informs community representatives of his schedule and when he may be absent from the health post. Interviews also revealed several examples of HEWs informing community representatives about scheduled immunization session dates, and of communities now expecting or seeking out services.

"It is good, the community has better awareness. If the HPs are not providing vaccination for some reason, parents are now carrying their children and walking to HCs though far from them to get the service. The community is even evaluating the work of HEWs if they have problems in providing the service."

– SNNPR WoHO Staff

Lessons on Sustaining Performance

Current status of RED-QI activities

To assess the current status of RED-QI activities roughly 13–17 months after the end of direct technical support, JSI examined: 1) what activities/processes that incorporated QI methods continued (including determining the extent of current use of QI tools): and 2) what solutions, initially introduced through a QI-driven process continued post-program support.

- **Quality improvement teams and QIT meetings** have continued and remain focused on problem solving and continuing communication/collaboration with the community. However, QI tools themselves (PDSA cycles, fishbone, run charts, etc.) were considered complex and difficult to implement at the facility level without support from supervisors;

supervisors had trouble as well. QITs had therefore reduced or ceased their use of these tools during their meetings or for documentation, due to lack of facilitation support.

> **"Truly speaking we are not using all [tools] like when JSI followed us, but still we are using the outreach site and quality committee [QIT] as before… There is also interruption of writing the quality committee [QIT] meeting minutes, but the meeting is going on every time."**
>
> **– SNNPR HP HEW**

In terms of solutions put into place through QI problem solving processes, several solutions were sustained.

- **Sites established for outreach remain** in underserved areas, though at times (particularly in Somali) some participants mentioned some budget constraints to implement all outreach sessions.
- **Defaulter tracing, powered by community participation and engagement of QITs**, has also continued.

Bottom-up microplanning, a foundational initial activity for planning that facilitates better management and delivery of services, was also commonly mentioned as continuing.

Building health worker capacity requires a comprehensive, continuous approach

Respondents repeatedly mentioned the **need for training and continued support** and mentoring. Training on RED-QI was greatly appreciated and transformed immunization services, as reflected in the positive changes witnessed. Still, some respondents expressed dissatisfaction. The training's duration, content, and sometimes quality varied; and often, HEWs viewed it as complicated and too short, without providing enough time to grasp all the concepts and issues. Post-training support and follow-up (e.g., through supportive supervision) offered a good opportunity to clarify training concepts and understand how to begin applying them in their work, and HW respondents saw this ongoing support as critical. Particularly within a context of staff turnover at both supervisory and provider levels, sustaining capacity for RED-QI was perceived as requiring continuous human resource development.

> **"No it [RED-QI training] was not adequate and at the time I was confused; I gradually learned what RED-QI means. I used to ask the Woreda EPI Focal Person how things are done and he helped me a lot in understanding what RED-QI means. Then, as result of [on] job training it improved my understanding in immunization services and doing the outreach services."**
>
> **– Somali HP HEW**

Several respondents noted challenges with teaching technical aspects of RED-QI due to health worker attrition and transfers. Some respondents did not feel that they could adequately orient

newly arrived staff on QI tools, or transfer the knowledge if they themselves transferred to a new post, because they considered the content complex and lacked materials and/or skills to teach others. However, there were several examples of respondents who had transferred to another post, and subsequently implemented some of the solutions that they had previously put into place through QI problem-solving processes (e.g., a defaulter tracing mechanism).

System inputs required for sustaining performance

Various factors contribute to sustained performance over time, including the overall context in which the program is implemented. As with any other health or development program, RED-QI does not exist in a vacuum. It lives within a broader context that inevitably affects the program's implementation and sustainability. RED-QI, like most other public health initiatives in Ethiopia, confronts basic problems: **lack of essential health system inputs**, the sheer weight of **responsibilities** placed on frontline providers, and **sporadic political/social unrest.**

One system input affecting sustainability is health worker **accountability**. As discussed, strengthened communication and partnership between the health facility and the community led to greater accountability for services at the lowest level, which helped sustain activities to immunize every child. Greater accountability from health workers meant improved service delivery; but at higher levels of the health system (at district level), managers did not commonly apply QI techniques to examine larger systems issues. This may have affected long-term implementation of certain activities.

For example, many respondents viewed **supportive supervision** for immunization as essential, but it was not consistently provided by health management after direct RED-QI support ended. Health workers were frustrated by the lack of supervision and support, and deflected responsibility upwards, while supervisors were frustrated by a lack of sufficient resources (e.g., transport, per diem) to conduct supervision regularly in remote areas. Each level of the health system blamed the next level up for deficiencies in the system, and at the district level, RED-QI tools were not used to address larger problems, such as overcoming barriers to implementing supportive supervision regularly, addressing health worker turnover and capacity, or trying to find new funding sources to continue outreach or mobile services.

> **"For example, I did not see any persons from the woreda doing supervision and no supervisor comes for supervision at my HP... I can say that I have no good understanding of what my supervisor expects from me."**
>
> **– Somali HP HEW**

Human resources for health, a core health system input and factor in sustainability, also has serious challenges in Ethiopia, and this was reflected in the KIIs. At the management level, competing priorities meant that managers' ability to focus on RED-QI as a priority area for supervision was mixed. Trained managers may transfer out, leading to a loss of institutional memory and leaving remaining staff particularly strained. A continually under-resourced, under-staffed management team also presents challenges for technical assistance providers such as those in UI-FHS, as some "gap filling" is bound to occur within this context (e.g., for supervision). This can affect the overall long-term sustainability of the technical assistance, if larger actions are not taken to fully resource managerial staff. At the provider level, health workers/HEWs are overburdened with an immense amount of work, both technical and administrative. Competency/skill levels among health workers

vary, but support either through on-job supervisor visits or professional skills-building opportunities is infrequent. This lack of support, besides having impacts on the quality of HWs' services, can also reduce motivation.

> **"They [HEWs] are overloaded with a lot of activities. To tell you frankly, you and I both cannot accomplish together the activities given to a HEW... The other challenge is they do not have better opportunities. HEWs have served for many years in rural kebeles but their salary is very low and they do not have education opportunities. Due to these reasons, they despair."**
>
> **– SNNPR HC Staff**

Political and social unrest also played an important contextual role in sustainability of RED-QI activities. For part of 2018–2019, in between the cessation of RED-QI support and implementation of the KIIs to assess sustainability, notable social unrest occurred in SNNPR in relation to a statehood referendum in the region. Periods of protest and unrest caused major disruptions in daily life and travel. This civil unrest also affected health system functionality, with reports of absenteeism from workplaces and temporary health facility closures due to safety concerns. Thus, the delivery of health services and capacity building for health workers was halted in some areas. As one respondent noted:

> **"To speak frankly, currently we stopped calling the [QIT] committee meeting as before. Before, we frequently call the [QIT] committee meeting and discuss the progress of our achievement and evaluate what we did. Many staff who received the training from woreda and health center left to the district hospital which recently opened, and no one is supporting us. Even the health post was closed, from December 2018 to May 2019."**
>
> **– SNNPR HP HEW**

Service disruption due to social unrest affected sustainability in SNNPR, and undid some of the progress made during RED-QI implementation.

Nevertheless, the inquiry showed that despite serious system and contextual challenges, which affected sustainability to a certain extent, there was evidence that RED-QI's problem-solving, results-driven approach had appeal with health workers. Besides benefiting from the engagement of the community through QITs, trained providers had a better understanding and use of data for local decision-making, and improved management capacity for setting up systems for monitoring and follow-up.

It takes time and resources to internalize and institutionalize a health systems strengthening strategy

Incorporating QI into RED was seen as both essential and challenging, due to both the technical aspects of QI and the nature of the approach and its ability to flexibly address various types of issues. Some respondents noted the relatively short period of technical support (e.g., roughly 12

months in SNNPR and 20 months in Somali) and said they would like additional training to further master and more deeply institutionalize the approach.

Although the cessation of support (combined with continuing general systemic problems) led to reduced knowledge and use of QI tools over time, some facilities made adaptations that worked for them--especially, continuing to meet with the community, even without QI tools, to determine how to solve problems. These adaptations represent what was ultimately feasible and manageable for facilities to continue. Several of the important solutions they had instituted remained, and respondents felt there was clear improvement in the delivery of immunizations that persisted.

Thus, RED-QI was not a panacea and could not solve broad health system challenges and restraints. Even so, it did improve the management and delivery of immunization services for underserved populations; and these improvements continued despite the relatively short implementation period.

STUDY LIMITATIONS

The sustainability inquiry had several limitations.

The research questions were illustrative and highly conceptual, and some questions could not ultimately be answered in full—for example, whether health workers believed they had strengthened their adaptive capacity (ability to solve problems, stronger management skills). Respondents often shared their experience in more generic terms, and in spite of further probing, could not articulate their perceptions about this multi-faceted program in a nuanced manner.

Local languages used a variety of terms for different aspects of QI tools and approaches. As much as possible, the inquiry KIIs tried to use the familiar, correct local words. Yet translated tools could also suffer from confusion, including because some respondents used different terms like PDSA, RED-QI, and fishbone interchangeably. Researchers tried to clarify shared understanding of technical terms through probing.

In SNNPR, the political situation created a vacuum in the health system, including disrupting the immunization system, as discussed. This also affected the inquiry, because it was not possible to reach all staff who had been exposed to the program, since some had vacated their posts and activities had been dropped.

RECOMMENDATIONS

Implementation of RED-QI helped to strengthen routine immunization service delivery, even in the weakest health systems in Ethiopia. Based on the findings and experience of RED-QI, the following recommendations should be considered as Ethiopia scales approaches to sustainably strengthen the RI system over the long term, with a goal of delivering more equitable services.

1. The Ministry of Health currently has a strategy that supports expansion of QI approaches at scale in the country but many initiatives, such as Quality Improvement Teams and PDSA cycle use at lower levels, are not operational. The MOH should **re-invest in the start-up of**

QITs at each level of the health system, and **integrate QI tools/methods** into planning and analysis of service delivery.

- QI tools should be used to **strengthen the adaptive management skills of subnational staff**, as part of a wider, multi-faceted **capacity building strategy** for health workers. It is critical to invest in management capacity and increase HWs' autonomy and accountability at the sub-national level. This will enable staff to build a more resilient health system and equip them to respond and adapt to local problems.

2. Reaching every child requires **continuous investment of resources in RI systems** and tailored approaches. Resources and strategies to reach the underserved should be prioritized and consistently funded. This includes **supporting bottom-up microplanning with community input and funding for outreach/mobile services**. As long as immunization remains chronically underfunded, lacking basic inputs such as last-mile transport costs and irregular supervision, frontline health workers will continue to struggle to reach the most underserved communities with this basic health service.

3. **Community engagement is critical to achieve broader reach of RI services, particularly to underserved populations**. There are concrete, doable actions that health workers and the broader health system can take to actively encourage community engagement. For health workers, this means engaging the community in routine activities such as microplanning and QITs, which reinforces communities' involvement in planning and using health services. For the health system, it means facilitating community engagement as part of HEWs' major professional responsibilities—for example, giving HEWs time to routinely go into the community or meet with QITs, and supplying HEWs with airtime allowances to call community members for meetings, or to follow up on missed vaccinations.

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