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Maternal and Child Survival Program

MCSP Rwanda's Impact on Improving the Quality of Maternal, Newborn, and Child Health and Family Planning Services

Results from a Contribution Analysis

Authors:
Alison Trump
Rachel Favero
Reena Sethi
Edwin Tayebwa

www.mcsprogram.org

The Maternal and Child Survival Program (MCSP) is a global, $560 million, 5-year cooperative agreement funded by the United States Agency for International Development (USAID) to introduce and support scale-up of high-impact health interventions among USAID's 25 maternal and child health priority countries, as well as other countries. MCSP is focused on ensuring that all women, newborns and children most in need have equitable access to quality health care services to save lives. MCSP supports programming in maternal, newborn and child health, immunization, family planning and reproductive health, nutrition, health systems strengthening, water/sanitation/hygiene, malaria, prevention of mother-to-child transmission of HIV, and pediatric HIV care and treatment.

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Abbreviations

CA	contribution analysis
DHIS2	District Health Information System 2
DHS	Demographic and Health Survey
ENC	essential newborn care
FP	family planning
HBB	Helping Babies Breathe
HMIS	health management information system
IMCI	integrated management of childhood illness
LDHF	low-dose, high-frequency
MCSP	Maternal and Child Survival Program
MNCH	maternal, newborn, and child health
MOH	Ministry of Health
PPFP	postpartum family planning
QI	quality improvement
QoC	quality of care
RBC	Rwanda Biomedical Center
RMNCH	reproductive, maternal, newborn, and child health
SO	strategic objective
TOC	theory of change
USAID	US Agency for International Development
WHO	World Health Organization

Executive Summary

While Rwanda has made significant progress in reducing maternal and infant mortality, there is still more progress to be made. The US Agency for International Development (USAID)'s 2014 *Acting on the Call* report estimates that in Rwanda, scaling up key interventions to prevent child and maternal deaths can lead to 123,000 children's and 6,800 women's lives saved by 2020.[1] Additionally, each district has different needs, with some that have made more progress than others.

The overall objective of the USAID's Maternal and Child Survival Program (MCSP) in Rwanda was to strengthen the capacity of the Ministry of Health (MOH) to manage and scale up high-impact reproductive, maternal, newborn, and child health (RMNCH) interventions. MCSP, in collaboration with the MOH, based MCSP Rwanda's priorities on the MOH's priorities outlined in the Government of Rwanda's Vision 2020, Economic Development and Poverty Reduction Strategy (2013–2018) and USAID Rwanda's commitment to preventing child and maternal deaths through approaches that focus on health systems strengthening, community mobilization, gender integration, and e-health, among others. In Rwanda, MCSP built upon the previous successes of USAID's investments, such as the Maternal and Child Integrated Program and the Rwanda Family Health Project, with the aim of accelerating the reduction of preventable newborn, child, and maternal mortality in 10 selected districts by 2018.

In partnership with the MOH, MCSP conducted an analysis to document contributions made by the program toward improving the quality of maternal, newborn, and family planning (FP) services in Rwanda. MCSP and the MOH used a contribution analysis (CA) to assess MCSP's work, whereby they explored cause-and-effect relationships between activities and results against theories of change (TOCs) to make credible claims about the contributions made by MCSP.[2] CA provided a framework for compiling and assembling evidence to tell a cohesive, robust story about MCSP's contributions based on confirming TOCs for interventions.[2] The use of this approach is novel for evaluating the impact of complex RMNCH programs.

This analysis set out to answer the following questions and to assess evidence to support these questions:

- RMNCH: How did MCSP's low-dose, high-frequency training and mentorship approaches improve and maintain health worker competencies in maternal, newborn, and child health (MNCH) and FP?
- Postpartum FP (PPFP): How did MCSP contribute to an increase in the uptake of PPFP services?
- Quality improvement: How did MCSP contribute to improved quality of care for patients in MCSP-supported facilities?

The results from this analysis showed that MCSP's support to the MOH contributed to three major achievements:

1. Improvement and maintenance of health worker competencies and client outcomes in MNCH and FP: The knowledge and skills of providers post-training improved by 40 percentage points in essential newborn care/Helping Babies Breathe, 39 percentage points in integrated management of childhood illness, and 27 percentage points in basic emergency obstetric and newborn care.
2. Significant increase in the uptake of PPFP methods in the immediate (predischarge) postpartum period: Since implementation began in January 2016, the program saw an increase in PPFP uptake before discharge, from less than 1% at the start of the implementation period to 45% by October–December 2017.
3. Improved quality of care at the facility level

[1] US Agency for International Development (USAID). 2014. *Acting on the Call: Ending Preventable Child and Maternal Deaths*. Washington, DC: USAID.
[2] Mayne J. 2008. *Contribution Analysis: An Approach to Exploring Cause and Effect*. Montpellier, France: CGIAR.

Introduction

Context

To date, Rwanda has made significant progress in reducing infant and maternal mortality, surpassing many of its targeted health indicators, as noted in Table 1. These achievements can be attributed to the government's strong commitment, the US Agency for International Development (USAID) and its funded projects, including the Maternal and Child Survival Program (MCSP), and other implementing partner technical assistance.

Table 1. Baseline and actual results for the Demographic and Health Survey (DHS), and 2018 targets for key health indicators according to the Economic Development and Poverty Reduction Strategy II, 2013–2018[3]

	DHS 2005	DHS 2010	DHS 2014–15	Target 2018
Neonatal mortality rate (deaths per 1,000 live births)	37	27	20	18
Infant mortality rate (deaths per 1,000 live births)	86	50	32	22
Under-5 mortality rate (deaths per 1,000 live births)	152	76	50	42
Skilled birth rate (%)	28.4	69.0	90.7	92
Maternal mortality ratio (deaths per 100,000 live births)	750	476	210	220
Percentage distribution by all women ages 15–45 using any modern contraceptive method	15.2	25.2	27.8	40
Total fertility rate	6.1	4.6	4.2	3.4

Despite these significant achievements, there is still more progress to be made. USAID's 2014 Acting on the Call report estimates that in Rwanda, scaling up key interventions to prevent child and maternal deaths can lead to 123,000 children's and 6,800 women's lives saved by 2020.[4] Additionally, each district has different needs, with some having made more progress than others. The below sections describe the reproductive, maternal, newborn, and child health (RMNCH) landscape that helped design MCSP's approach and priorities.

The day of birth is the most dangerous for pregnant women and newborns.[5] Rwanda has made significant achievements in maternal health and survival, and has institutionalized maternal death audits so that it can continue to effectively target the causes of maternal death. As noted in the MCSP project description, the rates of facility delivery and skilled birth attendance approximately doubled from 2005 to 2010, achieving a rate of 69% for both indicators in 2015, and 91% of births were assisted by a skilled health provider.[6] Furthermore, the percentage of women and babies receiving a postnatal checkup in the first 2 days after birth increased from 18% in 2010 to 43% in 2015. Despite the fact that 99% of women attend at least one antenatal care visit, only 44% of women attend four or more visits, and entry to antenatal care is often late. High levels of early fertility (41 births per 1,000 women ages 15–19) contribute to the risk of complications in

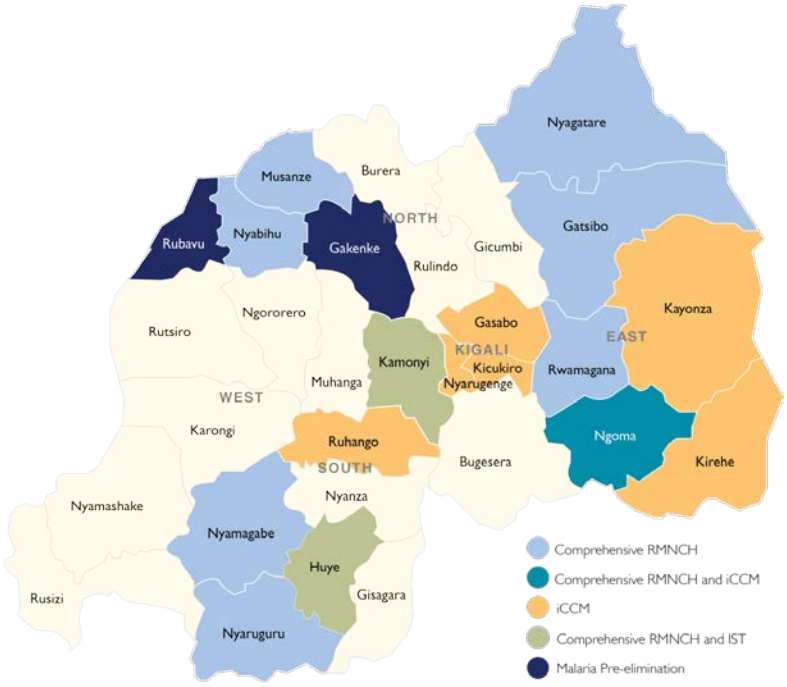
[3] Ministry of Finance and Economic Planning (MOFEP). 2013. *Economic Development and Poverty Reduction Strategy II, 2013–2018*. Kigali, Rwanda: Great Lakes Communications.
[4] USAID. 2014. *Acting on the Call: Ending Preventable Child and Maternal Deaths*. Washington, DC: USAID.
[5] Lawn JE, Blencowe H, Oza S, et al. 2014. Every Newborn: progress, priorities, and potential beyond survival. *Lancet*. 384(9938):189-205. doi: 10.1016/S0140-6736(14)60496-7.
[6] National Institute of Statistics of Rwanda (NISR), MOFEP, MOH, ICF International. 2015. *Rwanda Demographic and Health Survey 2014-15*. Kigali, Rwanda: NISR, MOFEP, MOH, and ICF International.

pregnancy and delivery. The leading causes of maternal death are hemorrhage (42.7%), sepsis (16.4%), and eclampsia (8.5%), with malaria (8%) the leading indirect cause of maternal death.[7,8]

Fertility in Rwanda has declined over the past two decades. The annual population growth rate is 2.6.[9] According to the 2014–15 Demographic and Health Survey (DHS), women in Rwanda had an average of 4.2 children, down from 4.6 in 2010, with women in urban areas averaging 3.6 children, compared with 4.3 children per woman in rural areas.[10] The country has made significant progress in increasing utilization of family planning (FP), with a rapid rise in the modern contraceptive prevalence rate among married women from 45.1% in 2010[8] to 47.5% in 2015.[10]

To maintain and build upon the successes of health programming in Rwanda, MCSP implemented a 5-year project, focusing on 172 public facilities in 10 of Rwanda's 30 districts.

Figure 1. Implementation geographic scope for MCSP (2014–2018)



MCSP Rwanda Program and Interventions

The overall objective of MCSP in Rwanda was to strengthen the capacity of the Ministry of Health (MOH) to manage and scale up high-impact RMNCH interventions.

The program had five strategic objectives:

1. Improve the quality, equity, gender sensitivity, and sustainability of RMNCH and malaria services along the continuum of care.
2. Support the scale-up of high-impact interventions to improve RMNCH and malaria outcomes in the public and private sectors.

[7] Ministry of Health (MOH). 2014. *Rwanda Health Sector Policy 2014*. Kigali, Rwanda: MOH.
[8] National Institute of Statistics of Rwanda (NISR), MOH, ICF International. 2012. *Rwanda Demographic and Health Survey 2010*. Calverton, Maryland, USA: NISR, MOH, ICF International.
[9] NISR, MOFEP. 2012. *Rwanda Population and Housing Census 2012*. Kigali, Rwanda: NISR, MOFEP.
[10] NISR, MOFEP, MOH, ICF International. 2016. *Rwanda Demographic and Health Survey 2014–15*. Kigali, Rwanda: NISR, MOFEP, MOH, ICF International.

3. Increase community mobilization for, participation in, and utilization of high-quality RMNCH and malaria services.
4. Build capacity to use data for decision-making and action at all levels of the health system.
5. Increase capacity to manage and control malaria in Rwanda as the country approaches pre-elimination.

MCSP, in collaboration with the MOH, based MCSP Rwanda's priorities on the MOH's priorities outlined in the Government of Rwanda's Vision 2020, Economic Development and Poverty Reduction Strategy (2013–2018) and USAID Rwanda's commitment to ending preventable child and maternal deaths through approaches that focus on health systems strengthening, community mobilization, gender integration, and e-health, among others. In Rwanda, MCSP built upon the previous successes of USAID's investments, such as the Maternal and Child Integrated Program and the Rwanda Family Health Project, with the aim of accelerating the reduction of preventable newborn, child, and maternal mortality in 10 selected districts by 2018.

Rationale for Using Contribution Analysis

John Mayne developed the contribution analysis (CA) in 2001 as a way to examine the extent to which observed results from a program are due the program's activities rather than other factors.[11] The use of this method allows evaluators to explore cause-and-effect relationships between activities and results as an approach for making credible claims about the contribution being made by an intervention or set of activities based on confirming the theory of change (TOC) for an intervention.[12] This method also helps to answer the following question: "In light of the multiple factors influencing a result, has the intervention made a noticeable contribution to an observed result and in what way?"[13]

One distinctive feature of CA is that it offers a more systematic way to be able to make credible claims of impact.[13] A strength of CA is its ability to unpack impact in a way that explicitly examines multiple actors and influences, and answers questions about what worked and why.[14] Another key advantage of using CA in the context of MCSP is that routine program data, both qualitative and quantitative, can be used to support causal claims, rather than more elaborate evaluation designs that are not feasible to undertake because of time and resource constraints. It is important to note that while incorporating use of CA from the inception of the program is favorable, the approach can also be used midway or toward the end of implementation, as was done with the Rwanda analysis.

Contribution Questions

This analysis set out to answer the following contribution questions and to assess evidence to support these questions:

- RMNCH: How did MCSP's low-dose, high-frequency (LDHF) and mentorship approaches contribute to improvement and maintenance of health worker competencies in maternal, newborn, and child health (MNCH) and FP and client outcomes in the same areas?
- Postpartum FP (PPFP): How did MCSP contribute to an increase in the uptake of PPFP methods in the immediate postpartum (predischarge) period?
- Quality improvement (QI): How did MCSP quality of care (QoC) interventions and interventions aimed to increase data quality and use contribute to improved QoC?

[11] Mayne J. 2008. *Contribution Analysis: An Approach to Exploring Cause and Effect*. Montpellier, France: CGIAR.
[12] Mayne J. 2001. Addressing attribution through contribution analysis: using performance measures sensibly. *Can J Program* Eval. 16(1):1–24.
[13] Mayne J. 2012. Contribution analysis: coming of age? *Evaluation (Lond)*. 18(3):270–80. doi: 10.1177/1356389012451663.
[14] Kane R, Levine C, Orians C, Reinelt C. 2017. *Contribution Analysis in Policy Work: Assessing Advocacy's Influence*. Washington, DC: Center for Evaluation Innovation.

Methods

MCSP employed CA as the primary analytical approach to guide causal inference analysis. Causal inference methods are helpful as alternative analytical approaches for when randomization is infeasible to study a problem or question. Mayne's method uses a six-step process designed to test the theory against logic and evidence to construct an "impact story."[11] These steps build evidence necessary to demonstrate a program's contribution to change while also considering other factors that affect this change. This section will discuss the methodology applied in the six-step process.

1. Set out the cause-effect issue to be addressed.

MCSP staff from Washington/Baltimore held a 3-day in-country workshop with MCSP staff in Kigali in June 2018 to begin the development of the CA story. Workshop participants included key technical and program staff. MCSP presented participants with information about TOCs and CA. They applied the learned concepts by developing TOC frameworks, timelines, and action plans. Participants divided into three groups: one worked on a TOC related to the program's FP work, one worked on a broad TOC for maternal and newborn health, and one worked on a TOC based on the child health interventions that the program was focusing on.

Given the wide scope of MCSP's work in Rwanda, the project asked participants to focus on only one of the three strategic objectives (SOs) for the CA. They chose to focus on SO 1: Improve the quality, equity, gender sensitivity, and sustainability of RMNCH and malaria services along the continuum of care. Within SO 1, participants chose to analyze their efforts related to ensuring clinical competence and readiness at all levels, including community health workers and community systems. More specifically, they chose to focus this analysis on their work related to improving the quality of RMNCH services, including FP and integrated management of childhood illness (IMCI) through the LDHF approach and clinical mentorship.

2. Develop the postulated TOC.

For the TOCs, participants thought through the inputs; activities; changes to capacity, knowledge, and skills; changes in behavior and practices; policy and resources; unanticipated results; direct benefits; and overall well-being impact for each technical area. The TOCs also included any external influences, assumptions, and factors that, though directly unrelated to the intervention, could have had positive or negative effects on the activities and subsequent results. Participants developed TOCs for each of these intermediate results.

The TOC model used for this analysis was the COM-B TOC. The COM-B model was developed by Michie, van Stralen, and West, and is based on their extensive synthesis of behavior change models in the literature, where behavior (B) occurs as the result of interaction between three necessary conditions: capabilities (C), opportunities (O) and motivation (M).[15] MCSP used the COM-B TOC model because most interventions at some level involved changing the behavior of different target populations within the program.[16]

The detailed TOCs can be found in Annex 1. As part of the development of the TOCs, the MCSP team documented several external influences that were neutral, positive, and negative that may have affected MCSP's outcomes of interest.

3. Gather the existing evidence on the TOC.

Based on the TOCs developed, MCSP mapped data sources against the causal pathways in the TOCs to identify what evidence already existed and areas that required additional information and data. Data sources included annual and quarterly program reports, work plans, assessments against standards, and qualitative

[15] Michie S, van Stralen MM, West R. 2011. The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implement Sci.* 6:42.
[16] Mayne J. 2018. The COM-B Theory of Change Model.

interviews with key stakeholders. In summary, the team reviewed and analyzed over 42 data sources to substantiate contribution claims with evidence.

4. Assemble and assess the contribution claim and challenges to it.

During the CA workshop, participants identified the top results and impact contribution statements based on the TOC. Results from the stakeholder consultations, together with the mapping against data sources and triangulating data, led to the identification of data needs and evidence that could be filled with program data.

5. Seek out additional evidence.

Due to staff availability limitations, MCSP used quarterly reports, annual reports, and performance monitoring plans as the primary sources of data for this analysis. Analysis entailed thorough review of the source, with the aim of triangulation. Secondary sources of data included peer-reviewed literature and reports from other sources.

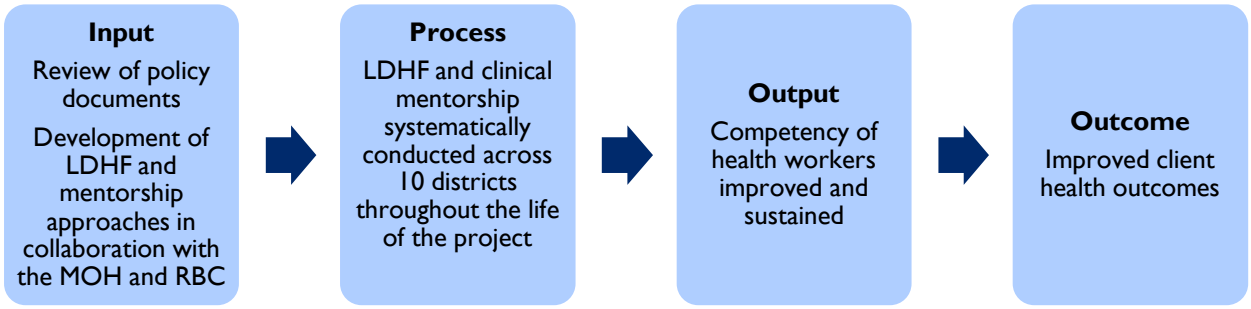
6. Revise and strengthen the contribution story.

MCSP shared the final TOCs and preliminary conclusions for the CA story with the Rwanda country support team and in-country counterparts; USAID Washington counterparts reviewed in March 2019. MCSP then incorporated all comments into a final version to be submitted in September 2019 to USAID.

Findings

The following statements describe MCSP's contributions to improved QoC and health outcomes across RMNCH service delivery areas in 10 districts of Rwanda.

Contribution Statement 1: The MCSP LDHF and mentorship approaches contributed to improvement and maintenance of health worker competencies and client outcomes in MNCH and FP.



MCSP's review of Rwanda's national-level policy documents and subsequent development of LDHF and mentorship approaches, in collaboration with the MOH and Rwanda Biomedical Center (RBC), resulted in the systematic application of the approach across the 10 MCSP-supported districts in Rwanda throughout the life of the project. In collaboration with the MOH and RBC, MCSP sought to find alternatives to traditional classroom-based training to maximize use of resources, minimize disruption to existing service delivery, and use effective teaching and mentorship methods to improve provider skills. Historically in Rwanda, the Helping Babies Breathe (HBB)/essential newborn care (ENC), IMCI, and basic emergency obstetric and newborn care training and mentorship package consisted mainly of didactic techniques. However, global evidence indicates that standalone training does not always result in improvements in health worker performance.[17] Instead, studies have shown that using interactive and engaging techniques, providing opportunities for simulated practice, and delivering learning opportunities at an appropriate dose and frequency can help providers retain knowledge and skills.[18] The LDHF and mentorship approaches are interventions that have been implemented in other settings for health worker competency improvement and have shown skills retention in health workers and improvement in patient outcomes (Box 1).

Box 1. Principle tenants of low-dose, high-frequency and mentorship approaches

- Competency focused
- Hands-on
- Interactive
- Thoughtfully designed and sequenced
- Team based
- On site
- Ongoing
- Optimizes technology
- Addresses gaps
- Improves quality of care and results

For example, from 2012 to 2014, Jhpiego and the MOH implemented LDHF training in Uganda to build the capacity of health workers in management of postpartum hemorrhage. The project used the Helping Mothers Survive Bleeding After Birth Training Package.[19] The results showed that the LDHF approach contributed to improvements in directly observed care. Facilities saw a 17% reduction in postpartum hemorrhage, a 47% reduction in retained placenta, a 34% reduction in intrapartum stillbirth, and a 62%

[17] Rowe AK, Rowe SY, Vujicic M, et al. 2009. Review of Strategies to Improve Health Care Provider Performance. In: Peters DH, El-Saharty S, Siadat B, Janovsky K, Vujicic M, ed. *Improving Health Service Delivery in Developing Countries: from Evidence to Action*. Washington DC: The World Bank; 101–9.
[18] Bluestone J, Johnson P, Fullerton J, Carr C, Alderman J, BonTempo J. 2013. Effective in-service training design and delivery: evidence from an integrative literature review. *Hum Res Health*. 11:51. doi: 10.1186/1478-4491-11-51.
[19] Jhpiego. 2018. Helping Mothers Survive Bleeding After Birth Complete Training Package. Baltimore, Maryland, USA: Jhpiego.

reduction in early newborn deaths. Jhpiego and the MOH/Ghana Health service also implemented LDHF training in Ghana to accelerate newborn survival. Results after implementation showed a reduction in stillbirth, from 1% to 0.5%, and a reduction in the institutional newborn mortality rate within 24 hours, from 7.6% to 3.4%.[17]

Given the important findings from other countries regarding the merits of the LDHF approach, MCSP and the Rwanda MOH/RBC decided to adapt the approach for the Rwandan setting. The team also incorporated a mentorship approach that was started but not completed under USAID's Rwanda Family Health Project. MCSP applied the LDHF and mentorship approaches in all 172 MCSP-supported facilities, with trained mentors reaching providers in all facilities in the 10 selected districts, including at all health centers and hospitals in these districts.

LDHF and Mentorship Approaches

MCSP selected 73 providers from all 12 district hospitals as potential mentors, as they were already supervisors or had scored well on an initial assessment of clinical skills for newborn care. MCSP provided them an initial 3-day offsite orientation on the mentorship activity, which included training in mentoring skills and refresher training in HBB. MCSP's validation of the mentors consisted of an additional 5-day refresher training on comprehensive newborn skills to select the candidates who showed the most promise to be successful mentors. It validated 68 of the participants as mentors in the subsequent post-test.

The selected mentors initially conducted LDHF in-service training with providers in four districts starting in January 2016 (Kamonyi, Musanze, Ngoma, and Rwamagana) and expanded to six additional districts in January 2017 (Gatsibo, Huye, Nyagatare, Nyabihu, Nyamagabe, and Nyaruguru). MCSP included all of the public health facilities in the 10 districts in the intervention, and each selected at least two health workers (mentees) who attend births to receive the training. The mentors conducted LDHF in-service training for mentees over three sessions of 2 days each, spaced over a 3-week period, with one session per week. The first day of each session was devoted to theory, and the second focused on simulation with anatomic models. Mentors employed the same curriculum with mentees that they used in their training. Participants completed pre- and post-tests on knowledge and skills.

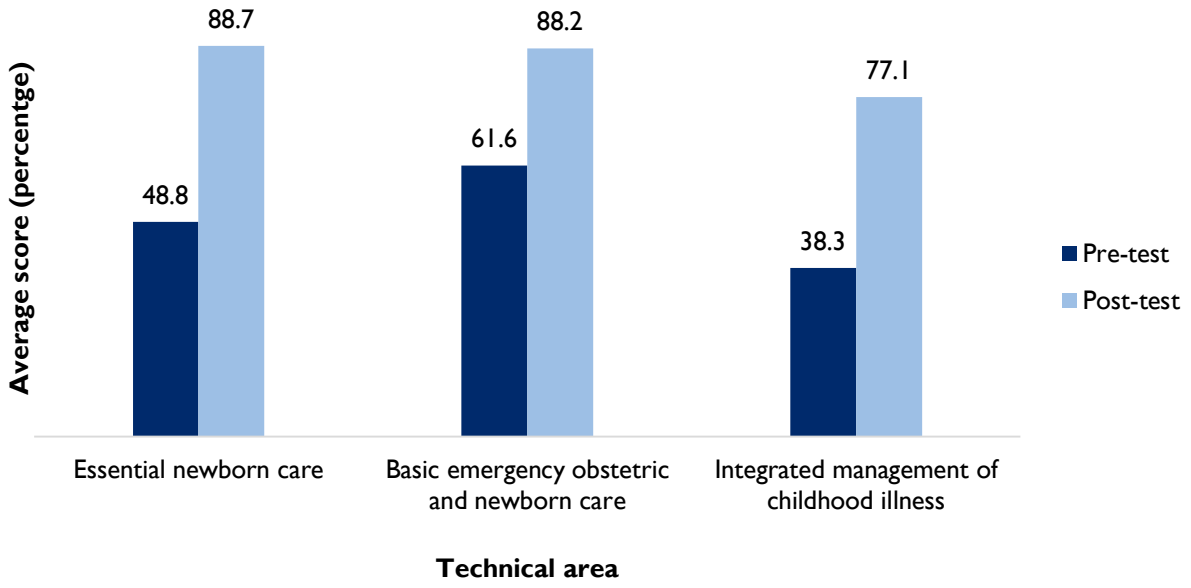
Clinical mentorship began immediately after the LDHF training in the initial four districts and began before the LDHF training component in the other six districts. District-based mentors visited each health facility at least once a quarter. During each visit, the mentor focused on the two mentees who had or would receive LDHF training using an observation checklist to assess progress in skills through observation of simulated resuscitation using a NeoNatalie anatomic model. The mentors also reviewed organization of services and observed other components of delivery readiness. In cases where mentees were not working or could not be located during the day of the mentorship visit, mentors would invite other providers to attend the mentorship visit. The mentors also gave mentees materials to conduct peer-to-peer mentorship activities in between visits. Sixty-two (6%) of providers received clinical mentorship only without participating in LDHF trainings.

Over the life of the project (June 2016–September 2018), MCSP reached over 900 health workers with the LDHF and mentorship approaches.[20] At least quarterly, providers received mentorship either through remote mentorship (e.g., telephone calls or WhatsApp) or in-person (on site).

LDHF training and clinical mentorship across the 172 MCSP-supported facilities contributed to improved and sustained clinical skills and competencies of providers. In a randomly selected subset of learners for whom MOH staff regularly documented pre- and post-test scores, knowledge and skills improved following LDHF training by 40 percentage points in ENC/HBB, 39 percentage points in IMCI, and 27 percentage points in basic emergency obstetric and newborn care, as measured by pre- and post-training assessment checklists. These results are shown in Figure 5.

[20] Maternal and Child Survival Program (MCSP). 2019. *MCSP End-of-Project Report.* Washington, DC: MCSP.

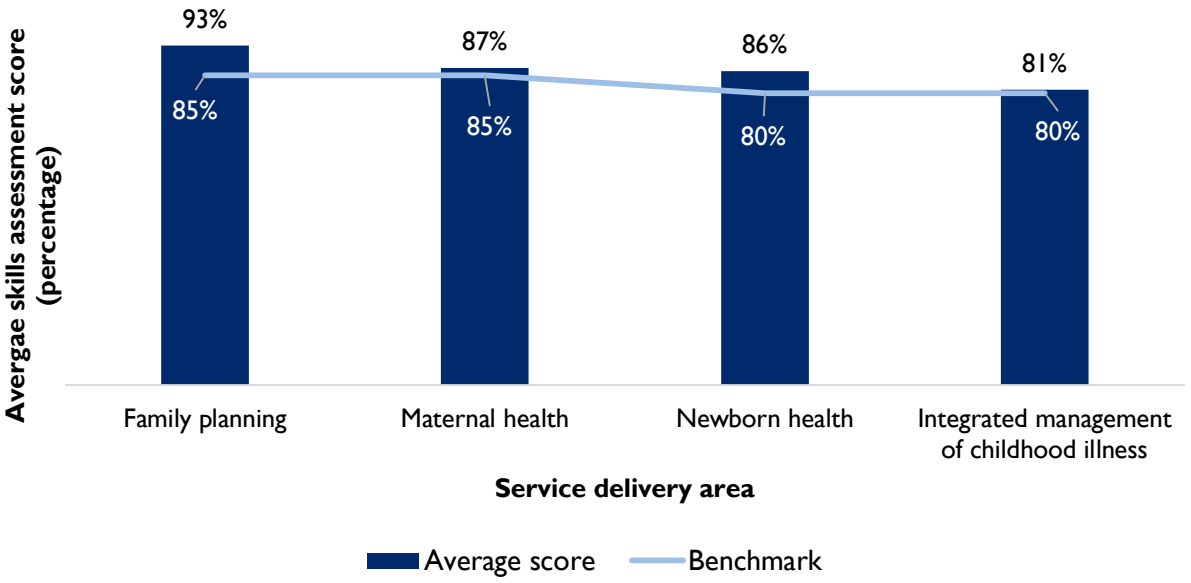
Figure 5. Improvements in average assessment scores pre and post LDHF training across 149 providers, by technical area



Source: Project training records

During an endline provider skills assessment,[40] previously validated providers (i.e., those who scored at least 80% on mentorship checklists) scored above the established benchmark for graduation from training in specific service delivery areas (Figure 6).

Figure 6. Average skills assessment score across providers in 64 MCSP-supported facilities (n = 64 for family planning and maternal and newborn health; n = 52 for integrated management of childhood illness)



Source: Project records (2018 MCSP endline assessment)

The new training approaches surpassed the World Health Organization (WHO)'s standard criteria for the classic IMCI training as well, and the providers who underwent either LDHF or on-the-job training

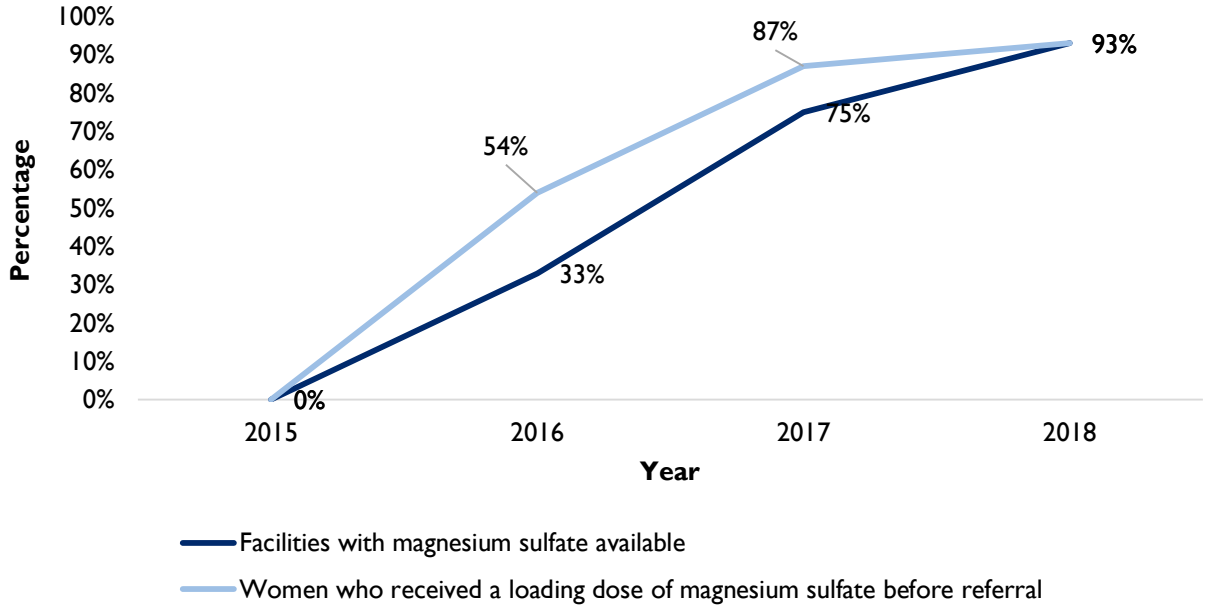
outperformed those who received classic training in all components of IMCI with the exception of counseling of the mother.[21]

MCSP interviewed 12 randomly selected mentees who received LDHF training and mentorship to better understand the acceptability and feasibility of the intervention. The respondents said the new capacity-building approach focuses on enhancing their skills, knowledge, and confidence. In addition to technical support that mentors provided, respondents perceived that mentors provide valuable assistance in improving and strengthening systems, including the flow of the maternity and reporting on consumables. This is attributed to the rigorous follow-up, with mentors making recommendations and checking on the next visit that the recommendations have been implemented.

One ENC/HBB mentee mentioned: "They [mentors] helped me expand my knowledge. With LDHF and mentoring visits, I have learned some best practices: 1) preparation of materials/equipment before delivery to warm and clean the baby, to resuscitate, using skin to skin; 2) breastfeeding: focus on the first hour is now practiced; 3) before this approach, we did not have a 'helper' before assisting a delivery; 4) improved capacity to manage complicated cases. I transfer patients when appropriate and in good time."

Improved and sustained provider competency contributed to improved client-level health outcomes. A key improvement after the basic emergency obstetric and newborn care training and mentorship was the use of magnesium sulfate at health center level. At the start of the program, none of the 155 MCSP-supported health centers had magnesium sulfate in stock for management of eclampsia. At the end, 144 health centers had it in stock (see Figure 7). Similarly, in 2015, no women with pre-eclampsia/eclampsia received a loading dose of magnesium sulfate before being referred to a higher-level facility, and by the end of the program in 2018, 93% of women with pre-eclampsia/eclampsia received it.

Figure 7. Improved readiness and quality of care in pre-eclampsia/eclampsia management (n = 155 facilities, n = 146 women with pre-eclampsia/eclampsia)



Source: MCSP records

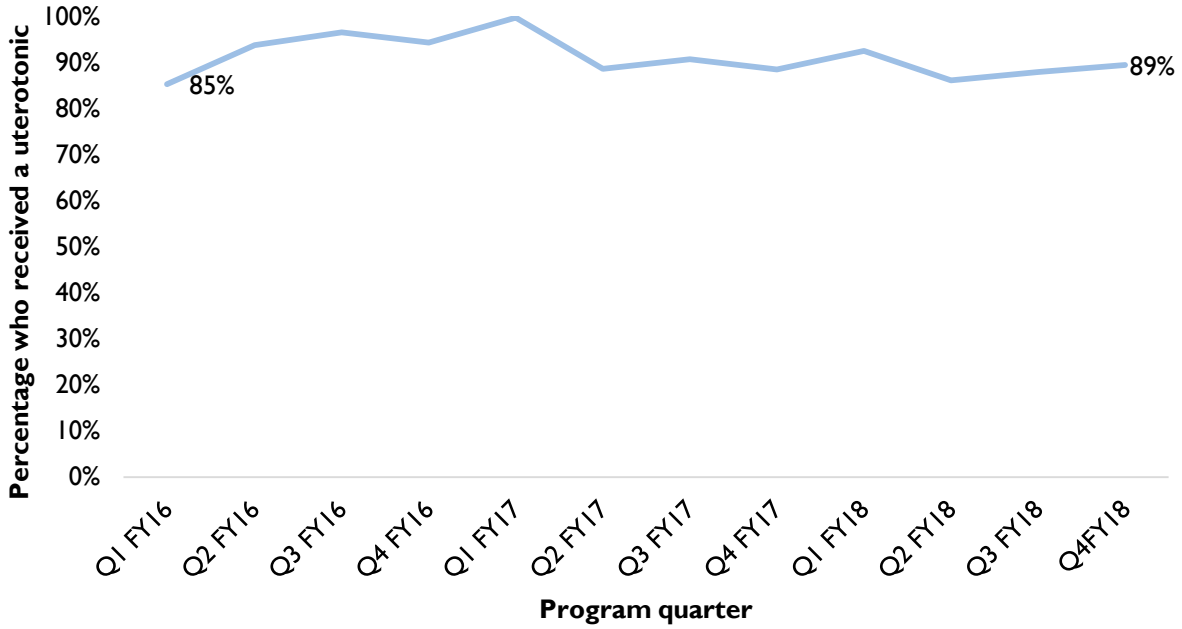
Note: MCSP was not able to obtain data from all 172 MCSP-supported facilities.

[21] MCSP. 2018. LDHF Child Health brief. Washington, DC: MCSP.

Facilities maintained use of uterotonics in facility-level births throughout the life of the program, with the percentage of women who received a uterotonic immediately after the birth remaining between 85% and 100% (see Figure 8). Improved clinical skills and advocacy for equipment and key commodities through the LDHF and mentorship approaches contributed to the continued use of this lifesaving intervention.

For IMCI, routinely reported data between January 2016 and June 2018 demonstrated an increase of the percentage of sick children treated according to the national protocol, from 53% to 85% in supported districts, compared to a national average increase from 55% to 72% during the same period.[21]

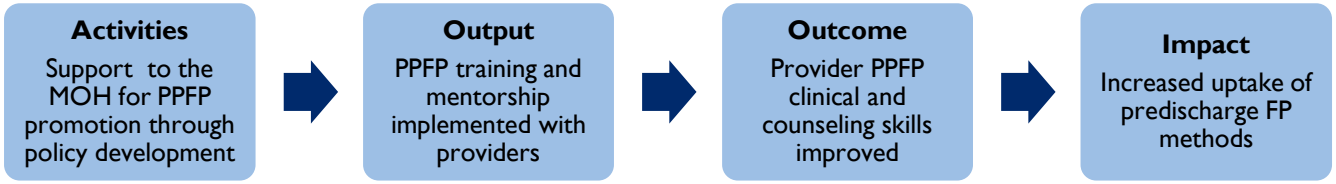
Figure 8. Percentage of MCSP-supported facilities where women received a uterotonic immediately after birth (n = 557,472 facility deliveries)



Source: Rwanda health management information system

The data presented above shows that the practice improvement intervention developed by the MOH/RBC and MCSP contributed to improved health worker knowledge and skills, which resulted in improved health outcomes for clients at the facility level.

Contribution Statement 2: MCSP contributed to an increase in the uptake of PPFP methods in the postpartum period in the 10 MCSP implementation districts.



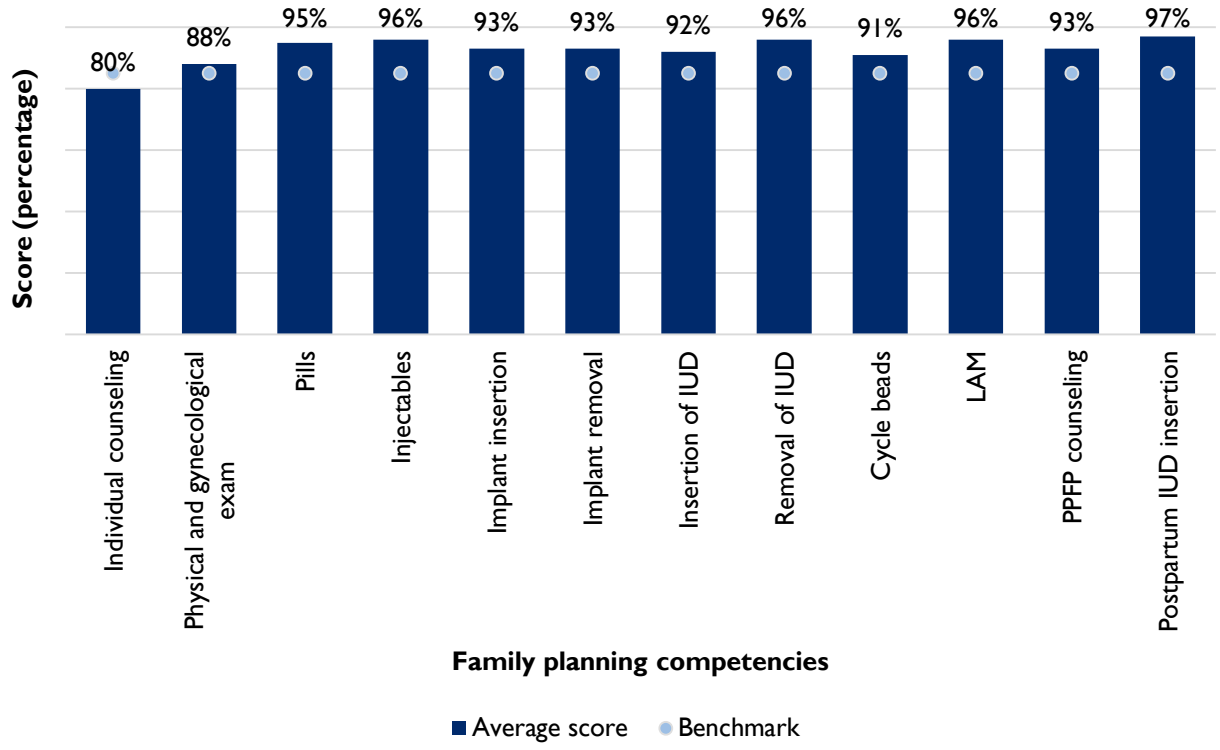
Support to the MOH for PPFP promotion through policy development led to MOH support for PPFP training and mentorship for providers. MCSP supported the MOH to incorporate PPFP into the national FP strategy. Through MCSP's partnership with the MOH, district hospitals, health centers, and nongovernmental organization partners, including PACT, Society for Family Health, and the United Nations

Population Fund, MCSP revised and adapted existing FP training materials to include information from the latest Rwanda DHS 2015, the new World Health Organization (WHO) Medical Eligibility Criteria (5th edition), and PPFP policy.[22] The national Maternal, Child, and Community Health Technical Working Group validated the updated training materials, further suggesting strong commitment from the government and from resource and implementing partners to provide PPFP services to beneficiaries.[22] Through the use of different training approaches (e.g., classic, on-the-job, LDHF, clinical mentorship, and community mentorship), MCSP worked to improve the knowledge and skills to FP providers and community health workers in MCSP-supported districts. MCSP also supported the MOH in scaling up PPFP/postpartum intrauterine device training in selected districts. MCSP trained 309 providers on counseling and 272 providers on FP technical skills in the immediate postpartum period.[23]

PPFP training and mentorship implemented with providers resulted in an improvement in providers' PPFP clinical and counseling skills. MCSP trained at least two providers of modern FP methods and PPFP at each health facility in the 10 MCSP-supported districts. MCSP also strengthened provider skills and knowledge to conduct clinical mentorship visits. These visits included promoting and using FP registers, providing mentoring on best practices in infection prevention and control to reduce complications, and enabling providers to improve their competency in providing FP services.[20]

Results from the MCSP endline assessment, in which MCSP selected a sample of mentors for a competency assessment, showed that mentors were generally at or above the benchmark for providing FP services (Figure 9).

Figure 9. Mentors' scores for most family planning competencies at endline (n = 64 providers)

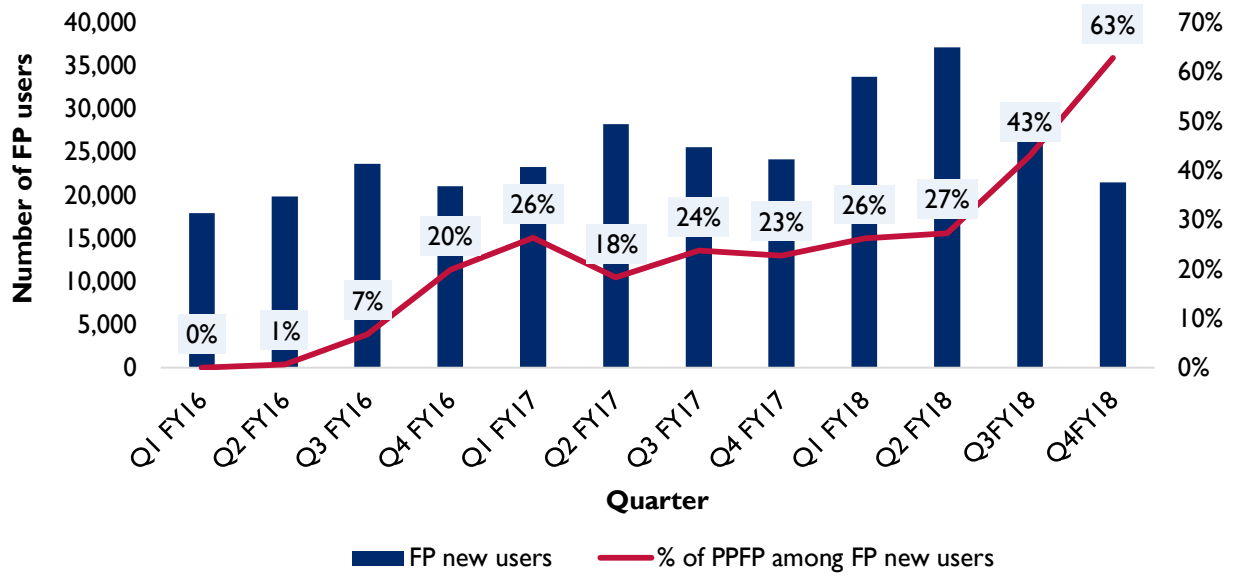


IUD = intrauterine device, LAM = lactational amenorrhea method, PPFP = postpartum family planning

[22] Maternal and Child Survival Program. 2016. *PY2 Annual Report*. Washington, DC: MCSP.
[23] Providers from 10 districts were trained on the different competencies: 309 on counseling and 272 on technical skills of FP in the immediate postpartum period (EOP report).

Improved PPFP clinical and counseling skills among nurses and midwives led to increased uptake of predischarge FP methods: Results showed that the integrated strategies of competency-based training for counseling and technical skills, followed by mentorship and QI activities, improved providers' knowledge and skills. In turn, MCSP-supported facilities that trained providers to offer a full range of PPFP methods saw a rise in rates of PPFP counseling and immediate PPFP uptake, versus facilities run by faith-based organizations, which generally provide PPFP counseling only.[24] Provision of PPFP counseling to pregnant women in the facilities across MCSP-supported districts increased from 78% in October–December 2016 to 93% by the same quarter in 2017. Before the intervention, the MOH did not routinely measure PPFP uptake before discharge. Since implementation began in January 2016, there was a marked increase in the 10 project implementation districts in PPFP uptake before discharge, from 0% at the start of the implementation period to 63% at the end of quarter 4 FY18 (see Figure 10).[25] This resulted in an increase in PPFP acceptors among new FP users in 172 health facilities.

Figure 10. Increasing percentage of postpartum family planning (PPFP) acceptors among recently delivered women in 172 health facilities



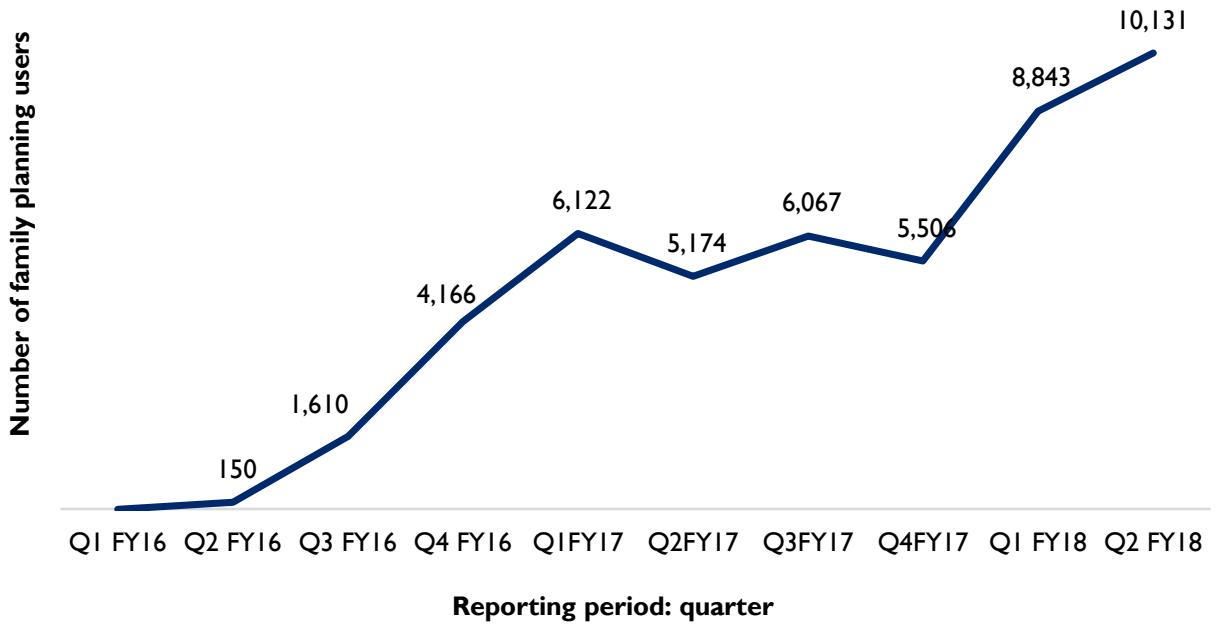
Source: Rwanda health management information system

Scale-Up of PPFP Intervention and Increase of FP Uptake in Postpartum Period

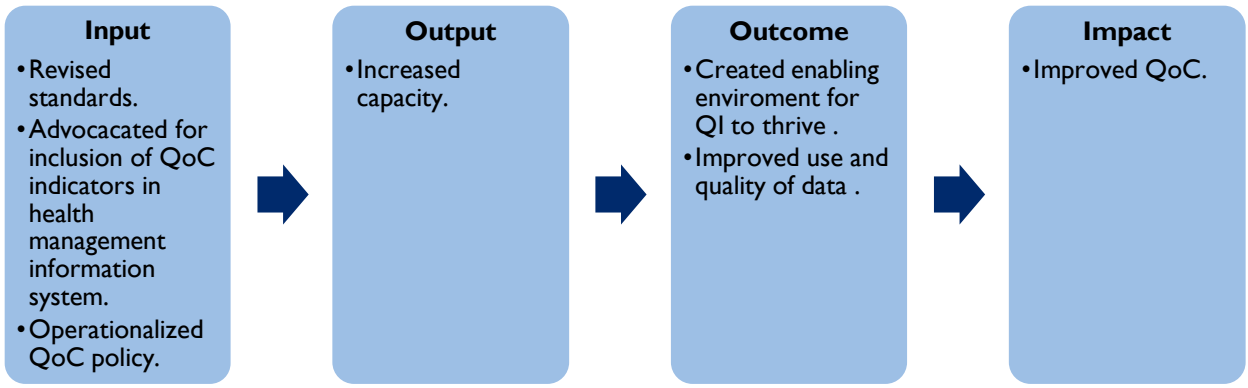
MCSP scaled up PPFP from three health facilities to 147 health facilities in 10 MCSP-supported districts. Integrating PPFP into antenatal, labor and delivery, and postnatal periods allowed women to choose an FP method before delivery, which could be clearly documented on their individual health card. Among clients counseled in those health facilities, 35% accepted and initiated postpartum methods (short- and long-acting reversible methods), 46% left the clinic with a specific FP follow-up plan, and 4% opted out of PPFP methods.[24] According to the head of an MCSP-supported health center: "The most important thing we benefited from training and mentorship is how to provide FP methods. The number of FP users has increased; we have more staff to provide FP method, including me. PPFP is 100%, while before MCSP, it was not done at all." By 2018, more than 10,000 postpartum women received an FP method (see Figure 11).

[24] MCSP. 2018. PPFP brief. Washington, DC: MCSP.

Figure 11. Postpartum uptake of family planning across 172 MCSP-supported health facilities



Contribution Statement 3: MCSP QoC interventions improved data quality and use, which contributed to improved QoC provided by health workers.



MCSP's support in revising standards, advocating for inclusion of QoC indicators in the health management information system (HMIS), and operationalizing the QoC policy laid the foundation to increase capacity of QI teams/providers: Several key activities laid the foundation for a solid QI system before MCSP used targeted activities to build the capacity of facility personnel in QI.

First, MCSP supported the MOH to adapt and develop standards according to those of the International Society for Quality in Health Care.[26] In collaboration with the MOH Health Services and Quality Assurance Unit, MCSP created a QI supervisory checklist based on quality measures from the national primary technical health care standards to align QI efforts at facility level with the Rwandan national plan and national

[26] The International Society for Quality in Health Care is an organization that accredits accrediting bodies.

standards of care. These standards included existence, organization, and functionality of quality management committees; effective customer care; patient satisfaction surveys; complaint and suggestion processes; data use for continuous QI; incident reporting; and staff satisfaction surveys.

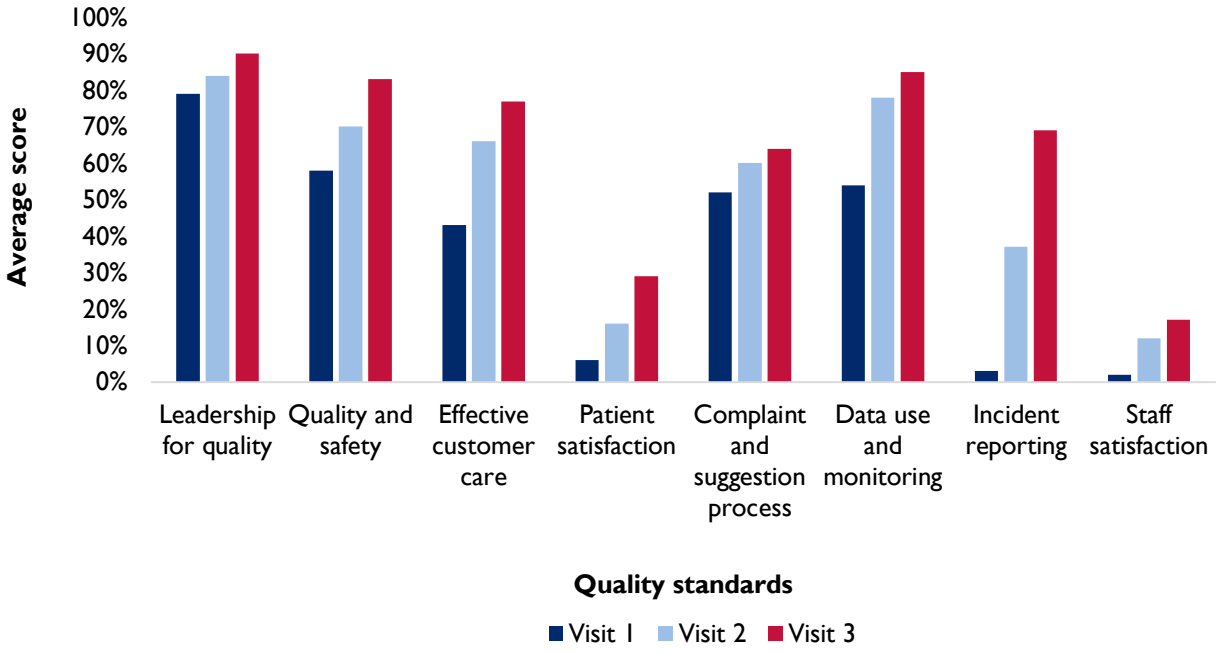
Building upon these revised standards, MCSP and the MOH integrated coverage and QoC indicators from the WHO 2013 QoC Technical Consultation report, which proposed core indicators to measure and improve quality of services at the health facility level.[27] Without the inclusion of these indicators in the HMIS, key data points could not be collected to inform overall clinical decision-making.

The third item that helped lay a solid foundation for the QoC system to thrive was the operationalization of the national QI policy, rooted in the Plan-Do-Study-Act model.[28] The MOH, with support from MCSP, implemented specific structures at each level of the health care system to support the approach. At national level, a quality assurance desk at the central level now oversees the institutionalization and implementation of a standards-based quality assessment system for all public hospitals (accreditation) and health centers (primary health care standards) in the country.[29] Regarding support for data management and use at national level, MCSP supported data management practices by developing, updating, printing, and disseminating data collection tools to health facilities. Through close collaboration and support, the MOH's HMIS team organized workshops to develop District Health Information System 2 (DHIS2)[30] dashboards for key RMNCH indicators. By the end of the workshop, the teams developed functional DHIS2 dashboards with self-updating (relative period) charts for all 12 hospitals and 160 health centers supported by MCSP. These dashboards with routinely reported HMIS data are used for continuous QI at facility level.[20] To inform national efforts, the MOH established district health management teams and QI focal people in each health facility and health center who were responsible for driving QI efforts. Efforts informed by 3-year capacity-building benchmarks included convening workshops to create dashboards and conducting supportive supervision visits.

Increased capacity of QI teams/providers and an enabling environment improved use and quality of data: Activities to build capacity of district- and facility-level staff were extensive and included performing newborn deaths audits and developing QI projects.[20] A crucial component of the approach was capacity-building supportive supervision visits by facility-based staff mentors, each of whom made separate visits to each health center. The teams used a collaborative approach with ample interaction within districts during coaching sessions.[31] These visits included open discussions on use of dashboards for key RMNCH indicators, identification of quality gaps/areas for improvement, and how to initiate QI projects in accordance with the Plan-Do-Study-Act model of QI. The main objective of the activity was to strengthen district hospital staff's skills on the continuous QI methodology and mentorship so they can help health centers improve their compliance with quality standards, thereby improving client experience of care and data use for QI.[31] Providers marked a gradual improvement of health center performance against quality standards (see Figure 12) at each supportive supervision visit. The literature supports the use of supportive supervision of/for clinical-based standards and QI.[32,33]

[27] World Health Organization (WHO). 2014. *Consultation on Improving Measurement of the Quality of Maternal, Newborn and Child Care in Health Facilities*. Geneva: WHO.
[28] Plan-Do-Study-Act is a four-stage problem-solving model used to improve a process or carry out change. By definition, plan is the portion of the cycle where action items are developed to test the change. The do portion of the model is when those action items are tested. Study is when observations and learning take place after carrying out the action items. Act is implementing the changes that are needed based on those observations.
[29] Rwanda Biomedical Center (RBC). 2013. *Maternal, Neonatal and Child Health National Strategy: July 2013–2018*. Kigali, Rwanda: RBC.
[30] DHIS2 is a tool for collecting, validating, conducting analysis, validating, and presenting statistical data on patients.
[31] MCSP. 2017. *PY3 Annual Report*. Washington, DC: MCSP.
[32] Washington M, Jayanna K, Bhat S, et al. 2016. Nurse Mentor Training Program to Improve Quality of Maternal and Newborn Care at Primary Health Centres: Process Evaluation. *Open J Nurs.* 06(06):458-69. doi: 10.4236/ojn.2016.66048.
[33] Nkomazana O, Mash R, Wojczewski S, Kutalek R, Phaladze N. 2016. How to create more supportive supervision for primary healthcare: lessons from Ngamiland district of Botswana: co-operative inquiry group. *Glob Health Action.* 9(1):31263. doi: 10.3402/gha.v9.31263.

Figure 12. Progress of health center compliance with quality standard (n = 157 facilities)



Data source: MCSP program records

Another important capacity-building technique aimed to create an enabling environment for QI efforts to thrive was facility-to-facility mentorship (also known as peer-to-peer mentorship). This included providing financial and technical support to organize peer-to-peer facilitation from more advanced to less advanced hospitals on compliance with accreditation standards. Staff reported this process encouraged them to take ownership of the QI efforts at their facility and helped improve compliance and performance.[34] While one-on-one mentorship has been proven as a powerful capacity-building approach,[35–38] the impact of group-based mentorship (or mentorship between facilities) needs more study.

In an effort to better understand the impact of the QI intervention, MCSP completed an assessment of facility readiness of data use in a sample of facilities in October/November 2015 and again in June/July 2018. It adapted the assessment from WHO's Service Availability and Readiness Assessment tool[39] and added a new section on data use for action. The tool looked to measure readiness for data visualization and use, implementation of the health facility QI process, availability of district-level support for data use/decision-making, and implementation of district-level supportive supervision and data dissemination through community engagement.[40] Results showed that while the structures, tools, and processes for data use and decision-making generally improved at hospital facility level (Figure 13), health centers saw fewer gains in the

[34] MCSP. 2018. *PY4 Annual Report.* Washington, DC: MCSP.
[35] Werdenberg J, Biziyareme F, Nyishime M, et al. 2018. Successful implementation of a combined learning collaborative and mentoring intervention to improve neonatal quality of care in rural Rwanda. *BMC Health Serv Res.*18:941.
[36] Okereke E, Tukur J, Aminu A, et al. 2015. An innovation for improving maternal, newborn and child health (MNCH) service delivery in Jigawa State, northern Nigeria: a qualitative study of stakeholders' perceptions about clinical mentoring. *BMC Health Serv* Res. 15:64. doi: 10.1186/s12913-015-0724-4.
[37] Manzi A, Magge H, Hedt-Gauthier BL, et al. 2014. Clinical mentorship to improve pediatric quality of care at the health centers in rural Rwanda: a qualitative study of perceptions and acceptability of health care workers. *BMC Health Serv* Res. 14:275. doi: 10.1186/1472-6963-14-275.
[38] Anatole M, Magge H, Redditt V, et al. 2013. Nurse mentorship to improve the quality of health care delivery in rural Rwanda. *Nurs Outlook.* 61(3):137–44. doi: 10.1016/j.outlook.2012.10.003.
[39] Health Statistics and Information Systems, WHO. 2015. *Service Availability and Readiness Assessment (SARA): An Annual Monitoring System for Service Delivery: Reference Manual.* Geneva: WHO.
[40] MCSP. 2019. *Improving RMNCH Service Readiness and Quality- Summary Findings from an Endline Analyses of the MCSP Rwanda Program.* Washington, DC: MCSP.

same areas (Figure 14). This may be because some areas had high values at baseline; for instance, 92% of MCSP-supported health centers already had functional QI committees.[40]

Figure 13. Improved environment, tools, and processes for data use for decision-making at all MCSP-supported hospitals (n = 12 hospitals)

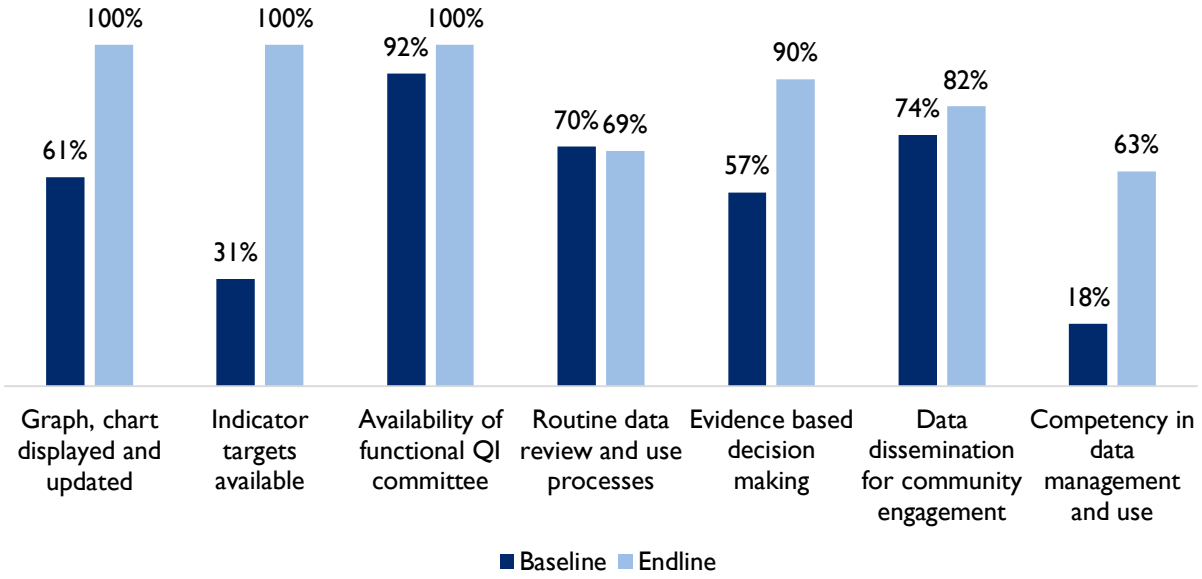
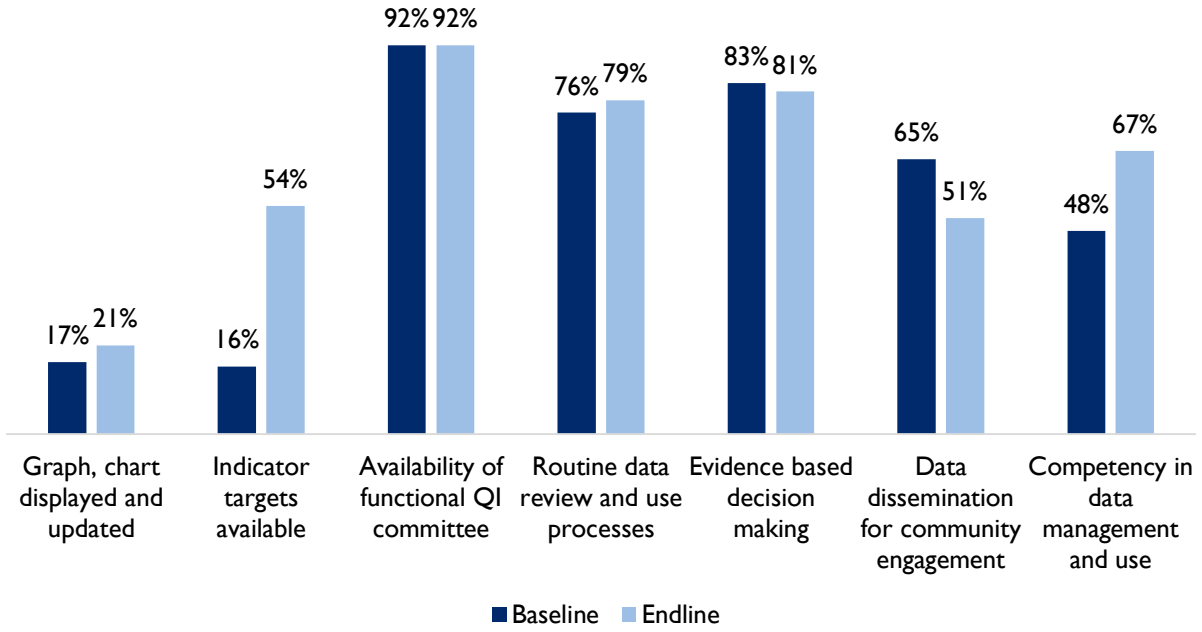


Figure 14. Findings regarding data and data use at baseline and endline at all MCSP-supported health centers (n = 52 health centers)



In addition to quantitative efforts, MCSP conducted qualitative interviews so respondents could speak in more depth about the impact of the interventions at all levels of the health care system. At national level, one respondent mentioned the impact of how the availability of data-informed key process decisions and impacts would be felt at each level:

> "For example, using dashboard or any database at national level, we can see if numbers on FP are low or high, and before making decisions, we talk to those responsible at the source and discuss in order to make appropriate decisions." –Monitoring and evaluation manager, RBC

In districts, respondents shared the impact of data analysis and how it is being incorporated into their quarterly meetings. During these meetings, districts analyze and present data, from which recommendations are made. Districts later follow up on recommendations. Respondents said that these meetings did include data use before MCSP interventions:**Error! Bookmark not defined.**

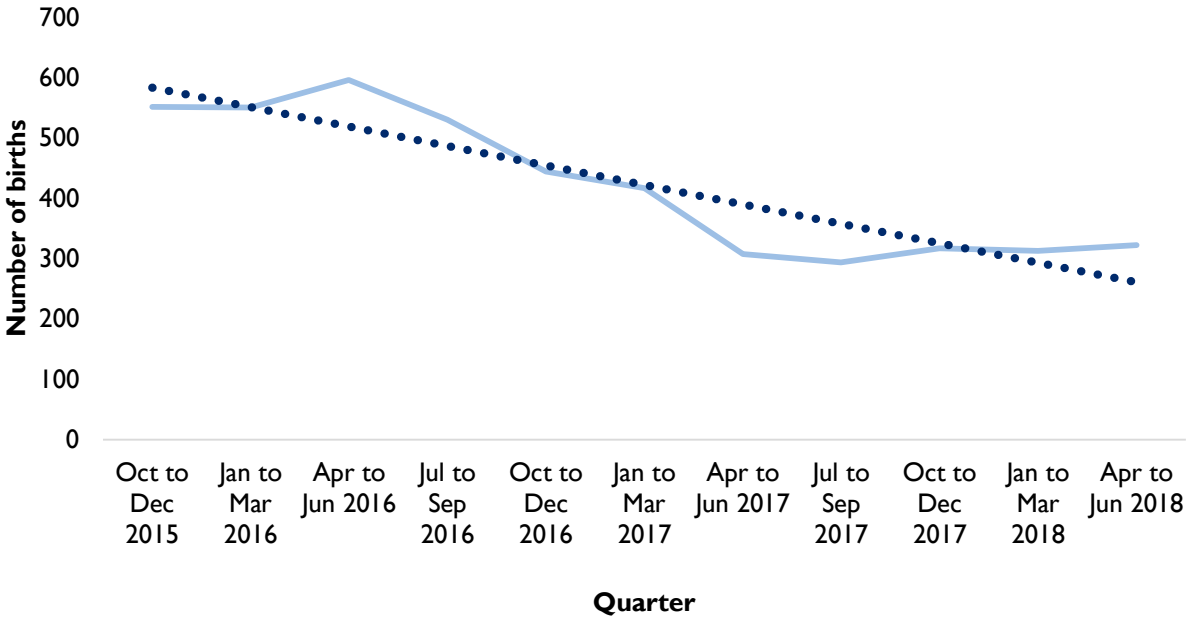
> "Other thing is about data QI. MCSP worked closely with data managers at health centers and hospital level, and provided trainings to all data managers in regard to data entry, data analysis, and data interpretation." –District health director, Ngoma

Respondents also gave important examples of how they used data for evidence-based decision-making. One provider gave an example of an important experience with improving data quality and use:[40]

> "Before submitting a certain report, I check and ensure the quality of my data. One time, we found that the number of partographs was not equal to the number of normal deliveries—there were missing partographs. We discovered that the missing partographs were attached to transfer notes. We made copies of the missing partographs and showed the issue to the staff."[41]
> –Midwife, Gituza health center

Improved use and quality of data led to improved QoC: MCSP observed marked improvement in QoC by the end of project implementation. As shown above, Figure 10 highlights the steady uptake of PPFP services in all 10 MCSP implementation districts. In addition, Figure 10 shows the decreasing number of birth asphyxia cases that were admitted from start to end of project. These data are important data collection/appropriate documentation that can help inform project design and overall national QI policy.

Figure 15. Decreasing number of admitted birth asphyxia cases in 172 health facilities (n = 292,899 facility deliveries)[42]



In collaboration with the Rwanda Society of Obstetricians and Gynecologists, providers in project facilities put together QI project teams to focus on birth asphyxia cases and review the issues in care when they arose. The teams worked through cases and data, reviewing all decisions made and actions taken during implementation. As a result, facilities saw a steady decline in birth asphyxia cases admitted to hospitals between October 2015 and June 2018 (Figure 15).**Error! Bookmark not defined.**

[42] MCSP. 2019. *MCSP End-of-Project Report.* Washington, DC: MCSP.

Limitations

Several key influencing factors affected the process and, subsequently, the creation of the CA story. First, much of the data collected as part of the program were not related to the execution of the skills at the point of care and health outcomes. Data informing provider performance pre- and post-training were available but did not provide information on how this trickled down to performance in the longer term. As a result, MCSP relied on the literature to provide supporting evidence for the program's contributions. MCSP learned that plans for using the CA process during implementation would be beneficial for understanding progress made on program objectives. By focusing on broader technical areas, MCSP needed to account for a myriad of interventions and their relevant program data. Data were not always available for inclusion in the CA approach.

Conclusion

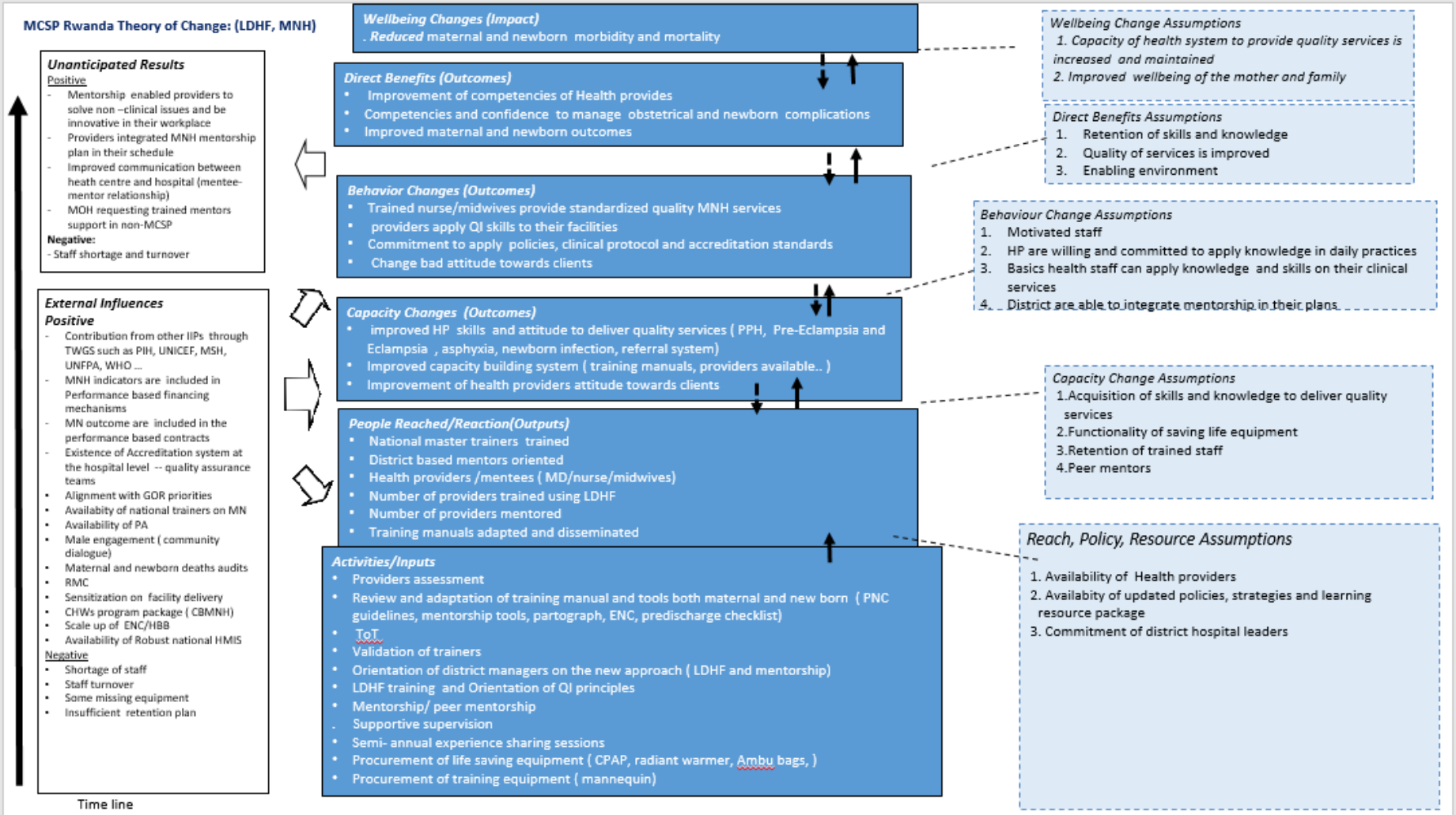
This report presents evidence that MCSP support and activities conducted in partnership with the MOH and RBC in Rwanda contributed to three major achievements:

1. Improvement and maintenance of health worker competencies in RMNCH and FP and client outcomes in the same areas
2. Significant increase in the uptake of PPFP methods in the immediate postpartum (predischarge) period
3. Improved QoC at the facility level

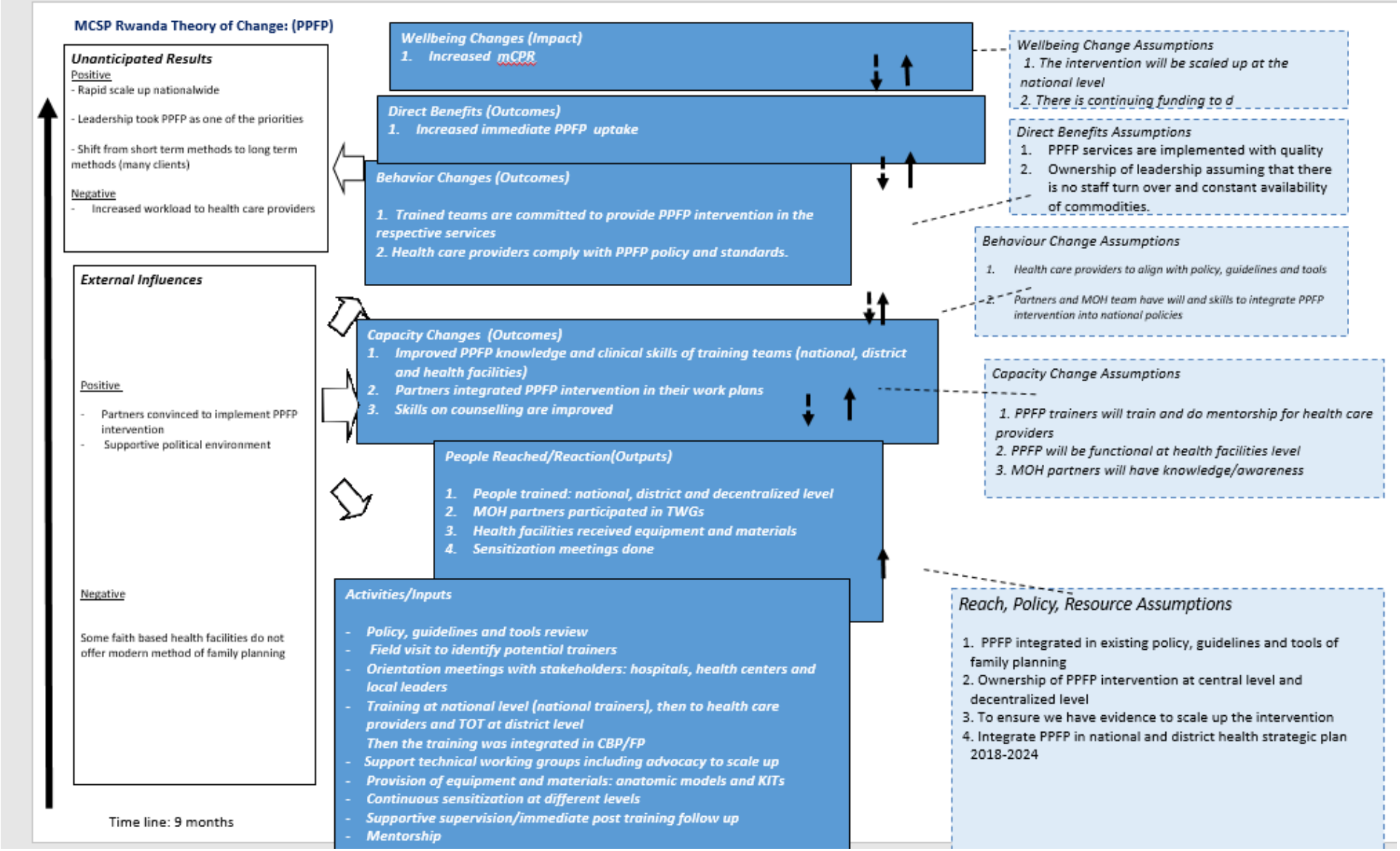
In light of these findings, the MOH/RBC and other implementing partners should work to budget for and implement the successful aspects of MCSP. MCSP found that the CA framework helped to elucidate its contributions within an environment with other actors and influences. Developing a TOC at the start of a project can help guide the rollout of activities and prepare implementers for challenges that may arise as the result of assumptions. Documenting course corrections that take place throughout the life of the program can help future programs carry forward the successful aspects of implementation.

Annex I. Theories of change

Theory of change for contribution analysis statement 1



Theory of change for contribution analysis statement 2



Theory of change for contribution analysis statement 3