



# Use of Quality Improvement Approaches to Strengthen Immunization Service Delivery and Reach the Hardest to Reach Populations



Barry Steinglass

Despite impressive advances over the past several decades, immunization coverage globally has plateaued. In 2019, an estimated 13.8 million children under 1 year of age did not receive any lifesaving vaccinations (“zero-dose” children), and a further 5.9 million children were only partially vaccinated, leaving them susceptible to vaccine-preventable disease.<sup>1</sup> There is a growing need to address inequity in immunization service delivery to ensure that all children have access to vaccination services that are safe, effective and of quality.<sup>2</sup> The emergence of a new disease, COVID-19, only adds to the urgency of ensuring equity in immunization: eliminating barriers in policy, governance, budgeting, and implementation so that *all* children have access to safe, effective, high-quality immunization services.

The Universal Immunization through Improving Family Health Services (UI-FHS) project (2011–2021), implemented by John Snow, Inc. (JSI) with the Ethiopian Ministry of Health (MOH), shows how a multifaceted approach can build equity in immunization from the ground up by instilling **innovative approaches to current strategies and improving use of new and existing resources.**

1 <https://data.unicef.org/topic/child-health/immunization/> [accessed 08.08.20].

2 Inequity in immunization: Avoidable differences in immunization coverage between population groups that arise because barriers to immunization among disadvantaged groups are not addressed through policies, structures, governance or program implementation <https://dx.doi.org/10.2471/BLT.19.241620>



## AT A GLANCE

### Improving Immunization Service Delivery for the Hardest-to-Reach Children



Invest in **building the capacity of health workers** to partner, build ownership and trust, with communities in an effort to provide quality immunization services.



**Use community resources and knowledge.** Involve knowledgeable community leaders in planning targeted outreach and mobile services to reach all communities, including remote and pastoralist populations.



**Work with communities to improve service use.** Community members’ knowledge and endorsement can enhance acceptance, improve utilization of services and track defaulter children.



**Support data use.** Using data from all available sources—headcounts, community maps, checklists—can strengthen program targeting and tracking.



**Use quality improvement tools.** By forming Quality Improvement Teams (QITs) using QI tools, facilities and communities can work together, to strengthen planning for service and outreach, identify service gaps, monitor progress, and address challenges.



**Invest in supportive supervision** to strengthen the quality of service delivery and of the generation of accurate data at the district and HF levels.



Ensure that **managerial staff have the skills, tools, resources, and institutional support** they need to support and monitor system improvements.

## CONTEXT

Ethiopia has made impressive gains in improving immunization coverage since introducing the national Reaching Every District (RED) strategy in 2003. However, major gaps remain—leaving wide variations in coverage and access to services—and Ethiopia is ranked 5th globally with the most unprotected children – 1.1 million.<sup>3</sup> The JSI/MOH intervention focused on four states, termed the Developing Regional States (DRS),<sup>4</sup> where many children remain under- or unimmunized. For example, in the Afar and Somali regions, about half of children (45 percent and 49 percent, respectively) received no vaccines or “zero doses” of vaccine, compared to the national average of zero dose children, which is 19 percent (Figure 1).<sup>5</sup> JSI’s approach was to focus on bridging the equity gap by reaching zero dose and under immunized children through **strengthening facility-community linkages, improving management, and building capacity to plan and monitor immunization services.**

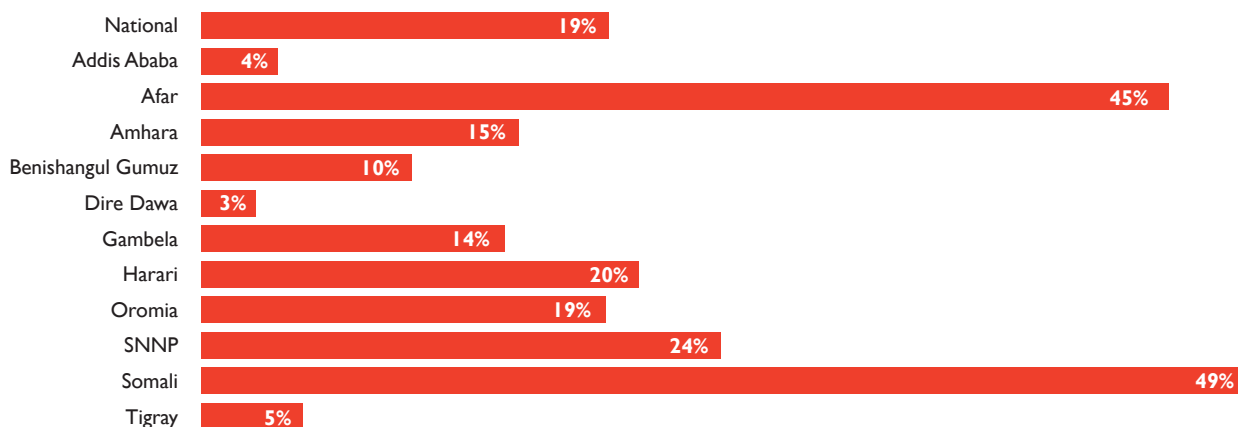
JSI identified three main determinants that produce inequity in the Ethiopian context:

- 1) Weak linkages between the health system and communities
- 2) Deficiencies in critical health system management processes that affect the provision of quality immunization services, such as immunization microplanning, regular supportive supervision, and routine monitoring of data
- 3) Limited capacity of the health workforce to effectively plan, deliver, and monitor immunization services

**Weak linkages between the health system and community:** A significant proportion of the population in the DRS is nomadic. It is a challenge for the health system to identify, reach and track each child over the first 15 months of life to receive all necessary vaccinations. In addition, much of the DRS population live in vast expanses of land in extremely hot desert climates with very limited infrastructure (roads, telephone, internet, etc.); this means that service provision from static health facilities is challenging. A UI-FHS analysis of 123 district microplans from the four DRS regions found that in 2019, **51 percent of planned immunization sessions were through mobile and/or outreach services**—representing 89,434 people, nearly half (47 %) of those projected to be reached for immunization. As healthcare is often provided intermittently (through mobile or outreach services), there is limited opportunity to establish and build a cohesive bond between the community- and the health system. This only exacerbates the challenge of reaching these communities with life-saving vaccination.

**Deficiencies in critical health system management processes:** In the DRS, some of the basic system components to manage high-quality and regular immunization services are not fully functional. Health care facilities often lack an immunization microplan; tools and systems to review and monitor data are weak, unavailable, or seldom used; staff commonly lack the ability to use local data to problem solve, and functions such as vaccine distribution and cold chain are limited, particularly at the facility level. Because expanded services (mobile and outreach) are necessary in the DRS, the health system **relies on partners to fill in resource gaps** for daily operations (such as transport for mobile and outreach services) making it unsustainable after the end of partners’ support. These issues seriously affect the health system in its ability to provide equitable immunization services.

**Figure 1. Percentage of Children in Ethiopia by Region Who Have Not Received Any Vaccinations at All (“zero dose”)**



3 WUENIC 2020. SAGE October 2020 Meeting.

4 The Developing Regional States include the Afar, Benshangul-Gumuz, Gambella, and Somali regions of Ethiopia.

5 The 2019 Ethiopia Mini Demographic and Health Survey; <https://dhsprogram.com/pubs/pdf/PR120/PR120.pdf>

**Health workforce capacity to effectively plan, deliver and monitor immunization services:** The health care workforce in the DRS, particularly female HEWs as defined by the Health Extension Program, are comparatively less qualified than in other regions, due to acute shortage of females in schools who meet minimum requirements to be trained as HEWs. The general staff have limited access to capacity building opportunities, other than classroom training which is insufficient on its own, to assess their own skills (Rowe 2018). At the management level, the capacity to design and manage immunization service delivery is either inadequate or lacking completely. These issues reinforce the need for a comprehensive capacity building strategy designed to improve the effectiveness and efficiency of the immunization program. In 2018, UI-FHS facilitated a self-assessment exercise, which revealed that only 27 percent of Regional Health Bureau (RHB) staff felt competent in their ability to manage funding for immunization, 15% reported to have the skills to build the capacity of their teams and 29% felt competent in their ability to develop an annual plan.

## JSI'S APPROACH

JSI's approach addressed inequity in immunization programming from the ground up, working at the facility, district, and regional levels to carry out the following three strategies.

### I. Engage communities in health programming to identify, target, and reach all children.

Planning for service delivery is a critical first step for immunization programs, but understanding the means to find and track children is also essential—especially in regions with dispersed populations, low-infrastructure and those with large nomadic communities, such as Ethiopia's DRS. JSI's strategy combined strong community engagement and quality improvement (QI) approaches. By working with both facilities and local leaders—leveraging their unique knowledge of their communities—and using QI approaches to plan and target fixed and outreach immunization sessions—JSI helped to improve service delivery by defining targets and ensuring planned outreach sessions happen at the right times and places to reach the desired number of children. The following principles describe how community engagement strengthened equity and access.

#### Approach:

- Include community members and district administration in the microplanning process, both at facility and district levels. Community members helped generate more accurate estimates of the target population by collecting headcounts, conducting community mapping of catchment areas, and planning when and where outreach and mobile sessions



## QI Approaches

- Collaborative decision making through Quality Improvement Teams
- Localized problem solving through Plan-Do-Study-Act (PDSA) cycles
- Root cause analysis

## Incorporated into the following immunization activities:

- Microplanning
- Supportive supervision
- Quarterly Review Meetings
- Addressing issues with the cold chain

should take place. Resourcing for immunization service delivery can be improved through inclusion of budgeting officials and local administrative leaders in the planning process. These leaders should receive regular updates on service implementation and the status of the immunization program.

- Involve communities in service delivery. Use leaders to mobilize their communities for immunization sessions, support traveling to outreach or mobile sites by providing local guides and help track zero-dose and defaulter children.
- Use quality improvement (QI) approaches to set immunization goals, identify bottlenecks, seek local solutions and monitor progress. JSI helped communities to form new or revitalize existing groups as Quality Improvement Teams (QITs), introduced or strengthened QI practices into activities such as microplanning and community mapping.

Communities also took part in brainstorming ways of expanding the availability of immunization services (thinking through reallocation of human resources, cold chain equipment, and community advocacy).

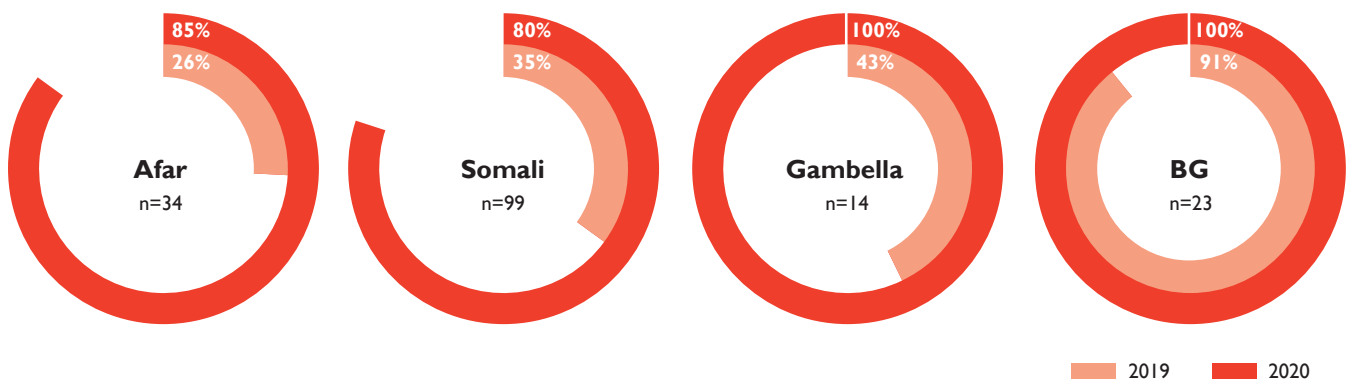
One of the clearest benefits of engagement with the community was increased use of defaulter tracking mechanisms to identify and track children who missed vaccinations. Assessment results comparing 57 facilities across the four DRS from baseline (2014) to endline (2018) found a 40 percent increase in the number of facilities that reported using defaulter-tracking mechanisms to track and vaccinate under-immunized and zero-dose children. As importantly, we also saw improvements in immunization microplanning in all four DRS regions from 2019 to 2020 with support from UI-FHS (Figure 2).

## 2. Operationalize health system management processes by enhancing health workers' use and management of data to improve the reach and quality of immunization services.

Health care workers (HCWs) and managers are central to immunization service delivery—those who design, implement, and monitor the immunization program. To improve the quality and reach of immunization service delivery, HCWs need to be able to identify service delivery challenges and use locally developed solutions to address them. To maintain and adjust their performance, HCWs require basic health system tools be available (i.e. immunization tools for monitoring such as an EPI monitoring chart), and that processes such as supportive supervision and review meetings be routine.

Recognizing the importance of quality data to make program decisions, UI-FHS focused on building both capacity and accountability in practices to improve immunization data—starting in facilities, where data is generated. This entailed using QI approaches to understand the importance of collecting, analyzing and using data. Over the course of the project, the RED-QI approach helped immunization managers and health workers to

Figure 2. Percentage of Districts in Each Region with an Immunization Microplan



increasingly integrate regular collection, review, and use of data into the management and delivery of immunization services.

**Approach:**

- Empower EPI (Expanded Program on Immunization) managers and health workers to use the data they have. Coach HCWs to review multiple data sources and help them to understand if data discrepancies exist and work with them to improve the quality and accuracy of data, starting from the point of generation at the facility level.
- Strengthen the skills of managers and health workers to use data, management tools and processes to solve problems.
- Build the capacity of HCWs through a comprehensive, continuous approach that includes training, on-job support, peer learning and supportive supervision.

At the district level, JSI's support centered on building skills of EPI managers and health staff to use data generated at the point of service delivery to solve problems. HCWs expanded their use of data improvement efforts, such as encouraging headcounts to improve accuracy of population estimates, as well as input from community members to improve session planning and service delivery to meet the needs of the population.

JSI's support to EPI managers also included building their capacity to use tools that facilitate data analysis and evaluate these data during routine review meetings. JSI developed an Excel based RED categorization tool based on WHO's system of cross-

tabulating coverage data to determine access to and utilization of immunization services. The tool allows users to identify facilities that need support (e.g., low coverage or high dropout), suggest actions to take, and develop a course for following up. In a review of supportive supervision data of 61 districts that received three or more supervisory visits, the use of RED Categorization tool at district level improved from 39 percent to 71 percent from first to last visit, indicating increased use of data and suggesting a growing appreciation of the value of good data to better manage programs. Managers could also use their data as justification to advocate for additional resource allocation and expanded service delivery.

Building and maintaining HCWs' capacity requires ongoing support and a supportive environment that embraces peer learning. In the DRS, where staff capacity is limited and turnover is high, institutionalization of supportive approaches such as peer learning and supportive supervision is critical. JSI used supportive supervision to help providers improve their performance while also offering on-the-job skill updates to strengthen immunization practices. Supportive supervision reinforces directly learned skills and gives HCWs a chance to refine their understanding.<sup>6</sup> Figure 3 shows improvements—sometimes dramatic increases—in district-level performance scores among facilities that had three or more supervisory visits (averaging 64 percent). This suggests that on-the-job coaching improves the quality of immunization services by improving HCWs' ability to plan and manage their facility's immunization activities.

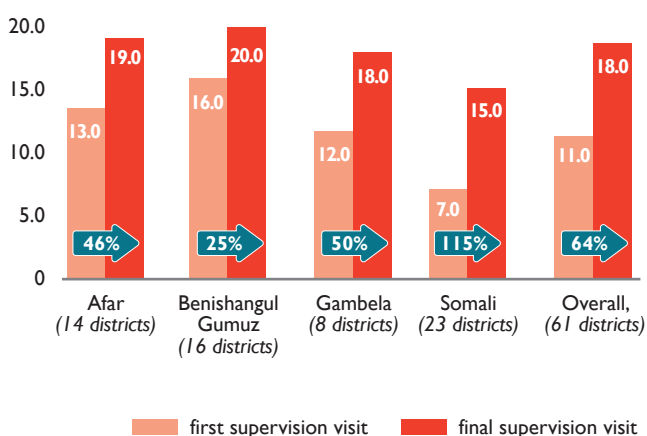
**3. Build health workforce capacity to plan, implement and monitor immunization services**

Improving a weak health system—especially in hard-to-reach areas with nomadic populations—requires a multi-tiered approach<sup>7</sup> that strengthens services from the bottom up and the top down simultaneously. This means improving problem solving skills at the health facility level (such as focusing on defaulter tracing) while also building capacity to address larger, systemic issues at the zonal and regional levels (such as improving functionality and outreach at all facilities in the district or region)—as well as components from the wider health system that influence EPI activities. JSI's approach to capacity building focused on using QI approaches to help HCWs and managers to identify immunization challenges and take stepwise measures to address them.

**Approach:**

- Institutionalize a process to identify skill gaps at the managerial level.
- Use QI tools to identify and break down systems problems into feasible, measurable actions.

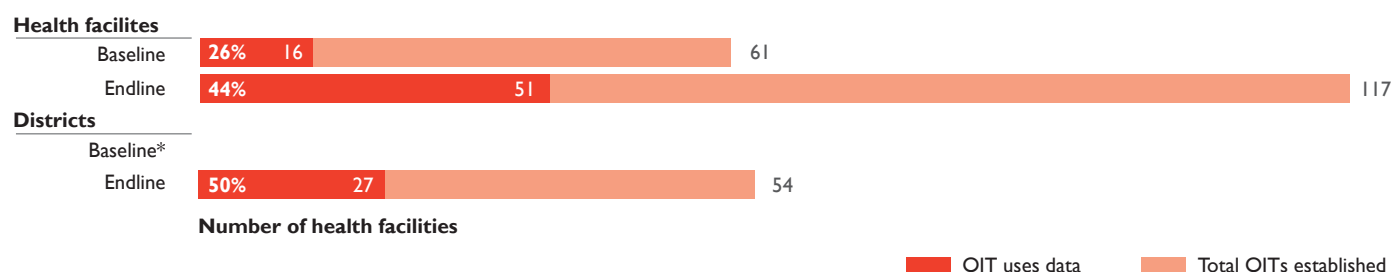
**Figure 3. Regional Average of Total Scores and Percent Change on EPI-specific Supervision Checklist, District Level Ethiopia (of districts that received ≥3 supervision visits, n=61)**



6 Ameha et al, 2014. Effectiveness of supportive supervision on the consistency of integrated community cases management skills of the health extension workers in 113 districts of Ethiopia. <https://pubmed.ncbi.nlm.nih.gov/25845075/>

7 Senkubuge, et al. Strengthening health systems by health sector reforms. <https://www.tandfonline.com/doi/full/10.3402/gha.v7.23568>

**Figure 4. Use of Data Among Established QITs (out of facilities that received ≥3 supervision visits)**



Source: UI-FHS project supportive supervision data

\*Baseline not available

- Support HCWs to use QI tools and processes to improve local problem solving. At each level of the health system, encourage development of a QIT whose members collectively identify problems within the immunization system, propose solutions to problems and monitor the outcomes.

At the regional level, JSI strengthened individual capacity to manage immunization programs and institutionalize practices into the health system. This began with a self-assessment questionnaire, which assessed individual competency in 15 skills critical for immunization programming. Following the self-assessment, JSI supported EPI managers to develop action plans to improve competency areas based on the self-assessment findings.

Subsequently, health managers reported to have their competency increased in several areas critical to management of a routine immunizations system over a period of one year, from December 2018 to October 2019. The self-assessment questionnaire has been integrated into annual joint planning, during which the RHBs review their progress each year and identify areas for further skills building (Table 1).

In addition, JSI worked with each RHB to examine the functionality of 12 health system components related to immunization (e.g., planning for immunization services, human resource management, budgeting, program monitoring). JSI then supported the RHB in developing strategies to address the stated problems with operationalizing these 12 components. During each year's joint annual planning meeting, the outcomes of these strategies are monitored and updated.

At the district and facility levels, JSI trained managers and HCWs to incorporate QI tools and processes within their immunization activities. Quality improvement teams were formed at each level of the health system and at the community level, comprised both HCWs and respected community members.

The QITs held regular interactive meetings and used available data and resources, including community members' knowledge, to identify major barriers to full immunization coverage within their catchment area, develop action plans to address them, and monitor progress and outcomes.

The majority of facilities in the intervention areas established QITs and used QI approaches help them analyze and improve their immunization program. The QITs used data on immunization coverage, local knowledge, and other available data to improve the quality of immunization services and health services in general. Over time, data use increased significantly across facilities and districts (Figure 4).

**Table 1. Change in Percentage of Respondents Self-Reporting “Competent” and “Expert” Immunization Skills for Select Indicators\***

Capacity Building Category	% point change from December 2018 (n=58) to October 2019 (n=61)
Provide capacity building to lower-level staff	↑ 34%
Manage funds and determine the allocation of resources for immunization	↑ 22%
Data analysis, interpretation, and use	↑ 16%
Use of QI tools	↑ 29%

\* DRS regions: Afar, Benshangul-Gumuz, Gambella, Somali

## RECOMMENDATIONS

Our experience in the four DRS regions in Ethiopia shows that implementing the following recommendations could strengthen the health system and primary healthcare workforce to identify, target, and reach the hardest-to-reach children in other countries.



Immunization programming must include technical assistance, along with adequate resources, to improve service delivery for all hard-to-reach populations (urban poor, rural remote, and nomadic). This should include:

- i. Supporting districts and facilities to engage the community in planning and implementing health services, particularly during development of immunization microplans;
- ii. Allocating resources to ensure static facilities are operational for immunization service delivery (e.g. expansion of static services) and allocating regular funding for outreach and mobile services indicated in the plan;
- iii. Establishing QITs to strengthen community trust and participation in health services.



Immunization services must be adapted and contextualized using participatory methods, including human-centered design, to elicit information from communities and local health workers to inform decisions on service delivery.



Design systematic capacity building approaches to increase the resilience of the health care system, mitigate the effects of staff turnover and maintain services during emergencies such as the COVID-19 pandemic. Use of approaches such as self-assessments to identify deficiencies in competency areas for immunization, applying didactic training, and promoting supportive supervision to support skills building and empower HWs to help and teach each other. This is particularly important in districts and health facilities where local capacity is low and attrition is high.



Ensure continuity of various types of experience sharing among HCWs and managers at all levels: exchange visits, online forums (where possible), and review meetings enable information-sharing among peers and between lower and higher levels. Prioritizing and resourcing peer learning can help to mitigate the effects of high HCW turnover.



Strengthen use of data at each level of the health system to improve program implementation, enabling context-specific actions. Reinforce quality data at the point of generation; and build in mechanisms, such as supportive supervision visits, to provide coaching and support on data quality. Conduct data analyses monthly, and review multiple data sources to mitigate data quality issues and improve interpretation and use of program data.

There is much to learn from experiences across the spectrum of implementing primary health care programs. The immunization program is well positioned to serve as an entry point to engage communities to identify and overcome challenges, to bridge equity gaps and improve access to services—ultimately maximizing the reach of immunization and all other primary care services.

## Strengthening Immunization Systems

# IN ETHIOPIA

JSI's 10-year (2011–2021) Universal Immunization through Improving Family Health Services (UI-FHS) project is using innovative approaches to expand equitable access to routine immunization (RI) services for all eligible children in Ethiopia—including those in hard-to-reach pastoralist communities. The project, funded by the Bill & Melinda Gates Foundation and implemented by JSI Research & Training Institute, Inc. (JSI), currently works in five of the country's 11 regions.

To reach these “last-mile” communities, JSI built upon the Federal Ministry of Health (FMOH) national strategy for RI, Reaching Every District (RED). The project's innovation, RED-QI, integrates quality improvement to the RED approach. RED-QI's three mainstays—strengthening community-facility linkages, sustainably building capacity, and improving data use—target regional-, woreda-, and facility-level managers and health workers. The approach helps them plan, implement, and monitor tailored health services to reach all children with RI, regardless of where they live. The expectation is that strengthening the management and delivery of context-specific RI services will not only offer full protection to all eligible children, but also has the potential to increase access to a wider range of primary care services.

The RED-QI approach represents a promising practice for immunization coverage in remote pastoralist communities. Based on the success of initial testing in three woredas and expansion of the approach to 103 woredas, the FMOH integrated several RED-QI practices within its national guidance. JSI's experience increasing access to immunization among hard-to-reach communities offers useful information on how to achieve equity in services for all children.

