



# Learning from implementation of the Reaching Every Child using Quality Improvement (REC-QI) to strengthen the routine immunization system in Uganda

## MCSP Uganda Routine Immunization

April 2019

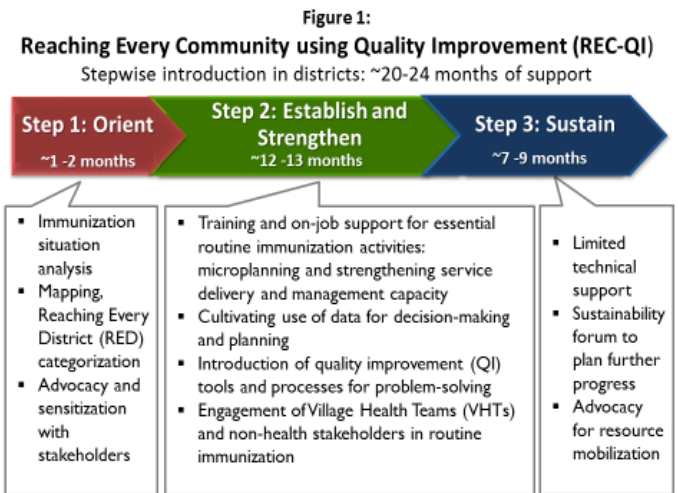
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For the past seven years, global rates of childhood immunization coverage, as estimated by a third dose of pentavalent vaccine (DTP3), have plateaued at approximately 85%—below the global target of 90%. In Uganda, DTP3 coverage, as estimated by the World Health Organization (WHO) and the United Nations Children’s Fund (UNICEF), remained at 78% from 2012 to 2017<sup>1</sup> and this level was confirmed by the 2016 Demographic and Health Survey (DHS). Novel approaches have been needed to strengthen local immunization management capability to address obstacles, improve performance, and reach those populations underserved by immunization and other primary health care services.

### Background

The United States Agency for International Development (USAID)’s Maternal and Child Survival Program (MCSP) worked closely with staff from the Ministry of Health (MOH) and Uganda National Expanded Programme on Immunisation (UNEPI) and district health teams with the stated objective of “improving district capacity to manage and coordinate the immunization program as guided by UNEPI leadership.”

To do so, MCSP has incorporated quality improvement (QI) concepts and tools into the standard Reaching Every District (RED)/Community (REC) management approach<sup>2</sup>. While Uganda was one of the first countries to introduce RED in 2004 and updated it to REC in 2007, REC’s widespread use by districts and health facilities was limited by persistent operational challenges; for example, analyzing data to prioritize problems and conduct detailed planning of service delivery proved very challenging to health facility staff. The innovative application of QI concepts and tools to Reaching Every Community, referred to as REC-QI, was designed to help UNEPI achieve its own



<sup>1</sup> Re-estimated by WHO/UNICEF in 2018 at 85% and retrospectively applied to years 2014-2017. WHO immunization monitoring database accessed 1 November 2018.

[http://apps.who.int/immunization\\_monitoring/globalsummary/countries?countrycriteria%5Bcountry%5D%5B%5D=UGA](http://apps.who.int/immunization_monitoring/globalsummary/countries?countrycriteria%5Bcountry%5D%5B%5D=UGA)

<sup>2</sup> Reaching Every District (RED) - A guide to increasing coverage and equity in all communities in the African Region: <https://afro.who.int/publications/reaching-every-district-red-guide-increasing-coverage-and-equity-all-communities>

goals for implementing REC. REC-QI is comprised of mutually reinforcing actions to build health personnel capacity with the goal of improving the management, delivery, and utilization of routine immunization (RI) services at the subnational level. Its components include:

- **Micro-planning.** Although UNEPI has required health facilities to prepare micro-plans for many years, few facilities had done so prior to REC-QI introduction. MCSP supported facilities to develop micro-plans, enhancing the utility of the standard micro-planning process by adding:
  - participatory community mapping to accurately identify catchment populations
  - root cause and fishbone analyses to identify the underlying causes of problems
  - Pareto analysis, which prioritizes problems having the highest impact<sup>3</sup>
  - Plan-Do-Study-Act (PDSA) cycles to test solutions crafted by health workers and community members working together
- **Quality Work Improvement Teams (QWITs).** Comprised of health workers and community members, QWITs focus on immunization and conduct PDSA cycles, trace defaulters, and obtain community input on optimal location and time for vaccination outreach sessions.
- **Data Use.** In addition to root cause and fishbone analyses, MCSP's work included introducing data quality self-assessment and improvement and building health worker capacity to monitor immunization coverage and drop-out rates to inform their own actions.
- **Supportive Supervision.** MCSP revised existing supportive supervision tools to increase the focus on health worker capacity building and on-site mentorship, particularly for data analysis and problem-solving. Supportive supervision visits were conducted by MCSP staff plus local health staff and non-health stakeholders.
- **Quarterly Review Meetings (QRMs).** These meetings are held with both health personnel and local non-health stakeholders (described below) to review performance and "think outside the box" to problem-solve, mobilize local resources, and flag problems needing national level attention.

The collective REC-QI inputs, when coupled with such critical system inputs as sufficient vaccines and other supplies, human resources, transportation, and cold chain equipment, are intended to strengthen the RI system in several ways, including by improving planning of immunization sessions, identifying and providing services to underserved communities, increasing the quality and completeness of immunization data, which, in turn, is expected to contribute to uniformly high and equitable immunization coverage.

With technical support from a small MCSP team of two district technical officers and two national-level staff who work in tandem with national, district, and health sub-district MOH personnel, MCSP introduced the REC-QI approach shown in Figure 1 to approximately 400 facilities in 11 districts across four regions of Uganda.<sup>4</sup> The REC-QI introduction process extended over a period of 20-24 months per district with a gradual reduction in technical and financial support for implementation in the final months (the "Sustain phase").

A key focus of MCSP's support was to leverage existing district structures and resources so that REC-QI practices can be maintained even after direct support from the Program ended. This vision is grounded in developing the capacity of the health workforce at district, health sub-district, and health facility levels, and it extends to the engagement of non-health stakeholders, such as local civil authorities and politicians, whose support and resource allocation decisions directly affect the provision of immunization services.

Through continuous learning and adaptive management,<sup>5</sup> MCSP modified the REC-QI approach in several ways since 2014 to improve its effectiveness and scalability in Uganda. Some key modifications include incorporating a coaching and problem-

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<sup>3</sup> See, for example: <https://www.urc-chs.com/sites/default/files/AModernParadigm.pdf>, page 72-73.

<sup>4</sup> REC-QI has been introduced in ten additional districts with support from the Bill & Melinda Gates Foundation through the Stronger Systems for Routine Immunization project, 2014-2019 and had previously been introduced in another five districts under the USAID-supported Maternal and Child Health Integrated Program in 2012-2014.

<sup>5</sup> Defined by USAID as, "an intentional approach to making decisions and adjustments in response to new information and changes in context." ADS Chapter 201 Program Cycle Operational Policy, 2018

solving into existing supportive supervision activities of the immunization program; involving all clinic staff (not just vaccinators) in supportive supervision in order to reduce missed opportunities for vaccination; building the leadership and management capacity of health facility in-charges as they play a pivotal role in assuring the quality of immunization (and other) services provided by the facility; revising the flow and sequence of activities for QRMs; increasing the engagement of non-health stakeholders in planning, supervision, and review meetings in order to improve local ownership, accountability, and resource mobilization for RI; and increasing the time for REC-QI introduction from 13-20 months to 20-24 months.

## Methodology

This document describes the findings from two structured assessments: the REC-QI assessment and the Kapchorwa district doer/non-doer assessment. Each was conducted by MCSP to systematically examine the uptake and sustainability of REC-QI practices and their effect on the RI system. The assessments used a combination of quantitative and qualitative methods, including key informant interviews (KIIs) and focus group discussions (FGDs) supplemented with quantitative data collected mainly through the program’s existing monitoring system and secondary data analysis of data from the District Health Information System (DHIS2)<sup>6</sup> (Table 1).

- **Kapchorwa District Doer/Non-doer Assessment:** In Kapchorwa district, which was challenged in its ability to improve the RI immunization program even after REC-QI introduction, what factors enable or impede the ability of health facilities to successfully implement key REC-QI activities?
- **REC-QI Assessment:** What are the tangible results of the REC-QI approach and the principle enablers/drivers of change along the REC-QI continuum from “Orient” to “Sustain”?

**Table 1. Overview of REC-QI assessments conducted by MCSP**

	REC-QI Assessment	Kapchorwa Doer/Non-doer Assessment
Learning Objective	Assess the effectiveness of the REC-QI approach in strengthening the RI system and understand the pathways and mechanisms by which this strengthening occurs. <sup>7</sup>	In Kapchorwa district, a low-performing district for RI, identify the factors that enable or impede the ability of health facilities to successfully implement key REC-QI activities.
Rationale	MCSP sought to define the pathways by which the REC-QI package of activities affects the functionality of the RI system. Such pathways had already been hypothesized but not systematically investigated using both qualitative and quantitative data. MCSP also recognized the possibility that other or additional pathways existed and wanted to explore this.	MCSP’s predecessor program, the Maternal and Child Health Integrated Program (MCHIP), introduced REC-QI in Kapchorwa in 2013-2014, but an MCHIP endline assessment suggested that its uptake was lower than in the other four MCHIP-supported districts. MCSP wanted to understand why REC-QI practices were adopted in some facilities but not others.
Location	MCSP selected representative districts from the two regions (East Central and South West) where MCSP and MCHIP introduced REC-QI. They included: <ul style="list-style-type: none"> <li>• Two MCHIP-supported districts: Iganga and Rukungiri, where implementation started in June 2012 and ended in June 2014</li> <li>• The two MCSP-supported districts where REC-QI introduction began in 2015: Butaleja and Kanungu (Program Year 1, or PY1, districts)<sup>8</sup> and continued through February 2017 (PY3).</li> <li>• Two of the four MCSP-supported districts where REC-QI introduction began in 2016: Mitooma and Bulambuli (Program Year 2, or PY2, districts)<sup>9</sup> and continued through April 2018 (PY4).</li> </ul>	In Kapchorwa District: <ul style="list-style-type: none"> <li>• Four “doer” facilities</li> <li>• Six “non-doer” facilities</li> </ul> “Doer” facilities were those which at the time of the study: <ul style="list-style-type: none"> <li>▪ had an up-to-date micro-map</li> <li>▪ were currently working to solve a problem using a PDSA cycle</li> <li>▪ had evidence of a functioning QWIT</li> </ul>

<sup>6</sup> DHIS2 is an open source software platform developed by the Health Information Systems Program. Uganda’s DHIS2 receives monthly data on vaccination coverage plus other health indicators from all districts in the country.

<sup>7</sup> The REC-QI Assessment did not attempt to estimate the effect of REC-QI on vaccination coverage rates.

<sup>8</sup> Program Year (PY1) began in July 2014 and ended in September 2015.

<sup>9</sup> Program Year (PY2) began in October 2015 and ended in September 2016.

	REC-QI Assessment	Kapchorwa Doer/Non-doer Assessment
	(The assessment was not conducted in four PY3 districts where REC-QI introduction was in early stages as of 2017.)	
Methodology	MCSP conducted phased data collection to generate findings from early districts that could help refine REC-QI implementation in later districts. The Program conducted a total of 104 KIIs (85 with district and sub-district level health management team members, health facility in-charges, district level EPI focal persons, and health workers and 19 with non-health stakeholders) and 24 FGDs (12 with caregivers and 12 with Village Health Team members).	MCSP conducted 37 KIIs with district and sub-district level health management team members, health facility in-charges, district level EPI focal persons, and health workers and 6 FGDs with Village Health Team members.
Timeline	MCSP conducted the first round of data collection in MCHIP and PY1 MCSP districts in late 2017. The Program conducted the second round of data collection in PY2 MCSP districts in mid-2018.	MCSP conducted data collection in the second half of 2017, almost 2.5 years after the direct support for REC-QI had ended.

## Key Findings

### 1. Uptake and adoption of REC-QI practices

Both the REC-QI assessment and Kapchorwa doer/non-doer assessment systematically examined factors that affected the uptake and adoption of REC-QI practices. The findings of the two assessments on this area of inquiry were highly consistent with each other and are presented in this section.

Both MCHIP and MCSP introduced REC-QI to health personnel at the district, health sub-district, and facility levels through trainings; on-the job mentoring; supportive supervision from MCSP, the MOH, and partners; performance review meetings; and peer interactions. MCSP involved various types of health personnel and non-health stakeholders from different levels of the health system (district, sub-district, health facility and community level) in different capacity-building activities and orientation on REC-QI based on the roles that they play in immunization. MCSP recognized that iterative exposure to the new content and methods in the REC-QI tools was required to build skills and maintain practices.

**Knowledge of REC-QI practices.** Findings from both the REC-QI assessment and Kapchorwa analysis indicated that higher-level personnel, such as District Health Team members, health facility in-charges, and district level EPI focal persons had greater familiarity with REC-QI methods than frontline health workers and could describe micro-planning and mapping, PDSA cycles, and QWITs. As highlighted in the Kapchorwa assessment, the facility in-charges were more regularly engaged and specifically charged with responsibility for developing facility micro-plans, mapping, QWIT formation, and initiation of PDSA cycles than other facility level health workers. By contrast, frontline health workers were more familiar with immunization service delivery practices such as how to administer vaccines. During MCSP, the REC-QI approach was adapted to more actively engage the front-line health workers in the REC-QI practices.

**Participatory approach of REC-QI.** The collaborative nature of REC-QI was widely noted by respondents. An emerging theme was recognition of its participatory approach, which has been credited elsewhere for improving buy-in and ownership of health interventions and improving the likelihood of sustainability. In a system traditionally dependent on external agencies that provide one-time trainings, REC-QI's collaborative approach of engaging local health managers to participate directly in activity implementation, review meetings, and performance monitoring to strengthen capacity was viewed as productive. Health workers at all levels said that they felt they were regarded as stakeholders in initially identifying problems affecting RI and then suggesting and implementing solutions; this was in contrast to the usual mode of support for RI.

*"I must say that REC-QI has done a good job in trying to bring people together so that they identify their needs and find solutions to them, since they know what their most pressing needs are and thus prioritize accordingly." -District Health Team member*

**Mapping and microplanning.** The REC-QI practices, particularly participatory mapping of catchment populations and identifying specific outreach or static sites for service delivery, were widely appreciated in the districts included in the two assessments. District officials and health workers noted that the presence of maps and micro-plans were strong enablers to effective implementation of RI services, especially outreach activities. MCSP's approach to micro-planning incorporates QI tools such as root cause analysis, problem prioritization, and problem-solving based largely on the use of local resources. As such, respondents saw micro-planning as a means for both planning to reach all communities and building health workers' capacity for problem solving.

Micro-plans were developed by health facility in-charges and district level EPI focal persons who received orientation on REC-QI methods. This process sometimes left a gap in the knowledge of other health facility staff on immunization service delivery and problem solving and this affected the implementation of the micro-plans and other REC-QI practices. Findings from the Kapchorwa assessment indicated that following MCHIP's end, there was a reversion to previous processes in which micro-plans were developed at district level and remained there, leaving facility staff without them and unable to revise them; they found this demotivating. In both assessments, health personnel noted the complexity of the microplanning tools, citing both their length and the technical concepts they present.

*"The micro plans are very useful, but the biggest challenge is that sometimes health workers find it difficult to understand the technical language used. However, we try as much as possible to train them and also encourage them to share the knowledge they acquire with their colleagues."*  
—district EPI focal person

**QWITs.** Study participants also valued having functional QWITs, which MCSP helped establish at facility level. These teams focus on immunization and include both health facility staff and community members. Respondents widely acknowledged that QWITs were important for improving service delivery, particularly outreach sessions. Staff at health facilities with active QWITs were generally more knowledgeable about PDSA cycles as an approach to effectively solve immunization problems with locally-available resources. At some facilities, QWITs leveraged other facility management meetings to introduce discussion of immunization and quality improvement.

**Time needed for REC-QI introduction.** MCHIP and MCSP initially planned for the REC-QI introduction process to take 13-20 months per district and this was the duration of support in Kapchorwa (an MCHIP district). Further experience gained with implementation during MCSP indicated, however, that introducing the process required 20-24 months depending on the strength of each district's health system. The REC-QI assessment identified two main reasons for needing the longer period. First, health personnel needed to initially become familiar with the REC-QI concepts and tools, actively use them, experience early successes, and finally develop confidence in using them. Second, for REC-QI activities that engaged non-health stakeholders in local resource mobilization and advocacy for RI, time was needed to build trusting relationships and effective communication between health and non-health actors.

**Challenges to uptake and continuation of REC-QI practices.** Key informant interviews in the Kapchorwa doer/non-doer analysis and REC-QI assessments indicated that challenges to the adoption of REC-QI practices were largely rooted in the context of the health system. Staff turnover was a key impediment to the uptake and continuation of REC-QI practices, with limited handover of knowledge and skills from those who had received orientation to new staff who had not. Understaffing (compounded by extended staff leaves and absenteeism) and heavy workload were a second key factor that discouraged health workers from spending time on REC-QI practices, especially more complex activities such as PDSA cycles and QWIT involvement. Health managers and health workers reported widespread low motivation and commitment to quality and poor linkages across different government structures. Key informants in Kapchorwa cited insufficient funding to cover costs for implementing micro-plans and outreaches as both practical and demotivating obstacles to REC-QI implementation.

Within this context, both assessments identified strong leadership by District Health Officers (DHOs) and particularly facility In-Charges as key to promoting the teamwork and commitment needed to adopt and maintain REC-QI practices. A change in District Health Team leadership in Kapchorwa following an extended dormant period led to a revitalization of REC-QI practices. At facility level, those health centers that exhibited strong leadership and a mentorship/training focus and were staffed with experienced workers were more likely than other facilities to carry out the REC-QI practices.

*"I had determination as an in-charge to have things done in the way they were supposed to be done...We sometimes used our personal resources to conduct some activities such as outreaches because funds were limited."* -Facility In-Charge, Kapchorwa

*“The [REC-QI data management] tools would appear as if they were complicated at the time but after consecutive application and utilization under my leadership, the staff found them relatively easier.” -Facility In-Charge, Kapchorwa*

Some respondents in districts where direct support from MCSP had concluded several months prior to the assessment noted the need for additional reinforcement of REC-QI practices after the training and supervision visits were completed.

[Referring to PDSA cycles in particular]: *“I am not familiar with REC-QI. You see, they taught us those things some time back and I have really forgotten them.” -Health worker, Butaleja District*

Despite challenges, the majority of key informant interviews with health workers indicated that on-the-job training coupled with supportive supervision and other technical support from MCSP had improved their skills and knowledge for micro-planning, QWITs, PDSA cycles, and working with communities.

*“...What is most important [with REC-QI] is that we have acquired some skills that we can use not only for immunization but also other activities. For example, we have interacted with different communities through outreaches, and this has helped us to understand their problems and work with them to come up with solutions. That has been one of the best achievements for us.” -Health worker, Kanungu District*

## 2. Effect of REC-QI on the RI system

In the assessments, MCSP focused on three specific system indicators that are expected to be directly affected by implementing components of REC-QI. If delivered optimally, REC-QI is expected to result in:

- better planning of immunization sessions
- increased equity in service provision by identifying and providing services to underserved communities,
- and improved quality and completeness of reported immunization data.

Micro-planning is the key gateway activity toward improving performance for the first two outcomes. Despite being a standard UNEPI practice for many years, its actual uptake had long been very low. Traditionally, it had been approached as an activity conducted at district rather than facility level, with completed micro-plans often retained by the district rather than available for use at the facility. With the introduction of REC-QI and support from MCSP, the availability of completed, up-to-date micro-plans at facilities increased dramatically (Figure 1a and 1b).

*Note: Quantitative data presented are from the same four MCSP-supported districts for which the REC-QI assessment collected qualitative data. These are the PY1 districts (Butaleja and Kanungu) districts, which initiated REC-QI in the first year of MCSP (“PY1 districts”), and the PY2 districts (Bulambuli and Mitooma) districts, which initiated REC-QI in the second year of MCSP (“PY2 districts”).*

Figure 1a. Proportion of HF's with micro plans increased since the baseline in Butaleja and Kanungu (PY1 districts).

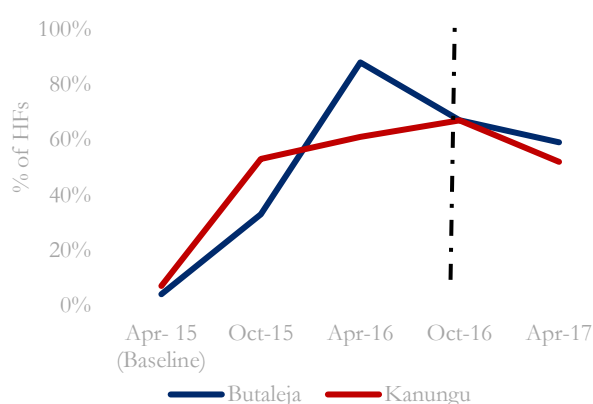
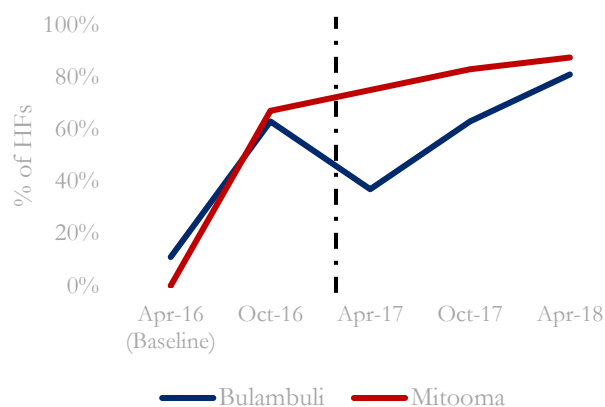


Figure 1b. Proportion of HF's with micro plans increased since the baseline in Bulambuli and Mitooma (PY2 districts).



- - - - - Line indicates introduction of “sustain” phase of REC-QI

With REC-QI introduction, the proportion of facilities with functioning QWITs increased substantially, as expected, and remained at a high level after a reduction of support from MCSP. QWITs were viewed as important for scheduling the time and location of RI services to meet the needs of communities (Figure 2a and 2b).

Figure 2a. Proportion of HFs with Quality Work Improvement Teams increased since the baseline in Butaleja and Kanungu (PY1 districts).

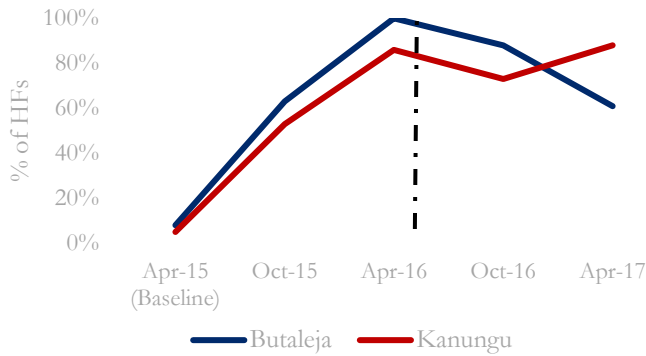
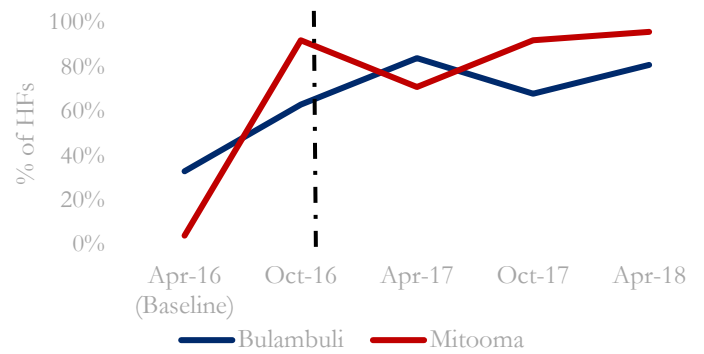


Figure 2b. Proportion of HFs with Quality Work Improvement Teams increased since the baseline in Bulambuli and Mitooma (PY2 districts).



--- Line indicates introduction of "sustain" phase of REC-QI

The REC-QI assessment found that in the districts studied, microplanning at the health facility level led to the identification of additional communities as well as the provision of RI services to them (Figure 3a and 3b). For example, in PY2 districts, there was a 68% increase (from 1,059 to 1,776) in villages identified and a 60% increase (from 774 to 1,237) in villages actually reached with RI services from baseline to endline. Approximately 70% of communities identified were reached with services by April 2018. Variation in findings across districts is in part a function of the different contexts, needs, and health infrastructure in those districts. Due to the very low availability of health facility micro-plans prior to MCSP support, it is not possible to know whether the newly-identified villages had previously received RI services in an unplanned, undocumented way.

Figure 3a. Number of villages identified increased 28% and number of villages reached with RI services increased 32% since the baseline in Butaleja and Kanungu (PY1 districts).

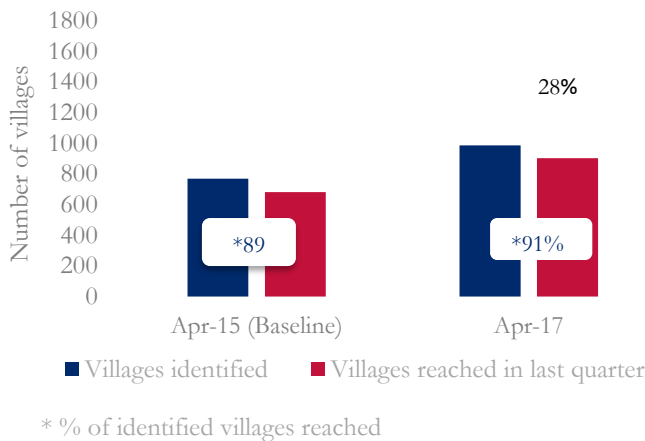
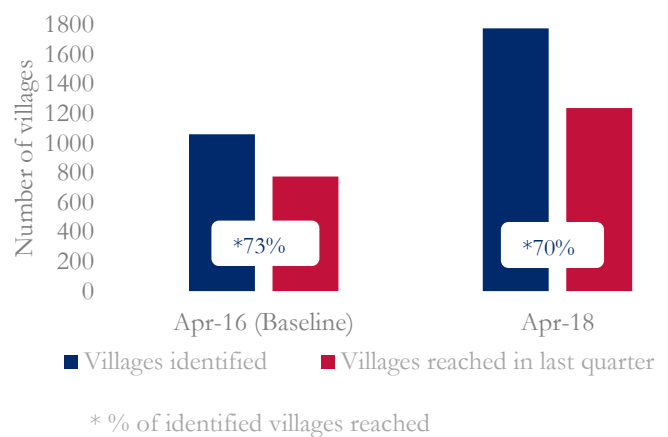


Figure 3b. Number of villages identified increased 68% and number of villages reached with RI services increased 60% since the baseline in Bulambuli and Mitooma (PY2 districts).



Micro-planning contributed to large increases in the numbers of RI sessions scheduled and actually conducted (Figure 4a and 4b). In PY2 districts, there was a 139% increase in the number of RI sessions planned, from 1,793 at baseline to 4,284 by April

2018. The number of sessions actually conducted more than doubled, from 1,346 to 2,758 (Figure 4b). When compared against the substantial increase in sessions planned, however, the proportion of planned sessions actually conducted dipped from 75% to 64%. This percentage obscures the large net increase in the reach of RI services and highlights the need to ensure that the indicator of percent of planned sessions conducted is always accompanied with data on the number of sessions planned.

Figure 4a. Number of RI sessions planned increased 6% and number of RI sessions conducted increased 8% since the baseline in Butaleja and Kanungu (PY1 districts).

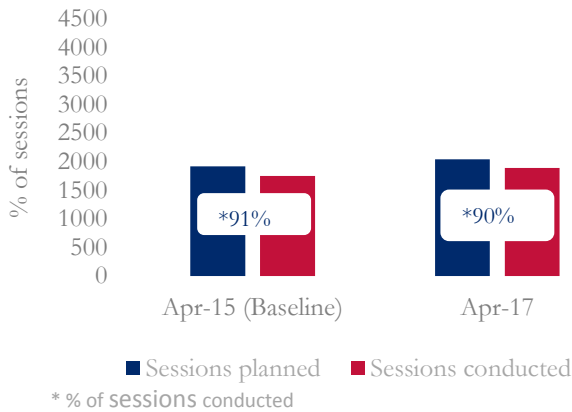
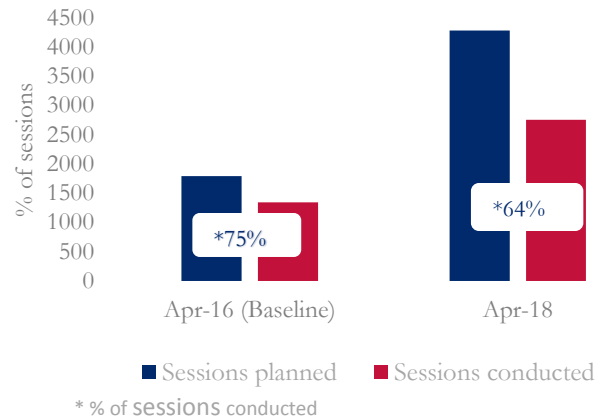


Figure 4b. Number of RI sessions planned increased 139% and number of RI sessions conducted increased 105% since the baseline in Bulambuli and Mitooma (PY2 districts).

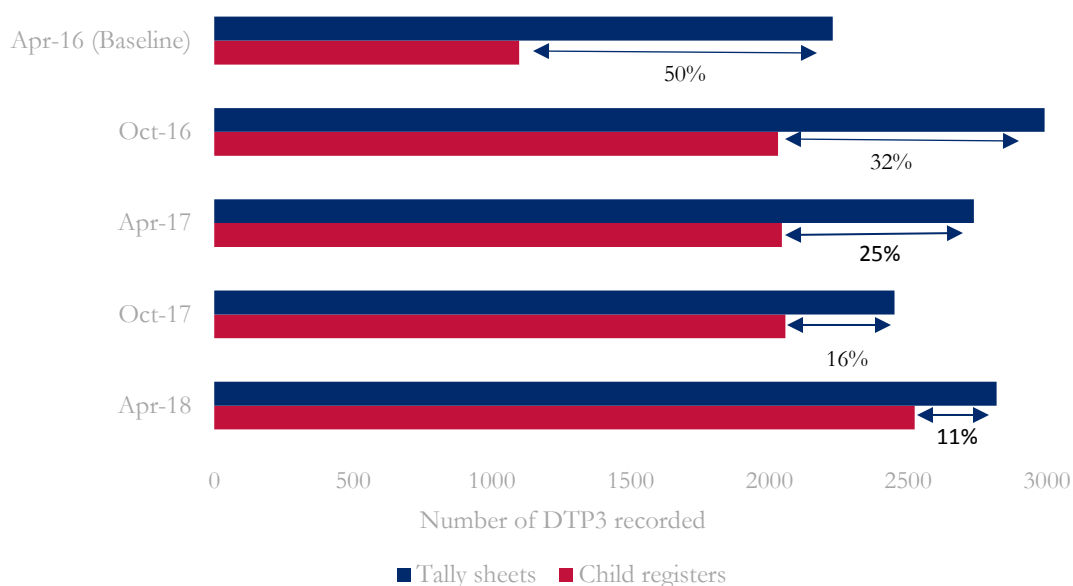


The data in Figures 3 and 4 highlights the challenge of mobilizing sufficient local resources to equitably provide RI and other services to all populations. If funding is insufficient or comes too late, as was widely reported in the two assessments, then it may be necessary to reduce the frequency of immunization sessions, mainly outreach sessions, while still attempting to ensure that all communities are reached with some level of immunization services.

MCSP supported health workers to improve the quality and especially the active use of data. Focus was placed on increasing the use of the child register, which identifies by name and location those children who started the vaccination schedule but require follow-up by health workers or volunteers to complete it. Because it takes some time to record data in the child register, health workers have traditionally under-utilized it in favor of only recording vaccine doses administered on a tally sheet. Since the introduction of REC-QI, the discrepancy between doses recorded on the child register and the tally sheet has steadily diminished (Figure 5). This indicates that these health facilities now generate and report more reliable and accurate data.



Figure 5. Reduced discrepancies in DTP3 doses recorded on child registers and tally sheets since the baseline in Bulambuli and Mitooma (PY2 districts).



The low quality of Uganda’s immunization data has long been recognized as contributing to inflated administrative reports of vaccination coverage.<sup>10</sup> Due both to the poor quality of data at the outset of REC-QI introduction and the fact that REC-QI activities to improve the data quality were expected to cause fluctuations in it, the assessments reported here did not seek to demonstrate a direct relationship between REC-QI introduction and changes in coverage or drop-out rates. MCSP’s review of administrative data from the DHIS2 in the districts it supported found that there was little change in coverage over the life of the program. Given the inflated reports at baseline and the improvements in data quality from the REC-QI interventions, this lack of change was not a surprise. The fact that the REC-QI districts showed fairly constant coverage is encouraging because when data quality improves, as it did in the REC-QI districts, reported coverage normally fall. Indeed, the 2018 Gavi Full Country Evaluation for Uganda noted a national decline in immunization program performance and attributed it to a combination of improvements in data quality, inadequate funding, and competing priorities facing the RI system in Uganda. The complex situation regarding immunization data quality is the subject of ongoing in-depth analysis in Uganda by the UNEPI and other immunization partners. It is not unique to Uganda but rather is a globally-recognized problem that is the topic of ongoing discussion by WHO, Gavi, and other partners.

## Conclusions

The REC-QI and Kapchorwa doer/non-doer assessments yielded valuable findings, particularly of a qualitative nature, that added substantially to the iterative learning already undertaken by the MCSP/Uganda. The MCSP team has continuously reviewed its experience with REC-QI in order to improve the model while also honing its own skills in introducing it. Some of the more striking findings observed in the districts where REC-QI was introduced later may reflect this increased expertise. At the same time, many contextual factors, including level of health infrastructure, district and facility health leadership, staffing, geography, and economic status, varied across districts and very likely explain some of the differences in findings. This point highlights an important aspect of the assessments: they were envisioned as structured learning in an open system rather than controlled studies to test a hypothesis.

The findings of the two assessments indicate that where REC-QI was implemented, it strengthened several key aspects of the RI system, including the reach and equity of RI services, the quality and use of immunization data, the capability of health personnel at multiple levels to plan and problem-solve, the building of partnerships with community members, and health workers’ ability to engage effectively with non-health stakeholders to increase support for RI.

<sup>10</sup> Ward K et al. Enhancing Workforce Capacity to Improve Vaccination Data Quality, Uganda. *Emerging Infectious Diseases*, Vol. 23, Supplement to December 2017

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At the same time, the assessments identified challenges. Some REC-QI practices were not fully implemented or not maintained due to staff turnover, lack of reinforcement after MCSP's direct support ended, low motivation, or the complexity of the practices themselves. Health system problems beyond the district's direct control, including human resource issues and frequent vaccine stock-outs, limited funding for outreach allowances and insufficient transportation were widely reported. These challenges limit the impact of the local problem-solving capability that REC-QI builds. However, the qualitative and quantitative findings indicate improvements in the management and delivery of RI services and increased capacity of health personnel to analyze and find solutions to many of the problems they encounter—moving from a passive attitude to active participation in increasing the reach and provision of services.

The assessment findings suggest several actions for future work with REC-QI interventions, some of which have already been initiated by MCSP. These include the following:

- **Simplify and streamline some REC-QI tools** so that they are less complex and labor-intensive. This is especially important where service delivery is integrated and immunization is not a standalone service. MCSP has already simplified the micro-planning tools for facility-level planning and budgeting and initiated a process to apply them to other health services beyond immunization. UNEPI has committed to adopting them for use nationwide by all partners.
- **Invest in leadership, teamwork, and on-the-job mentorship** at the facility level. MCSP has introduced a whole-site approach to supportive supervision that engages all facility staff in order to improve RI service quality and reduce missed opportunities for vaccination and other services.
- **Reinforce new skills and practices** introduced through REC-QI. Given frequent staff turnover, easy-to-use reference materials or job aids are needed that remain at the health facility. They should clearly articulate the benefits to those who are to use them.
- **Institutionalize key aspects of REC-QI.** With the support of MCSP, UNEPI has incorporated some components of REC-QI into standard UNEPI immunization reference materials, information management tools included in DHIS2, and the MOH training curricula that will be used for both pre-service and in-service training for EPI nationwide. This broad uptake will contribute to the long-term institutionalization and reinforcement of these practices through MOH channels.
- **Strengthen the capacity of health personnel to interact with non-health stakeholders.** Domestic resource mobilization at sub-national levels is essential to cover the costs associated with high, equitable coverage of immunization and other services. REC-QI has pioneered methods that engage local civil authorities and political and community leaders and increase the transparency and accountability of their actions, yielding concrete financial and material support for RI. MCSP/Uganda's sister project, Stronger Systems for Routine Immunization, is currently developing user-friendly tools to assist health personnel in engaging non-health stakeholders in immunization.
- **Nurture a culture of data quality and use** that encourages decision-making based on local data. The assessments showed that improving the use of data at the local level demonstrated to those who generate the data in the first place why it is in their best interests to improve data accuracy and quality.

The innovations reflected in the REC-QI approach were designed to help UNEPI operationalize certain aspects of the Reaching Every District/Reaching Every Child (RED/REC) approach that had proven challenging for several years. For similar reasons, a modified version of the REC-QI approach has also been introduced in over 80 districts in Ethiopia with support from the Bill & Melinda Gates Foundation. RED is a management strengthening approach used widely by the global immunization community. Selected REC-QI tools, including those on mapping and problem analysis, are now captured in the 2017 edition of the WHO/AFRO RED guide which has been widely disseminated.

The REC-QI approach represents an early introduction of an innovation, and it has undergone iterative revisions based on what has worked and what needed to be changed to make it both more effective and more scalable. The approach includes a relatively limited period of engagement with each district, and it is likely that the achievement and maintenance of results over the long term requires a longer period of engagement and more intensive mentoring of health personnel. Finally, more advocacy and

action is needed at higher levels to address the broad health systems problems such as human resource management, last-mile vaccine distribution, and financing of operational costs, all of which affect immunization performance but are beyond the direct control of districts and health facilities to resolve. Despite these challenges, the REC-QI approach has produced promising results that suggest that the RI system in the MCSP-supported districts is stronger and now better able to meet the needs of the communities it serves.

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