



# Achieving Enhanced Financial Monitoring of Global Health Programs

Findings From the Country Owned, Real-Time, Resource Tracking (CORRT) Initiative

# EXECUTIVE SUMMARY

Imagine you are responsible for strategic planning of health programs within a low-resource country. You aim to improve health outcomes, but you don't know how much money you have, how much services and commodities cost, or where the need is greatest. These conditions are the norm in health systems in low-and middle-income countries.

Fortunately, the oft-neglected field of health financing is experiencing a resurgence of interest. Ministries of Health and Finance in recipient countries are leading their own health financing agendas after years of following those of donors. They are asking:

- What are our total resources from both donors and internal revenues?
- What is the burden of disease at a granular (sub-national) level?
- What is the unit cost per health service?
- Why is there a wide range of unit costs for the same service?
- How quickly are we spending our funds?
- What is the economic value our country derives by investing in the health of our citizens?

Decision makers draw from the limited information available to answer these questions. Their information systems collect data infrequently from excel spreadsheets or paper-based tools. These tools and systems have become more mature over time, improving Ministries' ability to share and discuss data. At Cooper/Smith, we have witnessed this shift broadly over the last decade, and especially over the last two years of our work on the "Country-owned, real-time, resource tracking" (CORRT) initiative. The Bill & Melinda Gates Foundation funds the CORRT initiative,

with support from the World Bank's Global Financing Facility, the Global Fund, Gavi, and the WHO.

The demand for CORRT is obvious. Countries need their own real-time, high quality, health financing data in order to achieve better health outcomes. They want advanced information systems for health financing data that match systems for programmatic data. They often have a foundation of information systems, governance, and human resources to build upon. Coordinated global support – through appropriate guidance, frameworks, technology, tools, and funding –can help them succeed.

This report summarizes two years of work to advance the health financing agenda. It includes collaboration with partner country leadership in Liberia, Malawi, Rwanda, Indonesia, and Tanzania, as well as global funders. We provide a brief history of the advances in health finance monitoring over the past decade. We then reflect on enduring challenges as well as opportunities for investment to improve health financing systems.



Based on our extensive work, the most persistent challenges to enhancing health finance monitoring are:

1. Lack of routine processes and adequate guidance to capture high-quality data on total health budgets and expenditure
2. Technologically outdated (sometimes paper-based) tools and systems that respond more to donor than domestic stakeholder needs
3. Weak incentives to share health finance data
4. One-size-fits-all software or data tools that fail to meet the needs of individual countries



Our work found major areas for investment that can address these obstacles:

- **Renew focus on local capabilities and leverage existing systems.** Solve health financing challenges at the country level. Each country has a different set of tools, systems, capacities, and data at varying levels of maturity. Therefore, tailor solutions for minimum disruption and maximal sustainability. We developed materials and frameworks to help meet this need (*see Appendix A*).
- **Invest in a coordination mechanism at the global level.** It should focus on reaching agreement on a set of guiding principles, frameworks, and tools for improving the state of health financing systems. **It can compare solutions, match funding to need, develop software, allocate technical assistance, and document best practices.**
- **Develop solutions for wide-spread replication.** They should address core functional needs in every country, such as automated and streamlined digital data capture for external sources of health financing. Solutions should be easy to replicate across countries with similar needs.

Advancements in information systems technology, along with keen country-level interest, mean that the time is opportune to improve data for health decision making, efficiency, and impact.

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# ACRONYMS

## **AIDS**

Acquired Immunodeficiency Syndrome

## **BI**

Business Intelligence

## **CHAI**

Clinton Health Access Initiative

## **CORRT**

Country-Owned, Real-Time, Resource Tracking

## **DHIS**

District Health Information System

## **EMR**

Electronic Medical Record

## **ET**

Expenditure Tracking

## **GFF**

Global Financing Facility

## **GOL**

Government of Liberia

## **HFU**

Health Financing Unit

## **HIV**

Human Immunodeficiency Virus

## **HMIS**

Health Management Information System

## **HRTT**

Health Resource Tracking Tool

## **IFMIS**

Integrated Financial Management Information System

## **LMIC**

Low-and Middle-Income Countries

## **MOF**

Ministry of Finance

## **MOH**

Ministry of Health

## **NASA**

National AIDS Spending Assessment

## **NGO**

Non-Governmental Organization

## **NHA**

National Health Accounts

## **PEPFAR**

United States President's Emergency Plan for AIDS Relief

## **RGB**

Rwanda Governance Board

## **RM**

Resource Mapping

## **RMET**

Resource Mapping and Expenditure Tracking

## **RSSB**

Rwandan Social Security Board

## **SHA**

System of Health Accounts

## **TA**

Technical Assistance

## **TWG**

Technical Working Group

## **UNAIDS**

United Nations Joint Programme on HIV/AIDS

## **WHO**

World Health Organization

# BACKGROUND

## TRACKING HEALTH RESOURCES REMAINS A PERSISTENT CHALLENGE

Imagine trying to plan a government-run health program without knowing how much money you have available, how much services cost, and whether funds were disbursed. Now imagine trying to plan and deliver health services without those key data in a pandemic. The primary goal of governments is to raise revenue, coordinate payor resources, and expend resources – while maximizing health benefit, equity, and access. Fundraising and coordination are particularly critical in low-income nations, where per capita health expenditures are estimated at only \$35.<sup>1</sup>

There are opportunities to make significant improvements for crowding-in resources and improving allocative efficiency. Additional and better use of resources can lead to significant improvements in health outcomes. Core to uncovering these efficiencies are understanding where and how resources are already allocated (resource mapping) and then tracking how those expenditures are spent (expenditure tracking).

Despite its importance, resource mapping and expenditure tracking (RMET) remains a persistent global health challenge. Reaching back to the 2008 global financial crisis, fiscal pressures led to the surfacing of the importance of RMET for both immediate continuation of health services as well as long-term expansion and sustainability.<sup>2</sup> Specifically, donors and recipient countries faced a need to increase technical and allocative efficiency. **Central to increasing efficiency is having a detailed understanding of health budget flows and expenditures in a timely fashion.**

Existing global tools, such as the World Health Organization's (WHO) **National Health Accounts (NHA)**, have historically not provided sufficient or relevant information for local level decision makers.<sup>3</sup> For example, the NHA might provide data on total health expenditures in the public and private sector, but might not disaggregate to the health program level or geographic level. This means that stakeholders cannot understand whether expenditures are aligned with disease burden and geographic need.<sup>4</sup>

From 2010 to 2013, the Clinton Health Access Initiative (CHAI) supported nine countries in Africa by introducing RM to routine budget procedures.<sup>5</sup> This initiative facilitated the collection of budget data from domestic, donor, and non-governmental organizations (NGOs). These data were used for health-sector wide planning to help crowd in resources and reduce duplication and wastage.

Beginning in 2012, the United States President's Emergency Plan for AIDS Relief (PEPFAR) began deploying its ET activity, named the Expenditure Analysis.<sup>6</sup> The exercise captured billions of dollars in HIV program expenditures by geography, program area, and cost category annually. **These data were linked with program outputs to calculate unit expenditures** and were critical to unlocking capabilities of understanding and improving transparency, accountability, and efficiency.

From 2010 to 2015, PEPFAR led global dialogue efforts with UNAIDS and WHO to harmonize RMET for HIV. However, in 2015 PEPFAR focused on improving internal processes, and global efforts languished. This led to an increased need for country governments to manage external financiers individually. This led to fragmentation and **lack of progress towards country-owned, real-time, resource tracking (CORRT)**.

In 2018, the Global Financing Facility (GFF) brought about renewed interest in RMET and sustainable health financing. With leadership from the World Bank and support from the Bill and Melinda Gates Foundation (BMGF), the GFF sought to support 36 low- and middle-income countries (LMICs) to reduce maternal, newborn, and child mortality.

Central to GFF financing was country commitment to improve efficiency, raise funds, and coordinate donor and private sector support.

Cooper/Smith was funded by the Bill & Melinda Gates Foundation to support initial global dialogues in 2019 and 2020 on CORRT with both partners and countries. This report is a summary of these efforts, including fact-finding missions to several countries, in-depth country support, and discussions with multiple global partners including BMGF, Gavi, GFF, the Global Fund, and the WHO.





# Enduring Challenges

## Financial Data are Special

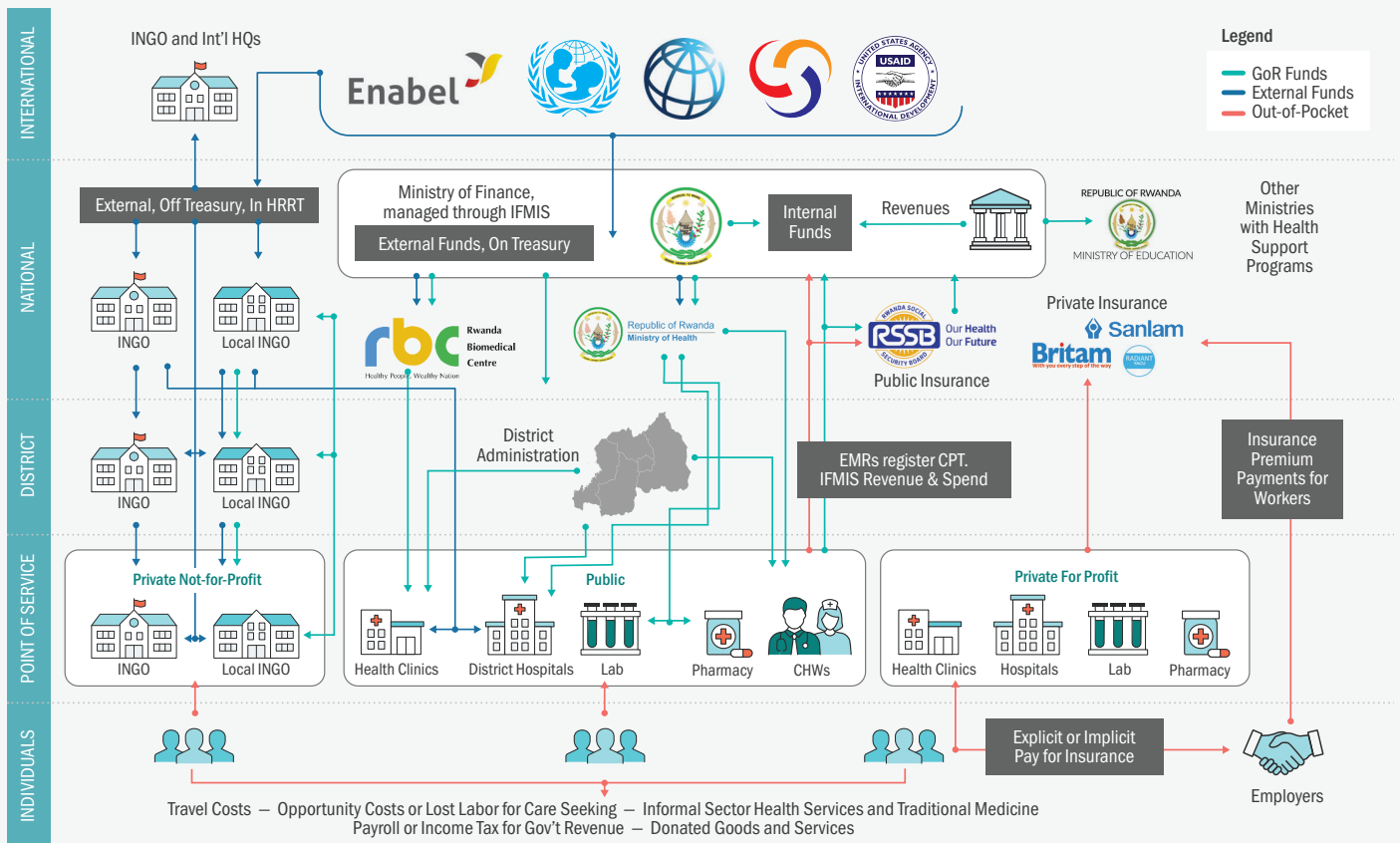
Despite the lack of progress globally towards greater access to timely and accurate health financing data, their complement – programmatic data (number of beneficiaries of health services) – has seen great advances in capabilities in LMICs. However, compared to programmatic data, financial data have some unique characteristics.

**First**, resources are fungible and shareable across space and purpose. Take for example the salary of a primary care doctor. Over the course of a year a

doctor will see patients for all sorts of conditions – from respiratory conditions to cardiovascular disease to cancer to maternal health. Attributing their salary to each of these critical services can be difficult without additional data on level of effort.

**Second**, producing health services at a clinic or hospital is often the product of a complex flow of resources from a variety of stakeholders (Figure 1).

Figure 1: Illustrative Example of Health Financing Flows, Rwanda



For example, a health facility may receive resources from domestic sources at the national and sub-national level, from international donors including bi-lateral and multi-lateral sources, and other local donations and in-kind contributions. This results in a somewhat unique outcome for financial information (vs. other types of health data) which is that there is differing visibility into financial information at various levels of implementation and planning (e.g., health facilities, districts, and national levels). This is because financial information may often be siloed and not easily aggregated or disaggregated across stakeholders.

**Finally**, the utility of financial information is largely contingent on the granularity and level of disaggregation available. Understanding total resources spent across the health sector is minimally useful, as planners often want to know who is spending money on what health services through which inputs and where are the services produced. Disaggregating resources by each of these features simultaneously can be challenging from a system and tracking perspective.

## Sustainability Has Been an Afterthought

Another challenge in the global RMET agenda has been limited attention and consideration for sustainability. Pay-for-consultant models to gather financial data on an ad hoc and infrequent basis has been predominant in LMICs. This approach ultimately led to the collection of financial data with limited usability at the local level, and no improvement in local capacity for financial monitoring of resources.

Furthermore, investments into building the capacity of financial management and monitoring systems have been limited, uncoordinated, and tertiary. With sustainability left as an afterthought, there is little wonder why CORRT remains unrealized in so many countries. Systems level thinking - which encompasses the ecosystem of processes, tools, and digital technology - is needed to implement solutions which can be sustainably and consistently maintained.

## Reporting Compliance is Suboptimal

Financial data captured through RMET efforts are only as useful as the data are high quality and complete. Historically, reaching high levels of reporting compliance has been challenging. Host national government efforts to gather financial data from multi- and bi-lateral donors have been limited, delayed, and incomplete. Conversely, the collection of complete host national government budget and expenditure data via international agencies has also been incomplete. This results in the obvious limitations of the usability of these data, as well as delays in the release of data.

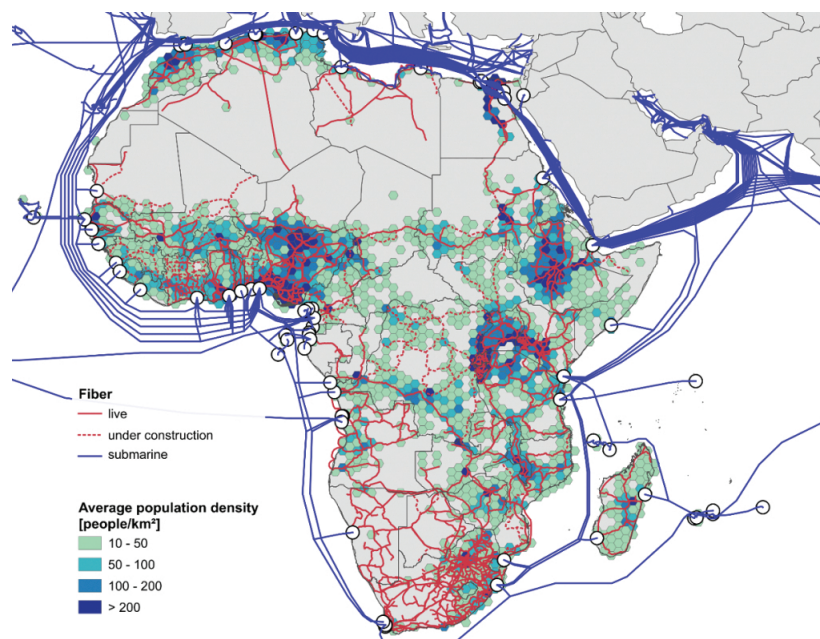
A frequent challenge for reporting compliance is lack of finance and accounting capacity, as well as accessible guidance, allocation keys, and tools which could make reporting financial data simpler. A contributing cause to this issue is the silos which exist between the relevant experts required to tackle such problems. Representatives from economics, finance, accounting, health, and information technology are often not coordinating when resources and effort is required to improve systems.

## Ad Hoc Financial Reporting is Common and Duplicative

Because global and local processes for reporting financial information are not streamlined and harmonized, frequent but ad hoc requests for financial information produce significant duplication on those responsible for contributing data. This inefficiency results in frustration, poor compliance, and inconsistency in data. Nevertheless, the motivation for these financial data are valid and the needs ought to be met.

## One Size Will Not Fit All

From a technological perspective, a one size fits all software platform, data collection tool, and analysis framework, has attractive properties. For programmatic health data, the District Health Information System (DHIS) has become a popular open-source platform for routine reporting of health output data. Such a tool could resolve technical data management and collection challenges faced by LMICs in capturing financial data. It could also move towards harmonizing and integrating globally.



Visualization of fiber infrastructure in Africa and population density, showing unserved regions.  
Source: Network Startup Resource Center, TeleGeography, and European Commission.

While seemingly a good choice for advancing the global CORRT agenda, a one size fits all approach for software is unlikely to be fruitful for financial data. First, it is important to recognize that financial management for health is a cooperative effort across multiple sectors – but primarily health and finance. In most settings, it is the Ministry of Finance (MOF) – not the Ministry of Health (MOH) – which has the critical responsibility of tracking and accounting for health resources. Specifically, Ministries of Finance leverage an Integrated Financial Management Information System (IFMIS) to track the outlay of resources across health (and other sectors).

Therefore, solutions to improving RMET capabilities for Ministries of Health ought to consider leveraging, interoperability, development, and capacity building for IFMIS and Ministry of Finance staff.

Furthermore, a one size fits all tool across many countries would serve to supplant existing IFMIS (and other information systems). This not only causes disruption to routine governance and monitoring, but also can be inefficient from a systems development perspective.



# Convening A Global Technical Working Group

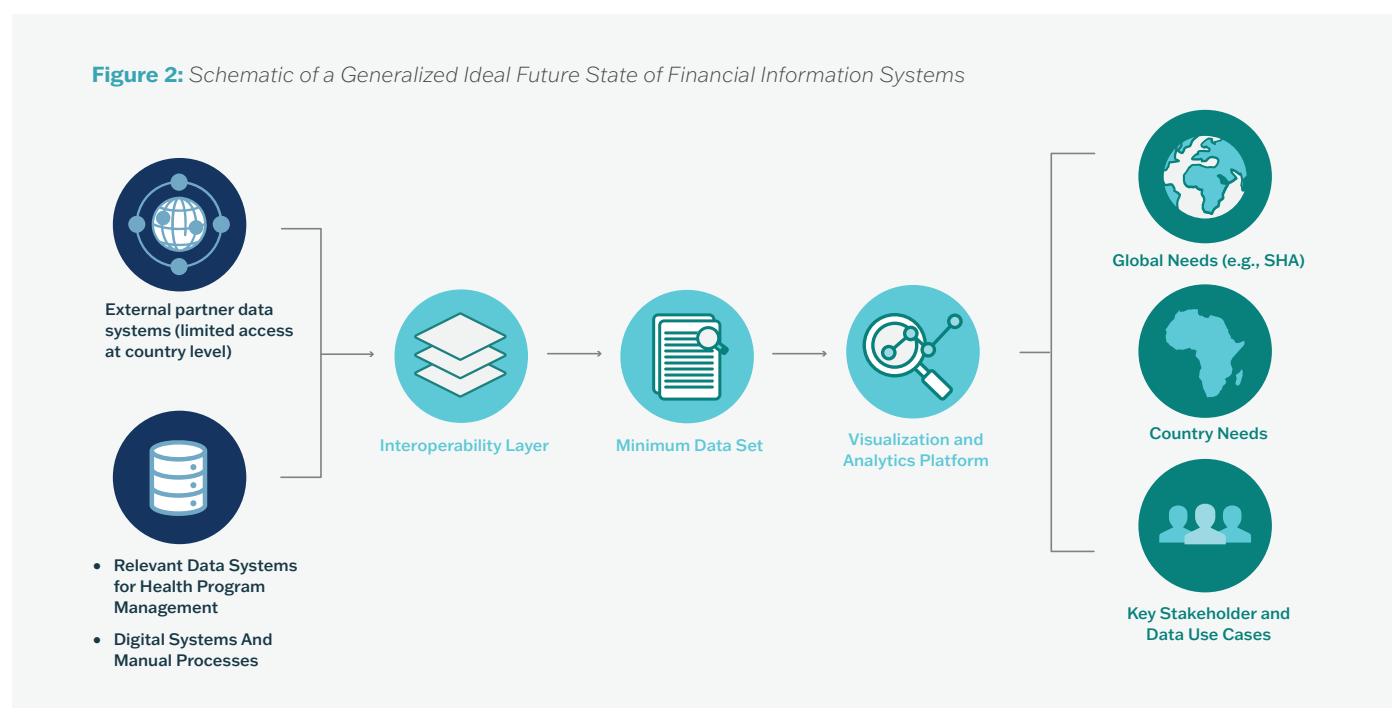
One critical gap to advancing the CORRT agenda has been the lack of clear leadership, guidance, and coordination at the global level among technical experts, implementers, and donors. This leadership is critical as there is a dearth of documentation of successes which could act as road maps for countries seeking to improve their public financial management capabilities. BMGF was interested in jumpstarting these discussions and convened a technical working group (TWG) composed of technical experts within multilateral agencies and institutions with a history and interest in CORRT for health.

The CORRT TWG was inaugurated in July 2019 in Geneva with participants from the Bill and Melinda Gates Foundation; Gavi; the Global Fund for AIDS, Tuberculosis, and Malaria; the Global Financing Facility; the WHO; the World Bank; the Clinton Health Access Initiative; and Cooper/Smith. Finance and planning staff from the governments of Indonesia, Liberia, Malawi, Rwanda, and Tanzania also participated in this initial TWG meeting. The purpose of the initial meeting was to harmonize and coordinate ongoing and planned CORRT projects from donors, as well as highlight a variety of use cases and needs from the country perspective. This group also defined a set of ten key principles for guiding country owned real-time resource tracking systems and tools (*Table 1*).

**Table 1:** Proposed CORRT Principles from TWG Stakeholders

<b>County Owned</b>	Systems and tools should be country owned and the country empowered to maintain the systems.
<b>Data Governance</b>	The system and tools should align with current legislation, policies, and standards and include data governance, privacy, sharing, access, and release policies.
<b>Country Capacity</b>	Countries should have the technical ability to maintain and continually access the tools.
<b>Fit-for-Purpose</b>	Systems or tools being developed should be fit-for-purpose and meet country needs.
<b>Shared Value Proposition</b>	Governments should build common purpose across stakeholders to have a more effective and efficient budget.
<b>Prioritize Interoperability</b>	Where able, countries and donors should strengthen and leverage existing systems and create linkages between them for interoperability.
<b>Public Goods</b>	The global community should develop scalable, sustainable, and interoperable public goods that meet country priorities.
<b>Collect Once, Use Many Times</b>	The global community should harmonize data requests for financial data and these data should be able to serve multiple purposes.
<b>Quantify Costs</b>	The global community and partners should determine and quantify the costs of operating and maintaining a resource tracking system and tool for sustainable country ownership.
<b>International Standards Alignment</b>	The global community should ensure that systems align to international standards and donors should coordinate to harmonize international requirements.

The TWG agreed that it is important to have a common definition for key terminology as some health financing terms have a generic single meaning, whereas other terms can mean something different across audiences. During the workshop, participants used an online survey to vote on the definitions of 12 key terms: budget, resource tracking, resource allocation, expenditure, expenditure analysis, allocative efficiency, resource mapping, tool, platform, data system, interoperability, and global good. The group defined budget as the total amount of resources required to support health activities for a particular year, including on and off budget resources. However, more time should be devoted to gaining a consensus on the remaining terms and additional health financing terminologies. The inaugural TWG workshop attendees also reached concurrence on a generalized framework of an ideal end state of capabilities, features, and interoperability of health financing systems (Figure 2).



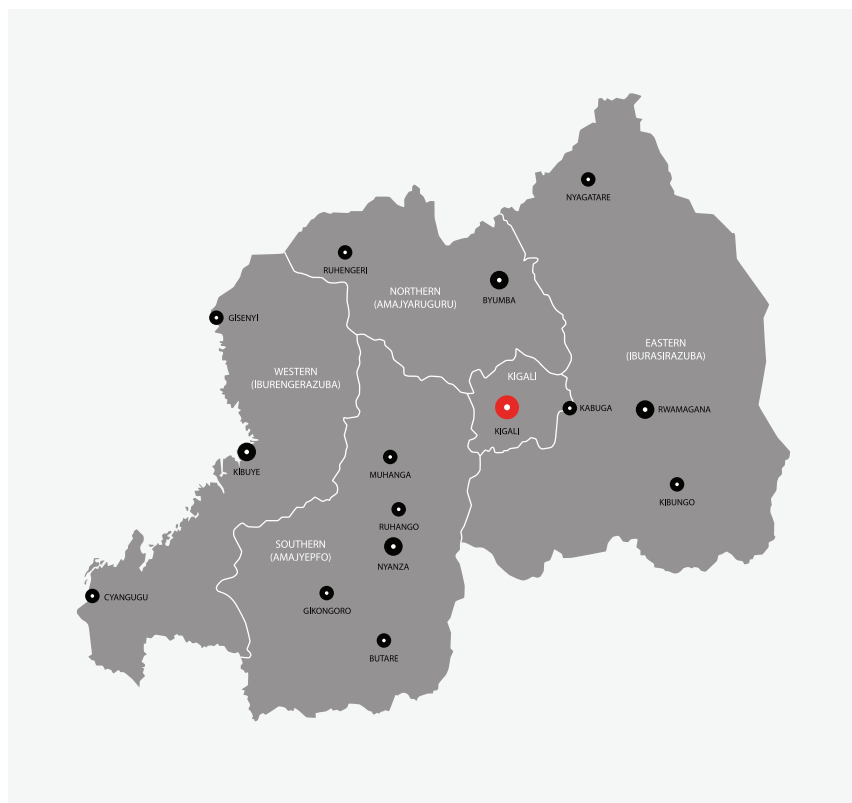
The TWG members continued to routinely meet (virtually) in 2020, but ultimately held its final meeting in September 2020. Further, the global landscape of CORRT priorities and efforts shifted, minimizing the utility of the TWG (at least temporarily). Still, there exists a tremendous need for a centralized institution(s) to lead the global CORRT agenda, to facilitate coordination across funders, harmonize and improve efficiency of technical efforts, and issue global guidance and recommendations for the specifications and systems requirements for marginal improvements to CORRT systems in LMICs.

Furthermore, conditional on achieving other global CORRT advancements, a global CORRT TWG could act as an effective intermediary between willing donors and recipient nations as planners and implementers hope to efficiently improve systems, without duplication and through leveraging diverse effort. Nevertheless, as country governments continue to express a need for investments and improvements to systems and processes, there is a dearth of technical resources and absence of strategy that will result in inefficiencies and suboptimal interventions.

## Country Insights

Beyond fostering leadership and growth at the global level, we observe a considerable demand and interest in improving financial management capabilities at the country level. Based on expressed interest from staff in Ministries of Health and Planning, we initially sought to describe the state of current capabilities, gaps, and roadmaps for development in five countries – Indonesia, Liberia, Malawi, Rwanda, and Tanzania – who were all present at the July 2019 convening. Each country articulated strong, compelling visions and use cases for health financing data and had unique objectives for their health financing systems. Here, we briefly summarize findings from Rwanda and Liberia as they present interesting contrasts across several dimensions of capacity, systems development, and needs.

## Rwanda



As previously mentioned, Rwanda has been regularly highlighted as among the most advanced LMICs in terms of governance and RMET capabilities. In coordination with the Planning Unit within the Ministry of Health, we conducted a two-week mission to interview and gather information to inform the CORRT maturity model. The end goal was to identify gaps and the necessary activities and funds required to advance Rwanda's RMET capabilities at a minimum or achieve CORRT if possible.

Key use cases highlighted by Rwandan stakeholders included improvements to national planning, coordination with partner institutions,

and data use by the Rwandan Social Security Board (RSSB). A simple planning use case involved the need to geographically map budget and expenditures for malaria control at the district level and align that financial data with epidemiological and programmatic data on malaria incidence and service delivery, with the goal of ensuring proper alignment between the two. At the partner level, there is a desire to review planned activities more accurately at the central level, across donor and implementing institutions to identify areas of potential duplication or to improve efficiency. Finally, there is an opportunity within RSSB to strategize to ensure that the highest impact interventions among the most vulnerable would be available and covered, without causing catastrophic health expenditures.

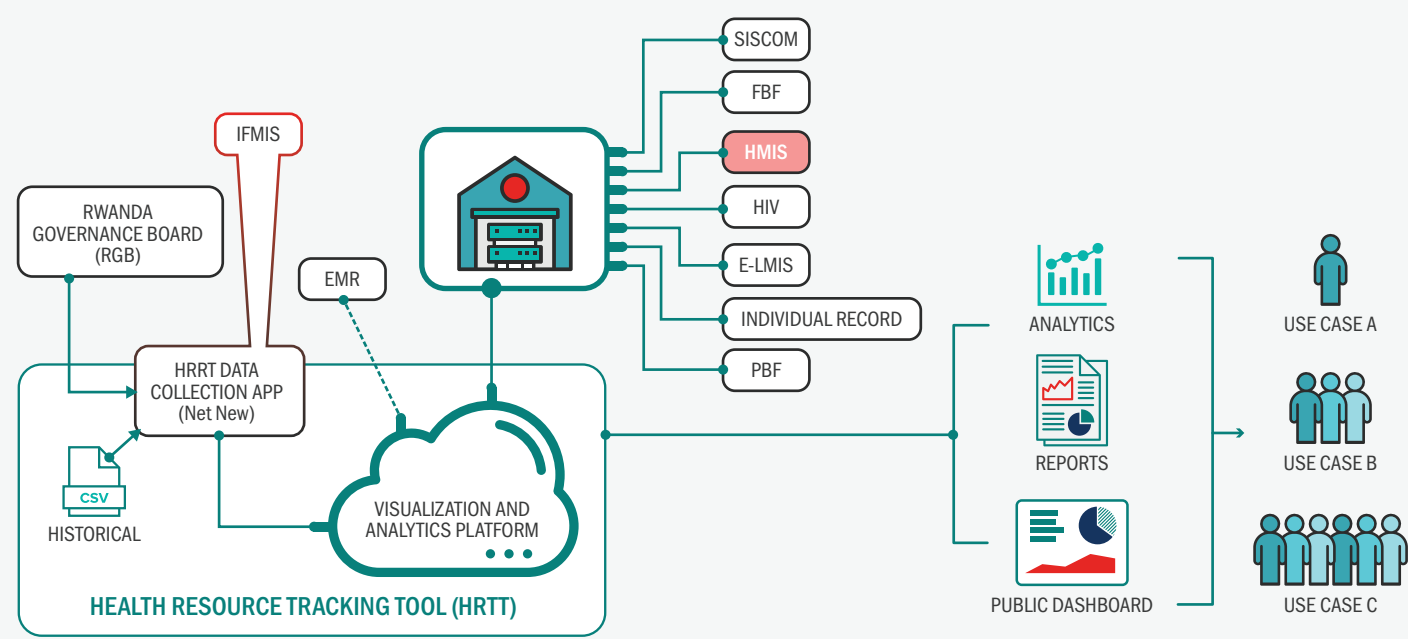


We also explored the digital ecosystems of health and finance data. Rwanda has a long history of activity in RMET, with their Health Resource Tracking Tool (HRTT) stretching back several years. The HRTT has undergone several revisions from its initiation, with inputs along the way from global donors and NGOs, with the Rwandan government now operating the exercise with effort from the Planning Unit and Information Technology jointly. Unfortunately, development and improvements to the HRTT software have been limited recently due to staffing and capacity shortages within the ministry. Further, reporting compliance, analytics, and reporting have been delayed and improvements in automation and reporting are needed. Finally, Rwanda has a rich ecosystem of other health information systems with high utilization and compliance throughout. Simply put, there was a desire to update and improve the data collection experience, leverage, and integrate existing systems, and build upon the excellence in capacity and governance which already exist in Rwanda.

Importantly, Rwanda has an extraordinarily strong capacity within its MOF, and specifically a large staff of in-house software developers who manage the IFMIS. While in country, we met with the leads of the IFMIS development team who expressed interest and capability to develop, customize, and integrate the IFMIS to meet their needs with direction and support from the MOH. This team of developers had recently completed a customized update to the IFMIS for the Education Sector to conduct bespoke analytics, while remaining entirely integrated and managed by government staff.

Based on the findings of this trip, we found that Rwanda was not quite a CORRT exemplar – the RMET software was not readily updated by government staff and the data were not real-time. However, there existed the groundwork, capacity, and desire to reach CORRT with a marginal improvement. The future idealized end state primarily involves the integration of existing systems, with a new development of the HRTT data collection app and a business intelligence (BI) platform to facilitate automated analytics and reporting (Figure 3).

**Figure 3:** Proposed Systems Interoperability for Advancing Health Financing Capabilities in Rwanda





On the financial side, we proposed leveraging in-house development expertise to customize the IFMIS to meet the categorical data needs of the HRTT. Specifically, the IFMIS has upwards of 36 digits which can be used to classify financial information, of which health is only utilizing a fraction. We proposed customizing the IFMIS to utilize its remaining digits to align categorization at a minimum with the HRTT. We would leverage the MOF's development team to work in 4-week sprints to develop, test, and implement the updated IFMIS system. If successful, this would automatically cover and automate reporting for government facilities which report into the IFMIS daily. Stakeholders could further consider expansion, enhancement, or adjustment to the HRTT (now or in the future) with in-house resources.

For external resources, we proposed an extension to the IFMIS which would be externally facing for donors to routinely enter data (minimum quarterly). Donor data entry would also be linked with the Rwanda Governance Board (RGB) system, which is required to be reported to from donors in order to maintain their operational licenses in Rwanda. On the programmatic side, we would link two high-quality, existing systems. First, the health management information system (HMIS) has extensive information on health services and program coverage including surveillance, performance, laboratory, and commodity data. Furthermore, Rwanda was in the process of reaching universal coverage of its electronic medical records (EMR), a presidential priority for 2020 and 2021. Together these data, linked to real-time and complete capture of financial data, would unlock new capabilities to meet the use cases outlined by stakeholders during our mission. The systems would all be owned, operated, and maintained by ministry staff, allowing for easy improvements and changes to remain relevant in the future.

## Liberia

In coordination with the Health Financing Unit (HFU) within the Ministry of Health and the Global Financing Facility, we assessed existing tools used to track and monitor external resources, understand the usefulness and limitations in the current structure, and collect preliminary requirements for an updated resource mapping platform. The end goal was to identify gaps and the necessary activities and funds required to design and test an improved resource mapping system in Liberia.

Key use cases highlighted by the HFU and MOH included harmonizing the resource mapping and activity mapping processes and leveraging existing platforms for the resource mapping process. At the beginning of CORRT, Liberia used an excel-based tool to capture resource mapping data annually. The excel tool had been in use for several years and had undergone multiple iterations. However, the RM and activity mapping were conducted separately and looked at different levels of data. Where RM reported financial data at the county level, activity mapping captured data at the district level. The MOH requested to use outputs of the resource mapping to provide the activity mapping, identifying the “who, what, where, and when” of partner activities throughout the country.

Several issues surfaced during consultations with stakeholders that underscored the need for a better understanding of health financing flows in Liberia to inform RM platform design. First, the true value of health resources available in Liberia was not known. We identified systems within the MOF and MOH that utilize health-related programmatic and financial data. Implementing partners have their own separate systems and only interface with the RM Excel tool. The MOF utilizes the IFMIS to manage all NHA and on-budget data. The MOH uses a separate system – NetSuite – to upload IFMIS data and capture off-budget data. The off-budget data captured in NetSuite includes funding that is on the books, such as direct funding to county health teams. The only time systems interact is when the MOH manually uploads IFMIS data into NetSuite. Additionally, there is no Government of Liberia (GOL)-accessed system that captures funding allocated by external sources directly to implementing partners. Though several systems within MOH and MOF capture future funding commitments in various levels of detail, none exhaustively capture all funding sources or implementing partners, leaving no benchmark to compare comprehensiveness of reported data.

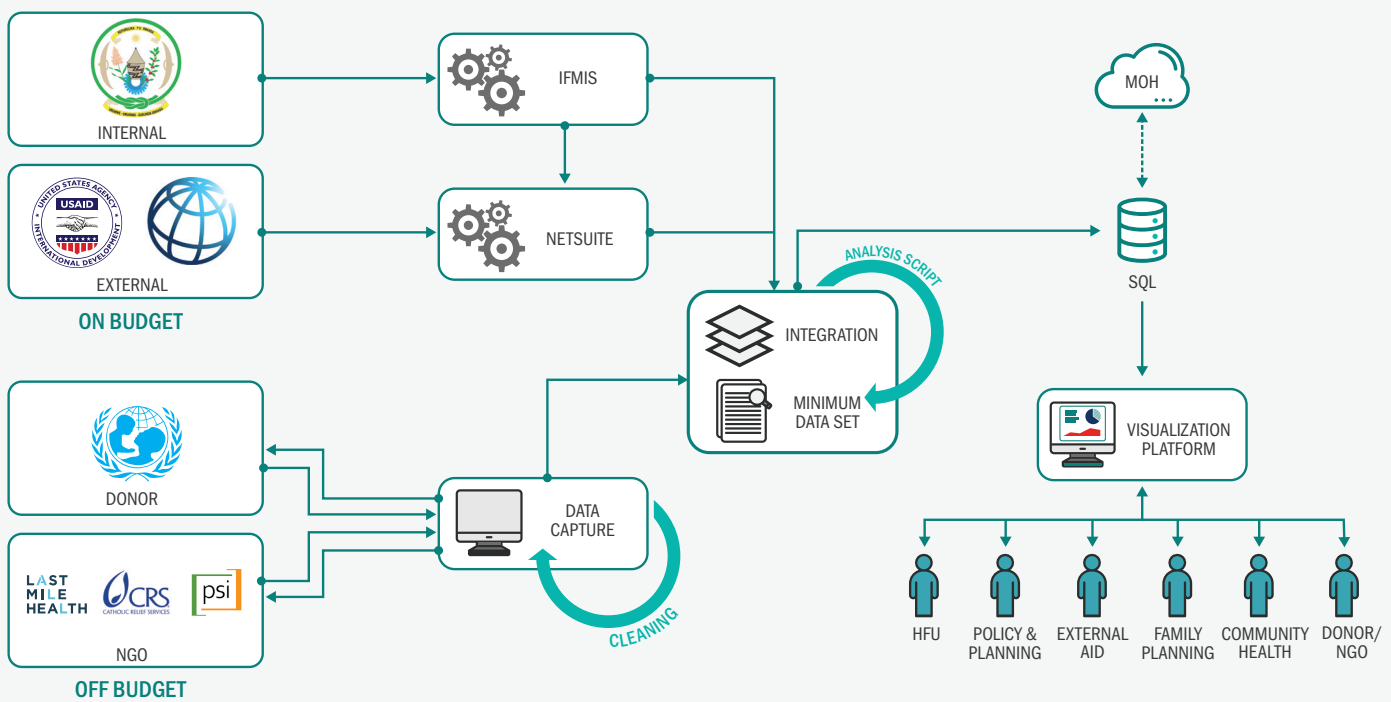




It was also not clear to the GOL how commitments are executed, or which priority activities may be overfunded or underfunded during implementation. The multi-transactional nature of health finances that trickle down from source to service delivery means earmarked budgets often do not reflect the true spending on a target or activity. Without data on actual expenditures, the GOL is unable to pinpoint gaps and barriers for optimal allocation of future funding. Recording actual expenditures requires knowing which partners spend which sources of funds.

With these issues in mind, we worked closely with the HFU to comprehensively map financial flows and processes within Liberia to better inform the future-state and design of the RM process (Figure 4).

**Figure 4:** Proposed Idealized End State for System Interoperability and Capability in Liberia



Using a human centered design approach, we collected requirements for full RM platform needs and specifications. In the interim, we updated the existing RM Excel tool by redefining cost categories, ensuring the Excel tool was more user-friendly, and capturing information at the district level. We customized an off-the-shelf software, Zoho, and tested it as a digitized resource mapping platform.

To transition from an Excel based tool to a digital tool, we synthesized the needs and requirements of key stakeholders, conducted in-depth vendor interviews to understand the most fit-for-purpose solution, leveraged in-house software developers to customize the off-the-shelf solution where necessary, tested to ensure the solution was viable in a resource constrained setting, and trained the HFU and donor/implementing partners to ensure alignment of the new approach and acceptability of the platform. *(For additional details on this process, please see Appendix C).*

We created a minimum data set that would allow the MOH to report against national health policies and incorporated it into the Zoho platform. This minimum data set reduces the reporting burden for donors and implementing partners while still allowing the HFU to report as needed. Cooper/Smith and the HFU trained donors and implementing partners on the platform in preparation for the upcoming FY2022 resource

mapping activity. The platform offers dashboards and visualizations that automate calculations and can be customized by the HFU according to their needs. This allows the HFU to develop and easily integrate graphics into existing or new reports that need to be generated. In addition, planned budgets will also be accessible to donors/implementing partners once their RM is submitted and accepted by the HFU. This provides such groups with more timely visibility when making allocation decisions in country.

To ensure sustainability, we trained the HFU on the backend architecture allowing them to adapt the platform to their data collection and reporting needs and trained the donors/partners on the front-end. Additional trainings and support will be offered to both the HFU and donor/partners during the next RM to ensure any challenges or technical issues can be addressed. The RM data captured is currently being stored in the Zoho cloud, however, the long-term goal is to move the RM data into the MOHs cloud server.

There remains an opportunity to integrate the MOH's financial system – Netsuite – directly into Zoho through an interoperability layer, along with programmatic data captured in DHIS2. In addition, the GOL can build out an additional module in Zoho and leverage existing platforms within the MOH and MOF to compare forecasted expenditures with actual expenditures. The HFU could further adapt Zoho to streamline existing processes within the MOH. For example, Zoho could be used to collect donor and implementing partner registration information for the External Aid Unit.

Additionally, through discussion with other departments within the MOH, we identified complementary processes – such as resource mapping for community health or activity mapping within the policy and planning unit – that could easily be incorporated by the HFU into Zoho to avoid duplicative tools and processes.

# FUTURE OPPORTUNITIES AND RECOMMENDATIONS

## Future Opportunities

### Appetite for Data

Across LMICs there has been a growing willingness, capacity, and demand for collecting finance data for host national government purposes of planning and improving efficiency. Therefore, an opportunity exists for development and donor communities to feed this demand with targeted and coordinated support to LMICs to advance the global CORRT agenda.

### Near-Exemplars Exist

We conducted a search of peer reviewed and grey literature sources for evidence of an exemplar LMIC or even MIC in terms of CORRT capabilities. While we found no clear exemplar, near exemplars exist. Specifically, advances in health information systems, interoperability, and local capacity have put countries on the precipice of obtaining a CORRT system. These near exemplars simply require marginal investments and support towards reaching that goal. In countries where there is a rich ecosystem of health and financial information platforms, a nudge towards integration and improvements in local capacity could launch the country into newly unlocked capabilities to efficiently manage their health funds. Rwanda is such a near exemplar country, where only small gains in capacity and capability could be leveraged against a robust governance and systems landscape for world-class capabilities in public financial management.

## Interoperability and Integration Are Needed

We consider a chief necessity of future development to include a focus on the interoperability and integration of local health and finance information systems. Leveraging existing systems – rather than introducing new software – will reduce duplication of data collection, improve efficiency of systems investments, and improve continuity and uptake of digital technologies. Each country context has its own history and system infrastructure, which requires a detailed review of the components, their interoperability, and overall quality to consider how to optimally improve and integrate financial systems. Ultimately, by linking all available programmatic and financial data sources, countries can best leverage information for better data-informed decision making.

## Link Registration and Reporting

A consistent challenge faced by host national governments in their quest to obtain high-quality financial information is poor compliance and sub-optimal reporting – particularly from donors and donor recipients. There is little that can be done in such situations, but greater capabilities of governance and donor management could provide a framework for enhancing accountability.

Specifically, host governments could consider linking international organization's guarantee of registration or operational licenses to their routine reporting of budget and expenditure data (in accordance with local systems and data structures). Doing so would ensure that donors and their recipients must report financial data to remain in good standing with local regulatory bodies.

# Recommendations

The case for renewed interest and progress in health resource mapping and expenditure tracking in LMICs is clear. While other aspects of data for health have advanced, information for budgets and expenditures have languished, with little improvement at the global level in terms of tools, coordination, and support – or at the country level in terms of capabilities, sustainability, and data use. The challenges laid out in this report are substantial, but not insurmountable. Below, we lay out a succinct list and summary of recommendations towards remedying the situation.

**Solve at the country, rather than global level** – a key challenge to accelerating progress in global RMET capabilities is that as of yet, no exemplar exists. A focused, concerted effort from relevant donors, stakeholders, and a willing country government should seek to achieve this goal in the near future. This is in contrast to the urgency to develop RMET capabilities across all LMICs simultaneously. As mentioned throughout this report, the global community lacks sound guidance, templates, roadmaps, frameworks, and tools to be broadly successful. We must first establish, document, and refine our approach, and then popularize widely.

**Focus on local capability and leverage existing systems** to increase chances of developing sustainable systems and processes. Significant effort has been put forth to expand, integrate, and improve the automation of health information systems over the past two decades in LMICs. On the financial systems side, where development is often more nascent, there is a need to leverage what exists in the ecosystem to increase buy-in and improve sustainability. Accompanying those systems is often a passionate and capable staff who can also be drawn upon for improvements to financial systems.

**Integrate financial information with routinely collected health data.** In most cases, health data and financial information are not integrated and operate in silos. To increase allocate efficiency of health resources, routine health data should be connected to financial information. If accomplished, a country government can better understand if resources are being over or under allocated to specific disease areas or locations.

**Enable decision support tools to reduce reporting burden.** In many countries, entities who are providing their resource envelope are often burdened with a long and tedious data entry process that often need to be repeated annually. By implementing a decision support system, logic can be built upfront in the form of questions that reduces the number of data inputs based on their answers. This methodology would consider the type of entity and their reporting requirements, as well as leverage their historical data inputs to pre-fill areas where applicable.

**Streamline processes within Ministries of Health to increase coordination and reduce duplication of efforts.** In many instances, units within the MOH often run similar exercises that collect nearly identical or complementary information. Coordinating efforts across these units can not only reduce duplication of efforts but will also reduce the reporting burden of donors/implementing partners.



One common example of duplication in reporting occurs while conducting an NHA. While the NHA produces valuable information at the global level regarding total available resources for health in a country, it has limited utility for planning at the local level. Similar systems and human resources are drawn upon in financial management units to respond to the NHA, as well as complimentary local requests for financial data. With the appropriate information RMET systems in place, and agreed upon harmonization with relevant stakeholders, reporting to an NHA could be automated to produce consistent and regular results with minimal effort from local data clerks in an ideal end state. Given the routine and standardized nature of the NHA, the only barrier to accomplishing this is a lack of mature financial management systems. A solution as described in the Rwanda example of this report could perform such a task easily.

**Develop solutions for wide-spread replication that addresses core functional needs in every country,** such as automated and streamlined digital data capture for external sources of health financing. While each country will have its own pathway or roadmap to RMET improvement and CORRT, there will be similarities across countries where global donors could leverage efforts to benefit many nations. This can be done through widespread adoption of a common terminology and maturity model, and global stakeholders available to review capabilities and gaps. Therefore, instead of searching for a “one size fits all” tool, we would benefit from finding a few options of “one size fits many” digital solutions and tools. This could be supplemented through adapting and generalizing off the shelf tools (i.e., Zoho) or through continued development of open-source and custom solutions, in places where country capacity is sufficient to manage and maintain those systems.

**Enable expenditure tracking to complement resource mapping.** Once a country has an established resource mapping process, the next logical step is to develop expenditure tracking to help understand actual spend. While complex and nuanced, an expenditure tracking module becomes more realistic with an existing resource mapping framework in place. While the digital solution may be different for each country based on the implemented resource mapping software, the inputs and overall framework for data collection should remain similar.

**Invest in a coordination mechanism at the global level to lift and compare solutions, match funding to need, allocate software and technical assistance (TA), and document best practices.** This global coordinating body would lead the use case documentation and focus available TA in an efficient model to unlock core capabilities at the country level.

There is rich potential for improving the financial management capabilities of LMICs in the near and midterm with the appropriate strategies. Advancing this agenda will result in improvements in accountability, donor coordination, increasing domestic health financing, and greater technical and allocative efficiency. These outcomes together will continue to accelerate the impressive progress achieved in the past twenty years of the health and development of low- and middle-income nations.



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# APPENDIX A – CORRT MATURITY MODEL

In our view, a key critical missing element to advancing the global CORRT agenda is the absence of an underlying framework for assessing country capabilities and gaps, and strategizing development towards a prioritized list of country use cases for financial data. To address this gap, we developed materials and frameworks of such a maturity model to help meet this need as a global good which could be applied throughout LMICs to advance their goals.

The motivation surrounding the maturity model development was to meet three goals. First and foremost, development and improvements to country RMET capabilities should meet the goals and use cases of country governments. Second, we believe that for development to be sustainable, incremental improvements should leverage and integrate into existing systems and infrastructure. Finally, the maturity model should produce comparable output across countries. Using this common language, donors and governments could leverage common software and technical needs across countries to increase efficiency and impact of limited resources.

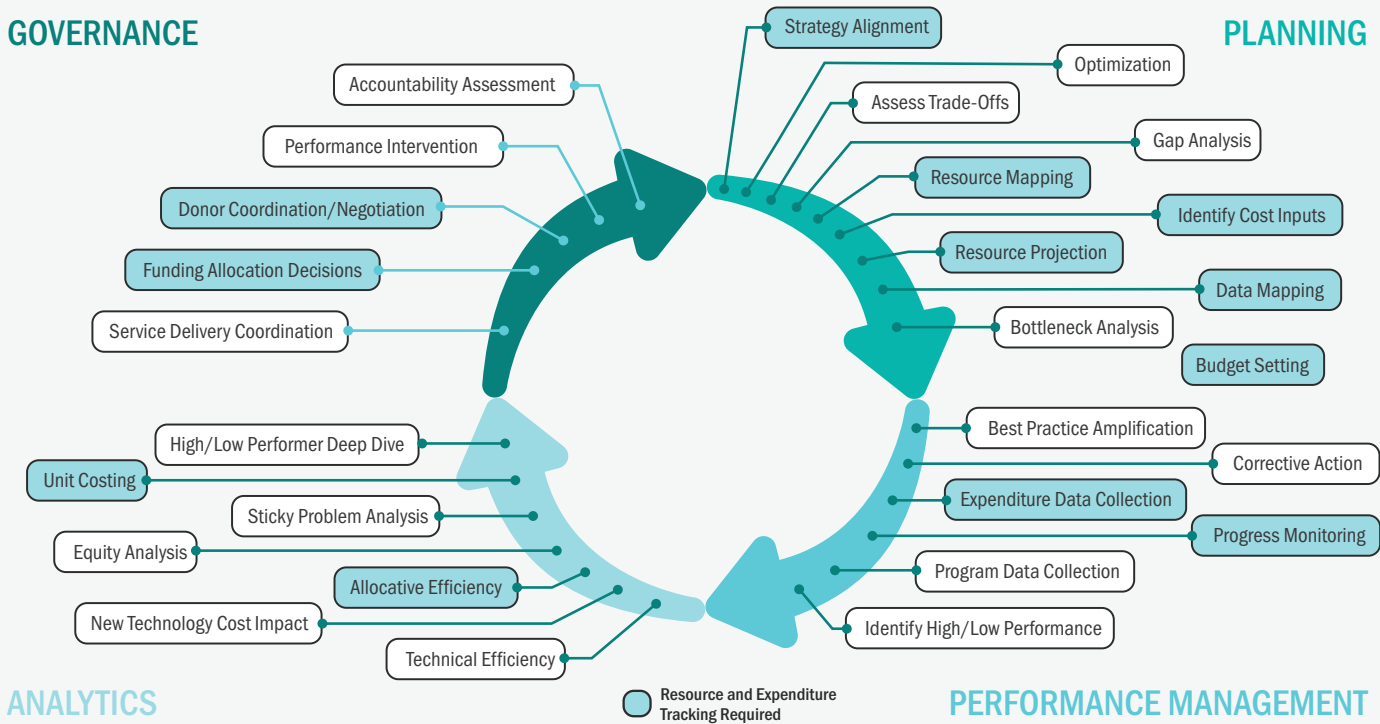
**With that motivation in mind, we developed a maturity model with four key applications:**

1. **A diagnostic** tool to establish baseline country capabilities to track health resources and adequately use financial data
2. **An inventory** for data sources, types, dimensions, and systems needed to construct a minimum dataset of value in context
3. **A prioritization** tool to assist countries in identifying key use cases for financial monitoring and analysis and develop specific roadmaps for incremental improvements to achieve objectives
4. **A learning instrument** that helps to pinpoint common pain points, gaps, and barriers across settings that might be addressed with fit-for-purpose public goods, better guidance, and/or targeted support.

The maturity model can be self-administered by a country's Ministry of Health through the Policy and Planning Department or Health Financing Unit equivalent. It includes a toolkit of assessment templates and guidance documents. The results of the exercise will correlate with minimum requirements to achieve desired use cases. Administering the maturity model involves extensive country-level engagement to elicit use cases and preferences, map technology ecosystems and financial flows, and conduct data inventory to understand what information is readily available. Based on these findings, recommendations can be put forth to direct a country and its supporting donors on how to best incrementally improve their RMET capabilities.

A key feature to the maturity model is the structure and definition of capabilities. The capabilities are separated into four distinct domains: Governance, Planning, Analytics, and Performance Management (Figure 5).

Figure 5: Maturity Model Domains and Capabilities



Each domain contains core capabilities. For example, within Governance is the capabilities of Donor Coordination and Funding Allocation. Within Planning domain are capabilities like Resource Projections, Budget Setting, and Gap Analysis. Performance Management involves capabilities such as Monitoring Progress and offering Corrective Action for inefficiencies. Finally, Analytics includes the capability to conduct Unit Costing, assess Allocative and Technical Efficiency, and evaluate Equity. Importantly, no single use case requires all capabilities. This means that creating a prioritized list of use cases, will in turn produce a prioritized list of capabilities to focus on for improvement.



# APPENDIX B – DESK REVIEW AND FINDINGS

We conducted a desk review to understand the global CORRT state of affairs. Specifically, we sought out global CORRT guidance, resources, software products, frameworks, and LMIC “exemplars”. We investigated peer reviewed and grey literature sources, resources from notable donors and stakeholders, as well as information from relevant organizations and institutions.

## Literature Gap

Published work in peer reviewed or grey outlets is extremely limited, with little in the implementation science and health information technology literature dedicated to viewpoints, opinions, or experiences – much less structured research – on health financing RMET. The remainder of resources are scattered across donor and stakeholder websites, often with highly specific scopes which are not generalized to national government needs.

## Global Guidance, Frameworks, and Tools

As covered in the previous section on the Global CORRT TWG, leadership in this space is significantly limited. Among the most critical gaps is the availability of routinely updated and issued guidance, aimed specifically at LMIC stakeholders, to recommend processes, tools, and frameworks to facilitate CORRT systems.

First, there is very little guidance available on the recommendations for national governments and systems in terms of developing and improving health financing information systems. Available global

guidance typically revolves around the interests and needs of global stakeholders and reporting activities, rather than stakeholders at country level. For example, one could easily find guidance and recommendations for conducting a WHO National Health Accounts activity but would find it difficult to understand what underlying systems, capacity, and data are needed to conduct such an activity (or more). Indeed, as far as we are aware, there is no referent or “gold standard” financial management system which could be sought after for willing LMICs and donors. This leaves such parties fending for themselves as they seek to improve their health financing management and accountability.

Developing a minimum set of requirements for such an optimal health financing information system is a requisite first step in advancing the CORRT agenda. It is required for country governments and donors to coordinate around a similar set of goals, identify gaps in capabilities and systems, and facilitate fundraising to support filling those gaps. Developing and maintaining this guidance would also involve the crowdsourcing of novel ideas, approaches, technical advancements, and other critical lessons learned that would be valuable as a global good.

A related gap is the lack of available frameworks for understanding the development roadmap for LMICs along the way to a mature CORRT system. Developing such a mature system does not happen easily or overnight, and many nations are currently in different places along this development continuum. Understanding where one's place is, and where one would like to be, is crucial to appropriately planning and meeting goals of progress. And yet, no such framework or assessment tool is available. Furthermore, it is important to note that each country context in terms of capabilities and gaps is likely to differ from others. Additional layers to this complexity include the implication that the development pathway towards a mature CORRT system is not linear, and that optimal and efficient pathways towards CORRT systems leverage and build upon the existing software ecosystem.

Finally, there is also an absence of a record or registry of data collection tools used by various countries in their RMET activities. This precludes three key activities. First, cross-national exchange and comparison of tools could benefit mutual parties as they seek to improve their tools. Second, broader availability and review of tools could facilitate and encourage greater harmonization success, leading to improvements in reporting compliance among donors who are responsible for reporting across many nations. Third, a review of data collection tools could assist in understanding the suite of software products which could help to digitize, streamline, and produce real-time results of budget and expenditure data.



# APPENDIX C – ASSESSING EXISTING HEALTH FINANCE INFORMATION MANAGEMENT SOFTWARE PRODUCTS: LIBERIA CASE STUDY

The challenges of improving RMET data collection can be, in part, improved through software and digital solutions. Part of Cooper/Smith's scope in Liberia was to enhance the resource mapping tool from an Excel-based system to a digital solution. To do this, in coordination with Liberian stakeholders, we first developed a list of driving forces behind the upgrade request.

Driving forces included: cyclical data entry by MOH and external partners, incorporation of standardized data taxonomies, ability to enter funding entries at every level of the hierarchy, data validation, data cleansing, centralized hosting of data, user-friendly analysis of data by the MOH, automatically generated exception and funding gap reporting, incoming and outgoing data integration with additional MOH system, ease of data entry by configuration of related values according to financing rules, ability to align fiscal calendars of partner organizations to MOH fiscal calendar, sustainable development, and ongoing maintenance costs.

## The driving forces were then compared against three software options:

1. Enhance or Customize Existing Software and Tools
2. Purchase an Off-the-Shelf Software and Customize based on Country Need
3. Custom Build Tailored Software

In this instance, the Liberian stakeholders opted for an off-the-shelf software that can be customized to meet their specific needs (*option 2*). It was determined that no existing architecture in the country fully met the requirements and needs for this solution (*option 1*), and the ongoing maintenance and support needed for a custom-built tailored software (*option 3*) was deemed not sustainable by country stakeholders (*a key consideration in choosing option 2*).

Based on this, a review of available off-the-shelf products and vendors was conducted against a list of essential elements. From this, it was determined that the optimal software vendor to meet the requirements of the enhanced resourced mapping platform was Zoho. In collaboration with stakeholders and Cooper/Smith developers, the Zoho platform was customized to improve the capabilities of Liberia's RMET effort. Importantly, this selection will allow the MOH in a future iteration to integrate with their existing financial management system (*NetSuite*). Therefore, this built upon existing capacity while meeting the desired improvement in an efficient way.

Notably, the three above major considerations for software solutions generally apply to all LMICs in pursuit of improved RMET capabilities and pathway to CORRT. Understanding which choice is most optimal requires a detailed understanding of the existing in-country systems, planned development, utilization, and quality of those systems, as well as their interoperability. This means that each country will have different preferences, driving forces and optimal options for improving their systems, and that “one size fits all” solutions are unlikely to be successful.

### **When we supported the Liberia HFU to transition their Excel based tool to a digital RM platform, we completed the following actions:**

- 1.** Synthesizing the needs and requirements of key stakeholders: Interviews conducted across key users, including units within the MOH, MOF, donors and partners were consolidated into succinct capabilities. These capabilities were used when assessing potential software solutions.
- 2.** Conducting in-depth vendor interviews to understand the most fit-for-purpose solution: Identified vendors were assessed against the key capabilities noted above (*Figure 6*). The software with the highest number of capabilities was chosen and put forth as the solution. It is worth noting that a back-up solution was also identified in the event the first solution was deemed not viable during testing or development.
- 3.** Leveraging in-house software developers to customize the off-the-shelf solution where necessary: While capabilities were identified, no solution offered every requested feature and therefore in-house customization occurred to ensure it met the country's needs. In-house software developers from Cooper/Smith were used, however, most software vendors also offered their own in-house technical development or consultants.
- 4.** Testing to ensure the solution was viable in a resource constrained setting: Software vendors for such a use case had limited experience in a resource constrained setting. Therefore, before finalizing development, the solution was testing by the HFU in-country to ensure the limited bandwidth and network connectivity would not hinder the platforms performance.
- 5.** Training the HFU and donors / implementing partners to ensure alignment of the new approach and acceptability of the platform: A key component of the platform was to ensure widespread adoption of the new platform and sustainability within the HFU. Therefore, a 3-day training was conducted with the HFU on the back-end architecture and a three-day training was conducted with donors/ implementing partners on the front-end. During these sessions feedback was gathered on the overall viability of the platform, as well as feature requests and technical glitches.



	VENDOR A	VENDOR B	VENDOR C	VENDOR D
Data Hierarchies	✓	✓	✓	✓
Cloud/On Premise	Cloud & On Premise	Cloud	Cloud	Cloud (AWS)
Workflows Enabled	✓	✓	✓	✓
Online/Offline Capability	Online Only	Online/Offline	Online	Online Only
Open Source	✓ SQL	DELUG International Access (JAVA/HTML)	✓ SQL	JAVA/SQL
Data Upload	Manual Entry	Publish/Offline Capability	CSV Upload	Scheduled Import
Web Based Data Entry	✓	✓	✓	✓ Host on own Website
Cyclical Data Capture	W. Connector	✓	✗	✓
Data Validation	✓	✓	✗	✓
Support Level (Time Zone)	Email (EST)	24-5 Email	24/7 Ticketing & Phone Support	Ticket/Chat/Phone
User Management	✓	✓	✗	✓
Data Security	N/A	Transit Encryption	Transit Encryption	Transit Encryption & REST API
Integration (API vs. CSV)	CSV	REST API/CSV	REST API (Not rolled out)/CSV	API & CSV
Low Resource Setting Experience	Some	Minimal	Minimal	Minimal
Data Access/Storage	External	Internal	Internal	Internal
Organization Focus	School/HR	Real Estate/Retail/Sciences	Healthcare/Education/Public Sector	Healthcare/GOV/Education
Development Available	✓ (\$180hr)	✓ (\$50-\$100hr)	✓ TBD	✓ (\$250hr)
Cost	\$3,500 Year	\$1,800 Year (+\$240 / internal)	TBD	\$2,000-\$3,000
Task List	✓	✓	✓	✓
Data Centers	N/A	7 Data Centers	N/A	4 Continents
NGO Discount	Follow-up	10% Off	TBD	10% Off

## Upgrading the resource mapping platform provided additional strength to the resource mapping process, including:

1. **Automated Workflows between HFU and Donor/Implementing Partners** – The ability to automate the information flow through a digitized platform removes the need to send heavy Excels files back and forth between the HFU and donors/implementing partners.
2. **Historical Data Storage and Inputs** – In an Excel based tool, historical data is often stored in a secondary file and manual work is needed to compile new RM data with historical information. In addition, as you continue to add years, a single Excel file may become very slow due to the amount of information being kept. With a digital RM platform, historical data is stored in the cloud and new RM information can be automatically added.

3. **Enhanced Accountability & Audit Trail** – An Excel based process makes it hard to keep track of which donors/implementing partners have successfully submitted information, which of those submissions need to be edited/alterd, and who hasn't submitted at all. With a digital RM platform, it is easy to understand which submissions have been fully accepted, which ones have requested changes and those who have not submitted yet. In addition, a digital platform provides an audit trail, allowing the HFU to understand where changes have been made and when.
4. **Enhanced Reporting Capabilities** – In an Excel based process, graphics for needed reports are usually done manually, adding extra work, and opening up the possibility for errors. With a digitized RM platform, reports can be routinely and automatically generated as information comes in. Known reports can be automatically generated based on the submitted information and embedded into existing reports.
5. **Increased Visibility and Timeliness of Planned Resources** – A major drawback of an Excel based tool is that individual submissions must be compiled into a single source before any insights can be gleaned. In addition, Excel is an offline product, therefore, information is only presented back to donors/partners in the form of a report. This process often takes a long time and therefore donors/partners do not have timely access to information to make resource decisions. A digital RM platform allows donors/partners access to graphics and reports once their RM is submitted, allowing for visibility into planned resources in a timely fashion.
6. **Integration with Existing Systems** – A key strength of a digitized RM platform is the ability to integrate information across existing systems. A digital RM platform allows both financial data and programmatic data to be routinely integrated into the platform. An Excel based tool does not have this feature readily available.

## When transitioning from an Excel tool to a digitized RM platform, the following points should be taken into consideration:

1. **Network and Connectivity** – A digitized RM platform requires information to be stored in on-premises or cloud-based server. This means a network connection is needed at some point for information to be uploaded. In a resource constrained setting, network and connectivity are sometimes limited and therefore may cause delays in getting information uploaded.
2. **Technical Glitches and Bugs** – Any platform or tool, including Excel, comes with technical glitches and bugs. Given the additional coding needed to set-up the necessary workflows in a digital RM platform, the ability to fix technical glitches and bugs becomes more resource intensive (time and money).
3. **Additions / Changes to Reporting Requirements** – In an Excel based process, categories or changes in reporting requirements can be easily updated, however, given the crosswalks built into a digital RM platform, these changes can become more difficult to implement.
4. **Sustainability within the HFU** – A digital RM platform requires more technical understanding than an Excel based tool and therefore capacity building within the HFU is important. If proper time is not given to training the HFU, then sustainability of a digital RM platform becomes very challenging.

Even with an upgraded RM platform, there are still challenges for the HFU to address. First is alignment to existing systems. While a digital RM platform can integrate existing systems and processes, there still needs to be buy-in and alignment across the groups to successfully implement it. For example, while the platform can integrate with Netsuite, there needs to be buy-in and support from the Treasurer and IT and Finance departments before integrating. This often takes time and motivation of all parties involved. Second is the timeliness of reporting by the GoL. Having a tool or platform does not mean the GoL's budget will be approved in a timely manner and therefore in some cases, the RM cannot be concluded in good time. The third challenge is the adoption of the platform by donors and implementing partners. Great efforts were made to ensure pain points of the current RM process were addressed in the digital RM platform; however, this still does not ensure the donors / implementing partners will willingly complete the RM exercise each year. It is therefore important to develop a strong partnership and ensure technical support and follow-ups are offered in the coming years.



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