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# Fostering Use of Routine Reproductive, Maternal, Newborn, and Child Health Data at the Point of Care

## Experience Applying Data Dashboards in Low- and Middle-Income Countries

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### Introduction

Routine health management information system (HMIS) data are underutilized in low- and middle-income countries (LMICs), especially by those who generate and record the data at the point of care. For example, health workers generally believe that health service delivery data should be reported up to the next higher level of the health system rather than critically reviewed and used for decision making. Moreover, concerns about accuracy and completeness often make potential users wary of drawing conclusions from data.

Encouraging better use of HMIS data for decision-making is a challenge at the heart of efforts to improve access to and quality of reproductive, maternal, newborn, and child health (RMNCH) services at the community, facility, district/regional, and national levels. The US Agency for International Development (USAID)'s flagship Maternal and Child Survival Program (MCSP) explored methods to encourage data use at the point of care (facility and community) and identified data dashboards as a promising approach for testing across supported countries. This paper describes MCSP's experience working with country partners to design and implement health data dashboards across 20 countries, including, the results achieved and recommendations moving forward.

### Lessons Learned from MCSP-Supported Dashboard Use

- Dashboards must be implemented in a way that complements existing data collection systems.
- Data review needs to be an embedded, ongoing process where providers analyze and discuss the data trends.
- Dashboard must reflect the technological context if they are to be a sustainable tool.

### Rationale

With expanded use of electronic information systems by ministries of health (MOHs), such as the District Health Information System 2 (DHIS2), many health systems now have access to tools that can analyze and visually display data as part of electronic data dashboards. These dashboards can enhance understanding and use of data for decision-making using easily understandable visualizations such as heat maps, bar charts, and run charts.<sup>1</sup> Although use of electronic data dashboards is feasible in most LMICs at the district hospital level

<sup>1</sup> MEASURE Evaluation. 2011. *Tools for Data Demand and Use in the Health Sector*. Chapel Hill, North Carolina: MEASURE Evaluation.

and higher, where computers or tablets are available, lower level facilities often do not have access to such electronic hardware. Thus, MCSP decided to support MOH partners to develop and use laminated poster data dashboards at the point of care when electronic dashboards are not feasible.

By adapting and introducing electronic and laminated poster data dashboards in various formats and across numerous clinical areas—family planning (FP), antenatal care, labor and delivery care, postnatal care, and sick-child care—MCSP anticipated that health providers and community health workers could effectively record and analyze data on a monthly or quarterly basis, as appropriate, to feed into service quality improvement processes across the RMNCH spectrum. The idea was to put the power of information directly into the hands of those generating the data.

A literature review of approaches to foster better use of health service delivery data in LMICs yielded few results. Data dashboards are a well-established tool for analyzing and displaying data as part of efforts to improve health service quality in developed countries—the UK, Canada, and the Netherlands have a history of using maternal and newborn health (MNH) dashboards<sup>2,3,4</sup>—but limited information was available on their application in LMICs.<sup>6,7,8,9</sup> However, studying the few examples from LMICs identified allows reflection on the importance of creating dashboards that are aligned with and integrated into existing information systems and responsive to user needs.

The methods used to establish dashboards determine their usefulness to providers, which can in turn affect the feasibility of improving quality of care.<sup>3,4,5</sup> For example, in southwest England, providers found that setting up dashboards and gathering initial data inputs were time-consuming, but the process of collecting and entering data became more routine and easier, and providers could see the benefits of using the dashboards.<sup>3</sup> However, if the data to calculate monthly indicators are outside of what is already collected in the health information system or creating the dashboards is overly complicated, providers may never overcome the initial reticence of filling in and using dashboards.<sup>4</sup>

Although MCSP only identified a limited number of publications on use of data dashboards in LMICs, all four examples show that dashboards are feasible tools to encourage data use at the facility level and can lead to significant changes in health outcomes. In Zimbabwe, to improve newborn health outcomes, a public maternity hospital designed dashboards to report labor and delivery outcomes. Providers and a statistician selected HMIS indicators that were also local priorities. The statistician trained providers to analyze the dashboards and held a bimonthly review meeting. At the end of the 28-month research period, the hospital staff could identify weaknesses in their quality of care, such as admission of babies to special care units and fresh stillbirths, and organize appropriate refresher trainings.<sup>6</sup>

Bhardwaj et al. described a similar initiative in South Africa that used dashboards with bottleneck analysis in all 52 districts to improve prevention of mother-to-child transmission (PMTCT) of HIV by recording critical points in the PMTCT cascade. Every quarter, the National Department of Health created district-, provincial-, and national-level data action reports that drew from the dashboard data. At the end of the 2-year study period, the National Department of Health saw improvements in all key PMTCT indicators across South Africa.<sup>7</sup> Similarly, Etamesor et al. showed how a national-level initiative that introduced routine immunization dashboards countrywide in Nigeria improved data completeness in DHIS2 (53% in the first quarter of 2014 to

<sup>2</sup> Simms RA, Ping H, Yelland A, Beringer AJ, Fox R, Draycott TJ. 2013. Development of maternity dashboards across a UK health region; current practice, continuing problems. *Eur J Obstet Gynecol Reprod Biol.* 170(10):119–24. doi: 10.1016/j.ejogrb.2013.06.003.

<sup>3</sup> Weggelaar-Jansen AMJVM, Broekharst DSE, de Bruijne M. 2018. Developing a hospital-wide quality and safety dashboard: a qualitative research study. *BMJ Qual Saf.* 27(12):1000–7. doi: 10.1136/bmjqs-2018-007784.

<sup>4</sup> Weiss D, Dunn SI, Sprague AE, et al. 2018. Effect of a population-level performance dashboard intervention on maternal-newborn outcomes: an interrupted time series study. *BMJ Qual Saf.* 27(6):425–36. doi: 10.1136/bmjqs-2017-007361.

<sup>5</sup> Dowling D, Randell R, Gardner P, et al. 2015. Dashboards for improving patient care: review of the literature. *Int J Med Inform.* 84(2):87–100. doi: 10.1016/j.ijmedinf.2014.10.001.

<sup>6</sup> Crofts J, Moyo J, Ndebele W, Mhlanga S, Draycott T, Sibanda T. 2014. Adaptation and implementation of local maternity dashboards in a Zimbabwean hospital to drive clinical improvement. *Bull World Health Organ.* 92(2):146–52. doi: 10.2471/BLT.13.124347.

<sup>7</sup> Bhardwaj S, Barron P, Pillay Y, et al. 2014. Elimination of mother-to-child transmission of HIV in South Africa: rapid scale-up using quality improvement. *S Afr Med J.* 104(3 Suppl 1): 239–43.

81% in the second quarter of 2017). The improved completeness led to more data available for review and increased ownership at the state level, since the ministries had real-time access to the data and dashboards.<sup>8</sup>

In addition to electronic dashboards, LMICs can use poster dashboards to encourage data use at a very low cost. For example, Hazel et al. describe a child health program in Malawi that introduced poster dashboards as a part of data quality and use training for 426 health surveillance assistants. This low-cost intervention cost \$172 total per facility. The total package includes training, poster supplies, and supervisory visits. Qualitative data showed increased data for decision-making in terms of stock management and prevention (such as malaria prevention community mobilization) at this relatively low cost.<sup>9</sup>

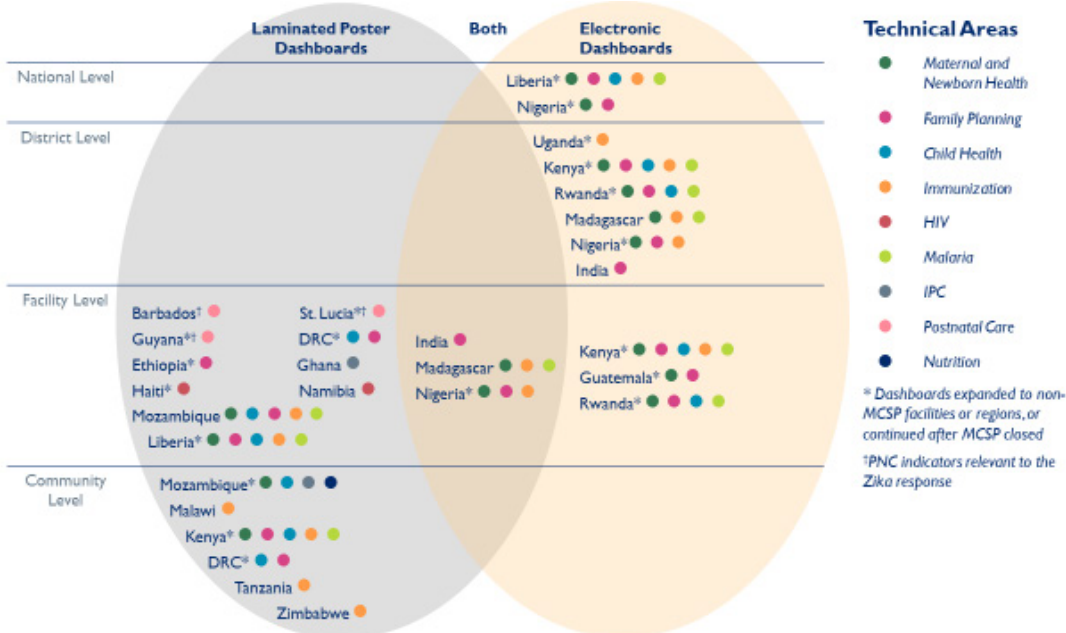
These examples suggest that dashboards are a useful and feasible tool to encourage data use and improved quality of RMNCH services in low-resource settings, but the methods used to design dashboards, select indicators, and integrate technology affect the sustainability of these tools.

## MCSP’s Approach to Applying Data Dashboards to Improve Use of Routine Data at the Point of Care

Ministries of Health in 20 countries developed and implemented laminated poster or electronic health data dashboards as part of their monitoring and evaluation systems to promote better use of RMNCH data with MCSP support. Because MCSP, local MOHs, and local partners designed dashboards jointly to respond to specific country contexts and information needs, this paper will analyze the larger implementation patterns across countries and summarize lessons learned but will not focus on the specific indicators used in the dashboards.

Figure 1 below shows the countries where MCSP supported data dashboards at the point of care. The graphic shows the countries where the MOH or facilities chose to continue to support dashboards for decision-making at the point of care after MCSP support ended or expanded this initiative to non-MCSP-supported facilities.

**Figure 1. MCSP data dashboard use across 20 countries, by technical area**



DRC = Democratic Republic of the Congo, IPC = infection prevention and care, PNC = postnatal care

<sup>8</sup> Etamesor S, Ottih C, Salihu IN, Okpani AI. 2018. Data for decision making: using a dashboard to strengthen routine immunisation in Nigeria. *BMJ Glob Health*. 3:e000807. doi: 10.1136/bmjgh-2018-000807.

<sup>9</sup> Hazel E, Chimbalanga E, Chimuna T, et al. 2017. Using data to improve programs: assessment of a data quality and use intervention package for integrated community case management in Malawi. *Glob Health Sci Pract*. 5(3):355–66. doi: 10.9745/GHSP-D-17-00103.

## Findings from Six Country Case Examples

Although MCSP supported use of data dashboards across a total of 20 countries, this paper will provide more detailed information on six of those countries. These specific country examples explain how MOHs and MCSP country teams adapted and implemented data dashboards to encourage use of routine RMNCH data.

### Improving MNH Service Quality in Nigeria

In Nigeria, MCSP worked at health facilities with local government area (LGA) and state MOH partners to improve the quality of MNH and FP services provided in Kogi and Ebonyi states. The approach included clinical training, supportive supervision, and quality improvement (QI) initiatives to develop an RMNCH quality strategy and operational structure at multiple levels of the health system to improve quality of clinical care. Central to this work were MCSP- and MOH-designed electronic and laminated poster data dashboards developed to encourage data use, which allowed providers to understand service trends and develop action plans to address quality gaps.

At all MCSP-supported facilities, the program provided data quality training and distributed reusable laminated poster data dashboards, markers, and erasers. MCSP worked with MOH partners, including QI teams, to select indicators that would allow providers to track progress for priority technical areas.

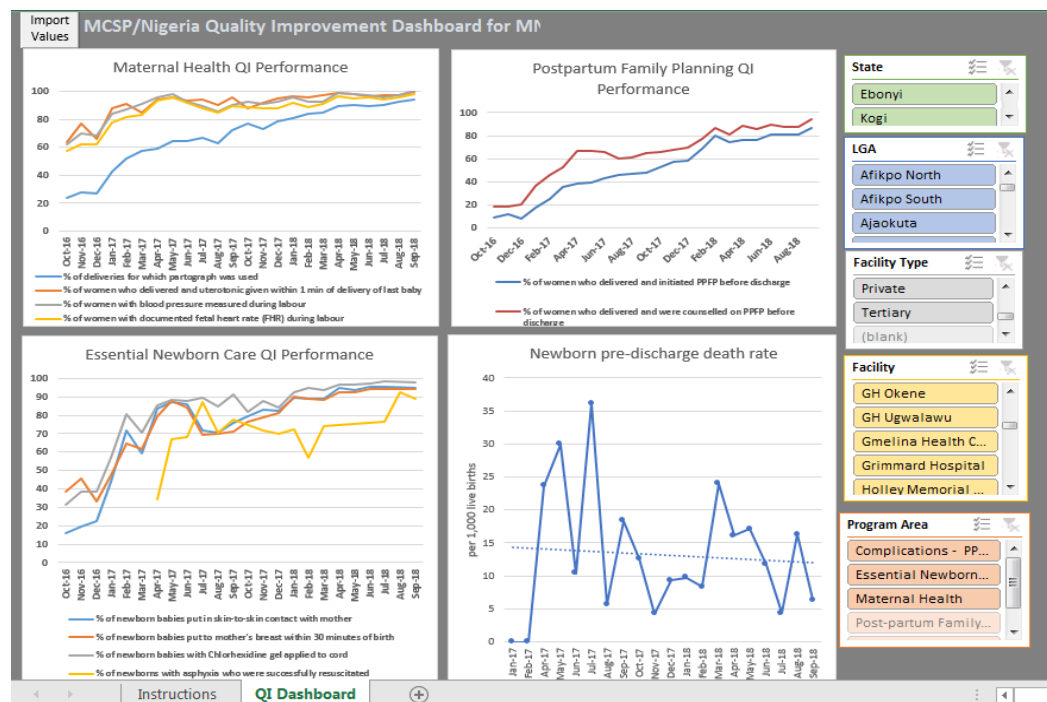
To complement the laminated poster dashboards in QI sites, MCSP and MOH partners at facility and LGA levels co-designed an electronic, Excel-based dashboard for use in 91 of the 321 MCSP-supported facilities implementing the full QI intervention.

Finally, MCSP supported a series of semiannual QI learning platforms to bring together QI teams at the LGA level or neighboring facilities with similar QI objectives. These meetings allowed QI teams to share learning on common indicators, compare data, and use data dashboards to analyze outcomes and make decisions.

### Overview of Nigeria Dashboards

- Levels: facility and state/LGA
- Service areas: antenatal care, labor and delivery care
- Total number of facilities: 321, 91 with QI interventions

**Figure 2. MCSP Nigeria’s QI electronic dashboards. Photo: MCSP.**



Following provider training and distribution of the laminated dashboards, more than 80% of 321 MCSP-supported health facilities across the two states plot their data on a regular basis. The dashboards, as part of the larger QI initiative, contributed to real improvements in quality of care between October 2016 to June 2018:

- The percentage of women in active labor for whom a partograph was used to monitor labor progress increased from 24% to 88%.
- The percentage of postpartum women counseled on postpartum FP (PPFP) prior to discharge from the facility after birth increased from 18% to 94%, and the percentage of postpartum women initiating a PPFP method of choice before discharge increased from 9% to 85%.
- Some facility staff report the dashboards help them to better support stock management and prevent stock-outs.

The MOH has institutionalized this QI approach at the federal, state, LGA, and facility level. The laminated poster data dashboards remain at health facilities for QI teams to continue to use after MCSP support ends. Also, MCSP provided the Excel dashboards to the state MOHs in Kogi and Ebonyi for use, transitioning data management from MCSP staff to MOH staff.

## Reaching Immunization Coverage in Malawi: My Village My Home

Immunization projects have long used data dashboards to show progress toward universal coverage for routine immunizations (RI).<sup>10</sup> In Malawi MCSP supported the MOH, using the Reaching Every Community approach, to introduce the My Village My Home (MVMH) immunization poster data dashboard. This dashboard shows how every family fully immunizing their children leads to a stronger community. Malawi's MVMH program demonstrates how dashboards can be designed to teach and involve the entire community.

### Overview of Malawi Dashboards

- Level: community
- Service area: immunization
- Total number of facilities: 2,000 communities, 43 health facilities, and 2 districts

The MOH, with MCSP, piloted MVMH in two districts in Malawi, Dowa and Ntchisi, from February 2015 to February 2018. MVMH included community mobilization, which established a village registry and sensitized families, and health zone monitoring through the MVMH poster data dashboard at the community level to show the community's progress toward universal immunization.

The poster dashboard is a graphic representation of how every family makes up the community. Shown in Figure 3, it depicts a house, and every line is a child in the community. When a child is immunized, the "brick" is filled in; the idea is that a strong community needs a strong house, and if children are not immunized, the house is missing bricks and may fall.

<sup>10</sup> World Health Organization (WHO). 2017. Immunization coverage. WHO website. [https://www.who.int/immunization/monitoring\\_surveillance/routine/coverage/en/index4.html](https://www.who.int/immunization/monitoring_surveillance/routine/coverage/en/index4.html).

**Figure 3. My Village My Home poster**  
**Figure 4 and 5. Village heads and volunteers mobilizing and monitoring the immunization status of the infants in the villages.**

**Figure 3**

Photo: MCSP/Parent and Child Health Initiative Trust.

**Figure 4**



**Figure 5**

in both districts.<sup>11</sup> Furthermore, the endline showed that over 75% of the communities still had their MVMH tool, and over 80% of those with the poster were continuing to use it to track immunization coverage.

MCSP applied the MVMH approach in other countries. Starting in October 2017 in PY4, MCSP introduced the MVMH tool to three wards of three LGAs in Nigeria, where it was called Healthy Children, Community's Pride. The tool serves as a complementary approach to existing name-based records. By the end of September 2018, 3,200 children were tracked in the Healthy Children, Community's Pride register, and 78% of them were up-to-date on their vaccines.

### Encouraging PFP Uptake in Ethiopia

In Ethiopia, MCSP introduced data dashboards at health centers as a part of a study testing an intervention package to improve PFP counseling during maternal and child health and PFP service provision. MCSP and the MOH designed the dashboards and trained facility staff to use them during supervision visits. MCSP and district health officials then mentored staff on data quality and analysis during subsequent study supervision visits (five to eight total, conducted about 4–6 weeks apart).

Because the project sought to integrate PFP within services for pregnant and postpartum women, separate, wall-mounted dashboards were kept in each service delivery unit (antenatal care, labor and delivery, immunization, and FP) to track relevant data. At the end of the month, the facility head called a meeting and brought their data for a discussion on the latest data and trends. The data review meetings gave providers the chance to solve problems as a team to improve PFP counseling.

### Overview of Ethiopia Dashboards

- Level: facility
- Service area: FP
- Total number of facilities: 6

MCSP trained village heads to analyze the poster dashboards. Village heads then used the posters at community meetings to interpret the immunization coverage and identify families to further mobilize for immunization. Community members appreciated how simple the posters were; everyone could understand how the data were organized and which doses were missing. By involving everyone in interpreting the data, MVMH energized entire communities to reach universal RI coverage.

Before MVMH implementation in February 2015, the fully immunized with card rate in the intervention districts was below 75%. At endline in December 2017, the full immunization with card rate increased to above 88%

<sup>11</sup> Maternal and Child Survival Program (MCSP). 2018. *Report on the Endline Immunization Coverage Survey in Dowa and Ntchisi Districts*. Washington, DC: MCSP.

During data review meetings, providers analyzed the mix of FP methods women adopted immediately after birth to look for the distribution, including any skewing toward one method. Focus group discussion findings at the end of the study revealed that providers thought these data reviews were useful and helped them make important decisions to improve services. For example, the low number of women counseled prompted facilities to make efforts to have all midwives and nurses in the labor and delivery ward provide counseling on PPF, beyond the midwives and nurses trained by study staff. One facility reported even taking the step of engaging pregnant women in conferences in the community.

Over the study period, there were increases documented in PPF counseling and uptake: the percentage of women who delivered in a facility and initiated PPF before discharge reached about 60% (including women who chose the lactational amenorrhea method). With MCSP advocacy support and the results from this study, the national HMIS now includes an indicator on PPF uptake, so all facilities and higher levels of the system (districts, zones, national) can track and use these data to ensure postpartum women are receiving PPF to help them prevent short pregnancy intervals.

**Figure 6. A midwife in a health center in Arsi Zone, Oromia, demonstrating how she uses a PPF dashboard to capture number and percentage of women counseled in PPF, and who initiated a method before discharge.**

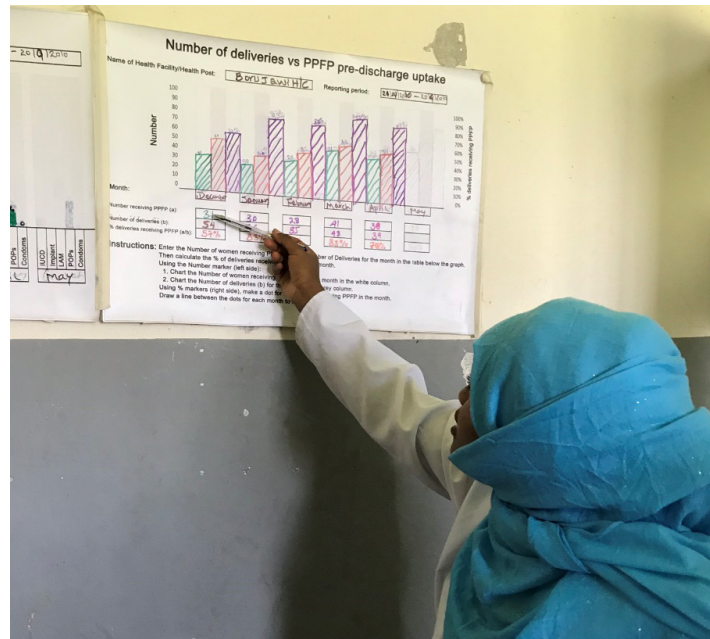


Photo: Anne Pfitzer, Jhpiego.

### Strengthening MNH and Malaria Care in Liberia

After the Ebola outbreak, Liberians did not trust health facilities and the facility birth rate fell. MCSP sought to improve quality of care to show clients that they could once again trust health facilities in Grand Bassa, Lofa, and Nimba counties. MCSP and the MOH chose to use laminated poster data dashboards since they allowed providers to identify bottlenecks and visualize data. MCSP also created dashboards in PowerBI to help analyze data at the program level.

### Overview of Liberia Dashboards

- Levels: facility and district
- Service areas: FP, MNH, child health, immunization
- Total number of facilities: 30 quality of care, 114 malaria

After MCSP’s baseline health facility assessment in three countries and thirty-nine health facilities, MCSP and the national MOH selected indicators to display on the laminated poster dashboards that reflected MOH priorities and the areas most in need of QI. Through use of these dashboards, as part of a larger package of health restoration services, MCSP-supported facilities tracked improvements in the quality of MNH services.

Health facilities quickly saw the value of visualizing data. With the data dashboard posters, facility staff looked at their monthly performance on graphs. If there were drops in the results, facility staff discussed the root causes. Facility staff also discussed the problems with other relevant stakeholders (e.g., community health workers when the issue related to the community) to ensure that everyone was aware of the issue and to improve quality of care.

**Figure 7. Drawing and interpreting graphs during data use training.**



Photo: Swaliho Kamara, MCSP.

MCSP’s baseline (August 2015) and endline (December 2017) health facility assessments provided evidence on how the laminated poster data dashboards, within the larger QI package, improved data use. First, the assessments showed an increase in use of these data for decision-making: 92% of facilities reported reviewing performance based on HMIS data with a district or county supervisor during recent supervision visits, compared to 61% at baseline, and 78% of facilities reported making a decision along with the supervisor based on the RMNCH data, compared to only 53% at baseline.

Improved quality of care helped restore faith in the health facilities; the number of women delivering with skilled personnel in MCSP-supported health facilities more than doubled between baseline and endline, with 2,439 delivering in August 2015, compared to 4,526 in–December 2017.

After MCSP support to these facilities ended, the facilities have continued using the data dashboards and are now including needed supplies, like markers and paper, in their own facility budgets.

MCSP also collaborated with the Liberia National Malaria Control Programme, USAID/President’s Malaria Initiative, and MEASURE Evaluation to design a laminated, reusable data dashboard specific to malaria case management and malaria in pregnancy indicators. MCSP is currently piloting the dashboard in 114 facilities in one county in MCSP/Expansion of Malaria Services facilities; after the pilot MCSP plans to scaled to all six MCSP/EMS counties.

## Improving Quality of Care in Madagascar

Madagascar’s MOH, with MCSP support, developed electronic data dashboards for use at the regional and national levels, and laminated poster data dashboards for use at health centers (*centres de santé de base*, or CSBs) and hospitals as part of efforts to improve the quality of RMNCH care across 16 out of a total of 22 regions.

### Overview of Madagascar Dashboards

- Levels: facility and district
- Service areas: MNH, malaria, immunization
- Total number of facilities: 513 health centers and 7 hospitals in 16 regions

The electronic system ran employed the mobile-based DataWinners platform that is in wide use by the Government of Madagascar. The MOH intended to expand the Internet-based DHIS2 system, which was being piloted at the outset of MCSP in Madagascar, within a few years. The plan was to ultimately incorporate the MCSP-supported electronic data dashboards into the DHIS2 system.

In the initial design phase for the content of hospital-level data dashboards, representatives from MCSP-supported hospitals selected MNH quality-of-care indicators related to their MNH QI objectives, like percentage of women who received uterotonic after giving birth. While some data elements were already collected in existing registers at the hospitals, other data elements needed to be collected through supplemental forms.

At health facilities, providers extracted data elements from reporting forms and registers and sent data via short message service (SMS) from the facility to a Web-based platform on a standard mobile phone. The results were forwarded via SMS back to each facility with a color code indicating the overall performance of



each indicator result (green: standard is met; yellow: improvements can be made; red: alert/corrective action is needed), which was then filled in on the poster in the facility.

**Figure 8. A midwife uses the standard MNH indicator dashboard in an MCSP-supported CSB.**

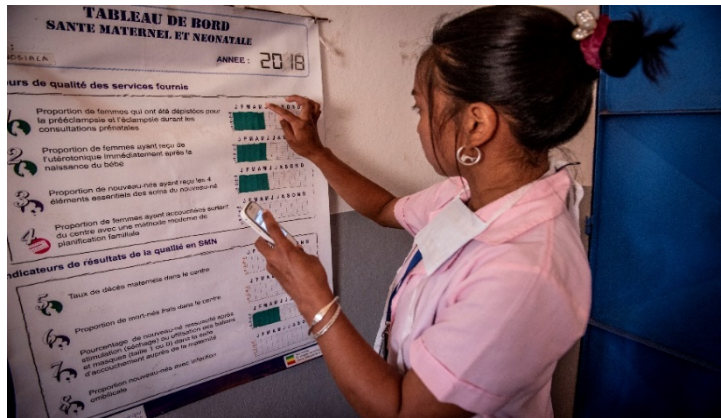


Photo: Karen Kasmauski/MCSP.

Health care providers displayed indicator results over time in each facility on a large, laminated poster data dashboard to encourage regular review and accountability. Regional and district managers could access electronic dashboard data, disaggregated by facility, on a website. This enabled them to monitor indicator trends for each health facility, guide management decisions, and support individual facilities.

Follow-up supportive supervision reports showed that facility staff used the dashboards to analyze problems in service quality and found ways to solve these

problems. For example, in one CSB, a medical director reported seeing in the dashboard that 40% of newborns had an umbilical cord infection. As a result, he reorganized services so that women stayed more than 48 hours after giving birth to monitor the baby and mother. The CSB medical director also organized a refresher mini-training for CSB staff to review best practices in clean cord care. Subsequent months saw decreasing percentages of umbilical cord infection.

Although the DHIS2 was not rolled out nationally at the time MCSP closeout in Madagascar, MCSP successfully advocated to include most of the dashboard indicators in Madagascar's national HMIS forms, eliminating the need for supplemental data collection forms and creating an opportunity for dashboards using these indicators to be created in DHIS2 once it is scaled up.

## Supporting Community-Level Interventions in Mozambique

In Mozambique, data dashboards are a critical tool in supporting evidence-based, community-driven decision-making and planning. Through regular data analysis and review, community health committees (CHCs) and the wider community use health data dashboards to understand local health trends and needs in 21 of 23 districts in Nampula and 8 of 13 districts in Sofala. Although MCSP Mozambique supported health data dashboards at the facility and community levels, this summary focuses on the community-level dashboards.

The MOH, with MCSP, supported CHCs to use a simple, paper-based dashboard with a table to analyze data each

**Figure 9. Community dashboard used by a community health worker during an on the job training in Sofala Province.**



Photo: Ildio Aizeque, Save the Children.

month and compare with previous results. CHCs selected five to seven key indicators to include for the main causes of morbidity, such as malaria or diarrhea, and for reported deaths. Each month, CHCs and other associations that support community health provision met to document and analyze community-level data using the dashboards. At the end of the meeting, the CHCs completed their monthly report for their respective health facility.

Dashboard data analysis allowed CHCs to better communicate and coordinate health campaigns with health facilities. For example, in response to an identified increase in malaria, diarrhea, or pneumonia, CHCs planned increased community collective action, such as ensuring more relevant health education outreach activities. At the health facility level, the process allows for the improved planning and prioritization of communities to receive integrated health outreach. Through informal documentation by project staff and field observation, MCSP found that CHCs quickly learned and adopted the community dashboards, as they found the data dashboards to be a useful tool to support them in setting goals that reflect community-driven health priorities and outcomes.

### Overview of Mozambique Dashboards

- Level: community and facility
- Service areas: child health; MNH; FP; immunization; malaria; water, sanitation, and hygiene; nutrition
- Total number of CHCs: 758
- Total number of facilities: 86

## Conclusion and Lessons Learned

Improving use of routine RMNCH service delivery data not only requires increasing user capacity to analyze, interpret, and act on the data, but also demands a normative and cultural change in understanding who should use the data and the process by which decisions are to be made.

MCSP's experience working with MOHs across 20 countries reveals that data dashboards are a promising approach for promoting better data use at the point of care; they are versatile tools that health systems can implement as part of broader capacity-building and QI efforts. Whether dashboards are intended to improve quality of care or encourage community care-seeking and participation or ownership in an intervention, they are a good tool for basic data analysis, visualization, and action.

The six MCSP country examples show some lessons learned when designing data dashboards:

- Dashboards must be implemented in a way that complements existing data collection systems. Facility staff can more quickly learn to fill out dashboards and analyze data when data reflect the facilities' priorities.
- Data review needs to be an embedded, ongoing process where providers analyze and discuss the data trends. The MOH and other ministries should support and mentor providers as they become more familiar with the data collection and review process.
- Indicator selection is important. Data must be readily available and important to the individuals using the tool.
- Dashboards must reflect the technological context if they are to be a sustainable tool. Although technology can automate the data entry and the creation and updating of graphs, facilities need to use tools that they can sustain without donor funding, and not all facilities have access to computers or tablets.

Data dashboards are an effective way to record changes in service provision over time, but change does not happen overnight. As seen in the literature and in the MCSP country examples, projects often need at least two years of data dashboard use to record and sustain changes.<sup>1,3,4,5</sup> Moreover, to improve quality of RMNCH services provided, there must be motivation to change and support for a behavior shift.

MCSP observed the process of monitoring changes in health indicators across multiple facilities and regions to be a motivation for frontline health workers and subnational managers in many countries and impressive improvements in the quality of care were documented. However, health worker QI capacity and quality of routine health data remained a challenge throughout program implementation in many cases; regular quality assurance processes and health worker capacity-building are essential. In sum, creation and use of data dashboards is just one of a range of interventions needed to establish a sustainable culture of data use among facility staff and community health workers and volunteers to help improve quality of RMNCH care and health outcomes.

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