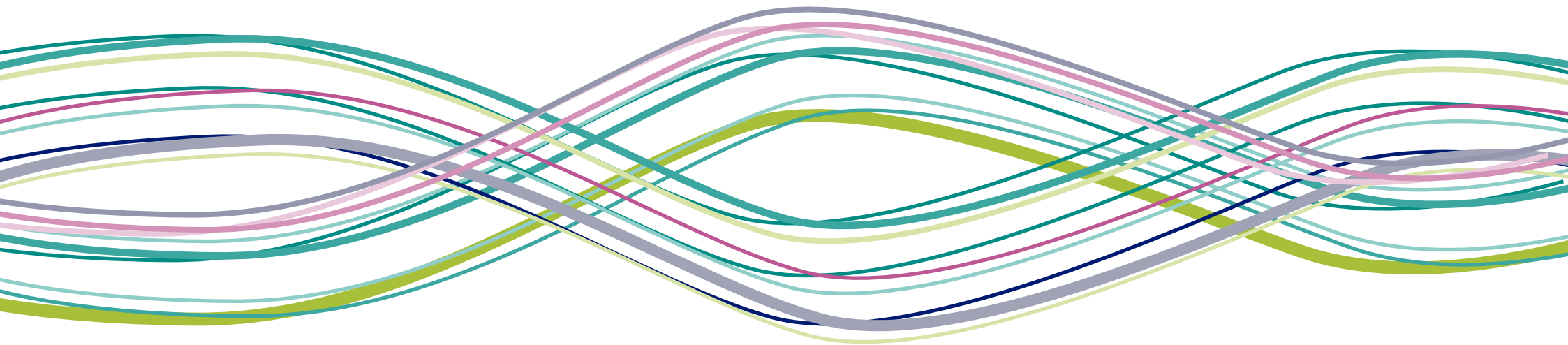


Information Products to Drive Decision Making: How to Promote the Use of Routine Data Throughout a Health System



MEASURE Evaluation

Eric Geers, Peter Nghui, Akaco Ekirapa, Viola Rop,
Selemani Mbuyita, Jackie Patrick, and Sono Kusekwa

Kenya Ministry of Health, Division of Health Information Management

David Soti and Martha Muthami

**Tanzania Ministry of Health, Community, Development, Gender,
Elderly and Children**

Claud Kumalija



Abbreviations

ANC	antenatal care
ART	antiretroviral treatment
CCHP	comprehensive council health plan
CHF	community health funds
CHMT	county health management team(s)
CHP	county health profile
CTC	care and treatment clinic
DMO	decision-making officer
EID	early infant diagnosis
DVDMT	district vaccine and data management tool
HCMIS	human capital management information system
HCMP	health commodities management platform
HMIS	health management information system(s)
HRHIS	human resources for health information system(s)
iHRIS	integrated human resource information system(s)
IDSRS	integrated disease surveillance response system(s)
ILS	integrated logistics system(s)
IT	information technology
KEMSA	Kenya Medical Supplies Authority
LMIS	logistics management information system(s)
MCH	maternal and child health
M&E	monitoring and evaluation
mRDT	Malaria Rapid Diagnostic Test
NGO	nongovernmental organization
NSMS	nutritional status monitoring system(s)
NTLP	National Tuberculosis and Leprosy Program
PMTCT	prevention of mother-to-child transmission
RCH	reproductive and child health
RMNCH	reproductive, maternal, newborn, and child health
USAID	United States Agency for International Development

Data are fundamental in health communications

An information product contains sound analysis of good-quality data routinely collected at health facilities. Products present the analysis in a compelling format that changes the audience's understanding, influences decision makers, and leads them to improve health services or policies.

Health behavior-change communication with the public takes time, effort, target audience pretesting, and tracking of message impact. Creating health information products to promote data use for decision making in the health system has these same requirements.

According to the Health Metrics Network, without data-informed decision making, a health ministry limits the return on investment from a routine data collection system, because it becomes simply a reporting tool, not a driver of action and persistent improvement in the delivery of health services.

Source: Health Metrics Network, World Health Organization, 2008

Conclusion: To have data and not use them is counterproductive for a health system.



What kind of data?

The design of information products for data use involves the analysis of raw data routinely collected by health facilities to answer important questions about health services, such as:

- Are we meeting targets?
- Are we reaching clients who need services?
- Are resources adequate to provide the package of services and maintain standards of care?

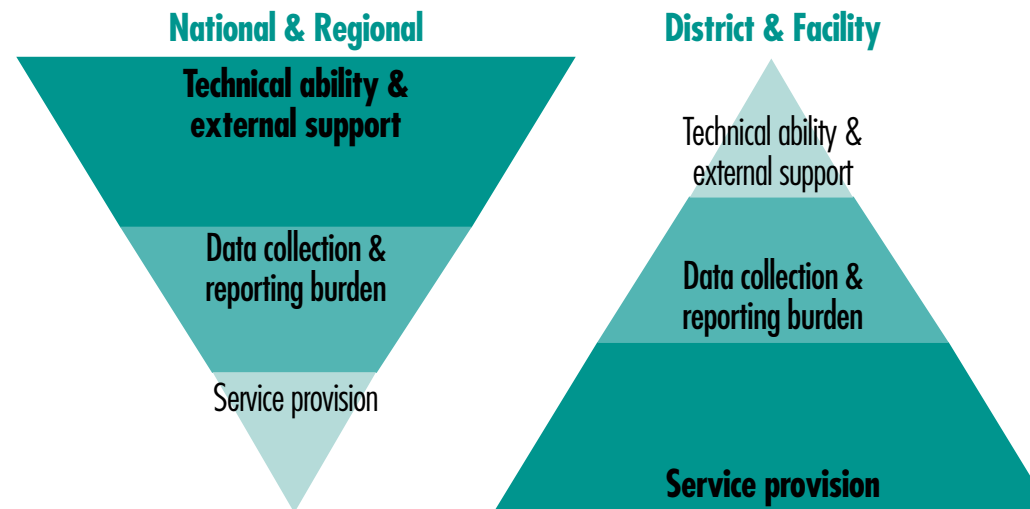


Who can or should produce information products?

In many countries, it's the health workers at the national and regional levels who have the technical ability to transform raw health data into information products that influence decision making. They also often receive the most external support from implementing partners, universities, and other experts.

Health workers at the district and health facility levels prioritize delivering health services, followed by routine data collection. They frequently have little technical ability, technology, or external support to analyze the data they collect. **They frequently cite an insufficient work force or technical capacity to fulfill their triple burden: services, data collection, and data use.**

Conclusion: Greater responsibility for analyzing data for health information products to improve health services may logically belong at the regional and national levels, where there are more resources and time for the task.



What does this tell us, so far?

A. Analysis of available data packaged in useful health information products is necessary in order to make good management decisions regarding health. This is data use.

B. Health systems could achieve more data use in several ways.

Many working in the Kenya and Tanzania health systems agree that the DHIS 2 platform to manage routine health data has promoted data use because it:

- Includes up-to-date, key health indicators from the point of service delivery
- Has multiple ways to manipulate and visualize data
- Features potential linkages to other data sources, such as health commodities,¹ human resources,² and disease surveillance³

¹ Health commodities databases—Kenya: DHIS 2, HCMP, KEMSA, and LMIS; Tanzania: ILS.

² Human resource databases—Kenya: iHRIS; Tanzania: HCMIS, HRHIS, and iHRIS.

³ Disease surveillance databases—Tanzania: IDSR.



“DHIS 2 is the mother database, so reports generated from DHIS 2 are the most important ones in informing routine health service delivery practices.”

– District

To promote data use, the facility and district levels need technical assistance to use the tools in DHIS 2, such as custom dashboards. Regional and national program experts should assist in analyzing data, because they have more time and technical ability than do those close to service delivery.

Conclusion: Information products that reduce the burden of analysis and data visualization for health workers, whose responsibilities are to their clients, will increase the likelihood that data will be used to make decisions on managing health programs.

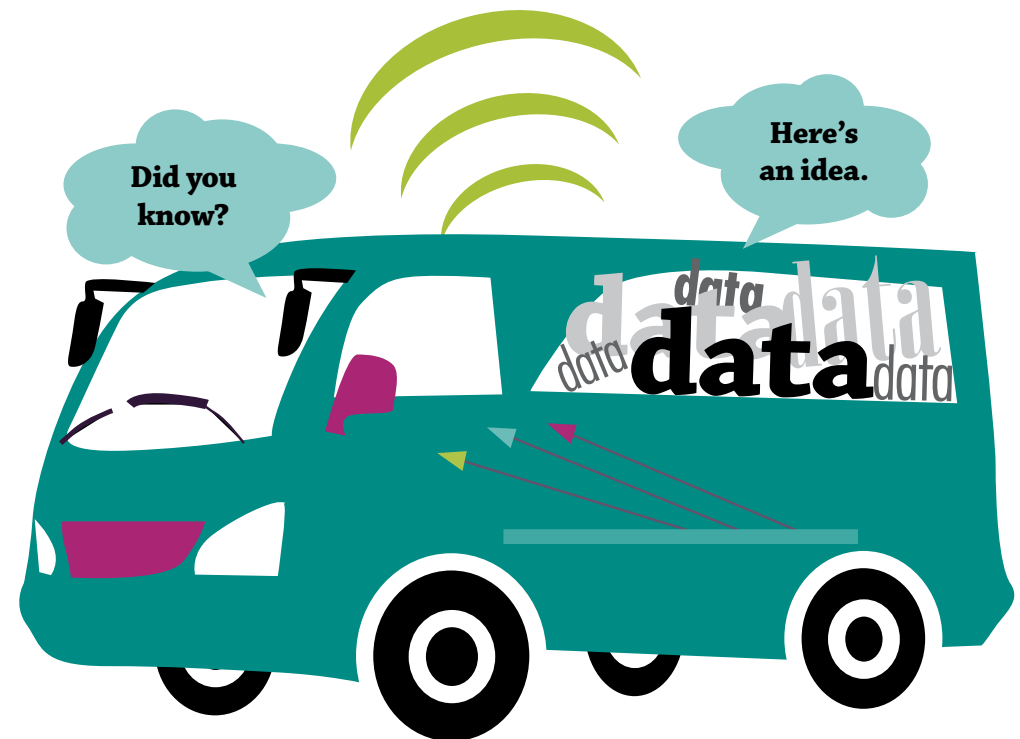


What types of information products are most effective to drive data use?

MEASURE Evaluation conducted qualitative studies in Kenya⁴ and Tanzania⁵ to find the answer. The research aimed to learn what products from routine health data were available, if they could be improved, and **how service providers could best use** them. Qualitative interviews with key informants in the ministries of health focused

on regional, district,⁶ and health facility levels to:

1. Explore how routine data are disseminated in information products, to whom, for what purpose
2. Describe organizational support or obstacles to using routine data contained in these products
3. Understand how target audiences understood and interacted with available information products
4. Identify other supports or barriers to using information products in decision making.



⁴ Kenya: Ministry of Health (MOH).

⁵ Tanzania: Ministry of Health, Community, Development, Gender, Elderly and Children (MOHCDCGEC).

⁶ In Tanzania, the health system consists of regions and districts. In Kenya, it is divided into counties and subcounties. For consistency, this report will describe different levels of the health system as regions and districts.

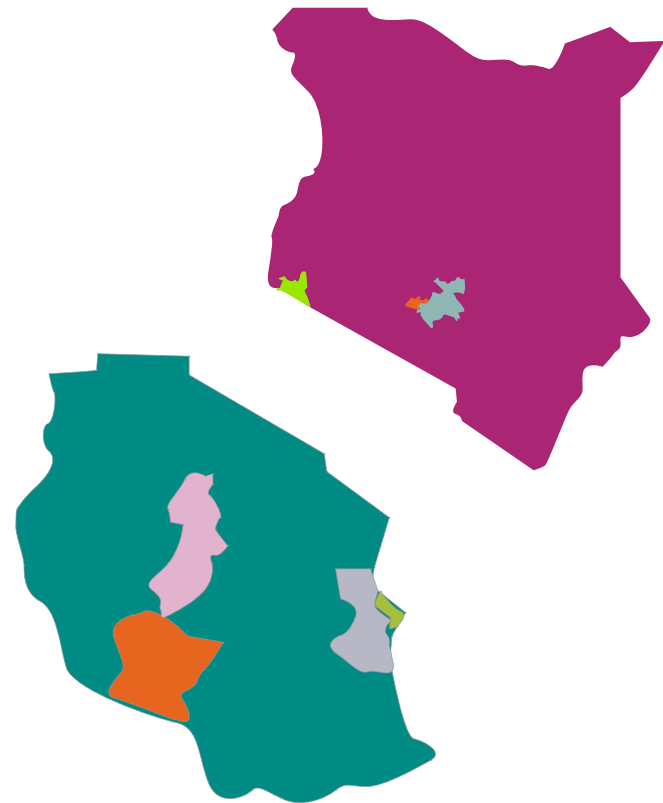
Group discussions were held with 57 staff managing services from the national to the facility level.

The staff represented units providing services in HIV and AIDS; maternal and child health (MCH); laboratory, pharmacy, logistics, monitoring and evaluation (M&E) units; and regional and district health management teams in Kenya and Tanzania.

Discussions at the health facility level were chiefly with nurses, health center in-charges, and data managers.

In **Kenya**, discussions took place from September 2015 to April 2016 in Nairobi, Machakos, and Migori counties (n=23).

In **Tanzania**, discussions were held from March to July 2016 in four districts in four regions: Central (Bahi); Dar es Salaam (Temeke); Mbeye (Rungwe); and Pwani (Mkuranga) (n=34).



Interview process

Group interviews permitted observations of the working relationships between those who managed health programs and those who managed health data.

After the interviews, informants reviewed samples of actual information products to interpret and to develop recommended actions based on data.

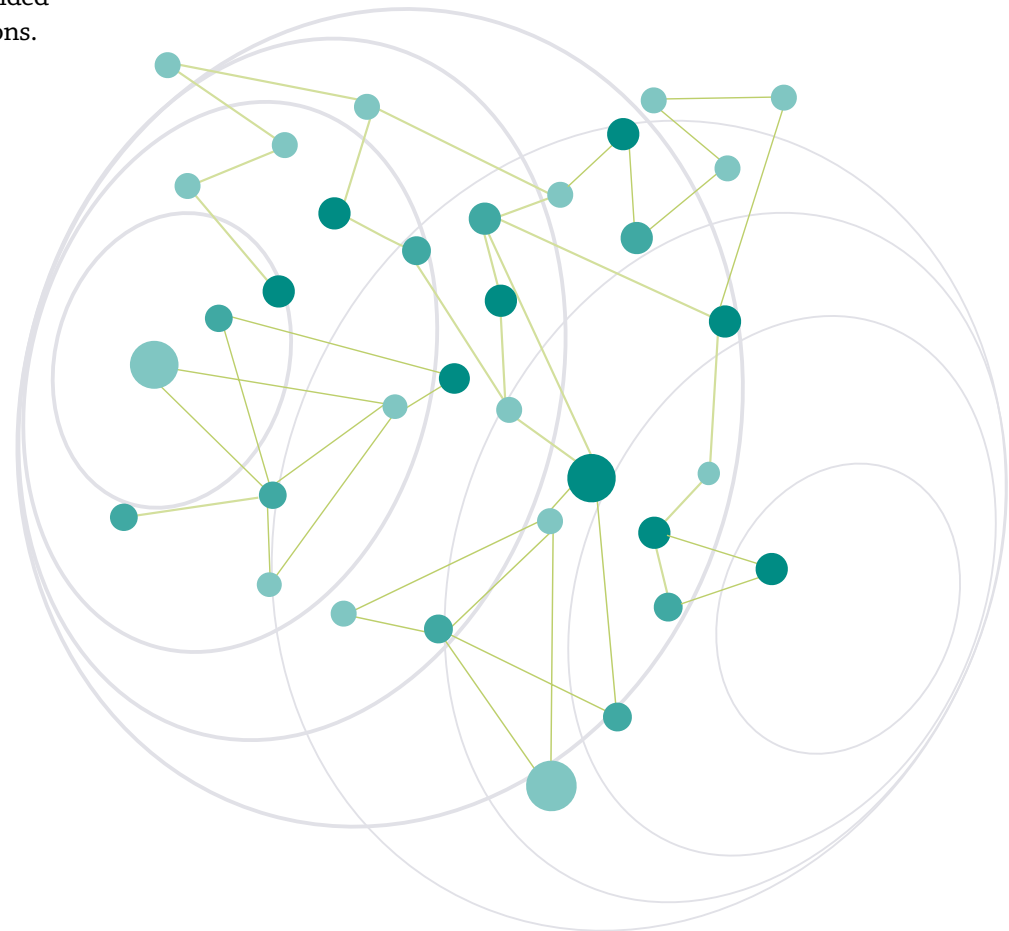


Analysis

The research included an analysis of interview reports, and employed a topical codebook created from the interview questions devised for data collection.

Researchers used the topically coded sections to inform the development of interpretative themes; all coded text was analyzed manually in Microsoft Excel and Word.

The analysis of themes suggested common patterns, based on how one theme aligned with or contradicted another, and provided answers to the research questions. All themes were supported by informant responses.



Sample questions

The interviews included questions about **data sources**:

- How did respondents access data to assess program performance?
- What specific data systems did they use, such as for services, human resources, or commodities?
- How did they triangulate data from multiple data sources?

We asked informants about their experience with specific **information products** developed from these routine data sources:

- Dashboards or reports
- Relevance of these products to their work
- Preferences for receiving information
- Organizational procedures around data reviews
- Challenges and motivations for using data for decision making



This report provides findings and recommendations, divided into four chapters.

Chapter 1. Data use promotion	14
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Chapter 4. Respondents' observations on the utility of information products	55

Chapter 1

Promotion of data use

This section summarizes **findings** on data use shared by informants. Given these findings and experiences of the MEASURE Evaluation project in strengthening health information systems, we **recommend the activities** below.

Summary of **findings and recommendations on promotion of data use:**

Findings

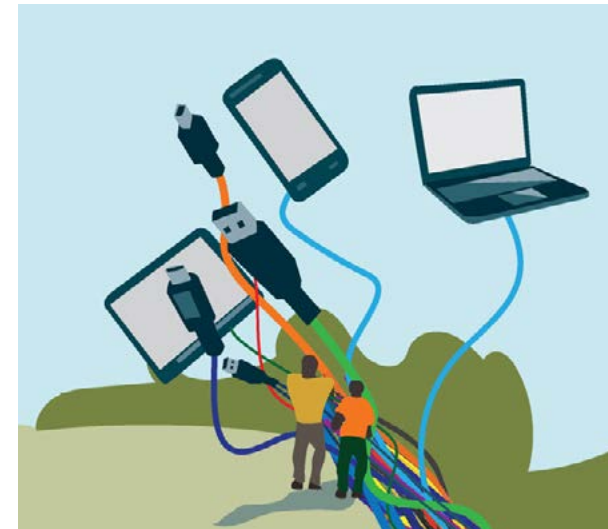
Information product design:

- Data are essential for regional/district, less so at health facility (see page 16)
- Capacity to analyze data declines with proximity to service delivery level (see page 18)
- Few standardized information products are tailored to local information needs, regularly disseminated, and used (see page 19)
- Dissemination of information products has greatest impact prior to key planning events (see page 21)

Recommendations

Information product design: (see page 30)

- Identify information needs at district and health facility level
- Design visual presentations of data that highlight key messages in the data
- Pilot-test with health management information system (HMIS) focal points and program coordinators
- Orient HMIS focal points and local decision makers to information product
- Disseminate prior to key planning events



Chapter 1 Promotion of data use

Findings

Feedback:

Informants value feedback on performance and advice on how to improve services (see page 24)

Recommendations

Feedback:

Provide performance feedback within the information product (see page 33)

Findings

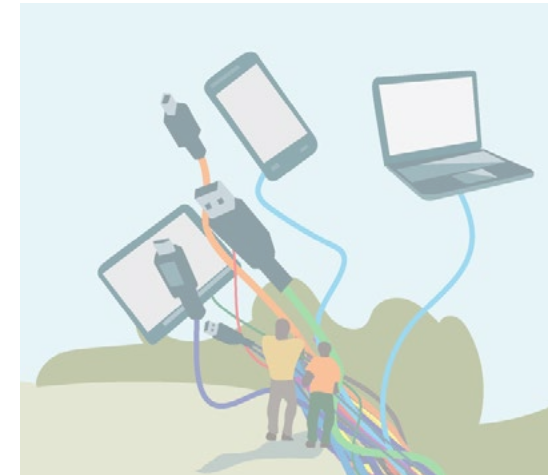
Information sharing:

- Analysis and interpretation of data are not shared across the health system (see page 26)
- When decision makers and HMIS focal points work together, data is likely to be used to improve programs. (see page 28)

Recommendations

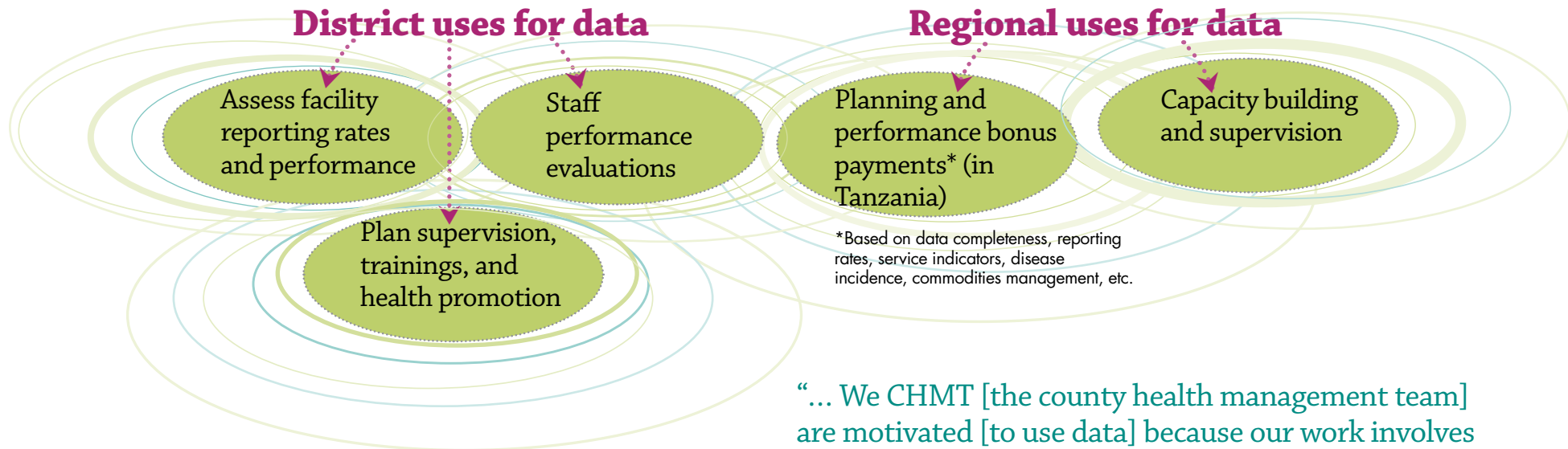
Information sharing:

- Provide opportunities for performance review meetings (see page 35)
- Facilitate access to program experts



Chapter 1 Promotion of data use

Data initiate actions at the regional and district levels...



“... We CHMT [the county health management team] are motivated [to use data] because our work involves a lot of reporting and measuring performance of our health providers... In doing so, we need data and we are happy to have them... Health providers are not equally motivated and find the data collection tasks and reporting just a burden.”

—District

Chapter 1 Promotion of data use

...but less so at the facility level

However, often data are not used to support any primary roles or tasks at the service-delivery level:

“A barrier to information use is when facilities do not really feel like the data they report gets used to support them. They believe that these reports only benefit the national-level program.” —District

In the health information system, health providers collect data every day in service registers and every month in summary reports for different data systems: service delivery, human resources, commodities management, disease-specific, and others.

Informants at health facilities were not aware of what happens to the data they collect at other levels of the health system.

“We don’t know how the data are being processed...” —Facility

They did not have access to or receive any processed data from the reports they submitted. They were familiar only with the HMIS through their own use of paper-based data collection tools.

Their primary interactions with the district level were to clarify reports or receive new guidance on data collection.

Conclusion: There is insufficient effort to engage service delivery staff to understand the data that they collect.

“We need to change the whole culture and practices of information sharing to motivate health providers. They need to feel and see the value of the data they collect by sharing with them frequently the outcome of the work they do on data.”
—National

Chapter 1 Promotion of data use

Less capacity to analyze data at district level

At the district level, program coordinators often are assigned to specific health areas. They produce standard reports that contain basic frequency tables of key indicators and a narrative. Informants gave four chief reasons why available data often are analyzed in topic-specific ways and without more complex analysis: workload, capacity, insufficient data to meet demand, and job responsibility.



Workload

There is limited time to synthesize data into useful information. The HMIS unit spends about one to two days a week resolving data-related issues. Program coordinators spend about a quarter of their time on data issues, report writing, and presenting reports at meetings.

“The policy requires a specific person [to manage data]. But in practice, one person cannot manage everything. Our unit has five people, of whom three are data clerks.”

“We also have data clerks who conduct data entry. They are just volunteers.”

“Vertical programs that come with vertical tools for data collection tend to increase service providers’ workload.”



Lack of skills

Informants said limited knowledge of basic computer skills is a barrier.

“CHMT staff do not have the capacity to produce their own displays in DHIS 2.”



Data ≠ demand

“County-level managers would also do poorly on the interrogation and use of these reports for their own decision making, saying that the data they need is not what is being collected...”



Not in job description

“Our staff do not produce their own analysis or displays. Their job description does not require them to do so.”

Conclusion: In order to promote additional analysis of routine health data, district-level staff need to see and understand more sophisticated analysis approaches, and the review of information products should be integrated in routine operations.

Chapter 1 Promotion of data use

Few standard information products are tailored to local information needs, and they are not regularly disseminated and used.

One of the more popular information products was the RMNCH* scorecard (see respondents' observations on information products on page 66). Informants also mentioned that they transfer raw data from DHIS 2 to Excel to form tables and charts for annual reports. None of the informants mentioned doing these types of analysis with other information systems, such as human resource or commodities systems.

“The RMNCH Scorecard is also linked to the PMTCT** indicators and is one of the very comprehensive summaries of reproductive and child health indicators as well as regional, district, and facility performance.” —District

*reproductive, maternal, newborn, and child health

**prevention of mother-to-child transmission (of HIV)

Chapter 1 Promotion of data use

Respondents were asked why **information products** are not used in decision making.



Staff lack capacity to interpret data:

“[The] RMCNH scorecards are difficult to interpret, but are the most emphasized by the national level...It is difficult to define the baseline versus the current figures.” — District

“The problem with the RMNCH Scorecard is that no one apart from the national level knows how to compute it.” —Region



Data lack credibility or do not match information needs:

“It is quite rare that we use DHIS to make a decision. We tend to use the surveys more, because they are felt to be more accurate, and reporting rates in DHIS are so-so. Some months it is good and other months it is wanting... and even the data quality is still in question for DHIS.” —National

Another informant thought the RMNCH Scorecard emphasized more long-term impact and so did not reflect more manageable short-term outcomes.



Products tend to be health-sector specific:

One informant said that some products—for instance, the distribution list for HIV test kits—are only used for USAID-funded HIV programs.

Another said that commodities were listed in the monthly request and report prepared by the pharmacist and district health secretary.



Insufficient dissemination:

Some informants had not seen the RMNCH or PMTCT scorecards and others said they were not consistently available.

Conclusion: In order for an information product to be successfully used for decision making, (1) its design should conform to the users' capacity to interpret the content; (2) dissemination should be consistent and shared across health sectors.


Chapter 1 Promotion of data use

Dissemination of information products is most effective prior to key planning events

The best time to receive new information and analysis is in preparation for key decision-making moments, when there is a need for evidence to justify future activities and budgets. Opportunities occur during a specific health promotion campaign or at monthly, quarterly, or annual performance reviews.

For example, annual health plans, such as the county health profile (CHP) in Kenya or comprehensive council health plans (CCHPs) in Tanzania, establish performance targets. These targets may create an “accountability effect” that motivates teams to monitor their targets and also a “competitive effect” as teams compare their performance with that of other health catchment areas.

However, some informants are skeptical, because they believe these annual health plans are more useful for management at the national or regional level and less important at the district level.



“The CCHP assessment report is more useful to the national and regional levels [than to the district and facility levels] to provide support in effective planning.”

—District

Chapter 1 Promotion of data use

The main channels of communication for feedback on routinely reported data vary at different levels of the health system.

	National	Regional	District
Phone	X		X
Email	X	X	X
In-person discussion	X		X
IT/DHIS 2 application		X	
Formal meeting	X		

“The [Regional] HMIS coordinator has established a ‘WhatsApp’ group with all district HMIS coordinators and hence can contact them and receive a pictorial spreadsheet of data from them.”

—Regional

“We communicate by phone and emails, although, to be honest, the emails are never responded [to].”

—District

Chapter 1 Promotion of data use

Whatever communication channel might be used, many informants considered the frequency of feedback to be insufficient.

They also did not always see their views or expert advice from others in the ministry reflected in the feedback they received. Communication was mostly about clarifying a report or ensuring accuracy of the health register.

“The **problem** is not sending the feedback, but [for] the national level to act and address the concern.”

—Regional

“We provide feedback on issues related to data and information products. But...we are not sure if our views are taken.”

—District

“The ministry [of health] has established an email group, but it is **not effective**. It is more of sharing concerns than receiving feedback.”

—District

Conclusion: More consistent feedback on the interpretation of data and the implications for service delivery is needed.

Chapter 1 Promotion of data use

Informants value feedback on performance and advice on how to improve services.



“If available, an information product would be useful to provide feedback on performance. It would help [us] to set new targets reasonably. It would help [us] measure our own performance. It would help [us] to correct ourselves where we go wrong. It would **guide us** where to put more efforts.”

—District

Chapter 1 Promotion of data use



“They usually give us feedback on our performance, how far or near we are towards nationally set targets, quality issues... in fact, they’re the first people to come and ask you, ‘Are you sure you have these percentages of couples tested?’... and, ‘What is this positivity rate we are seeing [among] key populations here?’ ”

—District

Chapter 1 Promotion of data use

Analysis and interpretation of data are not shared across the health system.

In general, if staff across all health sectors and levels of service can have more opportunities to network and share ideas on what data are saying about service performance, they will be more likely to use data in decision making.

Based on informant responses, most of these opportunities occur in the districts, followed by regions, then national, and, last, in health facilities.

For example, a district official said: “That’s why we meet weekly and monthly to discuss about data. Even today, in the morning, we met to discuss about strengthening our emphasis to improve the quality of data during supportive supervision.”

In contrast, a health facility worker said: “There is **inadequate time** to do data review because [of] other duties ... Only the indicators that are performing dismally are therefore highlighted.”

However, some district-level informants said they **do not engage** in data sharing and reviews outside of preparing annual plans. “We rarely get the opportunity to review data on a monthly basis. These meetings are conducted on an ad hoc basis.”

Opportunities to network and share data

More

Districts

- Several informants said they discuss data during regular daily, weekly, or monthly county health management team meetings
- One added that they also review information products

Regions

- Data review once a month or quarterly
- Not often on the agenda of regular regional health management team meetings

National

- Annual planning session meeting
- Annual sector-wide review meetings

Health Facility

- Data sources are HMIS registers and summary reports
- Little experience in DHIS 2 and data visualization
- Lack skills in data analysis

Less

More

Likelihood of data use in decision making

Conclusions: To promote data use, service providers at the health facility level need more opportunities to talk with others about the data they collect.

Chapter 1 Promotion of data use

When decision makers and HMIS focal persons work together, data is likely to be used to improve programs.

The job of an HMIS focal person⁷ is (1) to communicate HMIS policy and information products, (2) to manage data, and (3) to generate tables and charts for standard reports.

“The HMIS focal person is the link between the national and the district and the lower levels.”
—District

Daily interaction with data gives the HMIS focal person more opportunities to become familiar with the data and how best to display them.

In contrast, the job of **health program coordinators** is to manage and implement services. Daily interaction with programs gives them more opportunities to understand the challenges of implementation, but they may have trouble describing program performance in a report.

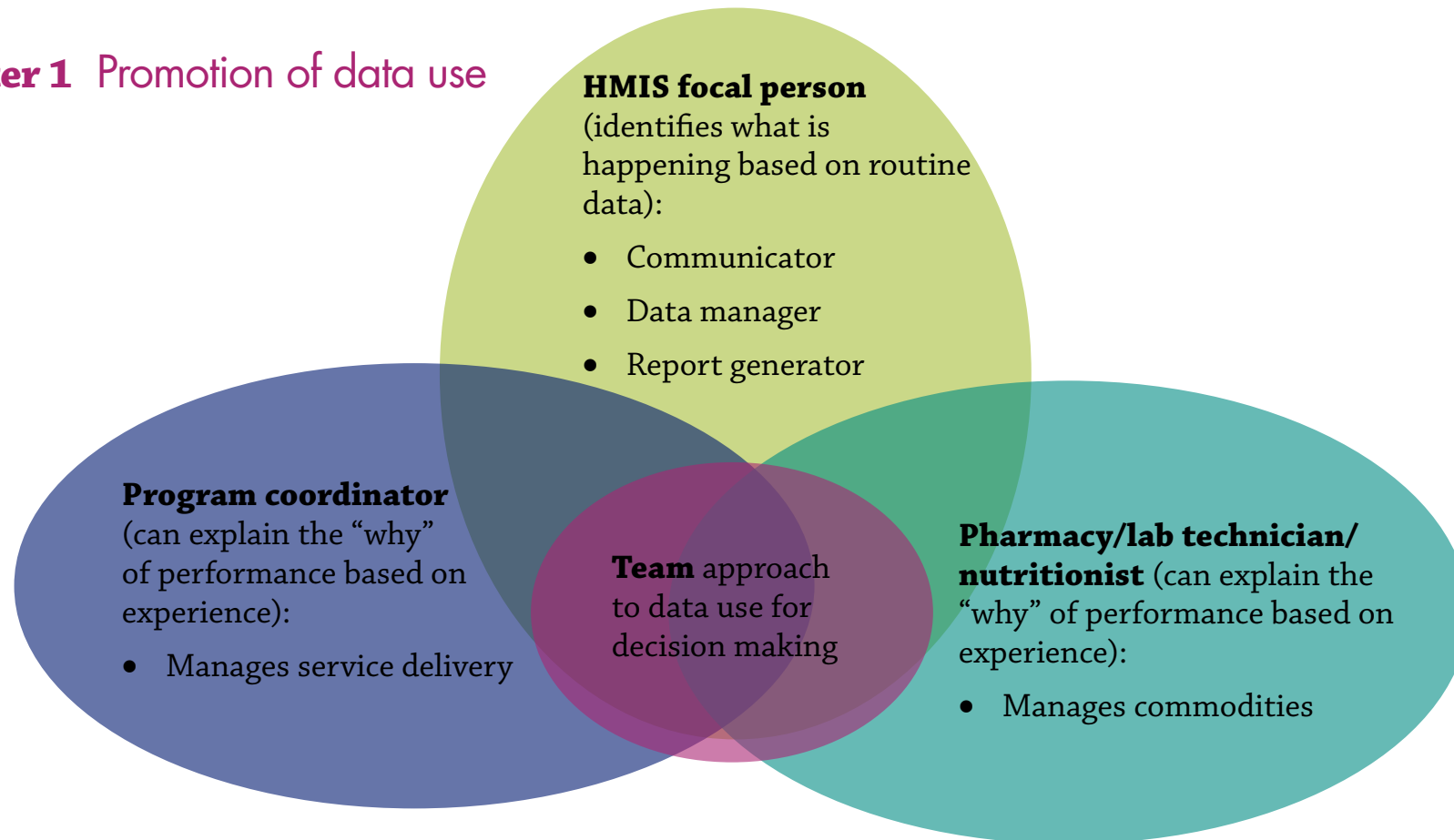
“Heads of other [health program] units are expected to make use of the data by themselves, but many of them lack analytical skills.”
—District

National informants also spoke of the increasing need to involve **staff managing health commodities** among those helping to use data to improve programs.

“... the people we are targeting to work with are the county pharmacists [and]...the county lab coordinators and county nutritionists, because those are the major areas where we have commodities being procured and being distributed.”
—National

⁷ Often a staff member would be designated as a “focal person” and be assigned to manage and report routine health information in addition to their existing service delivery duties.

Chapter 1 Promotion of data use



“We never make a presentation, or even give anybody any data, before consulting each other, because there are some things you will understand as a program manager for HIV, and there are some things you need to understand in data management.”

—District

Conclusion: A close collaboration among all these staff is essential in order to use data to describe health system performance and to plan activities.

Chapter 1 Promotion of data use

Recommendations on **promotion** of data use

Based on these findings, this assessment recommends activities that would effectively promote the use of information products in program decision making.

A) design, B) test, and C) promote use



Chapter 1 Promotion of data use

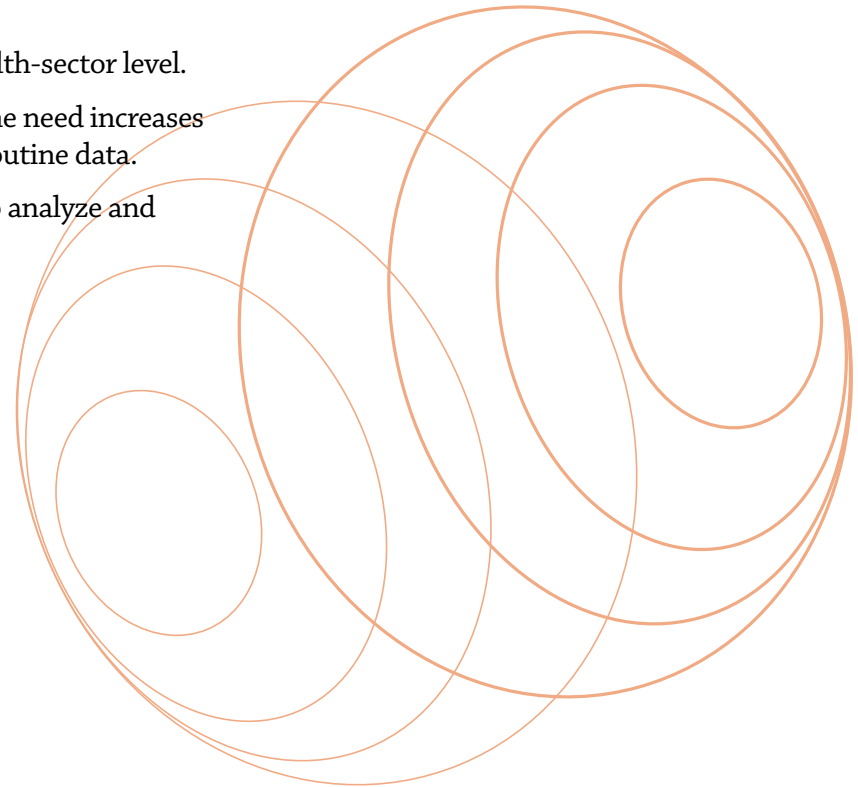
A) Recommendations on information product **design**

Identify information needs by region, district, and facility levels.

- Systematically **develop a series of standard information products tailored to the information needs of these audiences.**
- Ensure products identify select indicators relevant to each health-sector level.

If a product is intended for those closer to the service-delivery level, the need increases for design that effectively communicates key messages contained in routine data.

- Competing priorities at this level mean there is less capacity to analyze and review data, so products must be more intuitive.



Chapter 1 Promotion of data use

A) Recommendations on information product **design**

Design visuals to highlight key messages from the data:

Experiment with different data visualization methods that communicate the key messages within the data.

“People don’t like reading. People want stuff that jumps out at them... PowerPoint is an excellent way, instead of sending 15 pages of prose and once in a while a table.”—District

“I can just click a button and just get a flash of what is happening in the subcounties... So that when you go for the quarterly meeting, you already know at least where you are.”—District

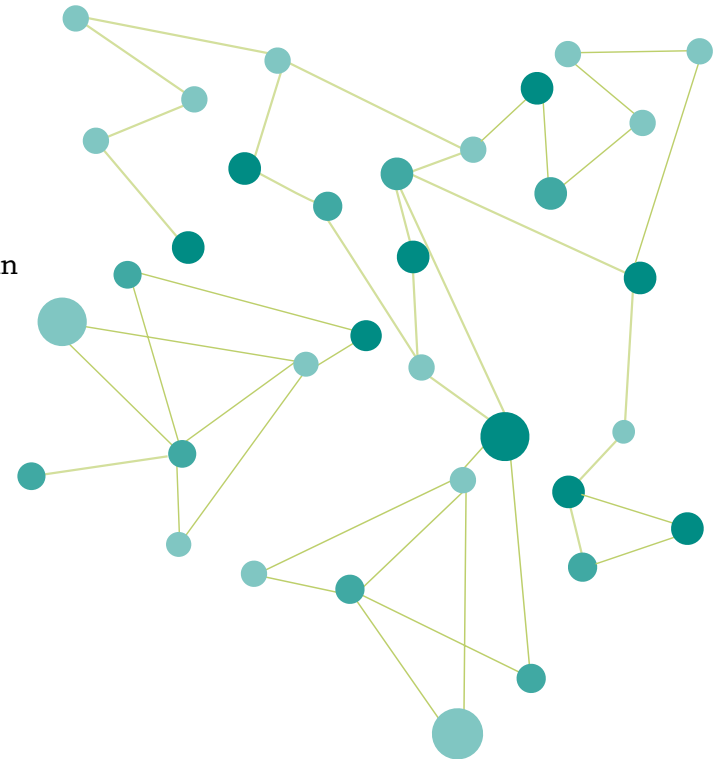
- **Tables:** Informants say these are the easiest to understand and interpret and they enable comparison of individual values of the data.
- **Bar charts:** These explain trends and patterns, identify exceptions in the data, and represent individual values of data.
- **Narratives:** Informants say these help explain key messages in tables and charts.
- **Dashboards:** Informants liked online dashboards of key indicators for specific health sectors.

Chapter 1 Promotion of data use

A) Recommendations on information product design

Provide brief written feedback within the information product, such as:

- Performance comparisons among health catchments areas
- Recommendations on how to improve performance
- Suggestions on where to focus resources or where to find resources
- Sharing of best practices
- Predictions of problems before they occur
- Recognition of good performance
- Guidance on how to access other relevant data sources
- Guidance on whom to involve in the review of an information product in terms of program expertise and decision-making authority

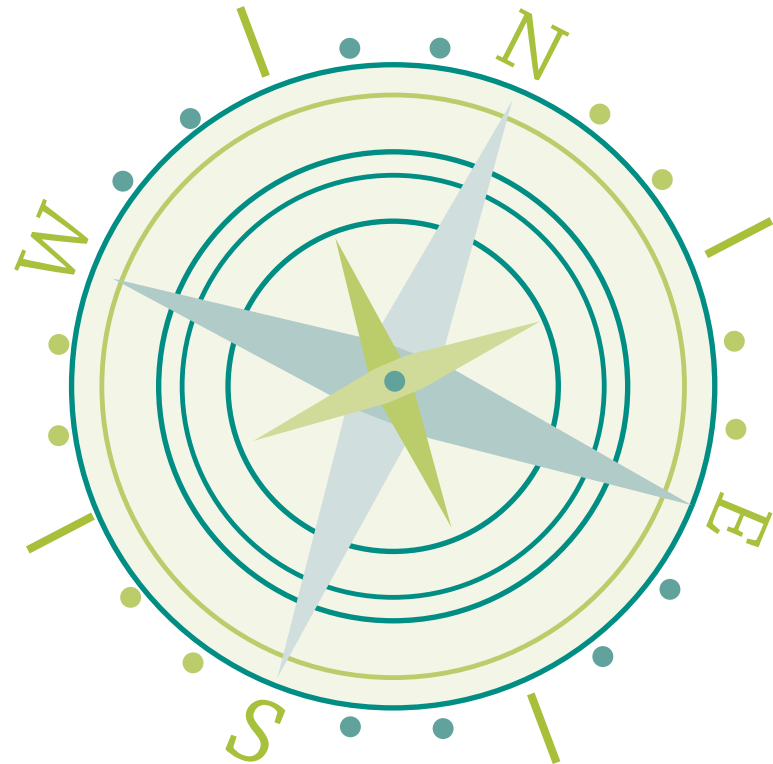


Chapter 1 Promotion of data use

B) Recommendations on information product **testing**

Pilot-test the proposed information product for accessibility, understanding, and utility.

- Testing ensures you communicate key messages and that the target audience finds them useful.
- HMIS focal points and program coordinators work most with routine health or HMIS data and should be included in the testing.
- Test to ensure that information products meet the needs of those who have authority to use data in program management decisions:
 - Regional and district medical officers or health directors
 - Regional and district health secretaries
 - Pharmacists
 - Lab coordinators
 - Health facility in-charges
- Before key planning events, orient decision makers on how to use the information product.



Chapter 1 Promotion of data use

C) Recommendations for sharing and promoting the use of information products

- Provide opportunities for performance review meetings
- Facilitate access to program experts

Outside of key planning events, data reviews for program performance are not a regular agenda item for meetings of regional and district health management teams. More opportunities for health staff—especially at the district level—to discuss specific performance would help increase familiarity with available data sources and give staff a chance to build their skills in data analysis and interpretation.

Informants also said they need access to health experts, either in person or remotely. Health teams, particularly at the subnational level, need help developing effective program strategies to address performance or to interpret discrepancies between different but similar indicators.

Discuss performance

Build data skills

Confer with experts

Chapter 2

Capacity building needs

Findings

- Limited skills in data analysis and information product design such as DHIS 2 dashboards (see page 37)
- Limited use of data triangulation from multiple sources (see page 39)

Recommendations

- Regional/district training of trainers (see page 43):
 - Information product development
 - Use of multiple databases
- Supportive supervision/coaching to prepare for performance reviews
- Working sessions to develop and share DHIS 2 custom dashboards or other information products (see page 44)
- Sessions on engagement with a variety of databases (see page 45)

Chapter 2 Capacity building needs

Limited skills in data analysis and creating information products, such as DHIS 2 dashboards

Many informants said they need better skills in data management, analysis, visualization, and report development, particularly at the district level. Others mentioned needing training on how to access and generate information products using DHIS 2.

“The data from the DHIS is quite relevant at subcounty level... But it requires that the officers be familiar with the system and set up their own information products (i.e., dashboards or pivot table summaries).”

—District

“You can see everyone is **struggling** to come up with the tables and then come up with the graphs.”

—District

“CHMT staff do not have the capacity to produce their own displays in DHIS 2. While they have access to the DHIS 2, they have **limited capacity** to conduct simple analysis and produce needed graphical displays.”

—District

Chapter 2 Capacity building needs

Informants said that platforms exist—separate from HMIS or DHIS 2—that are useful for assessing performance, setting priorities, budgeting, and general decision making. They also said, however, that a staff member assigned to manage a particular data source is typically the only one to use it.

Data sources by frequency of mention (1 being mentioned most often)
1. Health facility registers: often cited as initial data source or to verify reported data
2. Logistics management information system (LMIS) to manage, reallocate, and send stockout alerts for commodities
3. Human resources information system (HRHIS) to manage staff allocation and training
4. HIV sector-specific databases: <ul style="list-style-type: none"> a) Care and treatment clinic (CTC)⁷ b) Early infant diagnosis c) Viral load
5. Malaria Rapid Diagnostic Test (mRDT)
6. National Tuberculosis and Leprosy Program (NTLP)
7. Nutritional status monitoring system (NSMS)
8. Integrated disease surveillance response system (IDSR)
9. District vaccine data management tool (DVDMT)
10. Community programs activity report

⁷ The CTC was managed by a nongovernmental organization (NGO) in Tanzania working in the MCH and HIV and AIDS health sectors. The CTC database was created by the U.S. Centers for Disease Control and Prevention. It includes a pharmacy or commodities module and tracks home-based care.

Chapter 2 Capacity building needs

Limited triangulation of data from multiple sources

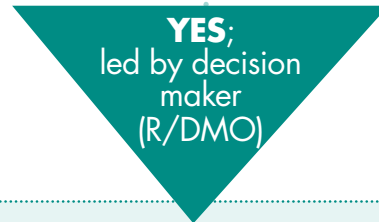
Because several health-related but separate databases exist, the researchers investigated whether informants compared data from multiple sources to produce useful information for program decision making and management.

Informants were aware of possible comparisons of separate databases, such as among:

1. DHIS 2 health service indicators and commodities
2. Specific program databases, such as for malaria and commodities
3. Indicators from different health services, such as reproductive and child health data compared with HIV services data
4. Reports from vaccinations campaigns and DHIS 2
5. DHIS 2 reports on healthcare provider training/performance and human resource databases

Chapter 2 Capacity building needs

Did data triangulation occur? Respondents described three scenarios:



Scenario 1: R/DMO requests reports and presentations from program coordinators for their health sector and leads efforts to merge this information into an annual plan.

"The RCH* coordinator makes use of the DHIS 2 data more than other sources, while the... pharmacist makes use of the ILS** database... Each of them would prepare their reports based on those data sources, and the DMO would be expected to lead the CHMT in merging these reports into one health plan..."

"The CCHP is prepared by merging plans submitted by different heads of units within the CHMT... Since funding is always limited, some aspects of the plans from each individual unit plan would need to be removed and in such a discussion there is usually... a lot of disagreement among CHMT members."

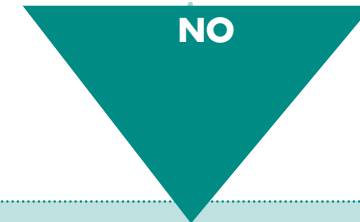


Scenario 2: Program coordinators collated data from sources relevant to their health sector and discussed conclusions as a team.

"As one person, such practice [of using more than one data source] is rare. But as a team, we tend to triangulate information extracted from various sources."

"...CHMT as a team conducts data triangulation all the time. This is because when planning, all data sources are consulted. The DHS*** will present HRHIS+, the district pharmacist presents ILS, and the tuberculosis and leprosy presents the NTLP++."

"The other time that you might find yourself looking at DHIS and... maybe what [vaccines] the facilities have ordered, is when you want to make a decision of what you want to order. Because maybe the figure you get with the DHIS compared with the commodities that you had in hand and what you distributed is not making sense."



"This culture of triangulation of information, data, and reports is missing here."

"I can't remember when as a team we brought in triangulation data or information products from different sources to arrive at a decision."

"We have never been able to compare commodity versus service data. But it is something that we are hoping we can do."

* reproductive and child health

** integrated logistics system

*** district health secretary

+ human resources for health information system

++ National Tuberculosis and Leprosy Program

Chapter 2 Capacity building needs

Barriers to data triangulation occurred when:

1. Program coordinators only worked with one type of database
2. There were technical challenges in reconciling data from separate systems with different management structures
3. Informants were unaware of or lacked access to other databases

Specialization:

1. "... [A] challenge is the specialization of key actors [such as program coordinators, DHS, and DMO] who become ignorant of how other data sources work."
1. "[A] challenge is navigating through more than one system. Thus, an integrated system will be more useful and easy to use."

Lack of awareness/access:

1. "I have only interacted with DHIS. I have not had a chance to access the iHRIS* and KEMSA**. I believe the KEMSA system is used by the pharmacist."
2. "... When I need data for malaria, I have to go through another person. [This] often [happens] when doing performance review, thus creating delays."

Barriers to multiple data source triangulation

Conflicting data reconciliation:

"Conducting triangulation is technically challenging and time consuming. Not many can do this."

Different periods:

"Using more than one routine data source is challenging because they may not be available at the same time or may have been produced with reference to different time periods."

* integrated Human Resource Information System

** Kenya Medical Supplies Authority

Chapter 2 Capacity building needs

Recommendations on **capacity building**

A. **Regional/district training of trainers**

- **Information product development**
- **Access to multiple databases**

B. **Supportive supervision/coaching to prepare for performance reviews**

C. **Working sessions to develop and share DHIS 2 custom dashboards or other information products**

D. **Promote engagement with a variety of databases**

Chapter 2 Capacity building needs

Recommendations on **capacity building**

A. Regional/district training of trainers

Formal training is most useful when introducing a new concept, such as systematic methods to develop new information products or how to access multiple databases.

However, formal training can be expensive, especially with high staff turnover. A way to spread training costs is to **train facilitators at the regional or district level** so they can provide the same training to other districts and health facilities. Another cost-effective strategy is to provide a guidance booklet with instructions that staff can reference as needed on how to access and use DHIS 2, perform common indicator analyses, and facilitate data review meetings to develop plans to address performance.

Also useful are tutorials or online courses. However, this approach would be limited to those with a consistent Internet connection.

“There is a need for subcounty officers to be trained on **visualization** of the data in order to know how they are performing on specific indicators.” —District

B. Supportive supervision/coaching to prepare for performance review

Ways to reinforce learning are to provide regular **supportive supervision and coaching** to prepare teams for performance reviews and program planning.

“For **future motivation**, [we] should target health providers by providing them with seminars and on-the-job orientations on data issues, including conducting simple analyses.” —District

Chapter 2 Capacity building needs

Recommendations on **capacity building**

C. Working sessions to develop and share DHIS 2 custom dashboards or other information products

Teams should **work together to develop their own tailored dashboards and other data visualizations** and share this work with others.

“Building their skills so they can also access DHIS 2 and be able to develop their own graphic displays would further motivate them in [the] future.”

—District



Chapter 2 Capacity building needs

Recommendations on **capacity building needs**

D. Promote engagement with a variety of databases

Several databases track healthcare delivery, each of them often managed by specific health staff. An effort to engage other health staff unfamiliar with these potential resources within different databases would encourage more triangulation of data for decision making.

Data use for decisions can be encouraged, by making sure that information products are available and all participating actors are familiar with them.



Chapter 3

Health systems strengthening

Findings

- Data collection burden (see page 47)
- Need for regular infrastructure maintenance (see page 48)
- Confidence in the quality of routine data (see page 50)
- Request for further systems integration and access (see page 51)

Recommendations

- Reduce data collection burden at the service delivery level (see page 53)
- Implement annual maintenance reviews of the HIS (see page 53)
- Work with subnational teams to identify initial data sources/indicators essential for system integration (see page 54)
- Provide multiple links within DHIS 2 to other data sources (see page 54)

Chapter 3 Health systems strengthening

Burden of data collection

All routine databases, health service indicators, commodities, human resources, disease surveillance, etc., draw from facilities that submit monthly aggregate reports.

Many facilities have no online access to DHIS 2. Facility staff use paper copies of registers to record data and then summarize them in reports for a district HMIS focal person to enter in an online system.

Informants spoke about the burden of data collection on **health providers, who spend from a quarter to half of their time** on data collection: completing registers, compiling reports, and resolving data issues.

“We are overburdened with **lots to do**. We usually have long queues when attending our patients and we cannot fill in all the details required. So we opt to fill in some of the gaps later and sometimes some of us tend to forget, hence having gaps in the register.”

—Health facility

Chapter 3 Health systems strengthening

Need for regular infrastructure maintenance

In terms of barriers to data use, the concerns informants mentioned most often were infrastructure issues:

1. **Reliable Internet access**
2. **Sufficient number of computers**
3. **Replacement data collection registers**
4. **Dependable power sources**

Internet connectivity was hampered by technical issues and lack of funds to pay for the service.

“Where there is **poor network**, like at [the subcounty hospital], we stayed for almost two weeks before I got the data I needed, because they were telling me the **network is low.**”

—District

Chapter 3 Health systems strengthening

Some informants said they needed more laptops distributed among both HMIS focal persons and program coordinators.

“If I had a **laptop** of my own, I would be able to assist my colleagues where I would be.”

—District

Another issue identified by district-level informants was delays in replacing the data collection registers at facilities. Informants said that responsibility for the distribution of new registers had recently shifted to the districts, and some were not prepared to take on this task.

“This has created a huge problem due to **procurement** policies, and thus we are into a fourth month now with scarcity of HMIS registers in our facilities.”

—District

Although a dependable power source was mentioned by some informants, there have been local efforts to deal with this issue. Others would simply wait until power resumed.

“We are in the process of installing our own **standby generator** to solve the power cuts problem.”

—District

Chapter 3 Health systems strengthening

Confidence in the quality of routine data

Most informants expressed confidence in the quality of routine data that are entered in DHIS 2 from summary reports of data contained in health-facility registers. They attributed this confidence to:

1. **Data quality checks built into the DHIS 2 system**
2. **Phone reminders sent to health facilities**
3. **Frequent training on registers and summary reports**
4. **Collective efforts of the HMIS focal person and program coordinators to review data for quality**

“Quality of data in the various data sources is good and has been improving over time.”

—District

However, some informants did question the accuracy of the health registers and attributed this to inadequate supervision or limited follow-up on outliers in the data.

“Some of the data that is entered, if you compare with what is on the ground, sometimes it does not reflect.”

—District

Chapter 3 Health systems strengthening

Request for more complete system integration and access

Although some links between DHIS 2 and other data systems were in place, informants said there should be more links among databases to overcome barriers to data use.

“All data sources should be **linked** so that one can have access to any data source. This will reduce workload and production of different reports (e.g., the CTC database could be linked with PMTCT indicators).” —District

Some informants said access to other databases was limited, because those authorized to access databases were not available. Others said that access was not a challenge. Still others said that access might be denied, because passwords expired when staff did not access the system.

“Some other CHMT members have reported [access failure] when they do not have passwords and those authorized are absent.” —District

Chapter 3 Health systems strengthening

Recommendations on **health systems strengthening**

- A. Reduce the burden of data collection at the service-delivery level
- B. Implement annual system-maintenance reviews
- C. Work with subnational teams to identify initial data sources/indicators essential for system integration
- D. Provide multiple links within DHIS 2 to other data sources

Chapter 3 Health systems strengthening

Recommendations on **health systems strengthening**

A. Reduce the burden of data collection at the service-delivery level

Reducing this burden would encourage health facilities to use data. Ways to reduce the burden are to **reduce or harmonize data collection** procedures.

“Massive data that are being collected through various registers could be ‘compressed’ or reduced, hence reducing the workload of health providers.”

—District

B. Implement annual health information system-maintenance reviews

Computer and Internet-based information systems require constant and systematic infrastructure maintenance to ensure data are available. We recommend that subnational teams conduct an annual **maintenance review** of the HMIS.

This review would provide staff with recommendations to ensure availability of: Internet connectivity, access to functioning computers by all essential staff, IT support, availability of data collection tools, and power sources.

Where consistent Internet connection is a problem, downloading specific data sets or an information product may be useful so users can review the information they need.

Chapter 3 Health systems strengthening

Recommendations on **health systems strengthening**

C. Work with subnational teams to identify initial data sources or indicators essential for system integration

Separate information systems create yet another barrier for the triangulation and use of data for decision making.

Informants wanted to see more integration of multiple databases in order to understand all aspects of service delivery. This integration should be incremental, especially as other health areas can gain confidence in the data. One way to initiate integration is to work with subnational teams to identify the information they need most frequently from other data sources and then work with the managers of those data to find technical solutions for the integration of selected indicators.

D. Within DHIS 2, provide multiple links to other data sources

This should be done among databases where data comparisons would be useful.

Chapter 4

Product utility

Respondents' observations on the **utility of information products**

After the interviews, informants looked at samples of information products, interpreted them, and recommended actions based on data.

The following page analyzes data from Kenya on HIV-positive pregnant women who were not documented to have received maternal antiretroviral therapy (ART) prophylaxis for PMTCT. The data are from January to March 2015.

We asked informants to:

1. Interpret information
2. Indicate questions about the HIV and AIDS programs in their area
3. Identify actions for HIV and AIDS services
4. Suggest recommendations after reviewing the information product

Chapter 4 Product utility

Analysis of HIV-positive pregnant women not on ART

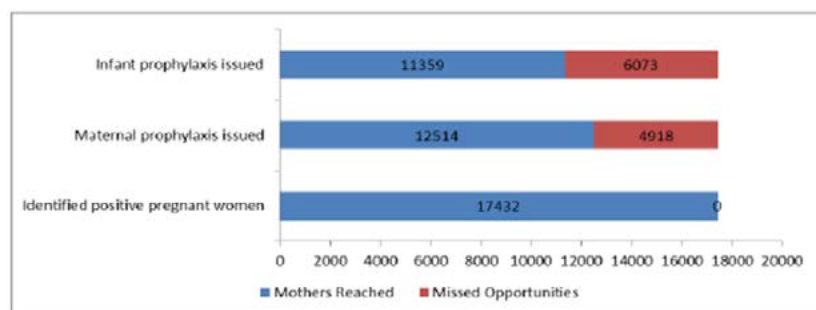


Figure 1: Analysis of HIV Positive Pregnant Women not documented to have received maternal ART Prophylaxis for PMTCT, Jan – March 2015, Kenya

In the period covering January to March 2015, the number of HIV Positive Pregnant women identified through the health system was 17,432. As part of the strategy to Eliminate Mother to Child Transmission (EMTCT), 12,514 were documented to have received maternal prophylaxis; 97% (n = 12,113) being Highly Active Antiretroviral Therapy (HAART). In addition, infant ARV prophylaxis was documented to have been given to cover 11,359 infants.

Counties accounting for PMTCT maternal prophylaxis uptake of $\leq 65\%$ are as indicated in the table below.

County	Maternal Prophylaxis Uptake (%)
1 Kericho	14
2 Tharaka Nithi	19
3 Garissa	21
4 Elgeyo Marakwet	42
5 Samburu	43
6 Turkana	44
7 Kwale	45
8 Narok	53
9 Taita Taveta	54
10 Mombasa	55
11 Uasin Gishu	56
12 Embu	61
13 Trans Nzoia	62
14 Nandi	63
15 Nairobi	65
16 Kilifi	65

Chapter 4 Product utility

Respondents' observations on the **utility of information products**

With the PMTCT information product, informants were able to identify the message: Many counties were doing a poor job of distributing ART to mothers.

Informants' immediate reaction was to question the quality of these data. The action they suggested was to look at the source registers to verify the validity of the data in this information product.



Observations on the PMTCT information product

Questions	Observation
<i>What does this information tell me?</i>	“... We are looking at performance for PMTCT... We look at the gap... We need to figure out why those mothers who are positive are not getting the prophylaxis.”
<i>Any questions about the program?</i>	“... Quality issues with the data... You can't know which health facility, or even which county.”
<i>Next steps?</i>	“...Interrogate the data... A lot of our mothers, if you go back to the registers, actually get prophylaxis. So we would probably do a DQA [data quality audit].”
<i>Recommend?</i>	“I would recommend that the team conduct a facility-level data analysis to identify which facility is reporting this data.”

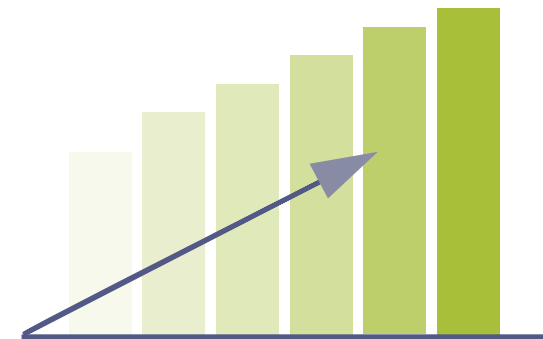
Chapter 4 Product utility

Respondents' observations on the utility of information products

After this exercise, interviewers asked informants to look at graphic displays of similar **hypothetical data that were visually enhanced** (pages 60, 61, and 62) for better communication of the message in the data.

Some of the visual enhancements were:

- Presenting a cascade of services, from antenatal care (ANC) clients tested for HIV, to the number of PMTCT clients receiving test results, to HIV-positive maternal clients receiving prophylaxis
- Displaying dual bar graphs with the analysis or calculation in percentages or differences on the left and the actual numbers on the right
- Changing the order of subcounties to highlight locations with the most health service issues
- Changing the color of the numbers displayed for areas with the most health-service issues

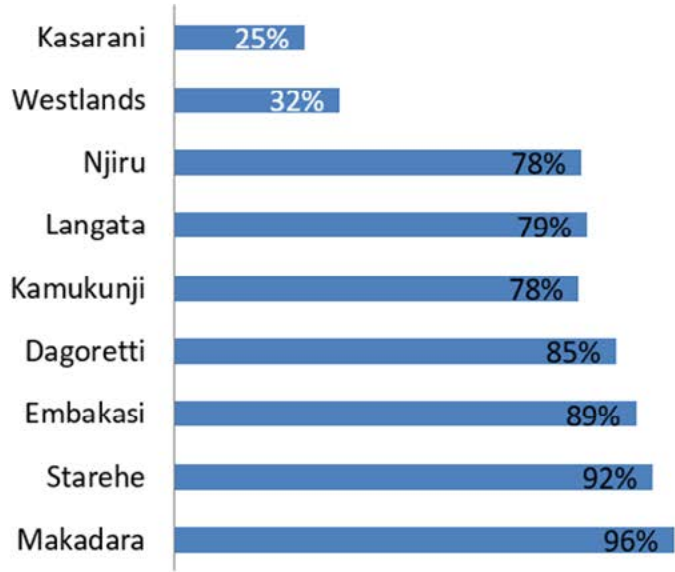


Chapter 4 Product utility

PMTCT data charts

Prevention of Mother-To-Child Transmission Graphs

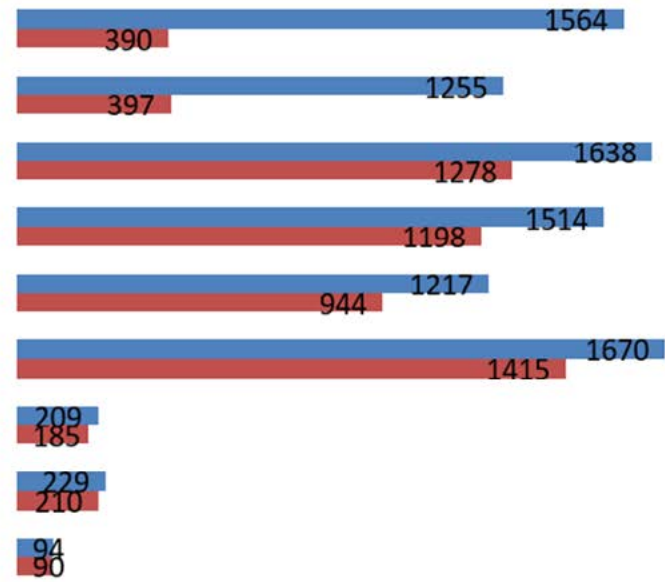
% of total HIV+ maternal patients received prophylaxis, Nairobi County, Jan. - Mar. 2015



*Total No. of maternal HIV+ patients who received prophylaxis = 6,106

* All data is hypothetical

No. of PMTCT maternal HIV+ patients



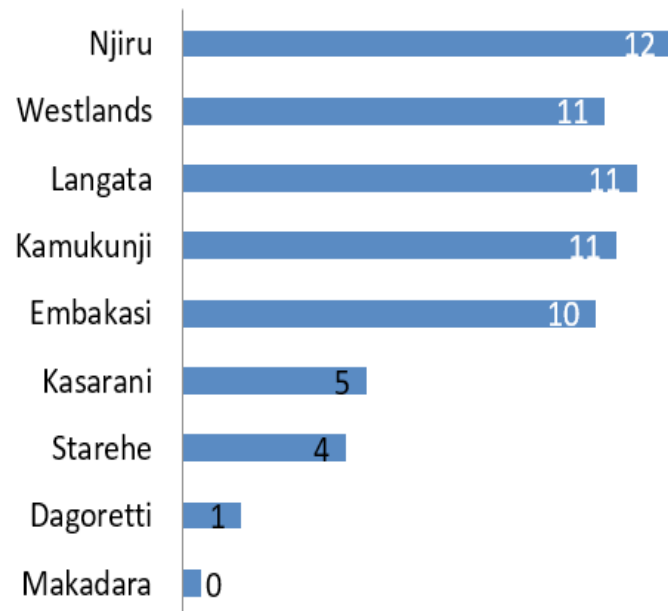
■ # of HIV+ patients ■ # received prophylaxis

*Total No. of maternal HIV+ patients = 9,390

Chapter 4 Product utility

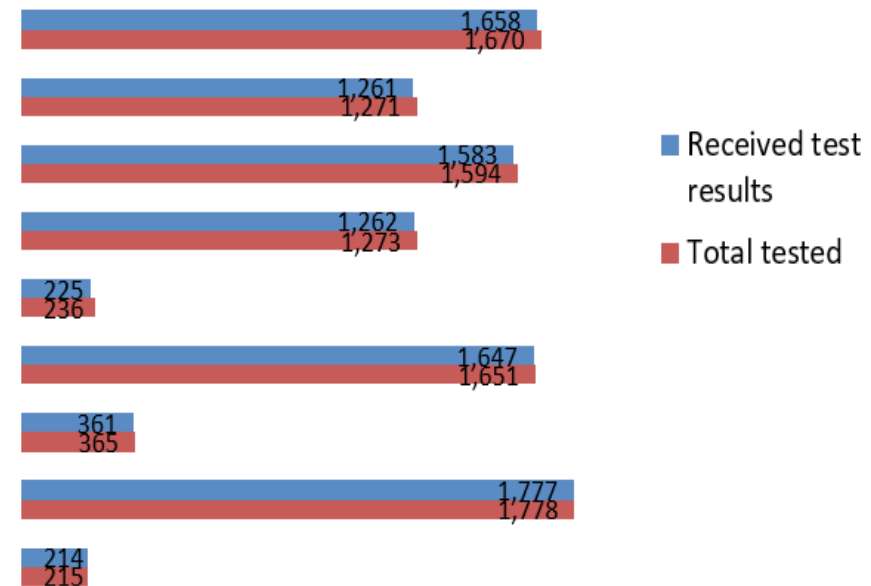
No. of PMTCT maternal patients who did **not** receive HIV test results

Nairobi County, Jan. - Feb. 2015



*Total No. of PMTCT maternal patients who did **not** receive HIV test results = 66

No. of PMTCT maternal patients who were tested for HIV and received their results



*Total No. of PMTCT maternal patients tested HIV+ = 9,390

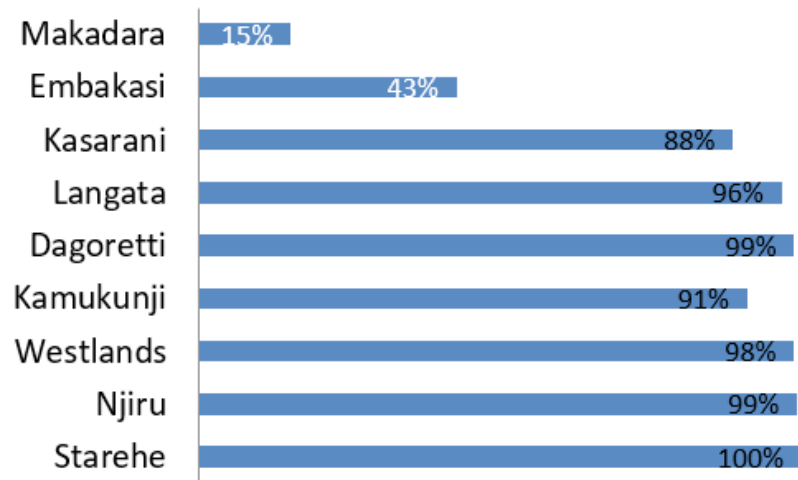
*Total No. of PMTCT maternal patients tested HIV- = 597

*Total No. of PMTCT maternal patients tested = 9,987

* All data is hypothetical

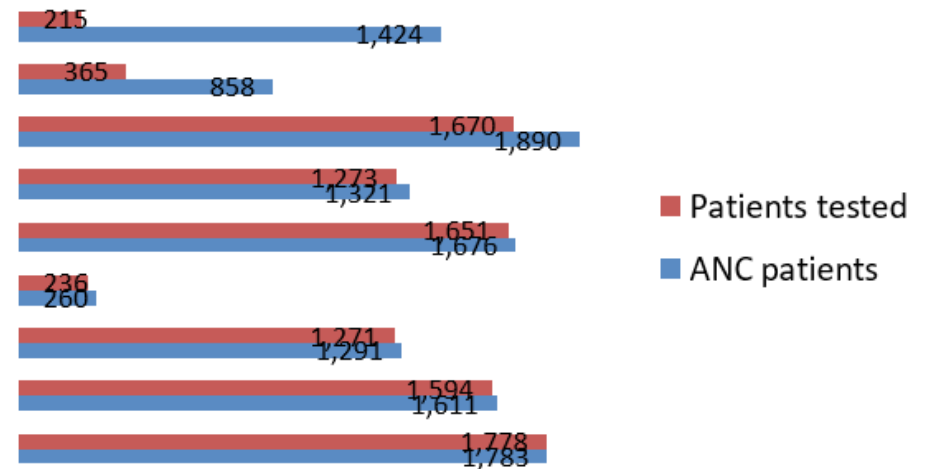
Chapter 4 Product utility

**% of Maternal ANC patients tested for HIV
Nairobi County, Jan. - Mar. 2015**



*Total No. of Maternal ANC patients tested for HIV = 9,987

Total Maternal ANC patients and total patients tested for HIV



*Total No. of Maternal ANC patients = 12,112

* All data is hypothetical

Chapter 4 Product utility

Based on the concept dashboard design on the previous slides, we asked informants to comment on whether these data visuals supported or inhibited their **ability to understand**, interpret, and make decisions based on the data.

At this point, instead of discussing data quality, informants discussed interventions to improve service performance. They also wanted to visit the facilities to find out exactly which ones were having issues.



Observations on the PMTCT information product

Questions	Observation
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<i>What does this information tell me?</i>	“... you can... kind of find out... how many of them did get their prophylaxis, the total number of maternal ANC patients, and the total number of those who are positive... So you can even now try to judge: are they doing very well or is there an area that they need to do an intervention.”
--	--

<i>Any questions about the program?</i>	“... there are areas with more [HIV-positive pregnant women]... Is it because of population... or way of life...”
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<i>Next steps?</i>	“This can tell you a lot... give you a lot to plan for interventions.”
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<i>Recommend?</i>	“... It will require a field visit after digging deeper...”
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Chapter 4 Product utility

Respondents' observations on the **utility of information products**

For the MCH sector, informants were asked to interpret the RMNCH Scorecard (on the following slide).

Some of the visualization techniques used were:

- Linking MCH and HIV- and AIDS-related indicators
- Using color to highlight indicators that needed immediate attention
- Displaying trends with an arrow

Chapter 4 Product utility

RMNCH observation exercise (Kenya)

Kenya - RMNCH Scorecard - Q1/2015

National indicators

MMR	488	NMR	31	US MR	74
IMR	52	% range of Health Services Outcome Index		Adolescent birth rate	
Under 5 stunting	35	General gov't expenditure on health		MMR (Facility-based)	99

Legend

■	Target achieved / on track	↑	Increase from last period
■	Progress, but more effort required	↓	Decrease from last period
■	Not on track		
■	N/A		
■	No data		

Scorecard

#	Region	Pregnancy & Newborn							Early Childhood			Late Childhood	Adulthood	Community		Health Systems	
		Deliveries by skilled health attendants	Skilled Delivery Utilization in Public Hospitals	Female Infants <6 mos on exclusive breastfeeding	PMTCT ARV Prophylaxis Rate (Infant) / PMTCT ARV Prophylaxis Rate (Mother)	HIV + pregnant mothers rec. preventive ARVs	Targeted pregnant women provided with LLITNs	% pregnant women attending 1st ANC visit / % pregnant women attending 4 ANC visits	PNC attendance	Vitamin A coverage (12-59 mos)	Fully immunized Child Coverage	% targeted under 1s provided with LLINs	% School age children correctly dewormed	WRA receiving FP commodities Coverage	% communities certified ODF	Latrine Coverage	Nurses per 10,000 population
1	Kenya	55%	60%	54%	85%	100%	80%	52%	5%	77%	11%	7%	42%	2%	36%	18	83%
2	Baringo	42%	62%	66%	89%	80%	82%	43%	7%	58%	0%	17%	30%	0%	12%	9	92%
3	Bomet	47%	53%	57%	90%	100%	80%	51%	1%	71%	7%	5%	45%	0%	0%	8	95%
4	Bungoma	56%	73%	58%	85%	72%	79%	54%	3%	71%	0%	5%	42%	2%	9%	14	86%
5	Busia	52%	60%	33%	78%	100%	87%	50%	9%	79%	0%	21%	39%	29%	72%	12	88%
6	Elgeyo-Marakwet	54%	67%	48%	18%	30%	81%	30%	2%	77%	0%	0%	44%	0%	4%	12	91%
7	Embu	69%	70%	70%	84%	100%	88%	77%	4%	80%	0%	3%	47%	2%	45%	46	97%

Chapter 4 Product utility

RMNCH observation exercise (Tanzania)

Tanzania: Lindi - RMNCH scorecard - Q2/2014

Highlighted indicators



Legend



Scorecard

Region		Pre-pregnancy	Pregnancy	Labour & Delivery	Newborn Health	Child Health					Health Systems		Human Resources	Health Financing
#	Region	% women 15-49 on contraceptives / Proportion of long-term FP methods	% pregnant women attending ANC1 by 12 weeks / % pregnant women attending ANC4	% deliveries w skilled attendant / % Institutional deliveries	PNC (7 days) - mother / newborn	% children receiving Penta3	% Infants exclusively breastfeeding (6 mo)	% Infants receiving ARV prophylaxis	% Infants receiving PCR test	% health facilities with ORS stocks	% HF w tracer drugs package	Data completeness / Data timeliness	Midwives per 10,000	% of households enrolled in CHFT/TKA
-	Lindi	100% ↓ 8%	17% ↑ 56%	100% ↑ 100%	100% ↑ 100%	100%	18% ↓ 10%	100% ↑ 64%	100% ↑ 100%	100% ↑ 100%	78% ↑ 78%	0 ↑ 0	3% ↓ 3%	
1	Kilwa District Council	100% ↓ 1%	100% ↑ 56%	100% ↑ 100%	100% ↑ 100%	94%	0 10%	0 76%	100% ↑ 100%	100% ↑ 100%	100% ↑ 100%	100% ↑ 53%	8 ↓ 8	2% ↓ 2%
2	Lindi Rural District Council	100% ↓ 2%	17% ↑ 43%	77% ↑ 100%	100% ↑ 100%	100%	17% ↓ 1%	100% ↑ 74%	0 2%	100% ↑ 100%	100% ↑ 100%	4 ↓ 4	3% ↓ 3%	
3	Lindi Municipal Council	100% ↓ 3%	65% ↓ 27%	100% ↑ 100%	100% ↑ 100%	100%	41% ↑ 41%	100% ↑ 40%	0 71%	0 43%	100% ↑ 100%	7 ↓ 7	1% ↓ 1%	
4	Liwale District Council	100% ↓ 4%	100% ↑ 74%	0 55%	100% ↑ 100%	37%	25% ↓ 67%	0 67%	0 80%	100% ↑ 100%	100% ↑ 100%	0 ↓ 0	0 0%	0 0%
5	Nachingwea District Council	100% ↓ 18%	100% ↑ 100%	100% ↑ 100%	100% ↑ 100%	100%	10% ↓ 10%	0 64%	100% ↑ 56%	100% ↑ 100%	100% ↑ 100%	8 ↓ 8	8% ↓ 8%	
6	Ruangwaa District Council	100% ↓ 8%	40% ↑ 100%	100% ↑ 100%	100% ↑ 100%	100%	4% ↓ 4%	100% ↑ 100%	100% ↑ 100%	100% ↑ 100%	100% ↑ 100%	0 ↓ 0	3% ↓ 3%	

Source:

HMIS / HMIS HMIS / HMIS HMIS / HMIS HMIS / HMIS HMIS HMIS HMIS HMIS HMIS HMIS HMIS HMIS / HMIS HR Directorate NHIF

Respondents' observations on the utility of information products

Reactions to the scorecard were dramatically different in Kenya and Tanzania. The reason may have been that Kenya respondents had been oriented to the tool more recently.

In Kenya, informants immediately began describing performance relative to targets. Informants questioned the **accuracy in reporting** for some indicators, but felt they **could still use the data**. In addition to addressing data quality, informants discussed where they needed to focus their efforts.

In Tanzania, several informants found it a challenge to interpret every indicator or differentiate the color patterns. Often they would not refer to the legend but go directly to the data. One informant said there were too many indicators.

These informants were able to identify some of the broad areas of service in the scorecard, such as newborn and child health, labor and delivery, and pregnancy. However, many were unable to describe the information depicted.

An informant requested that the data be in a table. Another informant wanted to know why these indicators were selected. Some informant recommendations for action were:

- Staff training
- Finding additional resources for services
- More supportive supervision
- Promotion of delivery services (attended birth)

Other informants wanted more orientation on how to use the scorecard.

Conclusion: These informant responses suggest that pilot testing and orientation to information products may increase the likelihood that these products will be used to manage programs.

Chapter 4 Product utility

Questions	Kenya MCH Sector Observations	Tanzania MCH Sector Observations
What does this information tell me?	“As a county we are able to tell where we are. We can identify the best county and even decide to do benchmarking there ... You don’t have to struggle so much, you see how the colors ... are ...”	“Why is half of the cell green and another half is yellow or red? What does it mean?” “We lack the knowledge on how to interpret the scorecard ...”
Questions about the program	“... with time the accuracy will improve. For now we can still use the data ... When partners come to the county, we are able to tell them, ‘these are the indicators we are not doing well on.’”	“Why is CHF [community health funds] coverage low in almost every district?” “We find it difficult to tell the meaning of the arrows ... The color key is helpful, but why do some cells have triangles ...?”
Next steps	“Like this one here [points to family planning commodity coverage]. It means we need to do a lot of advocacy, especially at the community level.”	“The district needs to think of interventions to promote facility delivery.”
Recommendations	<ul style="list-style-type: none"> • “We should have a subcounty one ...” • “Is it possible to have this on the dashboard ...?” • “... not everyone would access the computer ...” 	“We recommend orientation of the scorecard to all CHMT members.”

Summary of key findings and recommendations

Provide information products at the point of service delivery. Information products that communicate key messages from data are most effective for staff working close to the point of service delivery.



Target HMIS focal points and decision makers. HMIS focal points and program coordinators are good sources to pilot-test information products. However, products should target decision makers such as regional and district medical officers or health directors, regional and district health secretaries, pharmacists, lab coordinators, and health facility in-charges.



Informants value feedback on performance and advice on how to improve. This includes performance comparisons, implementation strategy, forecasting problems, recognition of good performance, and guidance on the use of additional data or engaging others to use data.

Relate routine data to service delivery. Performance review meetings and other team working sessions to develop tailored dashboards or other information products and to share this work would be opportunities to learn how to use data. Reinforcing the links between the HMIS focal person, program coordinators, and decision makers is essential.



Target information product development in capacity building efforts, interpretation of analyses, and access to multiple databases.

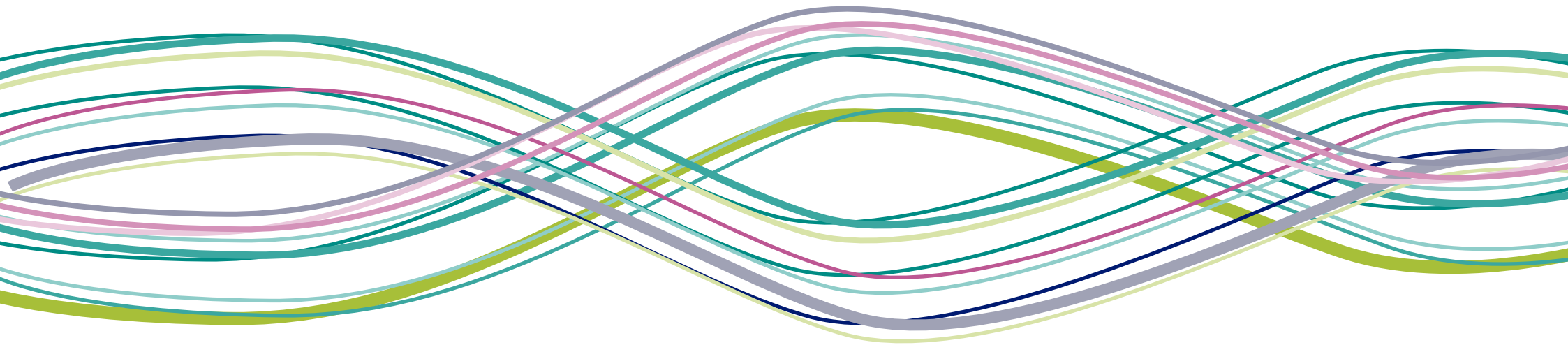
Provide access to health experts. This could help subnational teams develop effective program implementation strategies to address service performance or to interpret discrepancies between different—but similar—indicators.

Reduce the burden of data collection at health facilities. Looking at ways to reduce the burden of data collection, by reducing or harmonizing data-collection procedures.

Conduct annual maintenance reviews on the HMIS to assess Internet access, computer functionality and access, information technology support, availability of data-collection tools, and access to power sources.

Integrate information system databases with DHIS 2. Although some linkages exist, further integration would improve access and overcome many data-triangulation challenges.





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