Updating Rwanda's Health Management Information System (HMIS)

Measuring What Matters

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Background

Director of Public Health opened the HMIS orientation for data managers in Rwamagana. Photo Credit: Jovite Sinzahera/MCSP

Rwanda's national health management information system (HMIS) has used a web-based open source platform (District Health Information System 2 [DHIS2]) since January 2012 to collect routine data for the health sector. Over the years, the HMIS/DHIS2 integrated different reporting systems and modules, such as Integrated Disease Surveillance and Response (e-IDSR), non-communicable diseases, tuberculosis and HIV. The maternal and child health (MCH) module in DHIS2 was included in 2012; however, no major changes had been made since the launch of the system. As a result, new program priorities were not reflected or measured in the HMIS. Furthermore, findings from past data quality audits revealed data issues across reproductive, maternal, newborn, and child health (RMNCH) and other technical areas (e.g., Tuberculosis [TB]), including:

- Misinterpretation of some indicators
- Missing key global indicators
- Data elements that were not linked to any strategy and that needed to be dropped
- Reporting forms that needed to be updated
- Data elements that were reported, but not captured appropriately in existing primary sources

USAID's Maternal and Child Survival Program (MCSP) collaborated with the Ministry of Health (MOH), Rwanda Biomedical Center (RBC), and other partners to update the national HMIS. Based on MCSP recommendations and discussions with stakeholders, the MOH integrated select coverage and quality of care (QoC) indicators from the WHO 2013 Consultation on Improving Measurement of the Quality of Maternal, Newborn, and Child Care in Health Facilities; Every Newborn Action Plan; and Ending Preventable Maternal Mortality. These indicators measured maternal, newborn and child health (MNCH) services at the health

facility level. As a result of the HMIS review process, the MOH incorporated family planning (FP)/postpartum FP (PPFP) indicators. Previously, there were no national indicators to measure whether the MOH was reaching the desired outcomes in the newly prioritized FP/PPFP agenda.

MCSP and the MOH aimed to align Rwanda with the global agenda and to ensure effective measurement of the Health Sector Strategic Plan IV (HSSP IV) activities across all levels of the health system. Empowered by the right data, sub-national governments and key stakeholders would be able to accelerate progress on the availability and quality of RMNCH services. This brief describes the process of revising the HMIS, MCSP's contributions to that process, final changes made to the system, and available intervention coverage trends as a result of the revised national HMIS.

Program Approaches

Identified the need for an HMIS review[1] and update (November 2015)

The RBC and MCSP prioritized an evidence-based approach to the national HMIS review process. MCSP and the PMEBS[2] Division at RBC engaged data managers from two non-MCSP supported health facilities within Kigali city (Masaka Health Center and Masaka Hospital) to assess the value of the indicators that MCSP had proposed via the project's complementary reporting. During this visit, the group reviewed the availability of data collection tools and the feasibility of data collection while also identifying the additional burden of implementing changes among data managers and the overall facility. Because data managers must operate in low-resource settings while managing the competing demands of various stakeholders, they provided a unique perspective in this process identifying the challenges and barriers to accurate, quality, data collection.

Advocated with the MOH for an update to the national HMIS (October 2016 – September 2017)

MCSP recognized that existing national HMIS registers did not include key measures for high-impact RMNCH interventions, such as PPFP and others listed in Annex A. To capture the required data, MCSP proposed new codes within existing facility record keeping forms to help gather the necessary information. For example, MCSP suggested codes that would capture data on PPFP counseling and FP uptake in the existing delivery and ANC registers. MCSP collected the RMNCH data[3] from facilities on a quarterly basis using a complementary report form, analyzed the data, and discussed results with the national Maternal and Child Health (MCH) Technical Working Group (TWG).

These modified data sources and quarterly data became critical components in building the case for an HMIS review and revision process. On a quarterly basis, MCSP presented the data to the MCH TWG and analyzed the value of addressing these data gaps. This evidence showed that something had to be done to allow the HMIS to capture the new RMNCH priorities, especially as the country was embarking on a new health sector development plan and national RMNCH strategies. Effective monitoring and data use became the key drivers of the HMIS review process.

[1] The HMIS review spanned multiple technical areas: Family Planning, Newborn Health, Maternal Health, and Child Health.

[2] Planning, Monitoring & Evaluation, and Business Strategies Division within the RBC.

[3] As a part of its overall programming, MCSP led quarterly data quality reviews to ensure the data was accurate and usable for decision-making. These reviews also helped uncover key data issues that were addressed during the HMIS Review Process.

With recommendations from the MCH TWG, the MOH validated the need for an HMIS update in July 2017 – adding new data elements, redefining existing data elements, and dropping irrelevant data elements by January 2018.

Engaged key stakeholders in gap analyses and ideation (July 2017 to January 2018)

Following these discussions, the FP and Newborn sub-TWGs within the MCH TWG formed smaller groups to identify data and system gaps and potential HMIS modifications[4]. MCSP subsequently supported the MOH to convene a workshop in August 2017 with the RBC/MCCH and RBC/PMEBS Divisions and key implementing partners[5] to refine the HMIS forms, registers, and relevant tools while also aligning them with the HSSP IV monitoring plan and global indicators (e.g., FP 2020). In the final workshop, the MOH's HMIS department convened with MCSP, all MCH sub-TWGs, and key implementing partners, to make the final changes to the national HMIS. During each step of the review process, the MOH led with MCSP support, creating the strong level of ownership needed to sustain implementation and use of revised tools and indicators to measure and evaluate progress.

Introduced HMIS modifications to facility level data managers (January 2018)

MCSP and MOH used the revised tools and reporting forms to train health center service providers (maternity), district-based mentors, and hospital / facility level data managers on the modifications (e.g., indicators that had been removed and clarifications to indicator definitions). The trainees also learned data collection strategies, reviewed responsibilities, and practiced developing HMIS monthly reports. The MCSP-led one-day trainings t allowed facilities to discuss and address potential challenges together before implementation. MCSP oriented 93% of target end users from 176 health facilities across 10 MCSP-supported districts.

Per the established joint implementation plan, Management Sciences for Health, Partners in Health, and Health Builders committed to conducting similar trainings in the remaining 20 districts of the country. All facilities from MCSP-supported districts began using the new HMIS registers and tools in February 2018 to report January 2018 health data to the national HMIS.

Key Results

The final set of data elements that were included in the national HMIS as a result of the review process are outlined in Annex A.

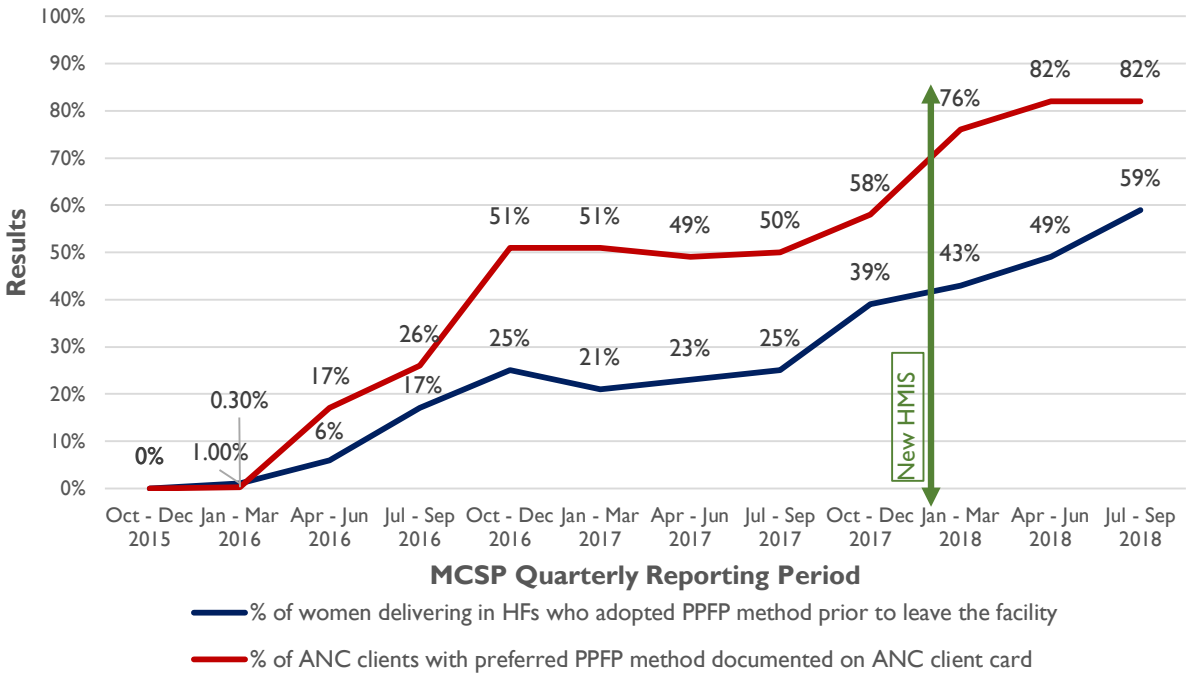
The three charts below highlight coverage trends for five of those indicators. While these charts were generated using the MCSP quarterly complimentary reports (introduced between October and December 2015), similar charts can be created using the MCSP-supported health facility dashboards and the national HMIS that MCSP could not have directly access.

Figure 1 (below) shows the rising trends in PPFP uptake during ANC and postnatal care (PNC). Between October 2016 and September 2018, MCSP-supported facilities across 10 districts experience an 82% increase in women who adopted a PPFP method prior to leaving the facility they delivered in. The data generated from the complementary form not only allowed MCSP to monitor outcomes of PPFP scale up in Rwanda, but they also helped the MOH visualize the benefits of including PPFP indicators in the national HMIS.

[4] While MCSP focused exclusively on the RMNCH component, they advised the TB, HIV, and Non-communicable Disease TWGs through a similar process because the MOH believed that it was important and more cost-effective for all the TWGs to review their indicators.

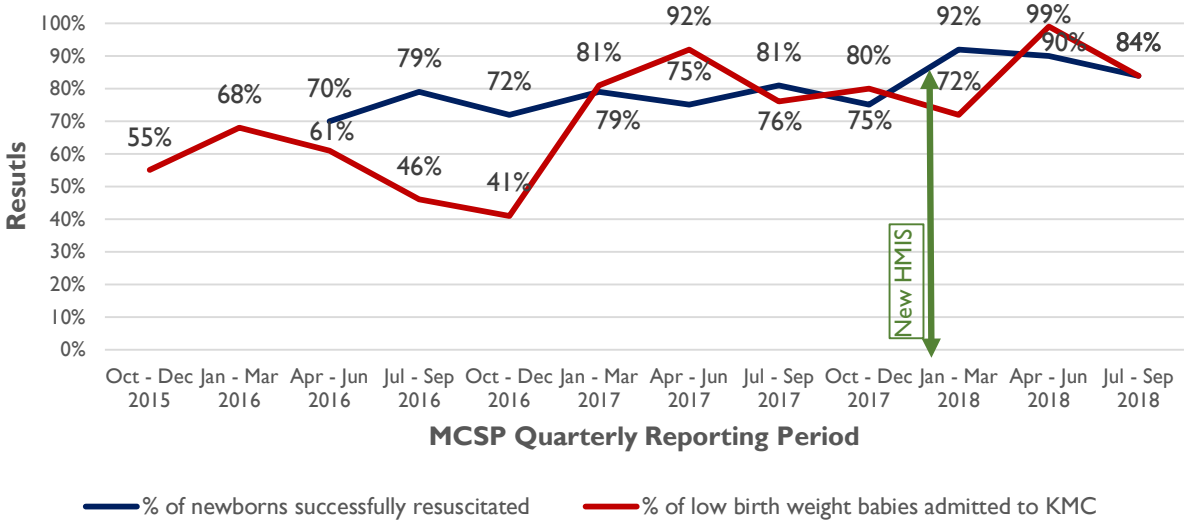
[5] Partners in Health, Health Builders, and Management Sciences for Health

Figure 1: Trends in PPFP Uptake during ANC and PNC prior to discharge after birth



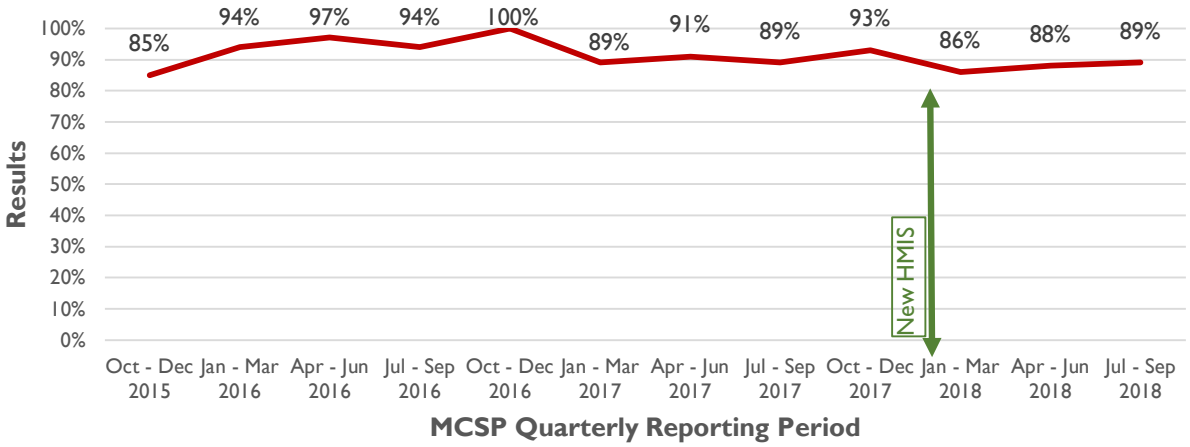
Prior to the HMIS review, the quality of newborn resuscitation data was unreliable. MCSP often found that the number of newborns successfully resuscitated were more than those that were reported not breathing at birth. During the HMIS review process, MCSP and MOH more clearly defined the indicator as "newborns who did not cry at birth and were resuscitated using ambu bag." This modification removed ambiguity and as a result, provided more accurate data that could be used by facility level quality improvement committees to improve intervention quality and implementation planning. Figure 2 (below) shows the trends in newborn resuscitation and the percentage of newborns with low birth weight that were admitted into kangaroo mother care before and after the HMIS review.

Figure 2: Trends in newborn emergency care indicators in MCSP supported health facilities



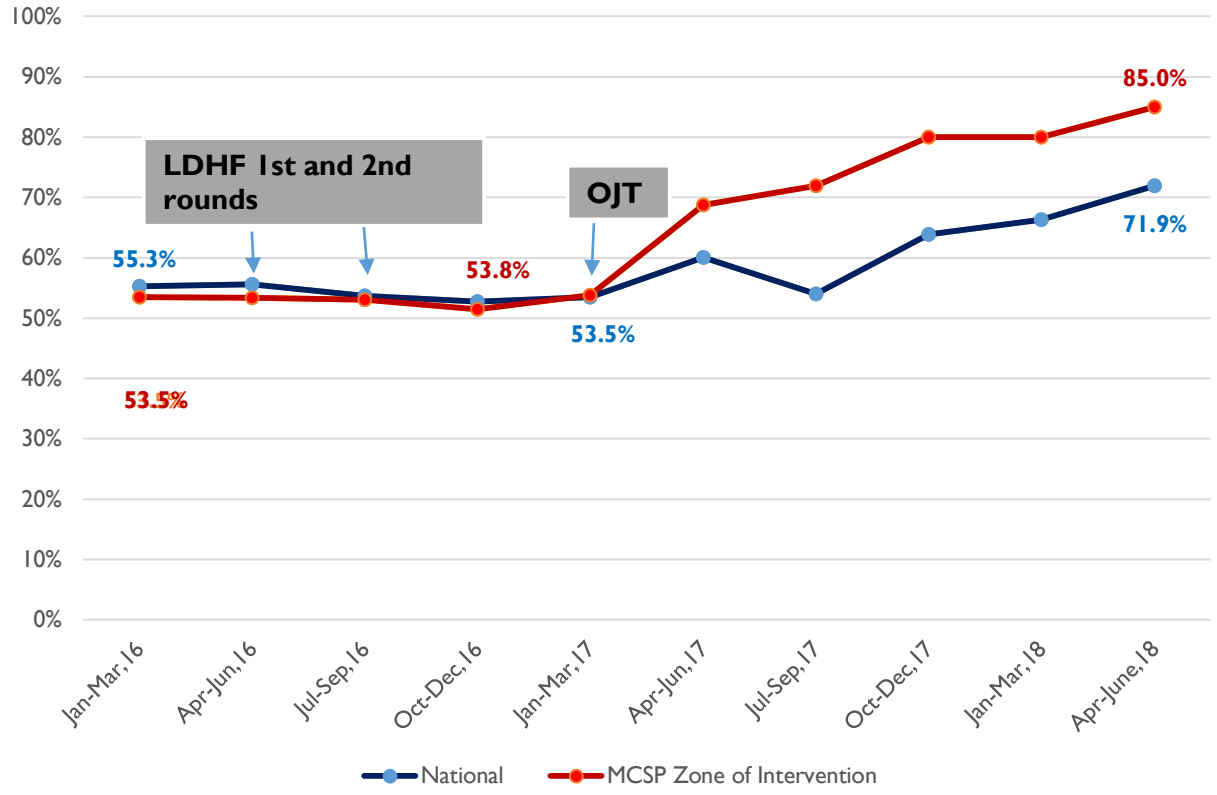
Per national guidelines, all women who deliver at health facilities should receive Oxytocin in the third stage of labor. While health facilities were measuring this indicator and documenting results in the partograph, the indicators were not being reported on in the national HMIS. Figure 3 (below), shows a trend in this indicator based on data that MCSP collected through complementary report form in MCSP-supported facilities. After the review, the indicator was included in HMIS and can now be reported on countrywide.

Figure 3: Percentage of women delivering in health facilities who received uterotonics in the third stage of labor



A key challenge with child health data was that only health workers who had been trained in integrated management of childhood illness (IMCI) were using the correct register and reporting against the IMCI indicators. Figure 4 (below) shows that, after more providers were trained in IMCI and understood how to use the IMCI register correctly, the percentage of sick children who were treated according to IMCI protocols increased. The improvement in MCSP supported areas with this new training method was greater than the improvement nationally.

Figure 4: Trends in percentage of children treated according to IMCI protocol



DHIS2 system of the Rwanda National HMIS

Lessons Learned and Recommendations

- **District level and national level stakeholder engagement is important at each step of the HMIS review and revision process.** While the national stakeholders are key drivers of the health system, district level data managers are in charge of implementing the updates. Therefore, they provide the unique perspective of how the system will respond to changes and, ultimately, the effectiveness of an intervention. The primary objective of the first development workshop was to create a common understanding of HMIS needs within a small group. While the intention was to be more efficient, the review process became lengthy when other MOH departments and partners were subsequently consulted. Involving all stakeholders from the start can reduce the time lost to negotiating indicators at the end of the process.
- **Stakeholders buy into evidence-based practices, not theory.** The MOH, RBC, and TWGs embraced the process because MCSP regularly presented recommendations for the HMIS review based on actual field experience. For example, although the MOH systematically recommended the provision of prophylactic oxytocin to prevent postpartum hemorrhage at the facility level, the national HMIS did not include an oxytocin coverage indicator. MCSP worked with the MOH to introduce this indicator at all MCSP-supported facilities and captured data every quarter. Using this data, MCSP identified inconsistencies in oxytocin coverage and presented the evidence to the MOH/RBC MCH TWG. Only then did the TWG agree to include this indicator in existing HMIS registers and monthly reporting formats.
- **An iterative review process can lead to better data quality outcomes.** Programmers should test each major iteration of the HMIS locally and focus on understanding the root causes of poor data collection, quality, and accuracy. In Rwanda, English is now the official language, however French and Kinyarwanda

are the most common languages used in the districts. MCSP found that language played a large role in contributing to data gaps and imprecise understanding of indicator definitions through the quarterly data review working sessions at the national and district levels. For example, in Rwanda, managers were incorrectly entering newborn resuscitation data because they interpreted the indicator definitions differently in French. For FP, data entry was inconsistent because staff had to refer to different registers for different languages. This could be applied in other countries where multiple languages are used and can lead to misinterpretation of indicator definitions. Organizations can significantly reduce data error and printing costs by using one register and reporting formats with translations for all major languages (e.g., English and French).

Conclusion

The availability of accurate and high-quality data has helped facility level quality improvement (QI) committees monitor implementation of high-impact intervention, uncover coverage gaps, and identify clinical priorities based on evidence. On a monthly basis, QI committees now use the data to discuss and determine facility-wide quality improvement projects that target clinical approaches with low-performing indicators. The accurate information promotes a cycle of data demand, collection, analysis and use to measure progress toward addressing and confronting disease, population issues, and poverty.

Other countries can take on a similar process depending on the maturity of their HMIS. For example, Rwanda uses an electronic-based HMIS, which includes dashboards that automates data aggregation and analysis at health facilities level, as opposed to many countries that are using a paper-based HMIS that poses a high burden on facility level staff. Despite these differences, however, each country should lead with the following core principles that strongly influenced the success of the Rwanda HMIS review process.

1. Collaborative meetings with partners and national departments that use the HMIS in order to effectively identify the HMIS indicator gaps and how the HMIS can be used for decision-making.
2. Close collaboration with the entity that manages the HMIS to help ensure consistent buy-in and leadership for the review process.
3. Iterative workshopping with key stakeholders, especially the TWGs and other implementing partners.

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Annex A: Complete List of Data Elements Added to the HMIS

1. ANC: Number of new registrations for pregnancy among women under 15 years of age
2. ANC: Number of new registrations for pregnancy among women 15-19 years of age
3. ANC: Number of new registrations for pregnancy among women 20-24 years of age
4. ANC: Number of new registrations that were accompanied by partner
5. ANC: Number of pregnant woman tested for urinary infection at any visits
6. ANC: Number of pregnant woman tested positive for urinary infection at any visit
7. ANC: Number of pregnant women counselled and selected a PPFP method
8. Number of pregnant woman with previous scar referred to hospital at last ANC (in last trimester)
9. Number of other indirect obstetrical complications
10. Number of women with obstetrical complications during labor or after delivery referred to high level for emergency care
11. Number of deliveries with episiotomy
12. Number of deliveries complicated by perineal tear (second-,third,-fourth degree)
13. Number of children delivered with omphalocel
14. Number of children delivered with laparoschisis
15. Number of children delivered with spina bifida
16. Number of children delivered with hydrocephalus
17. Number of deliveries among women 20 to 24 years of age
18. Number of deliveries among women 35 years of age and above
19. Number of women who received oxytocin (intramuscular) immediately after birth for active management of third stage of labor
20. Number of woman consulted for risk of premature delivery
21. Number of mothers who received corticosteroid in management of risk of premature delivery
22. Number of women consulted with Preterm Premature Ruptured Membranes (PPROM)
23. Number of women consulted with PPROM who received prophylactic antibiotics
24. Number of mothers in labor referred to higher level for delivery
25. Number of alive newborns with birthweight ≤2000 grams
26. Number of stillbirths macerated (≥28 weeks or ≥1000 grams)
27. Number of stillbirths fresh (≥28 weeks or ≥1000grams) -
28. Number of stillbirths fresh (≥2500 grams)
29. Number of alive newborns with birth asphyxia (APGAR score < 5 at 5th minute)
30. Number of deaths at birth of live born babies ≥2500 gram (within 30 minutes)
31. Number of newborns who were placed skin to skin after birth for at least one hour
32. Number of live newborns who didn't cry at birth and for whom newborn resuscitation was performed using ambu bag
33. Number of newborns alive who didn't cry/breath at birth and were resuscitated successfully (cry/breath within 5 minutes, APGAR score >5 at 5min)
34. Number of newborns with complications at birth referred to higher level for emergency care
35. Number of women who completed four postnatal care visits
36. Number of newborns that were discharged from KMC at hospital and followed up at health center
37. Number of women who received PPFP method within 6 weeks after delivery
38. Number of new acceptors of FP methods in the FP program
39. Number of women who delivered at a facility that accepted PPFP method before discharge
40. Number of women who choose lacta-tional amenorrhea as FP method
41. Number of new acceptors of FP methods in FP program accompanied by partner
42. Number of new FP users referred by community health workers for modern FP method

43. Number of new FP acceptors in the FP program by age group