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Maternal and Child Survival Program

Supporting Communities to Use Health Data

A Resource Package

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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. The Program 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.

* USAID's 25 high-priority countries are Afghanistan, Bangladesh, Burma, Democratic Republic of Congo, Ethiopia, Ghana, Haiti, India, Indonesia, Kenya, Liberia, Madagascar, Malawi, Mali, Mozambique, Nepal, Nigeria, Pakistan, Rwanda, Senegal, South Sudan, Tanzania, Uganda, Yemen and Zambia.

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[1] More information available at http://www.ichc2017.org/.

Abbreviations

CHIS	community-based health information system
CHW	community health worker
EPPICS	Encouraging Positive Practices for Improving Child Survival
HDC	Health Data Collaborative
HMIS	health management information system
MCSP	Maternal and Child Survival Program
M&E	monitoring and evaluation
NGO	nongovernmental organization
QIT	quality improvement team
RMNCH	reproductive, maternal, newborn, and child health
USAID	US Agency for International Development
WHO	World Health Organization
WIT	work improvement team

Introduction

Background and Rationale

As countries work toward the Sustainable Development Goals and universal health coverage, community-based interventions are gaining recognition for their potential contributions to improve reproductive, maternal, newborn and child health (RMNCH).[2,3,4] Service providers, including paid or volunteer community health workers (CHWs) and other volunteers, provide essential promotive, preventive, and curative services in communities, and mobilize populations to seek timely and appropriate care.[5,6,7] Community engagement in various forms is also associated with improved health outcomes, and it is widely recognized that communities should take an active part in improving their own health.[8] Communities can participate in planning, implementing, monitoring, evaluating, and improving health service delivery. Empowering communities is part of the Astana Declaration.[9] Data collected at the community level rightfully belong to those in the community, and any information generated should be shared and discussed with its owners. Removing restrictions to data access democratizes data and facilitates use. When bottlenecks to data access are removed, communities can use their data to improve the quality and coverage of health services,[10] decide which activities to plan and prioritize, and/or determine how to spend or advocate for resources.[11]

Why Should Data Be Used at the Community Level?

Community members themselves are best placed to identify health and health care issues and concerns of the community. Engaging communities as equal partners in using locally collected data positively influences the supply and demand sides of the health system, as well as confidence in it.[12] People will be more likely to use health services if they have been involved in decisions about how those services are designed and delivered (see Box 1).[13,14] In addition, community engagement in providing care and assessing quality of care can contribute to increased utilization of services and improvements in quality.[15]

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[2] Black RE, Levin C, Walker N, Chou D, Liu L, Temmerman M. 2016. Reproductive, maternal, newborn, and child health: key messages from *Disease Control Priorities 3rd Edition*. *Lancet*. 388(10061):2811–24. doi: 10.1016/S0140-6736(16)00738-8.

[3] Perry HB, ed. 2017. *Engaging Communities for Improving Mothers' and Children's Health: Reviewing the Evidence of Effectiveness in Resource-Constrained Settings*. Edinburgh, UK: Edinburgh University Global Health Society.

[4] Chou VB, Friberg IK, Christian M, Walker N, Perry HB. 2017. Expanding the population coverage of evidence-based interventions with community health workers to save the lives of mothers and children: an analysis of potential global impact using the Lives Saved Tool (LiST). *J Glob Health*. 7(2):020401. doi: 10.7189/jogh.07.020401.

[5] MEASURE Evaluation. 2016. *Community-Based Health Information Systems in the Global Context: a Review of the Literature*. Chapel Hill, North Carolina: MEASURE Evaluation.

[6] Ricca J, Kureshy N, Leban K, Prosnitz D, Ryan L. 2014. Community-based intervention packages facilitated by NGOs demonstrate plausible evidence for child mortality impact. *Health Policy Plan*. 29(2):204–16. doi: 10.1093/heapol/czt005.

[7] Olaniran A, Smith H, Unkels R, Bar-Zeev S, van den Broek N. 2017. Who is a community health worker? – a systematic review of definitions. *Glob Health Action*. 10(1): 1272223. doi: 10.1080/16549716.2017.1272223.

[8] Lassi ZS, Kumar R, Bhutta ZA. 2016. Community-Based Care to Improve Maternal, Newborn, and Child Health. In: Black RE, Laxminarayan R, Temmerman M, Walker N, eds. *Disease Control Priorities: Reproductive, Maternal, Newborn, and Child Health*. 3rd ed. Washington, DC: International Bank for Reconstruction and Development/The World Bank; 263–84.

[9] World Health Organization (WHO), UNICEF. 2018. *Declaration of Astana*. Geneva and New York City: WHO and UNICEF.

[10] Tesfaye S, Barry D, Gobezayehu AG. 2014. Improving coverage of postnatal care in rural Ethiopia using a community-based, collaborative quality improvement approach. *J Midwifery Womens Health*. 59 Suppl 1: S55–64. doi: 10.1111/jmwh.12168.

[11] Save the Children. 2014. *Community Capacity Strengthening Guide: Community Module*. London: Save the Children.

[12] Routine Health Information Network. 2004. *Second International RHINO Workshop on: Enhancing the Quality and Use of Routine Health Information at the District Level.*

[13] Rifkin SB. 2014. Examining the links between community participation and health outcomes: a review of the literature. *Health Policy Plan*. 29(Suppl 2):ii98–106. doi: 10.1093/heapol/czu076.

[14] Alhassan RK, Nketiah-Amponsah E, Spieker N, et al. 2015. Effect of Community Engagement Interventions on Patient Safety and Risk Reduction Efforts in Primary Health Facilities: Evidence from Ghana. *PLoS One*. 10(11):e0142389. doi: 10.1371/journal.pone.0142389.

[15] Marston C, Renedo A, McGowan CR, Portela A. 2013. Effects of community participation on improving uptake of skilled care for maternal and newborn health: a systematic review. *PloS One*. 8(2):e55012. doi: 10.1371/journal.pone.0055012.

Box 1. Communities use services when they are engaged in designing and improving them.

A community collaborative improvement approach to postnatal care services at facilities and in communities was associated with increased coverage of postnatal care in Ethiopia.[7] In Ghana, data collected from community groups enrolled in a randomized controlled trial found that community engagement in quality of care assessments improved quality of care in health facilities.[13,14]

Community-based health information supports program monitoring, performance measurement, coverage documentation, case management, and resource allocation and service delivery adjustment.[16,17] Communities can use data to monitor and improve the quality of health services (i.e., community-level data may be used to improve quality of care as perceived by the beneficiaries or communities). Perceptions of quality of care, including perceived stigma, abuse, long wait times, and lack of drugs, influence care-seeking decisions. In addition, engaging community representatives in collecting data on the quality of care, such as health facility assessments, is an important approach for increasing transparency, improving relationships between facilities and communities, and even improving perceived and actual quality of care.

Data can be used during advocacy in two ways. Program planners can use data to attract support for interventions from donors and other higher-level health system stakeholders, while community members can use the data to advocate for higher-quality services and more targeted programing to benefit their peers. From the donor perspective, obtaining evidence of impact from their investment or the possibility of leveraging promising interventions is also attractive.

Public health activities implemented by the community and health system produce important and relevant data and information at the community level. Data can be used to help communities decide what activities to plan/prioritize or how to spend (or advocate for) resources.[18] For example, if CHW reporting finds that the burden of diarrheal disease is high and rising, a community can use that information to advocate for the resources needed to construct latrines and encourage their use. Given that community-level data can provide a range of information, it is essential to ensure that the data collected are of high quality and useful for programmatic, advocacy, and decision-making purposes.

The processes of identifying, collecting, and utilizing data are interrelated. While respecting the privacy of individuals' data, community health data should be collected, analyzed, and used within the community wherever possible. Community-level data should also be linked to the health management information system (HMIS) utilized by catchment health facilities and analyzed together with community members and health workers to create meaningful and actionable information. In many cases, these data should also be integrated into the HMIS at all levels. For example, data collected by CHWs should be included in monthly health facility reports for facilities to which they are attached and then entered into the District Health Information System 2 at the district level. These practices for community-level data generation and utilization are key to improving service delivery and allowing regular interaction between facilities and community members.

Even with the recognition that data use at the community level is an essential component of community monitoring and evaluation, and that high-quality community data help to "track, understand, and ultimately improve the quality and reach of services that are provided by community-based organizations and CHWs to communities,"[19] demand for and use of community-level data remains suboptimal. The capacity to produce and use high-quality health information for community-level decision-making and advocacy, and opportunities to do so, should be increased.

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[16] Hellen J, Walker D. 2018. *Conceptual Framework for Community-Based HIV Program Data Demand and Use*. Chapel Hill, North Carolina: MEASURE Evaluation.

[17] Blake C, Annorbah-Sarpei NA, Bailey C, et al. 2016. Scorecards and social accountability for improved maternal and newborn health services: a pilot in the Ashanti and Volta regions of Ghana. *Int J Gynaecolog Obst.* 135(3):372–79. doi: 10.1016/j.ijgo.2016.10.004.

[18] Save the Children. 2014. *Community Capacity Strengthening Guide: Community Module*. London: Save the Children.

[19] de la Torre C, Unfried K. 2014. *Monitoring and Evaluation at The Community Level: A Strategic Review of MEASURE Evaluation, Phase III Accomplishments and Contributions*. Chapel Hill, North Carolina: MEASURE Evaluation.

Purpose and Use of This Resource Package

This resource package describes core elements of data use at the community level and presents guidance on the use of existing tools and resources to support use by program managers, communities, country policymakers, and their partners to strengthen primary service delivery and community engagement. Community-level data refers to those data that aggregate individual data, which represents health status in a community (i.e., at the community level). It does not refer to individual-level data, which should be protected and private. There are two principal objectives of this resource package:

1. To provide guidance on the core elements and steps to strengthen communities' capacity to use RMNCH data for action
2. To provide links to existing tools and resources pertaining to data use at the community level, including data analysis, interpretation, and decision-making

Data use at the community level to anchor development of this resource package is defined as: Data and information (formal and informal; see Box 2)[20] regularly expected, analyzed, interpreted, and used for decision-making by community actors to monitor and manage performance; track and adjust service quality and use; identify community needs, health status, practices, and trends; and ensure shared accountability.

This document focuses on strengthening the use of data by community actors, considering community as a collection of households in a specific geographic locale. In some places, the community may be the first level of political organization or the first level at which health services are delivered. For example, data collected by CHWs or volunteers attached to health facilities and serving multiple communities fall into the scope of this resource. This document does not include guidance for higher levels, such as facility-based health workers or district managers, about the use of data from community-based programs, as these are available elsewhere.[21,22] The resource package does not consider data collected by governmental or nongovernmental actors external to the community, such as national survey or census data. Although these are important stakeholders and data sources, they are outside the scope of this document.

Box 2. Defining what constitutes formal and informal information

Formal information can be "hard"/paper-based and/or electronic forms of information. It includes predetermined data points collected by an HMIS. Informal information includes verbal, observational, and experiential data points not collected by an HMIS but important for decision-making and for qualitatively understanding health outcomes or populations.

Organization of the Resource Package

This resource package was informed by resources from MEASURE Evaluation[23,24] and other sources, including nongovernmental organization tools and descriptions of processes. This resource package can be used in its entirety or as separate modules. A brief description of each module follows.

Module 1: Engage Data Users and Producers

Working in communities provides an opportunity to advance understanding between data users and data producers. CHWs and community members are both users and producers in different situations, but they need systems support (e.g., through training and designated time) to enhance their data use. CHW meetings

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[20] Mutemwa RI. 2006. HMIS and decision-making in Zambia: re-thinking information solutions for district health management in decentralized health systems. *Health Policy Plan*. 21(1):40-52.

[21] MCSP. 2018. *Visualizing and Using Routine Reproductive, Maternal, Neonatal, and Child Health Data at Health Facilities: A Resource Package for Health Providers and District Managers*. Washington, DC: MCSP.

[22] WHO. 2018. *Analysis and Use of Health Facility Data*. Geneva: WHO.

[23] Nutley T, Reynolds HW. 2013. Improving the use of health data for health system strengthening. *Glob Health Action*. doi: 10.3402/gha.v6i0.20001.

[24] Nutley T, Snyder E, Judice N. 2015. *Data Demand and Use: An Introduction to Concepts and Tools*. Chapel Hill, North Carolina: MEASURE Evaluation.

with community members are opportunities for further discussion about the production and use of data. In addition, supervision of CHWs affords further opportunities for users at other levels of the health system to discuss data use.

This module reviews different types of community stakeholders and the importance of engaging them in the community health information system by reviewing processes and providing templates for collaborative mapping and stakeholder engagement.

Module 2: Conduct Assessments for Improving Data Use at the Community Level

Assessing data needs as part of a larger, contextual assessment is critical for improving data use. Information needs may vary by type of stakeholder (e.g., community member, community leader, CHW). Thus, mapping available data and identifying information needs are key steps that inform data use efforts. Stakeholders must also identify and overcome barriers to data use to build effective system supports.

This module builds on the stakeholder engagement process to outline the importance of identifying stakeholders' information needs, provides guidance for prioritizing information needs, and identifies potential sources of data that will yield needed information and improve availability of data. Additionally, an initial assessment can identify common barriers to data use and opportunities to improve data use at the community level.

Module 3: Build and Strengthen Core Competencies for Data Use

Just because data exist does not mean that they are used—data availability does not equal use. Community-based programs may collect and report data. However, producing and using high-quality data requires competencies among data producers and users and systems supports. MEASURE Evaluation recommends implementing a team approach to build capacity for data use.[25]

This module describes processes and tools for data collection, management, analysis, presentation, interpretation, and using data for action.

Module 4: Support Communities to Translate Data into Action

This module addresses the impact that community-level data can have—specifically, how these data and information products can be used to spur community action.

Module 5: Ensure Systems and Policies Support Sustained Data Use

To ensure the institutionalization of data demand and use, appropriate systems and policies must be put into place. This module describes how data management and supervision systems support community-level data use.

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[25] MEASURE Evaluation. 2018. *Data Demand and Use Curriculum: Facilitator's Guide*. Chapel Hill, North Carolina: MEASURE Evaluation.

Module 1: Engage Data Stakeholders

Key Actors in Data Generation and Use

High-quality health data, generated and used locally, involves the participation of multiple community-level actors who can be both producers and users of data, including the consumers of health services. Health systems and the populations they serve benefit from improved community-level data use and integration with national systems: policy and strategy are better informed, human and financial resource allocation is better targeted, and services reach intended beneficiaries more efficiently. Ministries of health often rely on collaborations with nongovernmental organizations, community organizations, and nonhealth sectors to implement community-based programs that reach underserved, predominantly poor populations. When planning activities to increase community-level data use, it is important to consider existing systems, how to engage stakeholders, and information needs. Annex 1 contains a tool to foster thinking and planning for the collection and use of data at community levels.

Box 3 lists potential community-level actors involved in data collection and use. While community health workers (CHWs) are often the backbone of community health programs, they do not function in isolation. Indeed, recent guidance on policy and systems support by the World Health Organization to support CHW programs underscores the importance of community-level actors, where their contribution to realization of universal health coverage and increased economic growth through creation of qualified employment opportunities is emphasized.[26] By capturing, analyzing, and using high-quality data to adjust and improve health programming, the work of CHWs and other community-level actors becomes more effective.

Many actors and stakeholders have a vested interest in community health data depending on the country context, ranging from CHWs and volunteers to community groups (such as mothers' groups and youth groups), village health committees, and traditional leaders. Stakeholder mapping (described later in this module) is crucial in understanding who the relevant actors are, where they fit within the health system, and what they are looking for in terms of community health data use.

Box 3. Community-level actors involved in community-level health data generation and use

- Community health workforce
    - Community health volunteers
    - Professional/paid community health workers
    - Health promoters
    - Peer community health workers for vulnerable populations
    - Other community health providers: trained traditional birth attendants, natural leaders
- Community members
- Community/village/ward leaders
- Community support structures, including community members participating in village health committees; women's groups for maternal, newborn, and child health; and grandmother groups
- Community-based organizations
- Civil society organizations
    - Community groups
    - Nongovernmental organizations
    - Labor unions
    - Vulnerable population groups (e.g., LGBT)
    - Indigenous groups
    - Charitable organizations
    - Faith-based organizations
    - Professional associations
    - Foundations
    - Providers

Importance of Engaging Stakeholders and Related Considerations

Data collected through community-based health information systems (CHISs) will only be consistently relevant and accurate when community members and CHWs find value in the data they generate and use it for local action. The CHIS varies by country and health area, use of technology, overall goals for the system,

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[26] WHO. 2018. *WHO Guideline on Health Policy and System Support to Optimize Community Health Worker Programmes*. Geneva: WHO.

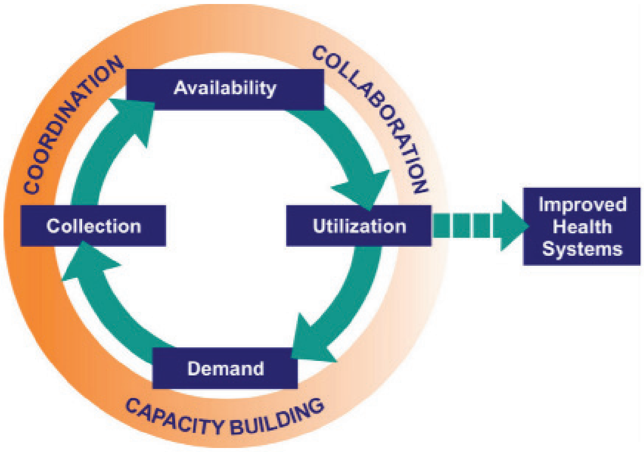
and integration into the health management information system.[27] For this reason, stakeholders should be identified early and often so that their inputs can ensure relevant and useful information for community-level health initiatives. It is also important to include marginalized groups in these conversations. This process involves understanding community-level stakeholders' data needs and identifying with community-level stakeholders the value added of the data being collected, especially if they are the ones doing the primary data collection. In addition, opening up health data and information to a wider public audience can greatly strengthen overall community-level use of reproductive, maternal, newborn, and child health (RMNCH) and nutrition data. It also strengthens the trust and relationship between community-level stakeholders and government officials, including health service staff. Community members have expressed frustration when they did not see improvements in services.[28] Traditional scientific inquiry has not treated participants as equal stakeholders in knowledge generation.[29] In addition, there is a tension between data-related work and service delivery in terms of time and effort required.[30] Box 4 shares guiding principles for stakeholder engagement.

Box 4. MEASURE Evaluation guiding principles for stakeholder engagement (2011)

1. Ownership fosters health data use.
2. Stakeholder engagement improves relevance of data.
3. Stakeholders should represent a diversity of perspectives.
4. Recognize the differing roles of stakeholder groups and individuals.
5. Engage stakeholders throughout the project process, from design to follow-up.
6. Acknowledge the unintended effects of stakeholder engagement.
7. The more stakeholders, the greater the complexities of project design.
8. A large stakeholder group might stimulate excessive expectations.
9. Transparency can add unwanted accountability.

Community-level stakeholders also have different data needs than traditional audiences for health service data. It is important to understand what kind of data community-level stakeholders prioritize and what information is valuable from their perspective. For example, in the Community Score Card approach,[31] perception-based indicators are developed jointly with the community based on the issues raised during focus group discussions with community members. These perception-based indicators can include things such as waiting time at the health facility, attitude of the service provider, and health facility operating hours. Understanding what data are valued by the community-level stakeholders can help inform the data collection, sources of data, and other important system designs to enhance data use. Figure 1 depicts a conceptual framework for a

Figure 1. MEASURE Evaluation's Conceptual Framework for Data Demand and Information Use in the Health Sector



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[27] MEASURE Evaluation. 2016. *Community-Based Health Information Systems in the Global Context: a Review of the Literature*. Chapel Hill, North Carolina: MEASURE Evaluation.

[28] MEASURE Evaluation. 2016. *Community-Based Health Information Systems in the Global Context: a Review of the Literature*. Chapel Hill, North Carolina: MEASURE Evaluation.

[29] Balazs CL, Morello-Frosch R. 2013. The Three R's: How Community-Based Participatory Research Strengthens the Rigor, Relevance and Reach of Science. *Environ Justice*. 6(1). doi: 10.1089/env.2012.0017.

[30] MEASURE Evaluation. 2017. *Applying User-Centered Design to Data Use Challenges: What We Learned.* Chapel Hill, North Carolina: MEASURE Evaluation.

[31] CARE Malawi. 2013. *The Community Score Card (CSC): A Generic Guide for Implementing CARE's CSC Process to Improve Quality of Services*. Lilongwe, Malawi: CARE Malawi.

system of data demand and use in the health sector.[32] This figure illustrates a cycle in which demand for data leads to use of data, which in turn further feeds the demand for data. This cycle is supported by coordination, collaboration, and capacity-building among and of the actors in the system. There is clearly a link between the production or collection, availability, and use of data at all levels, including at the community level. Standard community engagement and participatory research or monitoring and evaluation approaches can be used to engage relevant community stakeholders for data use, including through community dialogs, community health committees, appreciative inquiry, and community mobilization.[33,34,35]

Stakeholder Mapping and Analysis

Stakeholder mapping for community-level health data is an approach that can be used to: (1) identify potential actors who should be involved in data utilization at the community level and their roles; (2) generate knowledge about these actors (whether individuals or organizations) to understand their behaviors, intentions, interrelations, and interests; and (3) assess the influence and resources they bring to bear on decision-making or implementation processes.[36] Mapping is an important step that enables subsequent engagement of these actors to promote community-level RMNCH data use.

Box 5. Stakeholder mapping

Stakeholder mapping is a collaborative process of research and discussions that draws from multiple perspectives to determine a key list of actors involved in community health data use. Stakeholder mapping can be completed by the ministry of health, implementing partners, and other civil society organizations. Mapping is broken into four phases:

10. Identifying: listing relevant groups, organizations, and people
1. Analyzing: understanding stakeholder perspectives and interests
2. Mapping: visualizing relationships to objectives and other stakeholders
3. Prioritizing: ranking stakeholder relevance and identifying issues

The process of stakeholder mapping is as important as the result, and the quality of the process depends heavily on the knowledge of the people participating. The process often begins by asking a pre-identified key informant (for instance, facility health staff or community health program manager) to identify the key stakeholders. During discussions with those key stakeholders, they will likely identify other stakeholders from the community. The process continues until all discussions have taken place with all relevant identified stakeholders (see Box 5).

MEASURE Evaluation's Stakeholder Engagement Tool describes the purpose of stakeholder mapping as a crucial component of data ownership and use: "Data is only valuable if it is seen as relevant and useful by prospective users. When data is seen as useful, it is more likely to be owned by those who need it to inform decision-making." [37] Annex 2 includes two tools from this resource to facilitate stakeholder analysis and engagement. Box 6 shares experiences using community mapping approaches.[38]
Before engaging stakeholders, program teams should consider the following, consulting with the stakeholders themselves where possible:

- Who are the critical stakeholders in the local context, and what are their respective roles in community health?
- What critical decisions and actions do stakeholders make in relation to the CHIS (i.e., what is their role in data collection and data use currently)?

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[32] MEASURE Evaluation. 2011. *Tools for Data Demand and Use in the Health Sector*. Chapel Hill, North Carolina: MEASURE Evaluation.

[33] Voluntary Services Overseas (VSO). 2004. *Participatory Approaches: A Facilitator's Guide*. London: VSO.

[34] Search for Common Ground. 2017. *Community Dialogue Design Manual*. Washington, DC: Search for Common Ground.

[35] Community Tool Box. 2018. Leading a Community Dialogue on Building a Healthy Community. Community Tool Box website. https://ctb.ku.edu/en/table-of-contents/assessment/assessing-community-needs-and-resources/community-dialogue/main.

[36] Varcasovsky and Brugha (2000) http://dess.fmp.ueh.edu.ht/pdf/Zsuzsa_Varvasovsky_2000_stakeholder_analysis.pdf

[37] MEASURE Evaluation. 2011. *Stakeholder Engagement Tool*. Chapel Hill, North Carolina: MEASURE Evaluation.

[38] Shanklin D, Sillan D. 2005. *Census-Based, Impact-Oriented Methodology: A Resource Guide for Equitable and Effective Primary Health Care*. Raleigh, North Carolina, and Washington, DC: Curamericas and CORE Group.

- What information do stakeholders need to make decisions related to their job functions or daily lives? What information do they currently have access to, and what information would they like to access?
- How would stakeholders use this information to guide decision-making or develop action plans?
- Where could stakeholders get relevant community health information?
- In what format (and frequency) would stakeholders want to analyze and interpret data, with respect to any data literacy limitations?
- What challenges do stakeholders face for data use?
- What types of decisions could stakeholders make from using data, and what are the intended benefits?
- What security measures should be taken to protect privacy (i.e., for data and for participation in collection, analytic, and subsequent processes), particularly for vulnerable populations within communities?

Box 6. Community mapping experiences

In countries that use a community mapping approach, such as the census-based, impact-oriented methodology in Latin America, a census and mapping are undertaken in the community. The initial phase also includes a knowledge, practice, and coverage survey to identify health needs. CHWs also monitor vital events, such as births and deaths, to update the original census. With the family folder approach, such as in Ethiopia, CHWs use forms to track household characteristics, family members' health and needed services, and the CHWs' contacts and services delivered to each household.

Module 2: Conduct Assessments to Improve Data Use at the Community Level

Data-informed decision-making is important for effective programs.[39] There has been much investment in improving data collection but less attention devoted to using the data collected.[40] Data-informed decisions result from the interactions of technical, organizational, and behavioral factors within a complex system, which ultimately facilitate or hinder data use.[41] The purpose of this module is to provide an overview of considerations and approaches for conducting assessments that will inform efforts to improve data use at the community level.

Assessing Data Use at the Community Level

The *WHO Guideline on Health Policy and System Support to Optimize Community Health Worker Programmes* recommends that community health workers (CHWs) not only document the services they provide but also collect, collate, and use health data on routine activities.[42] Although there has been a focus on data use by program staff and policymakers, community use of data is a more recent consideration and requires interested parties to adapt existing tools or create new ones. Understanding stakeholders' motivations and needs has emerged as a key theme in improving data use, as discussed in Module 1.

Having stakeholders collectively assess and come to consensus on key questions and data required to fulfill their roles is important. Initial assessments for improving data use at the community level require:

- An inventory of the kind of data that currently exist at community level; which data are used, by whom, and how; and which data are not used at community level
- An understanding of stakeholders' information needs, if not identified in the stakeholder mapping and engagement process
- An assessment of the barriers to data use, informed by an understanding of:
    a. The information needs of potential data users (health program stakeholders, including data producers, community members, and CHWs) and users (community members and health staff at all levels)
    b. Potential data users' attitudes toward data collection and use
    c. System supports for optimal data collection and use

Annex 1 presents guiding questions and considerations for the collection and use of community-level data that could be used as a preassessment planning tool to determine what to assess and how.

Assessing Types of Data Available at the Community Level

Data availability suggests that data are available in specific (geographic or online) locations and in standardized formats. Data accessibility is also important and implies data are in a usable format tailored to a specific context, including differing levels of literacy and for the intended purposes. Data can be stored and made available in a variety of ways, such as in registers, reports, online databases, or cloud-based platforms.

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[39] Nutley T, Snyder E, Judice N. 2015. *Data Demand and Use: An Introduction to Concepts and Tools*. Chapel Hill, North Carolina: MEASURE Evaluation.

[40] Nutley T, Snyder E, Judice N. 2015. *Data Demand and Use: An Introduction to Concepts and Tools*. Chapel Hill, North Carolina: MEASURE Evaluation.

[41] MEASURE Evaluation. 2017. *Applying User-Centered Design to Data Use Challenges: What We Learned.* Chapel Hill, North Carolina: MEASURE Evaluation.

[42] WHO. 2018. *WHO Guideline on Health Policy and System Support to Optimize Community Health Worker Programmes*. Geneva: WHO.

Survey and routine data are often stored and managed by health facilities, nongovernmental organizations, and donors; an assessment will uncover how accessible they are to stakeholders. Close collaboration between primary health and community actors allows for information sharing, updates, and increased data use.

Health data commonly collected and used at the community level can be both quantitative and qualitative, and classified in six categories based on the location and frequency of data collection and the purpose of data use. Table 1 defines six data categories and lists some conditions that would encourage community-level data use. An overriding precondition is that stakeholders are engaged throughout the process, from design through follow-up.

Table 1. Types of data, definitions, and examples to facilitate data use in communities

Data Type	Definition	Examples of Actions That Can Encourage Community Level Data Use
Service delivery data; data for logistics management tracking for commodity tracking and supply	Data collected on health services sought and provided using registers, forms, digital health applications, and wall charts, to include distribution of family planning commodities, childhood illnesses treated through integrated community case management, commodity stock management (if applicable); and health promotion activities, such as the number of households visited to promote maternal and newborn health or number of educational sessions held about best sanitation practices	Simplify registers and consolidate forms, such as those used in My Village, My Home[43] and family health folders in Ethiopia.[44] Provide recurring coaching and supportive supervision on tools and approaches so community health workers (CHWs) are able to interpret findings and identify appropriate responses. Tap into functional structures with authority to take action.

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[43] Maternal and Child Health Integrated Program (MCHIP). 2014. *My Village, My Home: A Tool to Optimize Immunization Coverage*. Washington, DC: MCHIP.

[44] MEASURE Evaluation. 2012. Family Folder System Guides Health Workers in Ethiopia. MEASURE Evaluation website. https://www.measureevaluation.org/our-work/health-information-systems/family-folder-system-guides-health-workers-in-ethiopia.

Data Type	Definition	Examples of Actions That Can Encourage Community Level Data Use
Data for accountability	Data collected during community meetings, where stakeholders, such as health service users and providers and local government and traditional leaders, discuss service quality issues and barriers to care within the community. These key "interface meetings," which can be facilitated by a neutral third party, bring together diverse perspectives to a forum to encourage dialog. Tools that support the process include the Partnership Defined Quality tool book,[45] the *Citizen Voice and Action Field Guide*,[46] and the Community Score Card, which helps to assess the quality of health services, identify priority areas, develop action items, and monitor progress over time.[47,48,49]	Adapt tools for community users. These could include videography and mobile solutions for real-time reporting that policymakers can respond to (including social media), such as Ureport, a free social messaging tool and real-time information system developed by UNICEF, designed to strengthen community engagement. Provide recurring coaching and supportive supervision on tools and approaches so CHWs are able to interpret findings and identify appropriate responses. Tap into functional structures with organization with authority to take action.
Community mapping or family folder data	Data collected by CHWs or other community workers pertaining to community- and household-level practices on an ongoing basis through household visits, such as on health and sanitation behaviors or household and community resources and characteristics; these data are used to provide targeted interventions and services to households	Use data visualizations that help guide CHWs in their work. Support CHWs to develop understanding of relationship to service delivery and logistic data, as high-quality data on household practices and family folders will help to target households with interventions and/or follow-up. Provide support to families to maintain home-based records. Provide recurring coaching and supportive supervision on tools and approaches so CHWs are able to interpret findings and identify appropriate responses.

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[45] Lovich R, Rubardt M, Fagan D, Powers MB. 2005. *Partnership Defined Quality: A Tool Book for Community and Health Provider Collaboration for Quality Improvement*. Fairfield, Connecticut: Save the Children.

[46] World Vision. 2013. *Citizen Voice and Action Field Guide*. Monrovia, California: World Vision.

[47] Raising the Score. 2019. Raising the Score website. http://www.raisingthescore.org/.

[48] Saich R, Engelman J, eds. 2017. *Citizen Voices, Community Solutions: Designing Better Transparency and Accountability Approaches to Improve Health*. Cambridge, Massachusetts: Harvard Kennedy School's Ash Center for Democratic Governance and Innovation.

[49] Results for Development (R4D). 2017. Reinventing community scorecards. R4D website. https://www.r4d.org/blog/reinventing-community-scorecards/.

Data Type	Definition	Examples of Actions That Can Encourage Community Level Data Use
Vital statistics	Data pertaining to births and deaths collected over time in a given population	Create awareness on value of data for population planning and well-being. Support CHWs to develop understanding of relationship to service delivery and logistic data, as high-quality vital statistics will help to provide targeted follow-up for households when a baby is born.
Disease/event-based surveillance data[50]	Data that track the occurrence of specific diseases or events in a target population over time and are used to report notifiable diseases to higher levels and assist in the estimation of the burden of specific diseases	Engage communities in defining data requirements and ensure adequate logistics for data collection.
Informal data	Informal observations or encounters based on knowledge of community members or the community context	Provide information and examples that community members can relate to.

Annex 3 provides a table with data sources that can support strategy and advocacy interventions.

An assessor (internal stakeholder or external consultant) may also want to document the data flow from the community level to the central level or health information system, as in Figure 2. This diagram maps the movement of data and provides a useful reference when considering other parts of the assessment (e.g., where or with whom to assess barriers to use). It should be noted that in some countries, short message service data can be sent by CHWs directly to the District Health Information System 2, and the growing use of digital solutions for patient and service delivery tracking is changing traditional data flows between the community and higher levels of the system.

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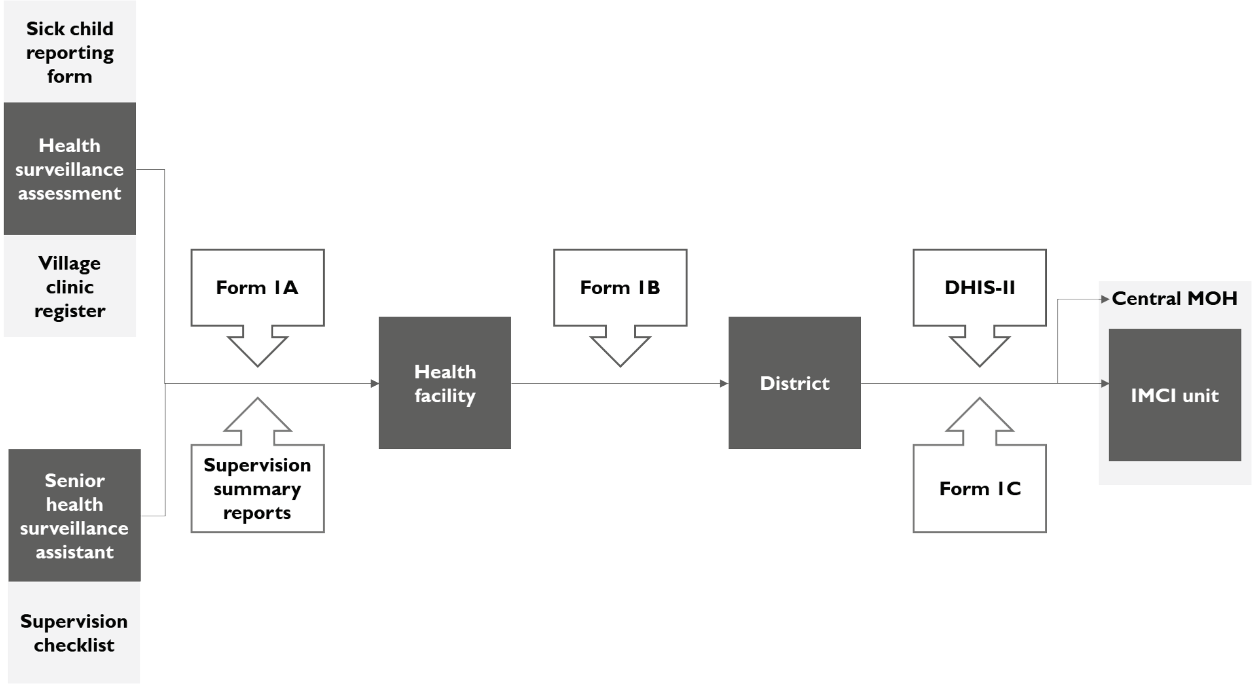
[50] Stone E, Miller L, Jasperse J. 2016. Community event-based surveillance for Ebola virus disease in Sierra Leone: Implementation of a national-level system during a crisis. *PLoS Curr*. 8: ecurrents.outbreaks.d119c71125b5cce312b9700d744c56d8.

Figure 2. Example of data reporting flow for integrated community case management data in Malawi[51]



The assessment should review current routine data collection forms and processes to understand the intended data to be collected and reported. This review or inventory would require interviews with the CHW, community members, and/or health workers or managers who collect and report data at different levels of the health system. A simple spreadsheet (electronic or paper), listing data points and definitions, data collection forms, source of data, and the reporting schedule, can record the information needed (Table 2).

Table 2. Sample data reporting and data use table

Community Stakeholder Data Need(s)	Data Point Definition	Data Collection Form	Reporting Schedule	Use	Point of Contact
Number of sick children in community ***[Name/title of stakeholders needing these data]***	Number of children under 5 with fever	Community health worker (CHW) register, CHW reporting form	CHW reporting form to facility: last day of each month	Facility aggregates numbers from all CHWs for report to district health office. Facility uses information to ensure stock of malaria rapid diagnostic tests for CHWs. CHWs create chart and report data to community at quarterly health talks.	*[Name of person who can address questions about understanding or interpreting the data, or can address data quality concerns]* *[Name of community stakeholder who is in charge of updating chart with this data]*

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[51] Yourkavitch J, Zalisk K, Prosnitz D, Luhanga M, Nsona H. 2016. How do we know? An assessment of integrated community case management data quality in four districts of Malawi. *Health Policy Plan.* 31(9):1162-71. doi: 10.1093/heapol/czw047.

Community Stakeholder Data Need(s)	Data Point Definition	Data Collection Form	Reporting Schedule	Use	Point of Contact
	Number of children with diarrhea	CHW register, CHW reporting form	CHW reporting form to facility: last day of each month	Facility aggregates numbers from all CHWs for report to district health office. CHWs/others working at community level inform programming.	*[Name of person who can address questions about understanding or interpreting the data, or can address data quality concerns]*

Identify Data and Information Needs

As described above, the first step in the determination of community information needs includes a detailed review by community stakeholders of data from existing health interventions and related social activities involving communities, either community based or community driven. [52] When deciding on the type of additional data needed, stakeholders should consider time, costs, data format, and the level of effort required for data collection to avoid collecting unnecessary data or information with no clear intent for use.[53]

- **Frequency of data collection** may be one time or on a routine basis depending on their purpose: Outreach and campaign data (immunization, mass deworming, etc.) are time bound and often cross-sectional, whereas users of routine health management information systems (HMISs) collate and analyze program data with much longer-term goals, such as addressing issues in reproductive, maternal, newborn, and child health; family planning; or noncommunicable diseases. Community data needs may fluctuate based on economic, social, and political factors. Data processing, management, and analysis should be timely, constantly updated, and tailored to reflect temporal fluctuations.
- **Organizational capacity of communities and data collectors** helps to determine levels of investment needed for the monitoring and evaluation of health interventions. CHWs are the first to collect, collate, and analyze community data.[54] CHWs form the backbone of community health programs, as they feed data into the community-based health information system (CHIS), which can be further pulled into the HMIS. The level of integration with the HMIS can differ depending on the country. Plans to train and supervise CHWs are essential for proper data collection at the community level, and there should be ample time and resources to continually build capacity and train these frontline workers.

Community members, program planners, and health system officials should be and are mutually accountable for sharing collected data and taking necessary and agreed upon actions. In prioritizing data needs, they must consider the interests, goals, and social and environmental contexts of desired services. A community health profile can help to identify actionable health data.[55] This profile could be developed by any group of stakeholders on paper or electronically. It should include:

1. Demographic data of the community

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[52] MEASURE Evaluation. 2016. *A Brief Guide to Identify Information Needs and Use Data for PEPFAR Country and Regional Planning*. Chapel Hill, North Carolina: MEASURE Evaluation.

[53] MEASURE Evaluation PIMA. 2016. *Best Practices in Strengthening Community Health Information Systems*. Chapel Hill, North Carolina: MEASURE Evaluation.

[54] MEASURE Evaluation PIMA. 2016. *Best Practices in Strengthening Community Health Information Systems*. Chapel Hill, North Carolina: MEASURE Evaluation.

[55] Institute of Medicine (US) Committee on Using Performance Monitoring to Improve Community Health. Durch JS, Bailey LA, Stoto MA, eds. 1997. Measurement Tools for a Community Health Improvement Process. In: *Improving Health in the Community: A Role for Performance Monitoring*. Washington, DC: National Academies Press.

2. Number and distribution of health facilities in the communities, by type, within 5 to 10 kilometers of the community
3. Travel time and/or road status to health facilities from communities
4. Health status of the community
5. Risk factors in the community (e.g., environmental or geographic)
6. Existing service coverage
7. Health staff, CHW, emergency transportation, and communication availability

Community-level indicators should be clearly defined, and the data may be disaggregated by sex, age group, location, socioeconomic status, and other demographics to allow in-depth analysis and decision-making. For example, the analysis of granular and detailed data can reveal problems related to equity and stigma or discrimination issues that may affect access to health services. It remains important to ensure that data are kept confidential and identifiable information is removed when conducting all analysis and reporting.[56,57,58] For this reason, care should be taken to limit disaggregation on small data sets being used at the local level to avoid unintentionally disclosing identity. Additional approaches could include using age ranges versus exact ages of community members and limiting specificity of the location.

Each community has health needs specific to its environment, dominant occupations, and other contextual factors, which necessitate tailored, community-based health indicators. The causes of priority health issues can be related to health systems (e.g., limited access to quality care), environment (e.g., polluted drinking water or poor air quality), social (e.g., ethnic groups that are discriminated against), and other factors. Selecting relevant indicators can help identify and respond to these conditions. These indicators play a useful role in decision-making and service evaluations.

Communities can decide in collaboration with the health system to prioritize and focus on a select number of indicators. A list of core and additional health and service delivery standard indicators that are aligned with the global strategies and facility standard indicators will be published by the Health Data Collaborative and UNICEF in 2019. The World Health Organization (WHO) and its Collaborating Centre for Innovation and Implementation Research for Health Information Systems Strengthening also have resources to assist in selecting facility-level indicators.[59] These standard indicators should be prioritized, but which to follow should be based on evolving needs, the health status of the community, and the maturity of the CHIS. Depending on the type of data collected, community-level indicators could be suitable to assess differences in health, education, social life, livelihood, and empowerment within the community. The comparison provides important information to community health managers, donors, and government agencies; supports advocacy; improves accountability; and guides decision-making. For example, the community-based rehabilitation indicators support WHO and its member states in their efforts toward strengthening community-based rehabilitation by generating evidence on its effectiveness.[60] Generally, community-based health indicators should inform accountability and policy change, feeding into community-level evaluation of health interventions. These indicators can also provide information on care-seeking behaviors and home-based practices by community members, which may help to encourage and empower action undertaken by communities. Annex 3 contains a longer description of using data for social accountability.

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[56] UNICEF. In press. *Core Indicators for Routine Community Health Information Systems (CHIS)*. New York City: UNICEF.

[57] MEASURE Evaluation. 2018. *Community-Based Indicators for HIV Programs*. Chapel Hill, North Carolina: MEASURE Evaluation.

[58] MotherNewBorNet, USAID. 2005. Indicators for monitoring progress towards maternal and newborn survival. Dhaka, Bangladesh: International Centre for Diarrhoeal Disease Research, Bangladesh.

[59] WHO. 2018. *Analysis and Use of Health Facility Data*. Geneva: WHO.

[60] Dickinson FM, Pyone T, van den Broek N. 2016. Experiences from the field: maternal, reproductive and child health data collection in humanitarian and emergency situations. *Int Health*. 8(2): 83–8. doi: 10.1093/inthealth/ihv045.

Assess Barriers to Data Use and Solutions

MEASURE Evaluation developed the Assessment of Data Use Constraints Tool to help program managers to rapidly assess data use constraints. The tool focuses on organizational, technical, and individual constraints to data use, and provides templates to guide interviews with key informants, data users, and data producers. It also provides a planning matrix to facilitate discussions regarding efforts to address barriers to data use.[61]

The MEASURE Evaluation report *Applying User-Centered Design to Data Use Challenges: What We Learned* notes several common barriers to data use.[62] Box 7 lists some of those barriers with adaptations and interpretations for community-level data, along with suggested solutions to explore.

Data use must be demonstrated and emphasized by committed leadership. The community level, specifically CHWs, typically generates data but has not been empowered to use it. Likewise, community members are not empowered to use data. Engaging community leadership or facilitating community meetings to review data can highlight trends in illnesses and health service delivery, and inform discussion of interventions and needed inputs.

Periodically reassessing data use through the inventory and barrier assessment described above will keep the system current and optimally supporting data use.

There can be other barriers to data use, such as performance-based financing, when many programs support the same CHWs to deliver different services. Different expectations, training, and reporting requirements could overwhelm CHWs, especially if they are responsible for large catchment or population areas. Other barriers include lack of trust from communities, data governance issues related to what information can be published and how, and presence of mechanisms to validate collected data and processes to track referrals. Solutions to some of these barriers are presented in Box 7.

Box 7. Barriers to data use and solutions

Lack of knowledge about how data are used after reports are submitted:

- Knowing how their work contributes to the data system and to program and funding decisions can motivate staff at all levels.
- Knowing how the information they provide contributes to program and funding decisions can motivate community members to provide accurate data.

Tension between service delivery and data recording and reporting for providers who are pressed for time and may feel undervalued:

- Supportive supervision should ensure that community health workers (CHWs) have the time or other resources they need to record data accurately and completely, and submit timely reports.
- Supportive supervision reinforces how staff contributions are valued and the impact of that work on a community's health and the health system overall.

Shortage of staff (including CHWs), specifically staff with data-related expertise, and inadequate training for staff on data-related issues:

- It is critical to ensure that CHWs have adequate training in data-related issues, including data collection, ensuring data quality, reporting data accurately, and identifying important issues revealed by data.

Shortage of materials (e.g., data collection tools) or hardware breakdowns:

- This is a matter of committed leadership ensuring that materials and equipment are sufficient and in good working order.

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[61] MEASURE Evaluation. 2011. *Tools for Data Demand and Use in the Health Sector*. Chapel Hill, North Carolina: MEASURE Evaluation.

[62] MEASURE Evaluation. 2017. *Applying User-Centered Design to Data Use Challenges: What We Learned*. Chapel Hill, North Carolina: MEASURE Evaluation.

Module 3: Build and Strengthen Core Competencies for Data Use

Once more is known about the stakeholders, data availability, information needs, and barriers to data use, programs can work with stakeholders to build and strengthen capacities necessary for improved data use. Data producers and users, such as community health workers (CHWs) and community members, may require core competencies in data collection and management, as well as analysis, presentation, and interpretation of data to use high-quality data for decisions that can be shared with and benefit the broader community.[63] Programs often focus on building these capacities in data producers to ensure higher-quality data and overlook the capacity-building needs of data users. While data producers may utilize skills related to data collection, such as numeracy, literacy, and an attention to detail, data users need skills related to interpreting information and strategizing about how best to remedy the problems indicated by data, which could be through direct action or advocacy. Solutions to community health challenges could lie in the community itself (e.g., behavior change) or could be systemic in nature (e.g., commodity stock-outs), but any solution will require resources to address.

CHWs, community members, and/or community leaders use tools, such as registers, tracking forms, family health folders, scorecards, and summary forms, to collect and manage data. CHWs and communities can use wall charts, graphs, data dashboards, and/or other tools to analyze and visualize their data. Communities should analyze, interpret, and use these data for action with different stakeholders in the community. Civil society organizations also contribute as data users through their oversight of collected program and budgetary data as part of "social accountability" in conjunction with government health personnel at national and local levels.[64] This module examines core competencies and packages/tools to build these competencies, and provides examples for different types of data and associated processes commonly collected at the community level. Processes for data use vary depending on different data sources, such as service delivery data and family folders, which provide data at geographical area levels and individual or family levels, respectively.

Data Collection and Management

While this guide is not focused on data collection and management, these are core competencies related to data use, and they are discussed here in that context. Service delivery data at the community level is most often collected through patient or client registers and tracking forms completed by CHWs. CHWs and/or their supervisors often aggregate and organize raw data into a summary form, with counts of the number of services provided, stocks available, or activities completed. In many countries and programs, the data from the community summary forms or paper registers are then submitted and aggregated at a higher level (e.g., district), such as through the District Health Information System 2, if this is available, which then becomes available to all levels of the health management information system, including at the national level. Most reproductive, maternal, newborn, and child health (RMNCH) programs supported by national ministries of health and/or partners have standard registers, summary forms, and tools that have been adapted to collect the necessary indicators and information given the country context and specific program components. There are many examples of registers, tools, and summary forms for community-based services, such as family planning[65] and integrated community case management for CHWs[66] and their supervisors.[67] The training

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[63] Nutley T, Reynolds HW. 2013. Improving the use of health data for health system strengthening. *Glob Health Action*. doi: 10.3402/gha.v6i0.20001.

[64] Wilcox S, Shanklin D. 2017. *Social Accountability Resources and Tools*. Washington, DC: MCSP.

[65] FHI 360. 2011. *Monitoring and Evaluation Package for Community-Based Provision of Family Planning Services: Tools for Community Health Workers*. Durham, North Carolina: FHI 360.

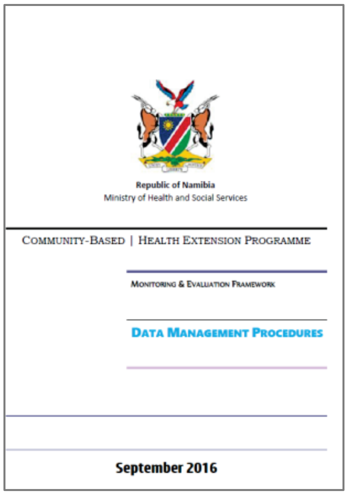
[66] CCM Central. Tools for CHWs. Available at: https://ccmcentral.com/resources-and-tools/tools-for-chws/

[67] CCM Central. Tools for CHWs Supervisors. Available at: https://ccmcentral.com/resources-and-tools/tools-for-chw-supervisors/

package for CHWs and CHW supervisors[68] from Ghana includes many examples of registers and summary forms, as well capacity-building exercises in data collection and use.

High-quality data collection and synthesis are necessary to have accurate data to make decisions. Programs most often train and build capacity of CHWs to collect and manage data during initial training and through ongoing supervision. Studies have found that this initial training and ongoing supervision for data collection and management are often inadequate,[69] and that programs should strengthen training and supervision, especially data use and feedback, during ongoing supervision. Heavy reporting burdens of CHWs across programs can also affect the quality of data and CHW motivation; programs should take this into consideration when deciding what data to collect and use.

Figure 3. Standard operating procedures for data management from Namibia Health Extension Program



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Ministry of Health and Social Services

COMMUNITY-BASED | HEALTH EXTENSION PROGRAMME

MONITORING & EVALUATION FRAMEWORK

DATA MANAGEMENT PROCEDURES

September 2016

Tools exist to help ensure CHWs have the skills to collect and organize high-quality data. For example, standard operating procedures for data management from Namibia's Health Extension Program (Figure 3) describe how CHWs should collect, process, and report data, as well as how to analyze and use indicators. Although this is currently not in the public domain, this sort of guidance should be developed at a country level to help ensure more systematic data collection and use among CHWs and communities. Data quality audits, done by program managers across different communities, can also assess the quality of the community data and identify areas for strengthening. These standard data quality auditing tools[70] can be adapted to use at the community level.[71,72]

Electronic Data Capture and Use

Electronic capture and use of data (mHealth or e-health) aid data collection and enable real-time analysis and decision-making. Electronic data platforms are powerful tools used for management, analysis, quality assurance, and reporting at all levels, and they enable faster performance monitoring and/or data dissemination. Considerations for data capture and use include access and availability of mobile devices, Internet connectivity, language of the platform, and literacy levels of the data collectors and consumers. CHWs are already contributing to electronic data capture in many countries. For example, through the Global Trachoma Mapping Project, CHWs collated an impressive quantity of environmental data, including on water, sanitation, and hygiene, in more than 60 countries, which were analyzed in real time and used to fight trachoma, a leading infectious cause of blindness globally. The Global Trachoma Mapping Project used an mHealth platform with numerous advantages, including an easy-to-use system to collect and analyze data, the ability to leverage material and human resources that resulted in long-term financial savings, fewer man hours

Box 8. Role of implementing partners in electronic data capture and use

Implementing partners have a role to play in engaging with and empowering communities with data so they can play an active role in identifying data needs, improving data availability, and making programmatic decisions.

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[68] Walker P, Owusu R. 2016. Ghana's 'Paradigm Shift' for CHWs. World Vision website. https://www.wvi.org/article/ghana%E2%80%99s-%E2%80%98paradigm-shift%E2%80%99-chws.

[69] Kumar MB, Regeru RN, Hawkins K, et al. 2018. *Improving Data Quality in Community Health Programmes: Recommendations from Inter-Country Research*. Liverpool, UK: REACHOUT.

[70] ICF. 2017. *iCCM Data Quality Assessment Toolkit*. Fairfax, Virginia: ICF.

[71] Hazel E, Chimbalanga E, Chimuna T, et al. 2017. Using data to improve programs: assessment of a data quality and use

10.9745/GHSP-D-17-00103.

[72] Yourkavitch J, Zalisk K, Prosnitz D, Luhanga M, Nsona H. 2016. How do we know? An assessment of integrated community case management data quality in four districts of Malawi. *Health Policy Plan*. 31(9):1162-71. doi: 10.1093/heapol/czw047.

required to collect and manage the data, the rapid synchronization and triangulation of data, and an improvement in overall data quality.[73,74]

Community-level implementing partners should use the data for reporting on progress and forecasting from lower levels up to the national level of the health system, regularly providing feedback to communities. Box 8 describes the role that implementing partners can play in data capture and use. Online libraries and platforms improve the ability to search data and can be accessible to communities in many developing countries. The use of geographic information systems through mobile devices by trained CHWs provides coordinates and shape files for specific locations. These systems are indispensable for generating large amounts of data that can be collated, analyzed, and turned into information in real time. For example, data on natural resources, demographics, water, and sanitation can be generated and managed in direct collaboration with communities. It is therefore imperative to "bridge the digital divide" by helping community-level stakeholders build capacity for electronic data capture using gender-sensitive approaches.[75]

Box 9. Examples of mobile options being used globally

- **upSCALE in Mozambique**: A national community health worker (CHW) mHealth system that can directly add community-level indicators into the District Health Information System 2 through a mobile phone. Data can immediately be used for surveillance and detection of infectious diseases and for decision-making.
- **RapidSMS in Rwanda**: System built to track mHealth data on the health of mothers and children under 5 as collected by CHWs.
- **cStock in Malawi**: A rapid short message service, open-source, Web-accessible logistics management information system for community-level health products in Malawi for community case management, family planning, and HIV testing.
- **Living Goods in Kenya**: Mobile tools for community health promoters and the community to diagnose child illnesses, remind patients to take medication, track pregnant women facing complications, and broadcast health messages and money-saving promotions to customers via short message service.
- **Last Mile Health in Liberia:** Developed an e-learning platform and data collection tools for CHWs to continuously strengthen diagnostic and treatment skills and learning, digitize reporting of the community-based health information system, and improve quality of care.

mHealth and Community Use of Data: Lessons and Applications

The rise of mHealth (i.e., the use of mobile technology to address health issues, including messages for clients, diagnostic algorithms, and others) over the past two decades has increased accessibility to data and the volume of data available.[76,77,78,79,80] Box 9 shows examples of mobile options used globally. Lessons from MEASURE Evaluation's case study on scaling mHealth for the community include[81]:

- Not all paper systems can or should be digitized. Digitization depends on data flow and user needs, and thus requires an understanding of the community health program or system.

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[73] Brooks P, Rosenberg J, Weintraub R. 2016. *The Global Trachoma Mapping Project*. Brighton, Massachusetts: Harvard Business Publishing.

[74] MEASURE Evaluation. 2016. *Community-Based Health Information Systems in the Global Context: a Review of the Literature*. Chapel Hill, North Carolina: MEASURE Evaluation.

[75] Sorgner A, Mayne G, Mariscal J, Aneja U. 2018. *Bridging the Gender Digital Gap*. Buenos Aires, Argentina: Argentine Council for International Relations and CIPPEC.

[76] Malaria Consortium. 2016. *upSCALE: mHealth System Strengthening for Case Management and Disease Surveillance*. London: Malaria Consortium.

[77] RapidSMS Rwanda. 2011. RapidSMS Rwanda Documentation. RapidSMS Rwanda website. https://rapidsms-rwanda.readthedocs.io/en/latest/.

[78] Supply Chains for Community Case Management of Pneumonia and Other Common Diseases of Childhood (SC4CCM). 2019. cStock. SC4CCM website. http://sc4ccm.jsi.com/emerging-lessons/cstock/.

[79] Living Goods. 2019. The Living Goods Approach. Living Goods website. https://livinggoods.org/what-we-do/the-living-goods-approach/.

[80] Last Mile Health. 2019. Community Health Workers. Last Mile Health website. https://lastmilehealth.org/chws/.

[81] WHO. 2014. *Monitoring Health Inequality: An Essential Step for Achieving Health Equity*. Geneva: WHO.

- Technology company partners must understand data and user needs to customize an application appropriately.
- Support from senior leadership is important for integrating mHealth into community-based health information systems (CHISs). Integration will help to ensure that adequate financial and human resources are channeled to it.
- It is important to leverage technical, financial (donor), government, and facilities partnerships to facilitate mHealth adoption, sustainability, and scale.
- A user-centered design is ultimately critical to data use; as such, a simplistic and intuitive design often facilitates data use. It is important to involve users of data entry screens, reporting, and dashboards in the design, deployment, and maintenance to ensure that the system is clear and easy to use.
- The CHIS should maintain offline options, with the ability to synchronize data later; this is particularly important in areas with unreliable Internet access.
- It is important to understand cost drivers of mHealth at each level (community, facility, etc.).
  - MEASURE identified eight cost categories for designing and implementing mHealth solutions: application development, user meetings and feedback, equipment, trainings, office, scaling, and program management and program support.
  - Total cost of ownership should be calculated for any CHIS developed, including the cost of system design, implementation, and support. In addition, potential cost savings for using digital tools should be factored in, such as reduced reporting, data aggregation time, and cost of printing and distributing paper registers.[82],[83]
- Train users and ensure CHWs have adequate capacity through initial and routine training.
- Professionalize CHWs through an institutionalized CHW program to ensure high-quality standards for data collection, data reporting, and service delivery across the country.
- Building in feedback cycles for data reporting is important. Feedback on results should be used during supervisory visits and mentoring support to the CHWs, and data should be shared with the CHWs and then shared and analyzed together with the community and relevant health facilities. Box 10 describes the importance of continually assessing and adjusting collected data.

Box 10, Continually assessing data

User-centered design facilitates data use. However, the system produces a lot of data, so it is important to continually assess if the data collected are actually used and to adjust either data collection or use accordingly.

The Principles for Digital Development provide global, consensus-based, current guidance for programs.

Mobile data collection applications also facilitate data use. For example, some programs create a task list based on data collected. If a CHW records a malaria diagnosis and dispenses artemisinin-based combination therapy, the mobile program prompts the CHW to check on the child 2 days later.[84] Using mobile algorithms (e.g., integrated management of childhood illness) guides assessment and treatment while producing data. Built-in feedback loops that incorporate the data generated into subsequent guidance improve service delivery quality.

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[82] ICTworks. 2018. Pop Quiz: What Does It Really Cost to Run mHealth Projects? ICTworks website. https://www.ictworks.org/cost-mhealth-project/#.XR-lcutKibg.

[83] Kuunika, Cooper/Smith. 2018. *mHealth in Malawi: Landscape Analysis*. Washington, DC: Cooper/Smith.

[84] Kuunika, Cooper/Smith. 2018. *mHealth in Malawi: Landscape Analysis*. Washington, DC: Cooper/Smith.

Data Analysis, Interpretation, and Use for Action

Once the community or program chooses indicators, collects the data needed for each, and calculates indicator values, CHWs and communities will likely perform one of three types of basic analyses with the selected indicators (Table 3):

Table 3. Overall steps to using data in communities by type of analysis

Steps	Examples for Descriptive Analysis	Examples of Comparative Analysis	Examples for Comparison of Time Periods
Pose question.	Is the community/community health worker (CHW) meeting its objectives?	Are certain groups in the community receiving fewer services?	Does the coverage or quality of CHW services or household practices improve over time?
Conduct analysis and presentation.	Compare set targets/goals to actual CHW/community performance.	Compare levels of CHW performance or coverage of one group (i.e., geographic, demographic) to another and assess for differences (using tables or charts).	Calculate indicators for each time period and compare on a table, graph, or chart to assess trends over time.
Interpret collectively.	Why has the community achieved or not achieved the target? What does this mean?	Why does one group of people in the community have better or worse performance or coverage? What factors are at play?	Why are service coverage or quality or household practices improving over time? Why are they declining?
Gather more information as required.	More contextual or qualitative information may be required.	More contextual or qualitative information may be required.	What factors are affecting the improvements or declines?
Take action.	What actions can be taken to meet unmet target?	What actions can be taken to reach the underserved part of the population?	What actions can be taken to improve the selected services or practices over time? What can be done to sustain positive trends?
***Source: Adapted from MEASURE Evaluation's* Introduction to Basic Data Analysis and Interpretation for Health Programs**			

- **Descriptive analyses:** These may be done to assess the current situation in relationship to targets or desired performance.
- **Comparison of time points**. Communities will often want to conduct these analyses at multiple points over the course of a program to analyze trends over time to monitor progress and assess if actions taken have led to improvements in indicators.

- **Equity (comparative) analyses:** These may be done between different groups in the community to determine if a CHW's performance or intervention coverage varies by geographic or demographic factors, if this information is available. For example, communities may want to assess if a CHW's performance varies by the age of a woman/mother receiving services or if coverage of improved latrines varies by geographic location in the community. In many contexts, capturing and presenting data about different population subgroups is important for understanding differences and revealing inequities and gaps in coverage. Even so, care must be taken to ensure privacy of individuals is maintained when small numbers of people are being analyzed. Ultimately, the importance of collecting data and applying an equity lens to data collection and analysis is to use data for action. The World Health Organization's guide on monitoring health inequality notes that "observing patterns in disaggregated data helps to indicate appropriate approaches to address inequality,"[85] which may be of particular interest to programmers or communities in different contexts.

There are four patterns of health coverage that are most common when disaggregating by subpopulation or using an equity lens in analysis, each requiring a different type of action.[86] These are detailed in Table 4.

Table 4. Types of inequality in health coverage and actions to address each

Type of Health Coverage	Actions to Address Inequality
High	Continued monitoring
Inequality faced by one or more specific groups	Targeted interventions to underserved population(s)
Income inequality where poorest have lowest coverage and richest have highest coverage	Combined universal and targeted
Mass deprivation	Universal action targeting the whole population

Health data captured at the community level and presented for different population groups may expose gaps in coverage. Common subgroup categories include place of residence (e.g., urban, rural, region, district, ward), level of education, economic status (i.e., wealth quintile), age, and sex. Collecting or analyzing data by subgroup is called disaggregation. Disaggregating service delivery data, vital statistics, and surveillance data may be particularly useful. However, disaggregation must be done strategically and carefully so that it maintains privacy and confidentiality of the people from whom data are collected. In small communities, for example, it may not be appropriate to disaggregate data by certain subgroups, as it could reveal sensitive information about individuals. Examples of such sensitive data include numbers of new HIV-positive cases or domestic violence data.

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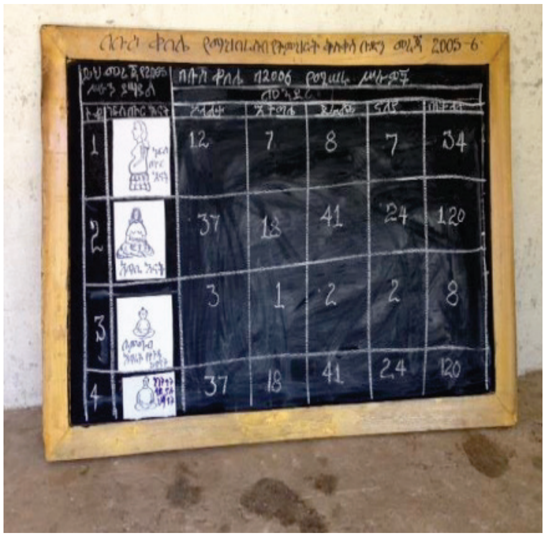
[85] WHO. 2014. *Monitoring Health Inequality: An Essential Step for Achieving Health Equity*. Geneva: WHO.

[86] WHO. 2014. *Monitoring Health Inequality: An Essential Step for Achieving Health Equity*. Geneva: WHO.

In general, analysis turns raw data into useful information that communities can use to identify problems and make decisions. Analysis allows communities to use the data to answer questions such as, “Is the program/CHW/community achieving the targets set by the program or community?” or “Are certain groups in the community receiving fewer services?” Communities themselves can define these questions, or the organization/program supporting the community to collect and use data may define these. The first step in analysis is identifying the indicators that will answer the questions pertinent to the community or program. Indicators are usually numbers or proportions and typically track program activities, health outcomes, or family practices. The selection and calculation of specific indicators across the RMNCH areas is beyond the scope of this guide, but MEASURE Evaluation’s [*Introduction to Basic Data Analysis and Interpretation for Health Programs: A Training Tool Kit*]() provides a good overview on indicator calculation, analysis, and interpretation skills.[87]

Figure 4. Example of community bulletin board, Ethiopia. Save the Children



In some cases, individual-level data with appropriate privacy protections but without further analysis (“raw” data) may be used for presentation and used for action and accountability, as in the case with the My Village My Home tool for immunization (Box 11)[88] and the example of its use in Malawi.

Box 11: My Village My Home tool to use immunization data in communities

My Village My Home is a community-level tool that collects and presents the immunization status of all infants born in a community on a large chart shaped like a house. Each child eligible for vaccination is a row or “plank” in the house, and each vaccination dose is a “brick” that a community health worker shades in when the child receives that dose, showing that vaccinated children make the house/community stronger. The chart is displayed in a place where the whole community can view it and follow the immunization status of all infants in their village. Early programmatic findings suggest that the tool is associated with higher rates of immunization timeliness and coverage.[89]

The My Village My Home tool was used through the Maternal and Child Survival Program in Malawi (see images below) to improve immunization coverage and reduce dropout rates of infants. Use of the tool was linked to increased availability and use of the data collected through the tool, helped to identify defaulters, and increased numbers of children who were immunized.[90]

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[87] MEASURE Evaluation. 2011. *Introduction to Basic Data Analysis and Interpretation for Health Programs: A Training Tool Kit*. Chapel Hill, North Carolina: MEASURE Evaluation.

[88] MCHIP. 2014. *My Village, My Home: A Tool to Optimize Immunization Coverage*. Washington, DC: MCHIP.

[89]

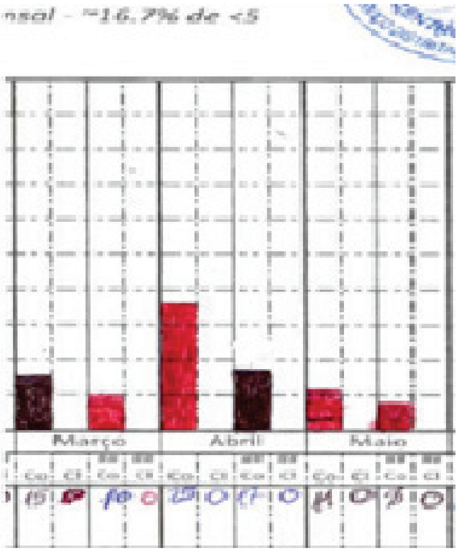
coverage. *Glob Health Sci Pract.* 3(1):117–25. doi: 10.9745/GHSP-D-14-00180.

[90] MCSP. 2019. *Measurement and Data Use for Action and Accountability*. Washington, DC: MCSP.

Data Visualization

Summarizing data in simple, easily understandable ways is a key competency often necessary to facilitate data use. Tables or charts and graphs, alone or organized in data dashboards, can be used to summarize data as absolute numbers or percentages. Community bulletin boards (Figure 4) are a type of table that uses pictures, symbols, absolute numbers, indicators, or a combination to display information that the community can interpret and use. Charts and graphs are also used to visually present data. For example, communities and CHWs can use line graphs (run charts) to see trends over time and bar charts (Figure 5) to show comparisons between groups or parts of a whole (stacked bar charts).
Building the capacity of CHWs to calculate indicators and to analyze and present data are important steps to facilitate data use.

Figure 5. Community-level bar chart showing numbers of people trained in data use in Mozambique



For example, a pilot program in Malawi trained CHWs and their supervisors to collect, analyze, and interpret integrated community case management data, and provided wall chart templates for visualizing data at health facilities and in communities. This pilot showed large uptake of the wall charts. CHWs reported using the displayed data to target community education activities (e.g., increasing sessions on malaria prevention and bed nets upon seeing an increase in malaria cases in the community) and advocate with the community to support more permanent structures to provide services and display the community data.[91] The training resources and wall charts used in this in this pilot are available through TRAction: Translating Research into Action project resources.[92]

Interpretation of data explains the results or trends in the data within the community context—a vital step in identifying issues, making data-informed decisions, and providing social accountability of programs. Interpretation of quantitative data most often requires additional information, such as qualitative information from the communities or additional quantitative data, to understand the meaning behind the data and implications for health programs. To interpret and use the analyzed data, CHWs meet with their communities, including community leaders, to jointly review the services and activities they offered, discuss any challenges they encountered, and get community feedback. Ministry of health staff, supervisors, and other program managers are often invited to these meetings. In some programs, community health committees, comprising community leaders, CHWs, and other community members, are responsible for monitoring health activities. They meet on a regular basis. Discussing data with communities is important. It may, and perhaps should, trigger debate.

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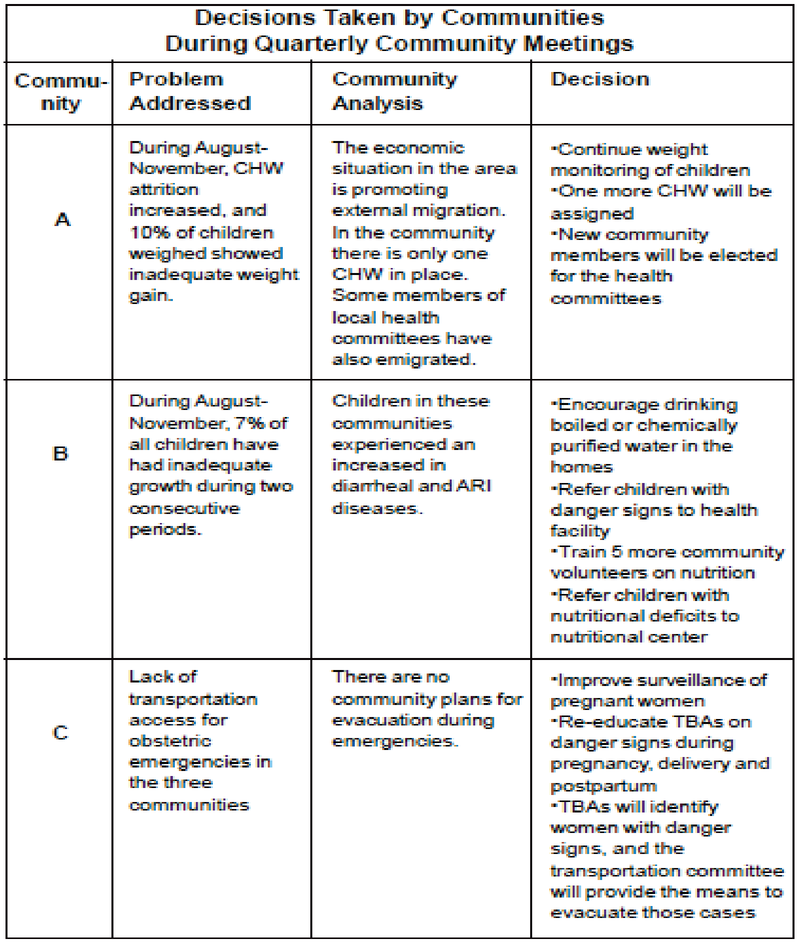
[91] Hazel E, Chimbalanga E, Chimuna T, et al. 2017. Using data to improve programs: assessment of a data quality and use intervention package for integrated community case management in Malawi. *Glob Health Sci Pract.* 5(3):355-366. doi: 10.9745/GHSP-D-17-00103.

[92] Johns Hopkins Bloomberg School of Public Health (JHBSPH). 2019. TRAction: Translating Research into Action. JHBSPH website. https://www.jhsph.edu/research/centers-and-institutes/institute-for-international-programs/completed-projects/traction-translating-research-into-action/index.html.

Module 4: Support Communities to Translate Data into Action

Supporting community health workers (CHWs) and communities to translate data into action is an important and challenging step in community-level data use.[93,94] There are a number of processes that can be used to encourage communities to review and use their own data. Communities can then use their data to inform program management, ensure accountability, and advocate for resources and policy decisions. Figure 6 shows a simple template from the census-based, impact-oriented approach that shows the problems, analysis, and decisions.[95]

Figure 6. Example summary from a quarterly community meeting from the community-based, impact-oriented approach



Decisions Taken by Communities During Quarterly Community Meetings

Community	Problem Addressed	Community Analysis	Decision
A	During August-November, CHW attrition increased, and 10% of children weighed showed inadequate weight gain.	The economic situation in the area is promoting external migration. In the community there is only one CHW in place. Some members of local health committees have also emigrated.	•Continue weight monitoring of children •One more CHW will be assigned •New community members will be elected for the health committees
B	During August-November, 7% of all children have had inadequate growth during two consecutive periods.	Children in these communities experienced an increased in diarrheal and ARI diseases.	•Encourage drinking boiled or chemically purified water in the homes •Refer children with danger signs to health facility •Train 5 more community volunteers on nutrition •Refer children with nutritional deficits to nutritional center
C	Lack of transportation access for obstetric emergencies in the three communities	There are no community plans for evacuation during emergencies.	•Improve surveillance of pregnant women •Re-educate TBAs on danger signs during pregnancy, delivery and postpartum •TBAs will identify women with danger signs, and the transportation committee will provide the means to evacuate those cases

Processes to Support Use of Data by Communities at the Local Level

As noted throughout this document, data collected at the community level belong to the community, and they have a right to the information generated. Making information accessible at the community level can promote analysis and discussion that enables communities themselves to set priorities and take actions that benefit their health. Recognizing the importance of communities provides insight on different mechanisms that could be employed to share and utilize data so that it can be understood and used by community-level stakeholders. It is imperative to include marginalized groups in data discussions and information dissemination. If collected and analyzed through an equity lens, the data will indicate who is or which groups are marginalized and suggest whether targeted community-level interventions are necessary. The process to work with these people and groups should be discussed with them. They may decide they want to be included in a general discussions with other groups. That could be an opportunity to highlight inequity in the area. Alternatively, they may want to meet separately with program implementers and policymakers to discuss their health needs. Box 12 describes the importance of keeping information accessible to community members of all literacy levels. The following descriptions include different ways to discuss data with communities.

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[93] Nutley T, Reynolds HW. 2013. Improving the use of health data for health system strengthening. *Glob Health Action*. doi: 10.3402/gha.v6i0.20001.

[94] Lippeveld T. 2017. Routine Health Facility and Community Information Systems: Creating an Information Use Culture. *Glob*

[95] Shanklin D, Sillan D. 2005. *Census-Based, Impact-Oriented Methodology: A Resource Guide for Equitable and Effective Primary Health Care*. Raleigh, North Carolina, and Washington, DC: Curamericas and CORE Group.

Engagement with Community Action Committees

Community action committees can be established to provide additional monitoring and support for community health services and aid in increasing demand for services. An example of this was in Democratic Republic of the Congo, where through the US Agency for International Development (USAID)'s Maternal and Child Survival Program, a community action committee was established, which was well received by the local population and helped to boost community ownership of the community health program.[96]

Quality Improvement Teams

Box 12. Keeping information accessible

It is important to share information in forms that community members can understand, even with low levels of literacy and numeracy. For this reason, pictorial/visual and conversational methods are preferred. They do not use highly technical language and can be employed in the context of community dialog sessions or data use meetings.

Community-level data can also provide information to help monitor CHWs' service delivery and the quality of care they deliver. For example, a number of projects have adapted a facility-based quality improvement approach for the community level using quality improvement teams (QITs), comprising community leaders, members, and often the CHW supervisor or other health program staff. QITs meet on a regular basis to review the CHW's and/or their community's performance on selected indicators and identify actions to take in response to areas of poor performance. This approach also often involves collaborative or learning meetings, where members of different community QITs meet to review the data and exchange ideas about the actions their community took in order to foster collaborative learning. An evaluation of this approach in Benin found significant improvements in CHW performance, as compared to CHWs receiving financial incentives alone.[97] Similarly, in a pilot in Ethiopia, the approach of tracking indicators and community-identified and led solutions was associated with increases in women attending antenatal care and postnatal care services, and in correct latrine use.[98] The USAID SQALE project has worked to improve the quality of community health programs in Kenya using work improvement teams (WITs) that are trained on concepts of quality assurance and improvement and their application for community health services. The USAID SQALE toolkit is a valuable and adaptable resource with a coaching and support strategy, data quality assessments for the community level, a WIT Maturity Index to routinely monitor the work of WITs, and a community follow-up tool that captures community experiences with community health services.[99]

Community Dialog Days

Community dialog days or sessions are also an important means of instituting accountability or joint decision-making. Any community actor or member can convene, host, or participate in a community dialog, although going through the district assembly or something similar is important to formalize the process and gain authority to work at district and community levels.[100] Using these platforms for sharing health data engages communities and enhances their sense of ownership of the data. Again, it is important to ensure participation of marginalized groups in the way that they prefer to participate, which may include separate meetings. These days/sessions are typically held periodically, such as bimonthly or quarterly. Opportunities could be created at these days/sessions to discuss data retrieved from either CHWs or other community actors. Community

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[96] John Snow Inc. (JSI). 2019. Community mobilizes to support child health services in the DRC. JSI website. https://www.jsi.com/JSIInternet/Results/article/display.cfm?txtGeoArea=INTL&id=2515&thisSection=Results&ctid=na&cid=na&tid=20.

[97] Riese S, Akogbeto M, Akonde R. 2014. *A Community Collaborative Approach to Improving Community Health Worker Performance and Retention in Benin*. Washington, DC: MCSP.

[98] Shrestha R. 2014. *Improving Community Support for Health Extension Workers in Ethiopia*. Bethesda, Maryland: University Research Co.

[99] USAID SQALE. 2016. USAID SQALE toolkit. USAID SQALE website. http://usaidsqale.reachoutconsortium.org/publications-and-tools/usaid-sqale-toolkit/.

[100] Malawi National AIDS Commission. 2007. *Guidelines for Conducting Community Dialogue: A Community Engagement Tool for Sustainable HIV and AIDS Behaviour Change*. Lilongwe: Malawi National AIDS Commission.

dialog sessions present opportunities for using health data to inform the discussions and initiate action planning toward resolutions for improving community health.

Other formats for undertaking community data sharing include:

- Question-and-answer sessions (household visits)
- Discussions at health facilities and with communities (at community level, everyone participates)
- Discussions among support groups
- Presentation of the information through drawings on flip charts by a local health promoter/CHW/community health volunteer
- Discussions among communities within a district or within multiple districts

Data Use to Improve Data Quality and Increase Data Use

Greater use of data can foster a culture of learning and accountability, and improve data quality when more attention is focused on data and quality issues are noted and can then be addressed. High-quality data will lead to more trust in data and data use. Data review meetings or data use workshops are participatory fora for stakeholders involved in data collection to review data collected to encourage data use and enhance data quality. These meetings are avenues to promote peer review, build teamwork, and stimulate self-assessment, using indicators to measure targets.[101] Participants at these meetings include those who produce the data and those who use the data among health facility staff, community-based organizations, nongovernmental organizations (NGOs), and program managers at subnational level. Data review meetings or similar fora:

- Provide an opportunity to address problems related to data quality and program performance holistically, with all stakeholders involved participating and reviewing the data.
- Allow joint decision-making with community-level stakeholders for the intent of improving service utilization and health outcomes.
- Should present data in a way that considers the role of the users, their education level, and their information needs.
- Could use mobile technology, which may provide a cost-effective approach to link CHWs with the health system.

It is recommended that these meetings culminate in an action plan developed with next steps, timeline, and individuals responsible for following through on the actions.[102] The action plans developed at community level will be tracked periodically at a frequency agreed upon by the community members and revised as applicable.

Linkage to Health Facilities, Health System, and Local Governance

Stakeholders for community health data include data users and producers, such as ministry of health staff from national to facility levels and community members. Engaging all of these stakeholders in the process of reporting data up through the health information system not only strengthens use of community-level data but also deepens trust among communities, health facilities, and government officials.

To increase sustainable health outcomes, these linkages can be further harnessed for action. Health facility management committees exist in many contexts and are a good platform from which to share data and generate community-driven action to address identified gaps. Health facility management committees, CHWs,

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[101] Braa J, Heywood A, Sahay S. 2012. Improving quality and use of data through data-use workshops: Zanzibar, United Republic of Tanzania. *Bull World Health Org*. 90(5):379–84. doi: 10.2471/BLT.11.099580.

[102] MEASURE Evaluation. 2017. *Data Use for Community-Based Organizations Discussion Summary*. Chapel Hill, North Carolina: MEASURE Evaluation.

and other community representatives can liaise directly with facility staff to implement new approaches or strategies to improve health-seeking behavior, uptake of services, or even access to services.

Use of mobile tools is one approach that is being used in many contexts to improve data transmission between CHWs and facilities and in even higher levels in the health information system. Pilots of mobile apps, such as CommCare, cStock, and upSCALE, have been implemented by NGOs throughout sub-Saharan Africa to support case management by CHWs, reduce CHW stock-outs, and identify Ebola contact risks (Box 13). In Liberia, community data were critical to Ebola case detection and containment, and the use of mobile tools enabled real-time notification of cases detected in and by communities.

Box 13. Case study on community event-based surveillance in Liberia

Community event-based surveillance was implemented to facilitate timely data collection and response to the 2014–2015 outbreak of Ebola in Liberia. Nongovernmental organizations and county health units worked with community cadres—such as community health volunteers and community health agents, referred to as frontline health workers—to implement community event-based surveillance.

Frontline health workers went household to household in their communities to screen and educate community members about Ebola. They used a sickness screening tool within their communities to identify probable cases, suspected cases, contact risks, and possible malaria. With each identification, a frontline health worker followed one of three protocols: use of the case management form, use of the malaria assessment form, or contact tracing and contacted the community health committees to report the contact risk.

Community event-based surveillance facilitated use of community health data to improved case detection and containment while simultaneously educating community members about Ebola risks. Ultimately, it improved community participation in management of the outbreak, which was critical to ending it.

Mobile tools were piloted for use with community event-based surveillance by Last Mile Health in Konobo and Grand Gedeh counties during the outbreak. In the pilot areas, community leaders provided mobile phones with digital tools to the frontline health workers so they could complete forms and send notification to community health committees in real time.

Using Data for Advocacy

Using data for advocacy requires planning for the time it will take to prepare the data and users for that purpose. The process begins with communities accessing community-level data, using these data to generate information about their needs, and determining together how to prioritize and use that information to advocate for the resources and services they need. Box 14[103] shares an example of using data for advocacy in Kenya.

Box 14. Using data for advocacy in Kenya

In Nyanza Province in Kenya, community health workers were trained to record data in the village register. These data were then analyzed by stakeholders at the health center, where they engaged in data-driven participatory planning to improve services. There were significant improvements in many areas, including immunization, facility childbirth, insecticide-treated bed net use, and treated drinking water.

NGOs and other implementing partners are critical in building community capacity to participate in this process, which may entail a gradual shift in social norms. NGOs and other partners can begin by implementing and maintaining a feedback loop in which data generated from communities are channeled back to communities; this is important for accountability, trust, and, ultimately, sustainability of actions and health outcomes. Results from initial community mapping efforts should be used to direct dissemination of information to specific stakeholders and identify data feedback loops for influential members of communities.

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[103] Kaseje D, Olayo R, Musita C, Oindo CO, Wafula C, Muga R. 2010. Evidence-based dialogue with communities for district health systems' performance improvement. *Glob Public Health*. 5(6):595–610. doi: 10.1080/17441690903418969.

The method(s) used to engage communities in reviewing data, identifying priority areas for action, and developing actions could be carried through to monitor progress over time, or other methods could be introduced for that purpose, such as meeting with a small monitoring committee of community volunteers on a regular basis. Examples of data accountability described in previous chapters, including scorecards, community billboards, and Partnership Defined Quality, can all be used for advocacy to bring in additional resources, improve quality of care, and drive policy changes that affect community-level health efforts.

For example, if community-level data show that long-lasting insecticide treated net coverage is low or that nets in most households are torn and require replacement, a community may leverage its influence through representation on health facility committees or health management committees to advocate for more nets to be distributed. In Mozambique (Box 15), results from community scorecards were used by communities to develop action plans to advocate for health facility staff to become more welcoming of male attendance at antenatal care visits.

Box 15. Case study on community scorecards in Mozambique

The community scorecard is a participatory tool for appreciation, planning, monitoring, and evaluating services. The scorecard facilitates dialogue among service users, providers, and decision-makers to jointly analyze issues related to problems in the provision of services and to find a common path and shared approach to address these matters.

In Mozambique, the Maternal and Child Survival Program facilitated use of the scorecard by community health workers (CHWs) linked to the health and the co-management and humanization committees in Nampula and Sofala provinces. The data are discussed with community development officers from community health management committees as a way of creating and strengthening the capacity of CHWs and facility providers to analyze, use, and share data. Following implementation of the scorecard, each participating health facility and its catchment area communities developed an action plan. Action plans are monitored on a monthly basis to ensure activities are being implemented at each facility according to agreed-upon timelines.

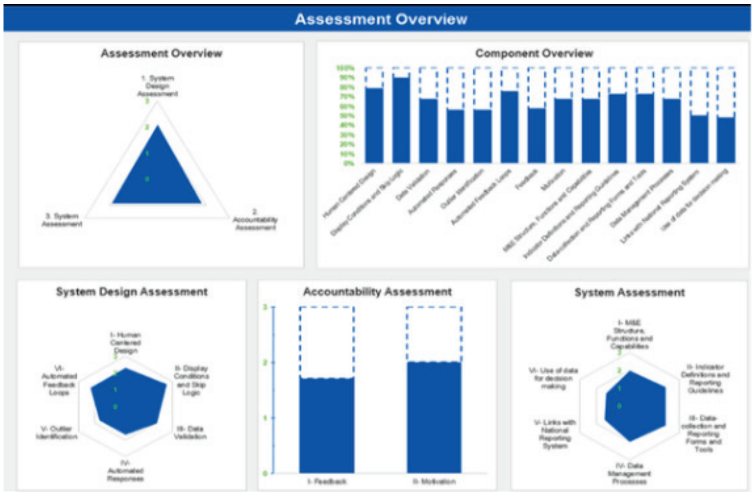
The number of health facilities implementing the scorecard is also gradually increasing. One year after introducing the scorecard in Mozambique, 49 out of 78 facilities (28 in Nampula and 21 in Sofala), representing 63% of functional community health management committees, are implementing the process. Action plans were developed to address issues, including delays in antenatal care, the quality of pharmacy and service, community deliveries, and the illicit sale of drugs. Some outcomes of the action plans included:

- Health facilities accepting the referrals made by CHWs
- Health facilities more accepting of male attendance during antenatal care visits, increasing the adherence to the service and the number of visits
- Increased demand and timely assistance to clients, contributing to a reduction in home births
- Reduction in the sales of commodities (drugs) outside of the health system, through strong involvement of community health management committee members to control the process of medicine deliveries at facilities

These outcomes inspired the Mozambique Ministry of Health to incorporate the scorecard process into other projects that will scale up scorecard use to an additional 31 facilities in Nampula and Sofala provinces. They also triggered advocacy at the district, provincial, and central levels for buildings with water sources and provision of ambulances, among other resources.

Ultimately, community-level data can and should be harnessed by communities to advocate for resources and services that meet community-identified needs and contribute to equitable, improved health and well-being of all community members. Annex 3 provides additional examples of use of data for social accountability within countries.

Figure 7. Example of mobile community-based health information system data quality dashboard



There is a growing catalog of examples and lessons learned from improving community-based data use. In Malawi, wall charts that tracked data, including stock-outs and staffing, helped CHWs and facility staff make informed decisions about activities and other program issues. Reporting consistency improved, and some staff stated that the charts helped them use data to improve programs by informing community education sessions and tracking stock-outs. However, the use of wall charts dropped when the intervention was scaled up.[104] Dashboards are an increasingly popular way to visualize data and facilitate data-informed decision-making (Figure 7).[105] MEASURE Evaluation reported that dashboards can be useful, but only if providers, program managers, and policymakers see value in using them.[106]

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[104] 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):355-366. doi: 10.9745/GHSP-D-17-00103.

[105] Li M. 2017. How to Help Community-Based mHealth Programs Collect High-Quality Data. MEASURE Evaluation website. https://www.measureevaluation.org/resources/newsroom/blogs/how-to-help-community-based-mhealth-programs-collect-high-quality-data.

[106] MEASURE Evaluation. 2017. *Applying User-Centered Design to Data Use Challenges: What We Learned*. Chapel Hill, North Carolina: MEASURE Evaluation.

Module 5: Ensure Systems and Policies Support Sustained Community Data Use

Given the multiplicity of actors that generate data at the community level, there is a need for systems to guide the sustained use of the health data generated by these actors. Appropriate systems improve community ownership and community participation in health, quality of data generated, motivation of actors that collect the data, and, ultimately, health outcomes of the community.

Several considerations inform the foundational aspects of gathering and using community-level data. These include understanding and establishing enabling policies, governance structures, and strategies; the operation of information systems at the community level; resources and funding; data sharing; supervision and management requirements; and monitoring and evaluation (M&E) processes.

Policies, Governance, and Strategy

Policies serve to provide the vision and guiding principles within which community-level data use can happen. Achieving the desired outcomes for community health requires sound governance and support from ministries of health, and clearly documented guidance on community-level data use. National community health policies and strategies should provide the framework and guidance to facilitate data collection at community level, and specify mechanisms through which the communities can extract and act upon the data. Some countries also have policies on data transparency and accountability, which should reference community-level data use. Liberia (Box 16), Ethiopia, and Rwanda provide promising country examples, as they have made strides in articulating policy and related guidance documents on community-level data use.

Policies should outline the priorities for community-level data use, roles and responsibilities of the various actors involved, expected outcomes, and targets or benchmarks for those outcomes. Policies and related documents can explain the general objective of democratization of data and facilitate data use, further specifying: coordination structures for data management at community level, including collection, analysis, and use; sources of funding for data utilization at community level; and necessary resources to ensure data quality, such as tools and requisite skills of data collectors and users.

Box 16. Policies for community-level data collection and use in Liberia

The Ministry of Health in Liberia embedded the generation and utilization of reproductive, maternal, newborn, and child health data at community level within its revised National Community Health Services Policy, Liberian health information system, and ICT Strategic Plan. The policy objective 5 in the policy states: “Develop robust community-based surveillance and information systems linked with National Health Monitoring, Evaluation, and Research (HMER) systems.” This provides a policy framework for community-level data use. The strategic plan provides details of how to operationalize this, along with indicators to track progress of integration of the community-based information system into the health management information system.

Box 17. Linking data and decision-making

National monitoring and evaluation plans should include activities for fostering the link between data and decision-making at community level, as this helps to institutionalize activities, enhancing community-level data use and providing opportunities for building capacity of the actors of at community level on data collection, analysis, and interpretation.

Including guidance on data use in national-level reproductive, maternal, newborn, and child health (RMNCH) policies and strategies is increasingly noted as one of the ways of mainstreaming CHW programs and community health systems into the formal health system. The process for developing the policy framework for guiding community-level data use has to be inclusive of the stakeholders who will be affected by these policies (i.e., community-level data producers and users). At the policy level, for example, in national M&E plans, there should be a consensus on the key RMNCH indicators to be tracked, analyzed, and acted upon at community level (Box 17).

However, at subnational and community levels, there should also be the opportunity to identify and track additional indicators specific to their context.

Systems Design

Understanding how information systems operate at the community level (i.e., how data are collected, analyzed, interpreted, and processed as information) is important for determining how data can be shared and used to improve or advocate for services or make programmatic decisions. The design of a health management information system (HMIS) that enables community-level use of RMNCH data should engage community stakeholders throughout the process and also consider:

- Data can be analyzed quickly so that it can be used.
- Data are analyzed with close participation of the communities for use in planning and implementing health interventions.
- Evidence generated can be acted upon by community-level actors.
- Contextual factors, such as countries or areas that are fragile, remote, or conflict affected, may influence presence of the private sector in delivery of health services.

DHIS2 Community Health Informational Systems Guidelines[107] serves as a practical guide for national and local decision-makers involved in all aspects of community-based health information systems (CHISs) and covers a range of topics, including data collection, analysis, dissemination, feedback loops, and use for taking action to improve equitable community-based health services.

Systems design needs to consider that data collected by community-level actors, when analyzed and made available, drive regular, evidence-based dialog for decision-making, advocacy, and social mobilization in communities. Thus, it is important that systems are designed to address common limitations of the CHIS, such as a tendency to focus only on the number of services provided rather than key processes and contextual issues within communities that are largely informed by qualitative data. The design should ensure inclusion of data on the effectiveness of referral processes, a key factor in connecting the community and the health system.[108] Engaging communities and citizens at the outset of a systems design aids in gaining the communities' commitment to collect, analyze, and use the data. Empowering community representatives as co-designers of the system and gatekeepers or overseers so that they have their fingers on the pulse of what data are collected from their communities, by whom, and for what purposes is a key consideration in community health information systems design and a critical step in facilitating community-level RMNCH data use. Additionally, the systems design needs to consider conditions that will encourage community-level data use depending on the type of data, such as what is identified in Table 1.

Funding

An oft-cited barrier for accessing and using health data at the community level is the lack of resources and harmonized tools that enable community data use. Community-level data use for decision-making for local planning and management receives minimal support in many countries. This lack of support is particularly notable when considering that the health workers responsible for collecting data are often not salaried and do not receive regular incentives.[109,110] Financial and human resources are necessary to strengthen local capacity for sustained data use at the community level. This includes allocated funding for data collection, analysis, and use, and building capacity for those efforts. Costing for these activities can help with resource planning and

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[107] 2018. *DHIS2 Community Health Informational System Guidelines*. https://www.ictworks.org/wp-content/uploads/2018/11/DHIS2_community-health-information-systems_Guidelines.pdf.

[108] Asweto CO, Alzain MA, Andrea S, Alexander R, Wang W. Integration of community health workers into health systems in developing countries: Opportunities and challenges. Family Medicine and Community Health. 2016;4(1):37-45

[109] Otienoi CF, Kaseje M, Kaseje D. 2017. Perspectives on utilization of community based health information systems in Western Kenya. *Pan Afr Med J*. 27: 180. doi: 10.11604/pamj.2017.27.180.6419.

[110] MEASURE Evaluation. 2014. *Case Study Series: Community-Based Information Systems: Overview*. Chapel Hill, North Carolina: MEASURE Evaluation.

advocacy. A corollary is that funding is disbursed in a timely manner to enable implementation of planned data use activities and monitoring. Sustained funding for these activities will ultimately empower communities to monitor service provision and quality over time and to advocate for changes that will improve the health of their communities.

Resources allocated to data use at community level can be applied to:

- Training the data collectors (e.g., CHWs, volunteers, committees)
- Supporting data collection with appropriate and standardized ministry of health tools
- Maintaining the infrastructure, such as hardware, for community-level data collection (mobile phones, power supply, new registers in good condition)
- Holding data review and utilization meetings
- Holding community dialog and action planning meetings

What Are Possible Sources of Funding for Data Use?

In many low- and middle-income countries, the health management information system (HMIS) uses a large portion of the budgetary allocation for health information. Such budgets for maintaining the HMIS ought to include resources to support community-level data use and decision-making. This is an area that may need advocacy.

Additional funding for community-level data use could be drawn from:

- Donor-funded community health systems interventions (should prioritize provision of financial resources to enable data use and decision-making by community actors)
- Nongovernmental organizations and other implementing organizations involved in service delivery activities at the community level
- Donor-funded programs on governance and accountability
- The private sector, such as the telecom companies that may be able to provide air time for mobile data collection

Supervision and Management Roles for Increasing Community Data Use

Supervision is crucial to successful community health programming—it helps maintain program quality, improves performance of health providers, and motivates frontline workers.[111,112] Supervisors play a critical role in ensuring quality data are generated, reported, and shared back with communities for use, and that the most vulnerable populations are serviced via evidence-based decisions. Data collected by community-level actors should be properly managed so that information not only flows upwards but also flows back to the community, allowing for local feedback and problem-solving, and for supervisors to monitor how communities are accountable to findings. Supervisors, therefore, play a critical role in this process by monitoring the quality of data collected and working with community-level stakeholders to utilize data to address the community-level bottlenecks. For data collected by CHWs, the CHW Assessment and

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[111] Pallas, S.W., et al., Community Health Workers in Low- and Middle-Income Countries: What Do We Know About Scaling Up and Sustainability? *American Journal of Public Health*, 2013. 103(7): p. E74-E82.

[112] Campbell, C. and K. Scott, Retreat from Alma Ata? The WHO's report on Task Shifting to community health workers for AIDS care in poor countries. *Global Public Health*, 2011. 6(2): p. 125-38.

Improvement Matrix tool [113]recommends that CHW supervisors should, among other tasks, review reports, collect monitoring data, and use data for problem-solving and coaching during supervision meetings.

Monitoring and Evaluation

As much as community-level heath workers need data to do their work well, their managers and supervisors require similar data to monitor work conducted at the community level. Effective M&E ensures that relevant qualitative and quantitative data are collected, analyzed, used, and shared (Box 18). Health and related information generated should be utilized at community level for improving community interventions and channeled upward for evidence-based planning, management, advocacy, and policy formulation.[114]

It is crucial to incorporate the M&E of community-level data use processes into national community health strategy M&E plans to monitor progress on program implementation and data utilization. In addressing M&E for community-level data use, a standardized plan to monitor community-level data use should include:

Box 18. Standardizing monitoring and evaluation plans

One standardized monitoring and evaluation plan for a national community health strategy promotes harmonization across implementing partners working to strengthen systems at community level.

- Identification of indicators to be tracked
- Establishment of baselines and data gathering on the indicators that are being tracked
- Quality assurance of data that are collected
- Supervision of the data collection and utilization process
- Data audit and feedback through supervision
- Participation of the community in tracking the implementation of data-driven decisions and its impact on health outcomes of the community

Table 5 outlines suggested steps and processes at all levels for effective M&E of community data use that need to be incorporated into national M&E strategies.

Table 5. Approaches to incorporate community data use at all levels of the health system

	National	Subnational/Regional/District	Health Facility/Catchment Communities
Indicators	Establish a set of indicators for tracking community-level data use.	Identify and integrate relevant indicators into subnational-level information management systems.	Identify the indicators that are of mutual interest at the community level.
Processes	Ensure community-level data utilization processes are captured in national monitoring and evaluation (M&E) plans and are funded, including data flow.	Address systems barriers by ensuring adequate financial, human, and technical resources are provided. For example, financial or resource incentives may be provided for communities that provide data and can show concrete evidence of data use.	Establish a routine for data utilization processes (e.g., monthly community dialog, data review workshops with community participation, household visits by community health workers to track defaulters).

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[113] Crigler L, Hill K, Furth R, Bjerregaard D. 2013. Community Health Worker Assessment and Improvement Matrix (CHW AIM): A Toolkit for Improving CHW Programs and Services Revised Version. Published by the USAID Health Care Improvement Project. Bethesda, MD: University Research Co., LLC (URC). http://www.who.int/workforcealliance/knowledge/toolkit/CHWAIMToolkit_Revision_Sept13.pdf Accessed on July 23, 2018

[114] Global Fund. (2014). Community systems strengthening framework. Geneva: The Global Fund

	National	Subnational/Regional/District	Health Facility/Catchment Communities
Availability	Make community-level data available in appropriate formats by adapting or developing community-level tools for data collection, such as community health worker registers, forms, scorecards.	Ensure relevant baseline data are established and disseminated.	Ensure M&E data are reported vertically and feedback is shared horizontally with all stakeholders at community level.
Monitoring and Reporting	Develop indicator dashboards for tracking: The processes involved with community-level data Implementation of data-driven decisions made with community participation Establish a reliable and transparent reporting system that is adequately resourced to ensure functionality.	Institute routine tracking of the processes for community-level data utilization and address any gaps identified. Ensure all relevant stakeholders within health and other sectors are regularly involved in monitoring the community-level data utilization activities.	Ensure accurate record entry. Ensure quality data collection. Establish routine use of data for service provision.
Capacity	Identify and train facilitators of community-level data use at all levels, including civil society.	Strengthen the capacity of lower-level stakeholders to utilize data and implement data-driven decisions through training.	Strengthen capacity of stakeholders depending on their roles and responsibilities through adequate mentoring support and supervision.

Conclusion

To improve data use, program managers should first consider what community health decisions need to be made and what community health data are needed to make those decisions, as well as data quality (the reinforcing cycle of data quality and use), capacity of data collectors, engaging stakeholders, support for data use within the health system, and access to data. An assessment for improving health data use at the community level should include an inventory of data available and information needs, and an assessment of barriers to use. Optimal systems include a user-centered design for the data collection and reporting system, with a regular review of a subset of indicators,[115] and a forum to review data regularly. Programs may need to strike a compromise between data needed for program management and data needed for donor reporting to keep a reasonable workload. It is important to thoughtfully design the monitoring and evaluation system, as the number of forms, data points, and signatures required can delay data flow.[116] Mobile data collection can facilitate data use but requires specific technological and resource inputs, complemented by work to analyze and take action on the information in a timely and transparent manner, and to share the results and any actions or decisions made with stakeholders throughout various levels of the system.

This resource package provides program managers with important considerations, examples, and tools to increase use of community-level data. It benefited from the input of practitioners and stakeholders at the global level and represents a diversity of experiences, but it is not exhaustive. As more practitioners document their experiences with increasing community-level data use, this package will need to grow and be modified accordingly. It is important for donors to encourage documentation of efforts to increase community-level data use so that more experiences are documented and the practice becomes a norm, while allowing for a plurality of approaches and experiences.

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[115] MEASURE Evaluation 2012 Strengthening health service delivery by community-based organizations: https://www.measureevaluation.org/resources/publications/fs-11-42/at_download/document

[116] MEASURE Evaluation. 2014. *Case Study Series: Community-Based Information Systems: Overview*. Chapel Hill, North Carolina: MEASURE Evaluation.

Annex 1. Questions and Considerations for Community-Level Data Collection and Use

Program managers should consider and periodically revisit the purpose and function of the community-based health information system to ensure adequate data use. Design of a data collection and use system should reflect the following processes, some of which are drawn from the logic model as elaborated by Nutley and Reynolds,[117] in the following table.

Question	Considerations

What plans are established on how to use community-level data?	• Who decides when to use information collected at community level?
	• When is the right time to use the data?
	  ◦ Within 1 week of data collection
	  ◦ One month after collecting the data
	  ◦ Longer than 1 month after data collection

Who should be involved in the data use process at community level?	• Who will be using the data? • What are their roles? ◦ Who will facilitate the process? • What are their information needs? • What are their education levels?
What is the frequency of data collection?	• How often does the information change? • Are information needs ongoing? • Is there a need to rotate data collected for manageability and to manage available capacities to collect data?
How much data can be feasibly collected?	• How will new data collection increase the workload for community-level health workers? • Can the current data management system (paper or electronic) support additional data storage? How can this system be modified to meet needs?
What data will be utilized (i.e., which data are relevant to the community actors)?	• Engage stakeholders at all levels to identify information needs and determine which data are needed.
What data sources will be utilized?	These could include: • Service delivery from the various of community-based health workers/volunteers (registers, forms, digital health, wall charts, My Village My Home) • Data for accountability (scorecards, Partnership Defined Quality, Citizen Voice and Action, etc.), operational research, focus groups, and key informant interviews • Community mapping, family folders, and census-based impact-oriented approach • Vital statistics and disease surveillance • Data collected externally but relevant to community (internal and/or external evaluations)

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[117] Nutley T, Reynolds HW. 2013. Improving the use of health data for health system strengthening. *Glob Health Action*. doi: 10.3402/gha.v6i0.20001.

Question	Considerations
What are the data collection tools?	• Paper based: community health worker (CHW) registers, reporting forms • Community scorecards • Electronic/digital: Mobile technology facilitates the reporting of community data and makes it easier to analyze and use it for decision-making at the lowest level. It also facilitates easier linkage with health management information systems and has potential for improved data quality.[118]
At what level is the data aggregated?	• Community level with the CHW or volunteer • CHW supervisor • Health facility level
What will the data be used for?	• Improving accountability • Formulating policy and advocacy messages • Identification of and responding to unmet need (identifying people in need of services) • Improvement of coverage of services targeting the unreached • Program quality improvement • Supporting case management and care coordination • Improvement of service utilization • Planning for community action

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[118] Asangansi I, Macleod B, Meremikwu M, et al. 2013. Improving the routine HMIS in Nigeria through mobile technology for community data collection. *J Health Inform Dev Ctries*. 7(1): 76–87.

Annex 2. Stakeholder Analysis and Engagement Tools

Stakeholder Analysis Matrix

Program issue: ____

Proposed activity: ____

Date: ____

Name of stakeholder organization, group, or individual (National, regional, or local)	Stakeholder description (Primary purpose, affiliation, funding)	Potential role in the issue or activity/vested interest in the activity	Level of knowledge of the issue (Specific areas of expertise)	Level of commitment: Support or oppose the activity, to what extent, and why?	Available resources: Staff, volunteers, money, technology, information, influence	Constraints or Limitations: need funds to participate, lack of personnel, political, or other barriers

Stakeholder Engagement Plan[119]

Program issue: ____

Proposed activity: ____

Date: ____

Stakeholder organization, group, or individual	Potential role in the activity	Engagement strategy: How will you engage this stakeholder in the activity?	Follow up strategy: plans for feedback or continued involvement

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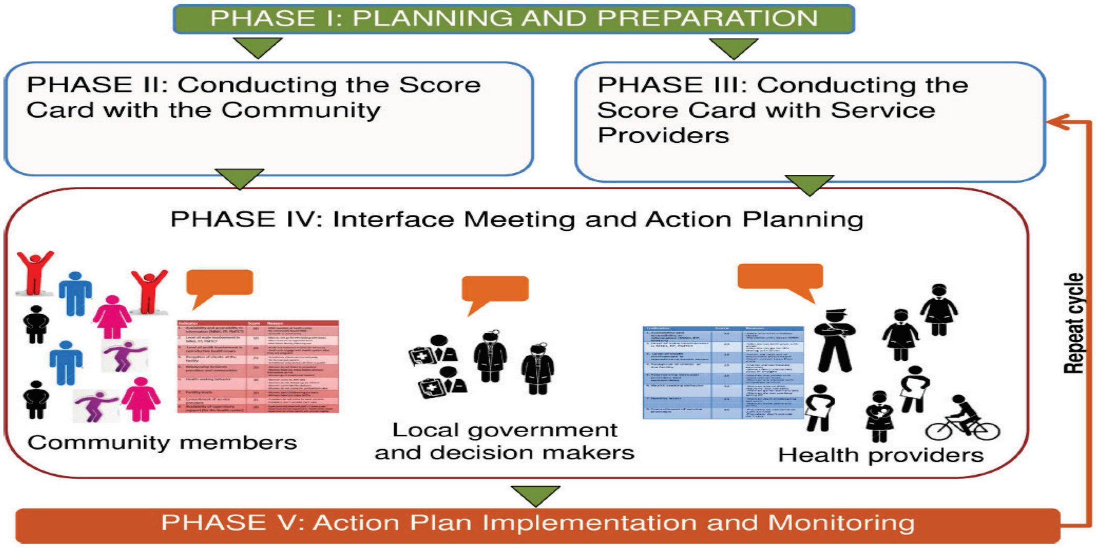
[119] Adapted from Brinkerhoff DW, Crosby BL. 2002. *Managing Policy Reform: Concepts and Tools for Decision-Makers in Developing and Transitioning Countries*. West Hartford, Connecticut: Kumarian Press, and POLICY. 1999. *Networking for Policy Change: An Advocacy Training Manual*. Washington, DC: POLICY Project.

Annex 3. Data for Social Accountability

Tools promoting social accountability to improve health outcomes are important sources of data at the community level. The implementation approaches vary, but all share a fundamental focus on providing a platform for community discussion. Themes that arise across the various tools include a preparatory phase, inclusion of marginalized populations, identification of challenges preventing improved health outcomes by community members and various community-level representatives, an interface meeting among stakeholders, and monitoring and measurement of health outcomes.[120] The iterative cycle includes the use of simple data at the community level to prompt actions and promote accountability. Examples of approaches to improve social accountability at the community level include World Vision's Citizen Voice and Action tool,[121] Save the Children's Partnership Defined Quality tool,[122] and CARE's Community Scorecard,[123] among others. Figure A1 outlines the Community Score Card approach.[124]

Figure A1. CARE Community Score Card process



Source: Gullo S, Galavotti C, Sebert Kuhlmann A, Msiska T, Hastings P, Marti CN. 2017. Effects of a social accountability approach, CARE's Community Score Card, on reproductive health-related outcomes in Malawi: a cluster-randomized controlled evaluation. PLoS ONE. 12(2): e0171316. doi: 10.1371/journal.pone.0171316.

Civil society organizations working with communities are generally the implementers of such tools because they have the capacity to support activities through multiple cycles. The cycle begins with a preparatory phase to identify the scope of the exercise, train the necessary facilitators, make community introductions, and build the capacity of the community to engage in the process. The first step in most of the community-level social accountability tools is community engagement. Citizen Voice and Action, which focuses on enabling communities to monitor government services, details a "community gathering" phase, in which a variety of

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[120] Hoffmann KD. 2014. *The Role of Social Accountability in Improving Health Outcomes: Overview and Analysis of Selected International NGO Experiences to Advance the Field.* Washington, DC: CORE Group.

[121] World Vision. *Project Model: Citizen Voice and Action: An Effective Local Level Advocacy Approach to Increase Local Government Accountability*. Monrovia, California: World Vision.

[122] Lovich R, Rubardt M, Fagan D, Powers MB. 2005. *Partnership Defined Quality: A Tool Book for Community and Health Provider Collaboration for Quality Improvement*. Fairfield, Connecticut: Save the Children.

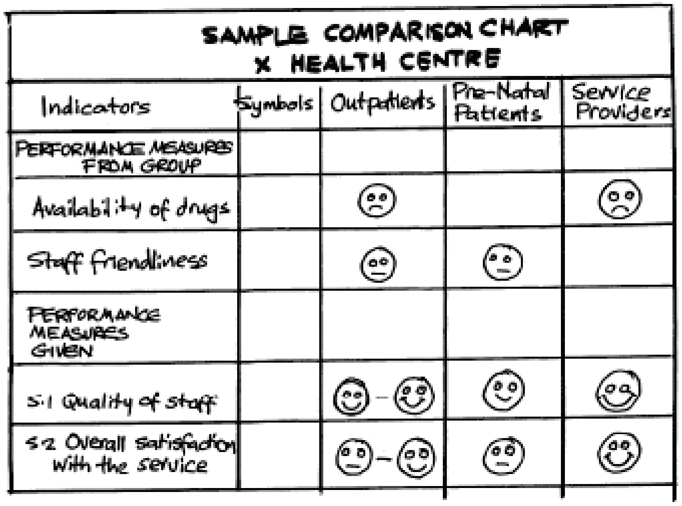
[123] CARE Malawi. 2013. *The Community Score Card (CSC): A Generic Guide for Implementing CARE's CSC Process to Improve Quality of Services*. Lilongwe, Malawi: CARE Malawi.

[124] Gullo S, Galavotti C, Sebert Kuhlmann A, Msiska T, Hastings P, Marti CN. 2017. Effects of a social accountability approach, CARE's Community Score Card, on reproductive health-related outcomes in Malawi: a cluster-randomized controlled

community stakeholders (government officials, service providers, users of the service, etc.) come together. For example, communities review the standards set by the government for performance within health facilities, discuss the quality of services, and identify gaps to be addressed.[125]

In the next phase, the community uses the information gathered in the initial meeting to jointly develop a tool to quantitatively assess health services or the factors the community seeks to influence. Almost all approaches use a community scorecard-type tool that assigns scores to services or factors that are then monitored over time. The creation of the community scorecard is a participatory process, in which the community identifies which indicators to include on the scorecard and decides the best method for scoring the indicators. The Community Voice and Action sample scorecard (Figure A2) is an example of one way scorecards can be set up, using symbols like faces to assign "scores" to each indicator listed. Traditional numeric scoring systems can be used where literacy and numeracy allows.

Figure A2. Citizen Voice and Action scorecard example[126]



SAMPLE COMPARISON CHART
X HEALTH CENTRE

Indicators	Symbols	Outpatients	Pre-Natal Patients	Service Providers
PERFORMANCE MEASURES FROM GROUP				
Availability of drugs		☹		☹
Staff friendliness		😐	😐	
PERFORMANCE MEASURES GIVEN				
S.1 Quality of staff		☺ - ☺	☺	☺
S.2 Overall satisfaction with the service		😐 - ☺	😐	☺

Figure A3. Citizen Voice and Action community engagement process[127]

Once the development of the scorecard or other quantitative assessment tool is complete, the community meets to discuss the indicators and assign scores, documenting the rationale for each score assigned and noting suggestions for improvement. The scoring process varies by approach. In some approaches, communities are split up by stakeholder group to complete the scoring process, and the groups come together afterward to discuss their findings. In other approaches, community members score in a group, and discussions take place throughout the scoring process. Figure A3 shows an example of this cycle used in the Citizen Voice and Action approach. Once a shared understanding of the challenges is established and the current state of services is determined, an action plan is developed.

The action plan outlines the considerations, such as the activity to take place, the person/people responsible, the timeline for completion, and the resources needed. Once the action plan is complete, the implementation phase begins (usually lasting a few months), after which the cycle begins again using the same indicators to monitor progress over time.

A unique aspect of the tools used to measure progress over time is that data visualization and use are built into the scorecard format. Users can develop scoring scales with colors or graphics to help review the status

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[125] World Vision. *Project Model: Citizen Voice and Action: An Effective Local Level Advocacy Approach to Increase Local Government Accountability*. Monrovia, California: World Vision.

[126] World Vision. *Project Model: Citizen Voice and Action: An Effective Local Level Advocacy Approach to Increase Local Government Accountability*. Monrovia, California: World Vision.

[127] World Vision. *Project Model: Citizen Voice and Action: An Effective Local Level Advocacy Approach to Increase Local Government Accountability*. Monrovia, California: World Vision.

of individual indicators—for example, the faces shown in Figure A2. Community scoreboards are another way to visualize data collected at the community level. Figure A4 shows a community scoreboard developed by Encouraging Positive Practices for Improving Child Survival (EPPICS), a 4-year child survival project in Ghana, to track skilled deliveries in the community.[128] Although the EPPICS project tracked service delivery data, the same format could be used for displaying progress toward accountability goals.

Figure A4. Community scoreboard used by EPPICS project in Ghana[129]

Photo by Michael Stulman, Catholic Relief Services

Dashboards are also helpful for visualizing scorecard data. The example in Figure A5 comes from the Coalition for Effective Community Health and HIV Response, Leadership and Accountability project in Zimbabwe. The project shared the Excel-based dashboard with district-level government officials and organizational partners to highlight progress in HIV-related service indicators over time in the various facilities using the scorecard.

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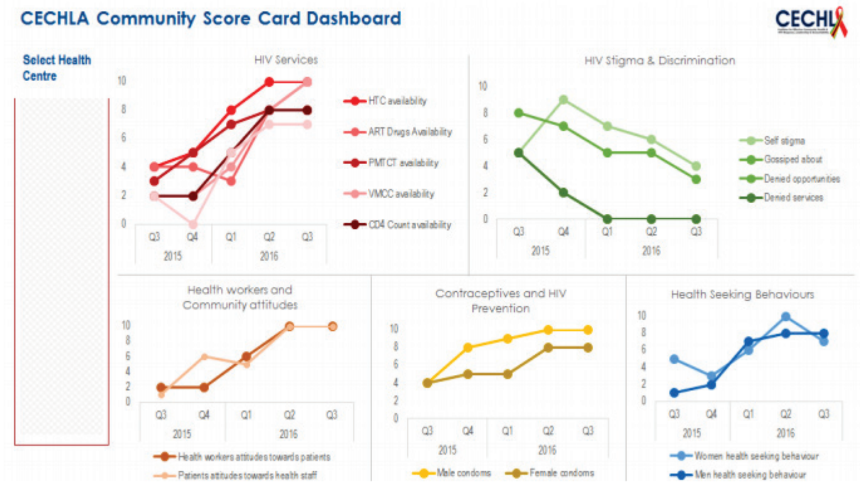
[128] DeVoe D, Ali M. 2016. *Adopting Healthy Maternal and Child Survival Practices in Rural Ghana*. Baltimore, Maryland: Catholic Relief Services.

[129] DeVoe D, Ali M. 2016. *Adopting Healthy Maternal and Child Survival Practices in Rural Ghana*. Baltimore, Maryland: Catholic Relief Services.

Figure A5. Community scorecard dashboard[130]



Source: US State Department

Community-level social accountability approaches with a focus on data use have reported successful results. Communities in Malawi used the Community Score Card approach to improve outcomes related to maternal and reproductive health by bringing together community health workers, facility-based service providers, and community members. An evaluation of the project found an increase in community health worker visits to women during pregnancy and the postnatal period, as well as improved client satisfaction with reproductive health services.[131] A recent pilot of MEASURE Evaluation's *Use of Community Health Data for Shared Accountability* resource in Ethiopia also resulted in successful identification of root causes of barriers to health and community-led solutions.[132]

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[130] Advancing Partners & Communities. 2016. *How Data Is Strengthening Community Health Systems in Zimbabwe*. Arlington, Virginia: JSI Research & Training Institute.

[131] Gullo S, Galavotti C, Sebert Kuhlmann A, Msiska T, Hastings P, Marti CN. 2017. Effects of a social accountability approach, CARE's Community Score Card, on reproductive health-related outcomes in Malawi: a cluster-randomized controlled

[132] Azim T, Tilahun B, Mullen S. 2018. *Use of Community Health Data for Shared Accountability: Guidance*. Chapel Hill, North Carolina: MEASURE Evaluation.