Data-informed decision-making for life-saving commodities investments in Malawi: A qualitative case study

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Abstract

Background
During the last 15 years, Malawi has made remarkable progress in reducing child mortality. However, maternal and newborn mortality remains persistently high. To help address these entrenched challenges, the Reproductive, Maternal, Newborn and Child Health (RMNCH) Trust Fund provided short-term catalytic financing of $11.5 million (2013-2016) to support country plans to advance the RMNCH and commodity agenda.

Objectives
(1) To document how Malawi (ministries, partners, working groups) used evidence to inform decision-making and RMNCH investments, (2) To identify barriers to utilizing information and evidence in the planning and prioritization process at national and sub-national levels, and (3) To assess the utility of the RMNCH Landscape Synthesis, which uses existing information to review life-saving RMNCH commodities and services.

Methods
This was a qualitative case study utilizing a Rapid Appraisal (RA) approach, where semi-structured interviews were conducted with staff members from UN agencies, development partners and the Ministry of Health (MoH) at national and district level. The analysis enlists a framework approach for manual qualitative content analysis.

Results
Led by the MoH, the RMNCH Trust Fund grant proposal utilized an evidence-based and equity-focused process for prioritization of investments. Data-informed decision-making permeates similar commodity-focused working groups. However, common health information system (HIS) weaknesses, such as data quality and collection burden, persist and are more prevalent at district-level. The collation of evidence in the RMNCH Landscape Synthesis was a useful and sustainable tool to support planning.

Conclusions
The evidence-based, equity-focused decision-making process for the RMNCH Trust Fund proposal provides an effective model for inter-agency investment prioritization. Strengthening data-informed decision-making will require financial and political commitments to HIS and capacity building for data use, particularly at the district-level. New initiatives (e.g. Health Data Collaborative and QED Network to Improve Quality of Care) provide opportunities to further improve evidence-informed decision-making.

Introduction
Malawi has experienced steady progress in reducing under-five mortality from 234 (per 1,000 live births) to 63 from 1992 to 2015, respectively1, an impressive 73% decline to reach the Millennium Development Goal (MDG). However, reductions in neonatal mortality have been more challenging – decreasing at a relatively slower pace of approximately 34% from 41 (per 1,000 live births) to 27 over the same 23 year period1. These rates vary widely across districts and the urban/rural divide, which may depict inequitable access to appropriate and timely health services1. In addition, maternal mortality is 439 (per 100,000 live births)3, which failed to reach the MDG target2. While institutional delivery varies widely by socioeconomic status3, on average, 91% of births are delivered in a health facility1. However, in 2013, only one-third of the facilities had recent relevant in-service training and 45% had insufficient stocks of essential medicines for delivery, such as injectable antibiotics (e.g. penicillin, gentamycin, ampicillin, or ceftriaxone)1. Inequitable access to essential services and quality of care contributes to this discrepancy between high rates of treatment seeking and relatively low mortality reductions2.

An equity-based and data-informed approach to health investment decisions provides a constructive framework for addressing these service delivery disparities. In the context of maternal and child health, an equitable environment provides an opportunity for each woman, newborn and child to survive, thrive and reach their full potential56. United Nations Children’s Fund (UNICEF) defines inequity as when certain groups are “unfairly deprived of the basic rights and opportunities available to others”7. Equity-based approaches focus investment on disadvantaged groups as well as the underlying factors creating the inequity. Investments in equity are both ethical and cost-effective89. Unfortunately, health services fail to reach the most vulnerable populations and often perpetuate socioeconomic, ethnic or gender differences9-11. In recent years, many UN agencies and partners have adopted an equity approach to public health and international development9-14.

Data-informed decision-making is “the consideration of data during program monitoring, review, planning, and improvement; advocacy; and policy development and review”15. Data-informed
With support of the RMNCH Trust Fund and its coordinating team, the Strategy and Coordination Team (SCT), Malawi, completed multiple rounds of the RMNCH Landscape Synthesis monitoring tool (also known as the RMNCH Situation Analysis)31. The RMNCH Landscape Synthesis is a relatively new monitoring tool and approach, which can link to existing planning processes and facilitate data-informed decision-making around RMNCH policy and investments2. Guided by the 13 UNCoLSC commodities and recommendations, the RMNCH Landscape Synthesis uses existing information systems and expert interviews to review the state of commodity manufacturing, import, procurement, regulation, quality control, supply and utilization, to help identify in-country barriers to accessing life-saving RMNCH commodities and services.

This research assessed how Malawi (MoH, partners, working groups) used data to inform decision-making and investments in life-saving commodities and related services since 2013 (year of the initial request to the RMNCH landscape synthesis tool). The goal of this analysis was to identify information and evidence in the planning and prioritization process at national and sub-national levels, and assessed the utility and sustainability of the recently introduced RMNCH Landscape Synthesis monitoring tool.

Methods

This qualitative study was conducted in Malawi from 13 to 20 July 2016 and consisted of semi-structured interviews with staff members from UN agencies, development partners and the Ministry of Health at national and district levels. To maximize the short time period available for data collection, the research team utilized a Rapid Appraisal (RA) approach2. RA approaches are characterized as timely, cost-effective and less structured, but often have limited capacity to generalize the findings2. In this study, RA can be utilized as a formative evaluation tool prior to the end of a project or activity2.

Participants and Sampling

Prior to the interview scheduling, a list of potential partners and individuals for interviews were purposively selected based on participation in RMNCH or commodity-related working groups as well as district-level management staff. The composition of the interviewees was deliberately broad to ensure wide-ranging perspectives from various types of organizations and stakeholders as well as multiple levels of the healthcare system.

Table: 1 Summary of Participants

<table>
<thead>
<tr>
<th>Participant Category</th>
<th># of Interviewees</th>
<th># of Organizations / Departments</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Ministry of Health</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>UN Agencies</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Development Partners</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>District Health Offices</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
<td>12</td>
</tr>
</tbody>
</table>

UNICEF contacted the interviewees via email or phone to schedule each meeting. Reasons for non-participation were limited to extended domestic and international travel or administrative leave during the data collection time period. With the exception of one organization, an alternative interviewee was identified from each organization where none volunteered to be interviewed. In addition, the verbal informed consent process at the start of each interview notified the interviewee of their right to refuse the interview or end the interview at any time, but no interviewee exercised this opportunity to cancel or prematurely end the interview.

Data Collection

Interviews were conducted in Malawi over an 8-day period in July 2016. Interviews were scheduled at the convenience of the interviewee and conducted in the location selected by the interviewee, which was typically their respective office building. All interviews were conducted in English. BN, MM, and SC, conducted all of the interviews with multiple enumerators present during sessions with approximately half of the interviewees. The interviewer obtained verbal informed consent from the interviewee prior to initiation of the interview. A guided by the interviewee and interviewee focus utilized during each interview. Based on the knowledge and experience of the interviewee, the interviewer had the autonomy to delve deeper into a specific topic or move to the next one. Different interview guides were utilized for the two primary types of interviewees national and district-level respondents. The development and use of the interview guide was an iterative process as the enumeration team discussed and made modest changes during the enumeration process.

Data Analysis

Interview discussions were recorded as typed notes and written summaries. Interviewees were asked questions about internal activities and external partners, which presented a risk of meaningful negative impact to the respondent. To promote openness, the interview was not audio recorded. Each interviewer entered written notes from the discussion into their respective password-protected computer. When multiple interviewers were present, the set of notes were compared post-interview for consistency and combined to ensure all relevant information was captured for analysis. This research utilized a framework approach for manual qualitative content analysis30. The researchers read through the interview notes to familiarize themselves with the key ideas. Using the a priori study objectives and experience during the interview process, the researchers identified recurrent themes and developed a thematic framework to organize the results of the interviews. Each interview transcript was annotated and results organized based on the thematic framework using Microsoft Excel software. Development of typologies and associations were based on the interview results mapped against the thematic framework. Data use for planning and prioritization was the analytic angle used for this study.

Ethics

The study required confidential interviews with respondents in various ministerial units, UN agencies and partners. Given the nature of the questions and solicitation of disclosure, responses has a meaningful risk of negative impact on the respondent. All respondents were given informed consent prior to the interview. Each respondent was informed of the study’s benefits, risks, contact list and their right to stop the interview at any time. Interview notes were recorded on computers by the enumeration team (no audio recordings). All interview notes and identifiable information on respondents were stored on password protected computers with the enumeration team. All interview and consent materials were presented to the National Health Science Research Committee of Malawi, which gave approval prior to undertaking the study.

Findings

In regards to data-derived decision-making, four main thematic findings were recognized, including:

1. RMNCH Trust Fund investment process was government-led and data-informed

To make investment decisions for the two RMNCH Trust Fund grants, the Ministry of Health established the RMNCH Committee, which was led by the Ministry of Health and included UN agencies, development partners, civil society and implementing organizations. The investment decision-making process had two fundamental steps: selection of 12 districts for investment and selection of activities within those 12 districts (Figure 2).

Fig 2: RMNCH Trust Fund Investment process

To select the 12 districts for investment, the Committee used an equity-based approach to prioritize geographical areas with relatively weak health indicators. Primary impact indicators of the population planning and information system (PPIS) such as maternal, newborn and child mortality, were used to compare districts as well as service and commodity availability and partner presence to facilitate implementation, among others. The interviewees were collated from various existing data sources (Table 2).
2. Data-informed decision-making permeates other technical working groups

A common thread across RMNCH-related technical working groups is data-informed decision-making. In Malawi, most essential medicines are procured and distributed through the Central Medical Store Trust (CMST). However, multiple partners manage parallel supply chain systems. The Drug and Medical Supplies Technical Working Group (DMS TWG) provides a forum for the government and partners to coordinate drug management decisions as well as related infrastructure, workforce and training activities. The DMS TWG wants “decisions to be evidence-based and use an array of LMIS and HMIS data sources (see Table 2) as well as the ‘Pipeline’ report, which collates data from multiple supply sources for a comprehensive view of commodity availability at national level. When a prospective commodity gap is identified in out-months, typically using the Pipeline report – the Ministry or Health (as the DMS TWG Chair) makes partner requests to fill the supply gap. Partners determine how procurement and resource allocation can be augmented to meet upcoming needs. For partners, final decisions are made outside the DMS TWG forum after confirmation with the partners’ internal teams – the decision is “left to partners to see what their budget can carry” – while official MoH decisions typically require endorsement from Senior Managers outside of the DMS TWG. When available resources cannot meet the demand across commodities, the DMS TWG prioritizes commodities and supplies with the highest impact. In particular, the essential health package (EHP) and other “must have” commodities at the national level, but it has limited capacity to provide feedback to health facilities (outside of infrequent supervision visits or poorly attended district review meetings), which in turn weakens data use capability. The DMS TWG recognizes the importance of commodity availability at district level and presented to the DMS TWG. At sub-national level, DHOs and other “must-have” commodities at this level, with low levels of data use capability, were identified as an issue, DMS TWG commissioned an assessment to identify the projected storage gap over the next 10 years for each facility. Infrastructure investments were made for health facilities with the largest projected gap. In addition, a sub-committee of the Central Medical Store Trust (CMST) conducted a landscape synthesis of existing health information systems. The perceived limitations of RMNCH Landscape Synthesis included the possible commodity quantification analyses; therefore, estimates are used.

Data-informed decision-making in Malawi

The RMNCH Landscape Synthesis was considered a valuable tool for national decision-making. The RMNCH Landscape Synthesis facilitated the prioritization of commodities and investments. The results of the RMNCH Landscape Synthesis were a useful tool for national level decision-making.

Discussion

In the last two Health Sector Strategic Plans dating back to 2011-15, the Malawi Ministry of Health has advocated

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capacity and resources to effectively institutionalize data-driven decision-making. These findings parallel other studies that identify similar challenges with a high local data use, poor leadership, and national capacity for data collection burden on health is a common problem – a recent study in Tanzania 13-15, while socio-political influences have the potential to impact decision-making in Malawi, these findings showcase a data-driven investment framework for equitable health system strengthening. However, strides to ameliorate the persistent challenges faced in this study surrounding HIS and decision-making are paramount for effective and sustainable planning and implementation.

Linking Data Use and Quality
Malawi is constrained by the interlocking forces of data quality and data use. The results of this study are consistent with experiences in other countries where perception of data quality is intertwined with insufficient data use.40,41 For example, Nicol and colleagues40 illustrated how a lack of trust in the quality of HIV-related data in South Africa was a barrier to information use from national program managers down to facility managers. Data use and data quality constitute a mutually reinforcing cycle34,38,50,51. The perception of low data quality reduces use. Conversely, low use reduces the incentives to maintain data quality. In Malawi, reasons abound for these circumstances including unsustainable data collection burden at sub-national level, low analytic capacity, insufficient supervision, and lack of a clear champion or “big sponsor” among stakeholders to continually drive progress in DHIS2.46,50. Collectively, onshoring and operationalizing the current ICT implementation can facilitate upward momentum within this cycle – accelerating data use to improve quality or vice versa. Even when data quality is perceived as sufficient for a specific data source, using the data is an effective approach for improving data use.22,36,51 Moreover, Chaulagi and colleagues51 for public servants within Malawi was constrained by limited access to and interpretation skills for health data. Therefore, organizations must push efforts at the community-level to provide relevant and user-friendly information to engage with civil society organizations, for example, promoting community-level scorecards22 between health programs and community members.22

Second, in terms of local data use, HIS improvements are typically targeted at district or regional level, which overlook local decision-makers and their data needs.22,36,51 Moreover, Chaulagi and colleagues51 for public servants within Malawi was constrained by limited access to and interpretation skills for health data. Therefore, organizations must push efforts at the community-level to provide relevant and user-friendly information to engage with civil society organizations, for example, promoting community-level scorecards22 between health programs and community members.22

While socio-political influences have the potential to impact decision-making in Malawi, these findings showcase a data-driven investment framework for equitable health system strengthening. However, strides to ameliorate the persistent challenges faced in this study surrounding HIS and decision-making are paramount for effective and sustainable planning and implementation.

Extending utility to sub-national levels: district, facility, and community
While some improvements are needed, this study illustrates that national-level planners and managers successfully use the HIS to make decisions that align with their strategic priorities, extending to other funding sources and technical working groups. This parallels attempts across other developing countries towards equity-based investment approaches.38,50,51

Health Performance Improvement (DHPI)
Recent years, MoH and partners have supported the District Health Information System for Health Performance Improvement (DHPI) – a productive start. Moreover, in recent years, MoH and partners have supported the District Health Performance Improvement (DHPI)38 approach in select districts, which builds capacity on local data use for equity-based bottleneck analyses and strategic planning. In a decentralized health system, extending these capabilities to all districts will improve local governance and long-term, evidence-based planning across the country.

Lastly, the results of this study indicate Malawi has taken critical steps to build a data-oriented culture within its national leadership. As Lorenzo and Riley38 proffer, leadership sets the pace for cultural shifts. However, like many other countries,51 Malawi needs to improve the data use culture at sub-national levels. To this end, Malawi is undertaking a new initiative to strengthen health services with the Quality, Equity, Dignity (QED) Network to Improve Quality of Care for Maternal, Neonatal and Child Health.84,85 The approach focuses on strengthening quality improvement (QI) plans locally by linking QI teams of existing personnel at district and facility levels. As outlined by Green and de Kock,86 QI teams undertake short cycles of improvement where they will identify urgent problems (e.g. low utilization of corticosteroids) and work expeditiously to improve availability and readiness at frontlines, measure and study the results, and sustain successful changes to operation. This approach has the potential to fundamentally change how sub-national planning for health will require strengthening financial and political commitments to HIS and capacity building for data use, particularly at sub-national levels. New initiatives (e.g. M&E Taskforce / Health Data Collaborative and QED Network to Improve Quality of Care for Maternal, Neonatal and Child Health) provide opportunities to further improve data-driven decision-making.

Conclusions
The data-informed, equity-focused decision-making process for the RMCH Trust Fund proposal provides an effective model for inter-agency investment prioritization. Strengthening data-driven decision-making will require better financial and political commitments to HIS and capacity building for data use, particularly at sub-national levels. New initiatives (e.g. M&E Taskforce / Health Data Collaborative and QED Network to Improve Quality of Care for Maternal, Neonatal and Child Health) provide opportunities to further improve data-driven decision-making.

References
6. The Global Strategy for Women’s and Children’s and Adolescents’ Health: Transforming the RMNCH Landscape Synthesis to local institutions provides an opportunity to more fully adapt the Human Capital Index – both national and sub-national. The tool was originally designed to track progress for the 13 life-saving commodities as “tracers” for the wider supply chain, but various public health practitioners such as a district-level health policy maker can modify the list of commodities or related indicators to fulfill the vaccinating needs of the Malawian health system, such as incorporating recent evidence on antenatal corticosteroids87. As advocated by Nutley and Reynolds88,90, engaging the data users and data producers at multiple levels of the healthcare system will ultimately increase the demand for and use of the RMCHN Landscape Synthesis in Malawi.

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Study Limitations
This study has several limitations. Due to the rapid assessment (RA) approach, the study team had limited time for in-depth examination of the subject matter. The short time window also limited the participation of health care providers based on scheduling availability, although only one organization on the interview list was not available. UNICEF provided the interview list, which may have unintentionally biased the representation of national stakeholders. Nonetheless, either nationalplanningcycles.org/sites/default/files/planning_cycle_repos/malawi/healthsector_strategic_plan_ii_00314_data_dps.pdf.
