



DATA USE PARTNERSHIP

The Journey to Better Data for Better Health in Tanzania

2017-2023



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EXECUTIVE SUMMARY

MAP MARKER: WHERE WE ARE

At all levels of Tanzania's health system, the right people do not have, or are not using, the right data to make informed decisions.

The consequences can be severe:

- Health workers cannot access the right data to ensure a continuity of high-quality care.
- Supervisors struggle to assess resource needs and identify ways to improve service delivery.
- Administrators do not have an efficient way to monitor performance of systems, facilities, or people.
- Policymakers are not able to make evidence-based investment and resource allocations.
- Patients lack a mechanism to hold health providers accountable.

Tanzania wants to seize these critical opportunities for data systems and data use to improve health systems performance and health outcomes.



ROAD MAP: THE JOURNEY

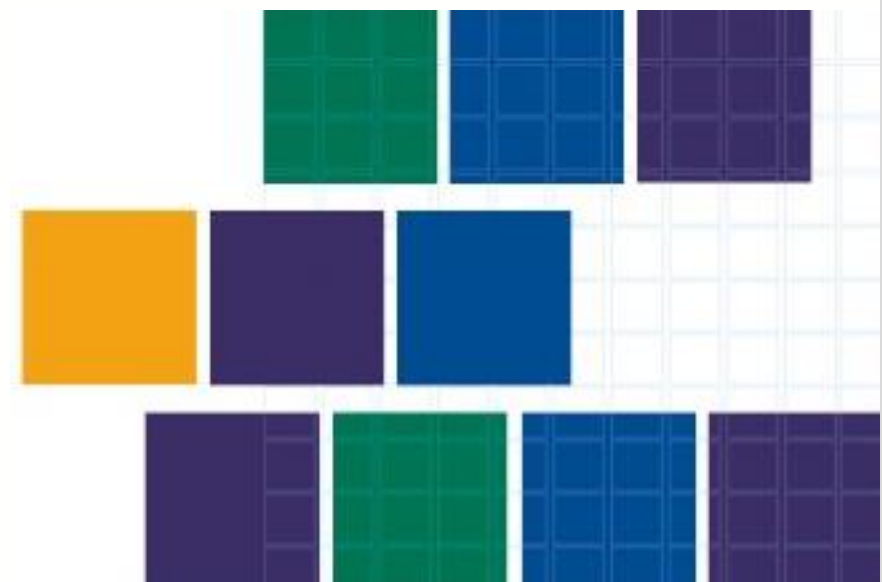
Tanzania is on a journey to stronger health data systems and data use.

The government has made this a priority. Important advances are already underway, but significant investments are to finish the work and make this vision a reality.

These investments in people and tools need to be a mix of elements that lay the foundation for long-term change, high impact actions that touch multiple parts of the health sector, and support quick wins to fill pressing needs at low cost. Investments must be coordinated so they **build on each other and maximise impact**.

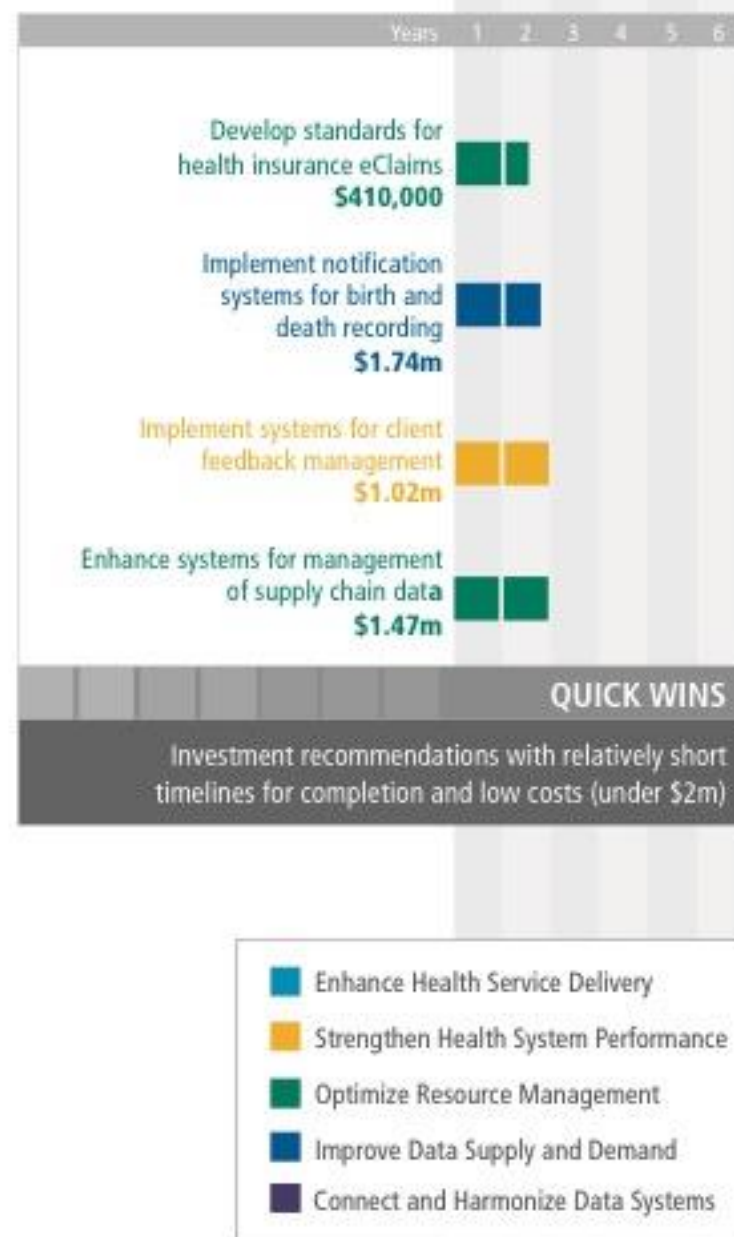
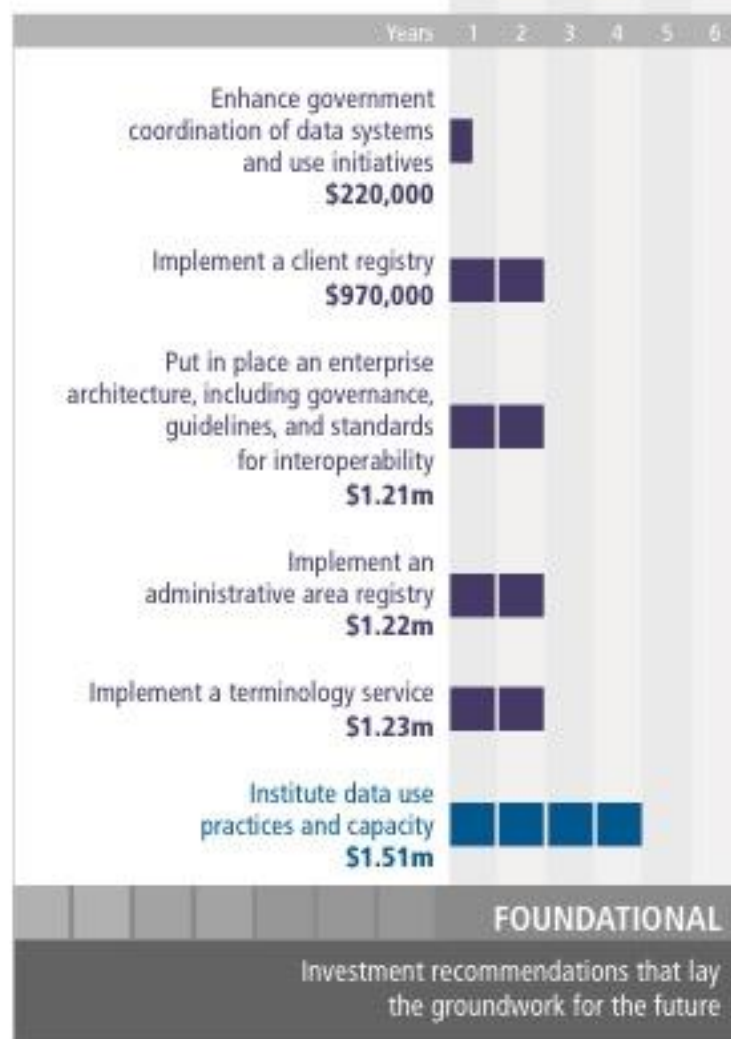
The government of Tanzania and its partners drafted **a set of 17 priority investment recommendations with specific activities, costs, and timelines**.

These recommendations will leverage existing government strategies and priorities, support work that is already happening, embody accepted principles, and **have the potential to jump start systemic change** in data use practices.



ROAD MAP: THE JOURNEY

With these priority investments, Tanzania will be able to effectively use data to improve health.

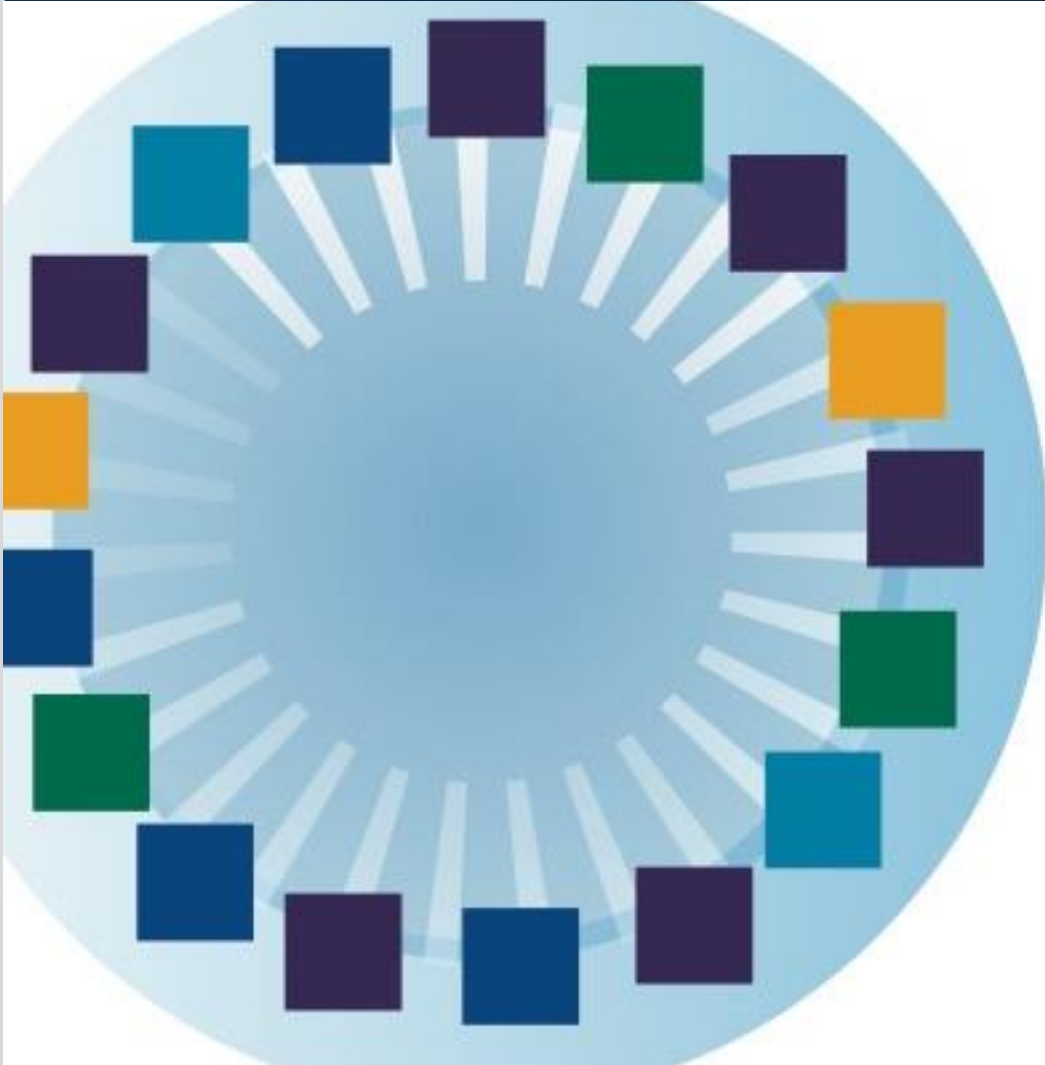


DESTINATION: WHERE WE ARE GOING

The government will be able to make evidence-based choices about how to best allocate health resources.

Funding these investment recommendations will unlock critical capabilities to:

- Respond to disease outbreaks.
- Track and monitor health insurance claims.
- Resolve supply chain challenges for vaccines, medicines, and equipment.
- Track patients over time and at different points of care.
- Manage complex diseases, like HIV/AIDS.
- Determine which health facilities are performing well and which need improvement.
- Transfer and analyze data across systems and geographies.



DESTINATION: WHERE WE ARE GOING

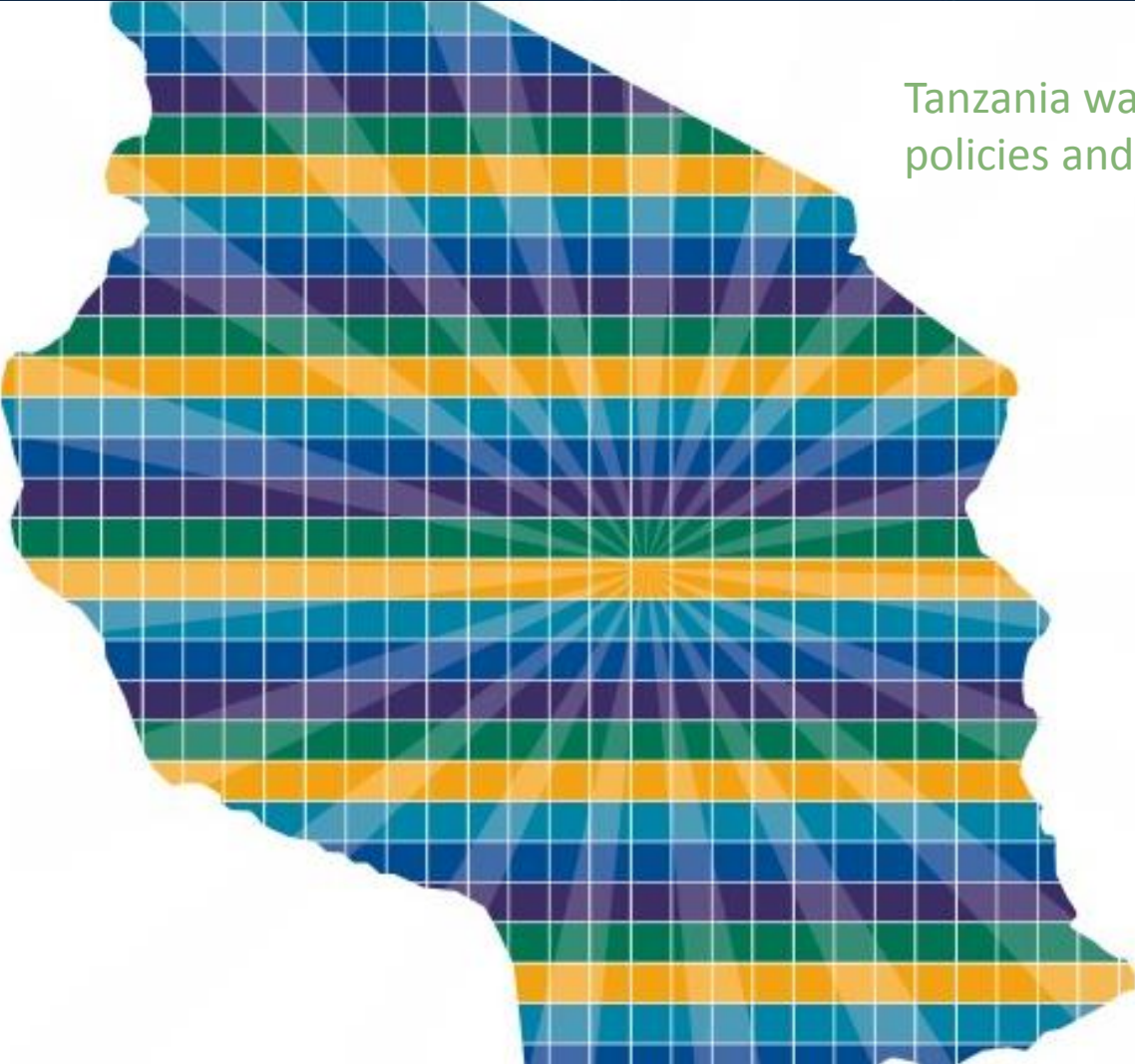
These investments will allow the government of Tanzania to:

- Improve health services in measurable ways.
- Expand access to health services by focusing on specific geographies and populations.
- Forge effective community partnerships.
- Achieve better return on health investments.
- Collaborate with other sectors on cross-cutting health initiatives.

Better health data systems and data use will make this vision a reality by supporting everyone—from government officials to health workers to patients—to make more informed decisions and improve health.



DESTINATION: WHERE WE ARE GOING



Tanzania wants to use high-quality, well-managed data to guide health policies and practices.

This will lead to positive outcomes at every level of the health system:

- Health workers will have the data to better deliver services, track and manage supplies, and treat patients.
- Administrators will be able to target supplies and staff to the areas that need them most.
- Policymakers will be empowered to make informed budgeting and planning choices, and then measure the results.

End result: Tanzanians will access high-performing health care and enjoy better health.



OVERVIEW

WHAT THIS IS AND HOW TO USE IT

What:

A costed investment road map to strengthen data systems and data use in Tanzania's health system

How to use it:

PARTNERS

Align projects and design solutions with government policies and plans

DONORS

Align funding streams and support government priorities

GOVERNMENT

Align investments, policies, and strategic planning; use as a benchmark for progress

OVERVIEW

Governments and donor partners around the world are expressing their increasing interest in, and need for, data systems and data use investments.

In response, the Bill & Melinda Gates Foundation funded the Data Use Partnership, a one-year commitment to work with select national governments in Africa to identify how their health outcomes can be improved through increased investments in national health information systems and data use.

The initial focus countries were Ethiopia, Malawi, and Tanzania.

The long-term goals of this work are:

- Improved use of data to inform health planning, performance management, and delivery decisions across the health systems in these focus countries.
- Adoption by government agencies and implementing organizations of identified best practices in data use, data system architecture, and governance in sub-Saharan Africa.
- Increased commitment by global stakeholders to align and invest in integrated health information systems and tools, and to strengthen data use and health workforce capacity at the country level.

These investments will be key to achieving improved health outcomes.

OVERVIEW

The Gates Foundation asked PATH to work with the government of Tanzania and its partners to develop an investment road map leading to improved health system performance by building on previous assessments, supporting ongoing investment planning for government data systems and data use, augmenting existing work with additional information collection, and optimising investments so as not to repeat prior work.

This work builds on past assessments and strategies guiding the field of digital health in Tanzania, such as:

- **BID Initiative**
- **Data Dissemination and Use (DDU) Assessment**
- **DDU strategy (draft)**
- **eHealth Strategy**
- **Guidelines and Standards for Integrated Health Facility Electronic Management Systems**
- **Health Sector Strategic Plan (HSSP) IV**
- **Monitoring and Evaluation Strategy (draft)**
- **Monitoring and Evaluation (M&E) Strengthening Initiative**

PRINCIPLES FOR DIGITAL DEVELOPMENT

The global Principles for Digital Development are central to, and embodied in, the design of this project and resulting investment recommendations. The Data Use Partnership approach emphasises principles such as data-driven, user-centered, country-owned, sustainable solutions collaboratively designed with humility, transparency, and a commitment to the end goal of making people healthier.

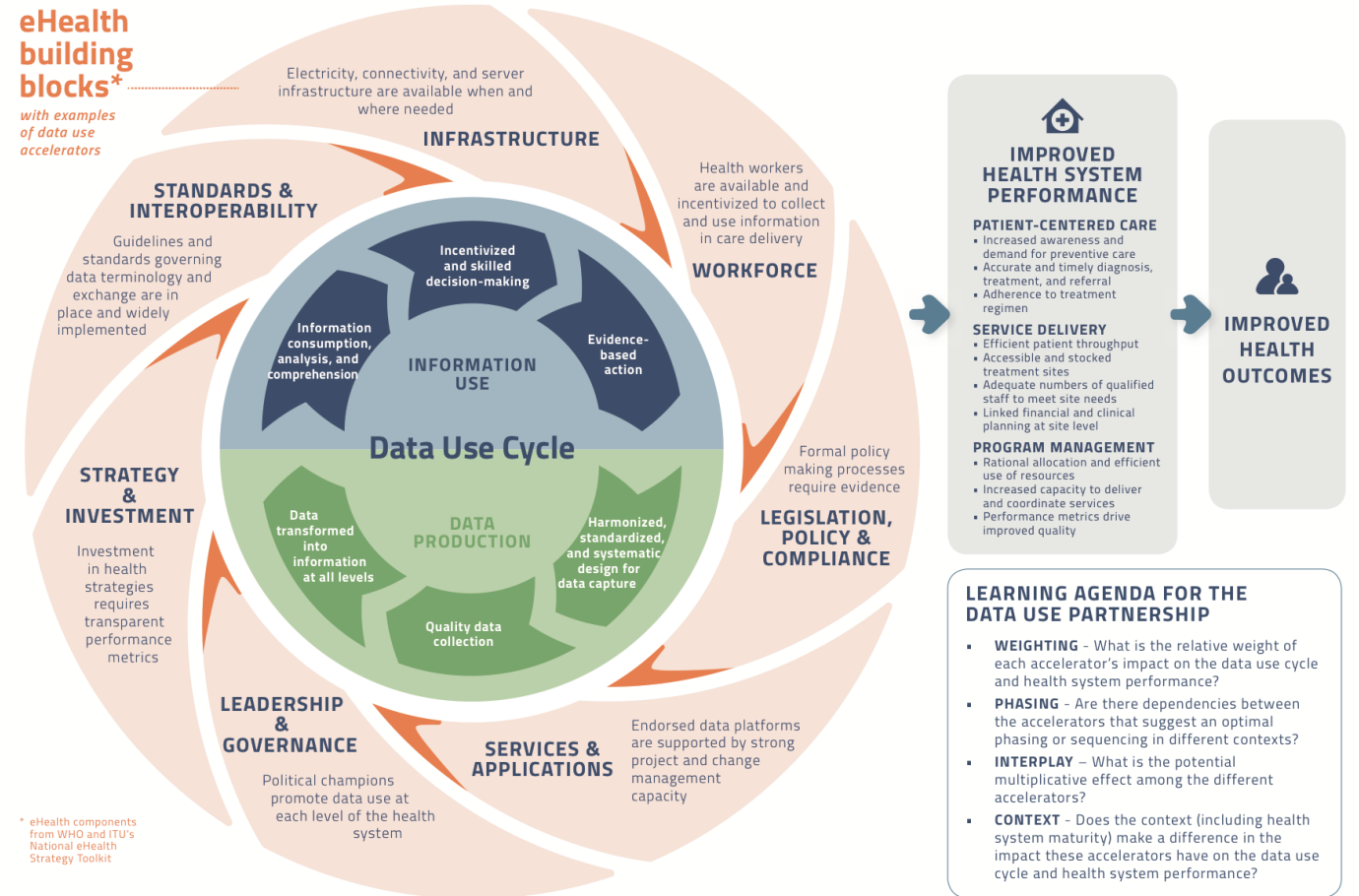
1 Design with the User	6 Use Open Standards, Open Data, Open Source, and Open Innovation
2 Understand the Existing Ecosystem	7 Reuse and Improve
3 Design for Scale	8 Address Privacy and Security
4 Build for Sustainability	9 Be Collaborative
5 Be Data Driven	

THEORY OF CHANGE

PATH and Vital Wave Consulting (asked by the Gates Foundation to conduct similar work in Ethiopia and Malawi) jointly developed a *theory of change* (TOC) graphic to illustrate our theory on how to strengthen data systems and accelerate data use over a ten-year period. This cycle of better data production and enhanced use of information will improve patient-centered care, service delivery, and program management.

The principal hypothesis is *better data and regular data use will create a data use culture, leading to better decisions, an improved health system, and improved health outcomes.*

Theory of Change TOC for the Data Use Partnership: Factors that accelerate the use of data for improved health system performance

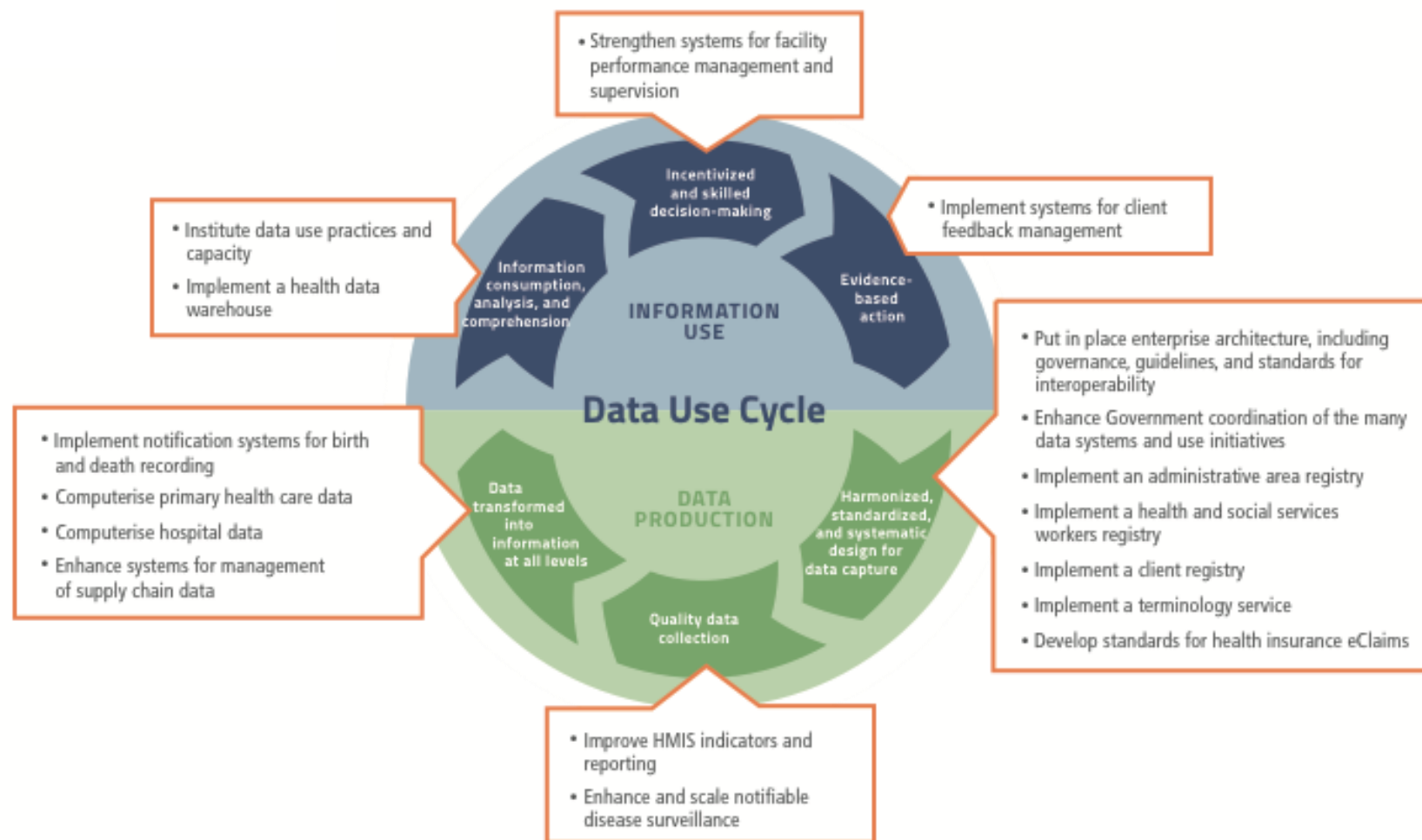


* eHealth components from WHO and ITU's National eHealth Strategy Toolkit

THEORY OF CHANGE

We applied the lens of the TOC's levers of change to guide the landscape and gap analysis of data use in Tanzania and start to address the TOC learning agenda. The resulting investment recommendations contain activities that pull on multiple levers to ensure the investments comprehensively contribute to the cycle of data production and information use.

The figure to the right denotes which components of the data use cycle the investment recommendations most directly (but not exclusively) affect. At this stage, Tanzania should focus primarily on the data production stages. These are necessary before a full and effective data use cycle is possible.



METHODOLOGY

A core team worked closely together to carry out this work. This team consisted of the Health Management Information System (HMIS), Monitoring and Evaluation (M&E), and Information and Communication Technology (ICT) departments in the Ministry of Health, Community Development, Gender, Elderly, and Children (MOHCDGEC); Statistics, ICT, and Health departments in President's Office of Regional Administration and Local Government (PORALG); and partners. Our investigation went beyond the health sector, and included exploration of cross-sectoral influences, systems, and practices that affect the health sector's performance (such as, public-sector human resources management).

Literature Review

Extensive review of existing literature on data use and data systems in Tanzania, including more than 60 government and donor strategies, progress reports, and external assessments.

Stakeholder Interviews

Interviews with almost 200 stakeholders from government agencies, multi-sectoral institutions, implementing partners, regional and district health management teams, health facilities, and training institutions.

Analysis

Synthesis of gathered information through data systems mapping, stakeholder network analysis, and donor investment mapping. Identification of prioritised recommendations for potential investment.

Final Investment Recommendations
(Costing for prioritised recommendations)

METHODOLOGY

Stakeholder Network Analysis

- Reviewed documents and spoke with local experts to identify stakeholders and key organizations involved with data systems and data use in Tanzania.
- Used snowball sampling to identify additional stakeholders and organizations.
- Developed interview questions and incorporated them into the key informant interview guide.
- Completed the network analysis component of the interview guide for 31 out of 38 interviews in wave one and all 19 interviews in wave two.
- Identified a total of 124 unique stakeholder organizations/units. (Note: multiple health facilities were combined to be represented as a single stakeholder/organization for the purpose of this analysis.)
- Cleaned data and incorporated key attributes (such as, organization type) for all members of the network, not only those that were interviewed.

See Appendix 1: Stakeholder Network Analysis for more detail.

Data Systems Mapping

- Reviewed existing sources of information (e.g., the MOHCDGEC ICT Unit Health Information Systems Inventory, list of hospital information systems from PORALG and the MOHCDGEC, online inventories, etc.).
- Noted ICTs mentioned in literature review and interviews.
- Compiled information about each system (name, coverage/geographic use, type/purpose, connections to other systems, owners/users, funders).
- Analyzed gaps, redundancies, and interoperability links (or lack thereof).

See Appendix 3: Data Use Systems Mapping for more detail.

Donor Investment Mapping

- Collaborated with stakeholders to identify key donors for data systems and data use.
- Built consensus with the MOHCDGEC regarding the purpose and methodology for donor mapping.
- Developed a donor-mapping interview guide and shared it with the MOHCDGEC to include in outreach to donors.
- Supported the MOHCDGEC outreach to the donor community to solicit interest and schedule mapping interviews.
- Supported parallel outreach from the Gates Foundation to key donors to promote interest in the investment recommendations.
- Scheduled and conducted interviews jointly with the MOHCDGEC.

See Appendix 4: Donor Investment Mapping for more detail.

Investment Recommendation Costing

Worked with the Touch Foundation to:

- Draft activities for each investment recommendation.
- Review activities and cost assumptions (e.g., personnel, others) with technical experts and government stakeholders.
- Conduct desk research to apply dollar amounts to cost assumptions.
- Validate cost assumptions and finalise estimates.

See Appendix 2: Investment Recommendation Costing for more detail.

MAP MARKER:

WHERE WE ARE

MAP MARKER: WHERE WE ARE

This section provides an overview of trends in health and technology innovation in Tanzania and globally, making ICTs more accessible and powerful tools for public health.

Summary:

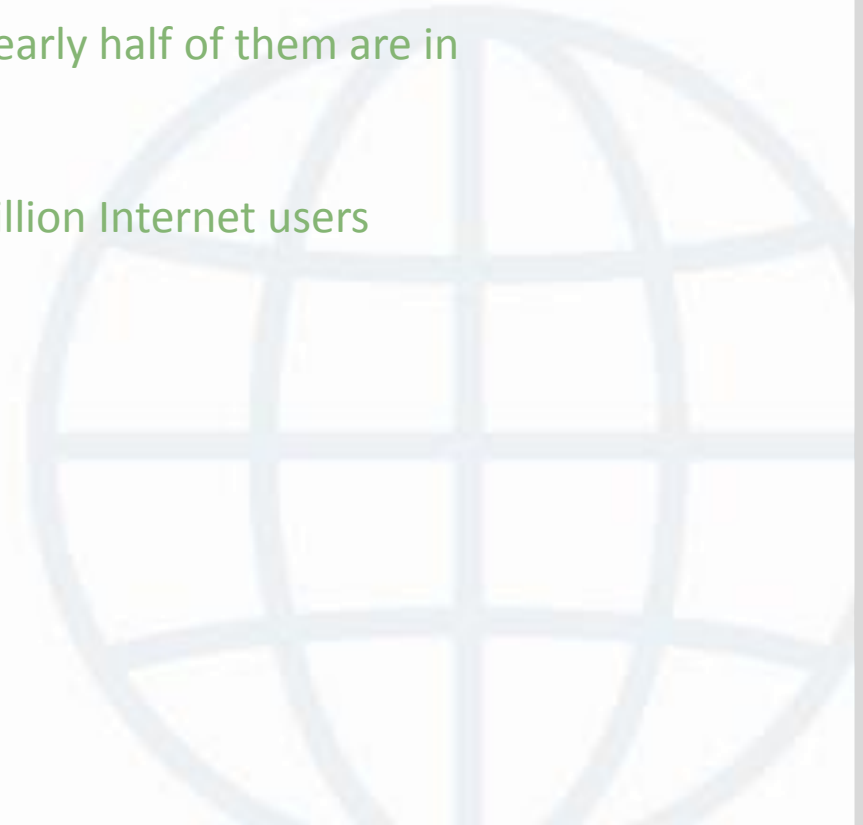
Software and hardware prices are declining, designs are improving to meet needs of users in developing countries, and the value of data analysis and decision support tools are increasingly recognised. ICTs are no longer seen as a luxury; they are a requirement for a modern, well-functioning organization.



GLOBAL CONTEXT

Consumer trends:

- At 7.7 billion, there are more mobile connections than people on the planet.
- Forty percent of the world's population has access to and uses the Internet. Nearly half of them are in the developing world.
- The use of digital technology in Africa is growing rapidly, with roughly 340 million Internet users (29 percent of the population, 7.5 percent growth rate since 2000).



GLOBAL CONTEXT

ICT trends:

- ICTs have become widely recognised as an essential and valuable tool for increasing access to and quality of information and services.
- There is increasing emphasis in the global ICT for development community on maturing away from a myriad of pilots and toward proven and scaled solutions built on common standards.
- ICT innovation and development is increasingly occurring in developing countries themselves—in Silicon Savannah, not just in places like Silicon Valley.

These consumer trends, coupled with declining hardware and communications costs globally, offer a huge opportunity to use ICT as a tool to address longstanding issues in health services delivery.



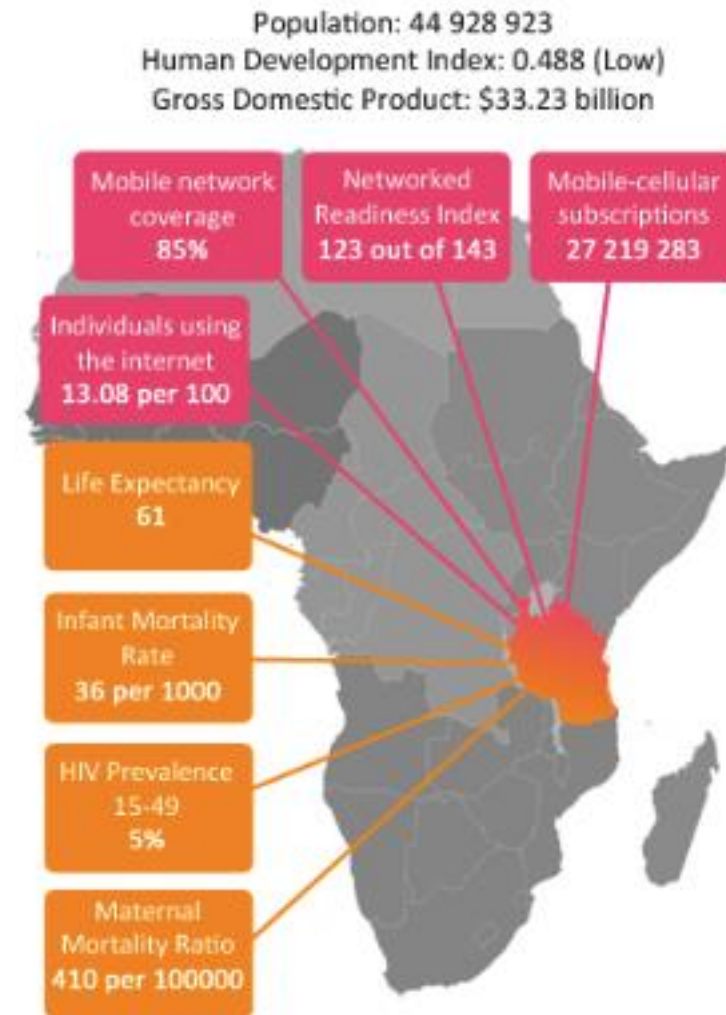
TANZANIA CONTEXT

Trends in population health:

- Millennium Development Goals (MDG) targets achieved: under-5 mortality, measles-immunization coverage, incidence of HIV, tuberculosis mortality.
- MDG targets not achieved: maternal mortality, antenatal coverage, births with skilled birth attendant, family planning, antiretroviral therapy coverage, malaria incidence.

Trends in ICT penetration:

- 39m mobile connections (21.7 percent of the population) and growing, mobile service and connectivity expanding nationwide.
- Landing point for East Africa fiber-optic cable.
- Significant public and private investments in ICT infrastructure.
- Increasing availability of hardware, including smartphones and tablets, at lower costs.



Source: Health.Enabled

TANZANIA CONTEXT

Tanzania's Health Sector Strategic Priorities

"Reach all households with essential health and social welfare services."

Health Sector Strategic Plan IV

1. Achieve objectively **measurable quality improvement** of primary health care services, delivering a package of essential services in communities and health facilities.
2. Improve **equitable access** to services in the country by focusing on geographic areas with higher disease burdens and by focusing on vulnerable groups in the population with higher risks.
3. Achieve **active community partnership** through intensified interactions with the population for improvement of health and social well-being.
4. Achieve a **higher rate of return on investment** by applying modern management methods and engaging in innovative partnerships.
5. Collaborate with other sectors and **advocate for the inclusion of health-promoting and health-protecting measures** in other sectors' policies and strategies to address the social determinants of health.

TANZANIA CONTEXT

High level findings from the landscape and gap analysis:

- Tanzania's health sector is building a strong culture of data collection. Now, government strategies and senior officials are championing a culture of data use, making it a priority to improve data use for better management and accountability of health system performance.
- Many good data systems have been designed and implemented; better integration and use of data systems and the information they can produce is the focus now.
- Training for health workers in data systems and data use is becoming more prevalent, but is still limited. Hiring, retaining, and distributing skilled health workers remains a significant challenge in Tanzania's health sector.
- Tanzania's government, in collaboration with development partners, is looking for ways to increase investments in health data systems and use. Improved coordination of investments and integration and governance of data and data systems are priority needs.

ROAD MAP:

THE JOURNEY

ROAD MAP: THE JOURNEY

This section describes a series of 17 investment recommendations and the context and rationale behind them. These recommendations have been prioritised by the Tanzanian MOHCDGEC and PORALG.

These investment recommendations are designed to strengthen data systems and data use to improve health outcomes through: **enhancing health service delivery, strengthening health system performance, optimising resource management, improving data supply and demand, and connecting and harmonising data systems.**

PATH worked with the Government of Tanzania to draft and cost activities for each investment recommendation that align with existing government strategies and priorities, support and enhance existing work (not solely within the health sector), embody the Principles for Digital Development, and pull on the levers of change to strengthen a data use culture.

Each investment recommendation has been costed as a unit. In some cases, there may be synergies and cost savings associated with implementing multiple investment recommendations as packages.



Approaches underlying the investment recommendations:

Build on existing work

The investment recommendations are designed to strengthen and add to existing work and avoid duplication of efforts.

Use electronic data systems

The vision of the Government of Tanzania is to move towards using digital systems across the country to increase accuracy and efficiency. However, paper will likely still be used in conjunction with digital tools.

Design for the ICT context

Connectivity is rapidly expanding across Tanzania, yet there are still gaps. During the requirements gathering and design stages for any new system or enhancement, an assessment of offline functionality needs will be important to ensure continuous use.

Engage local personnel

The costing assumptions for each investment recommendation emphasise the use of Tanzanian personnel, with foreign personnel typically serving in short term technical advisor roles, if needed.

Plan for sustainability

For each investment recommendation, the government and its partners must start planning for long-term sustainability at the start.

Increase data use

Increasing the use of data in decision-making is a key objective of each of the investment recommendations.

Enhance Health Service Delivery

BEFORE INVESTMENT

Health workers do not have readily accessible and actionable data to ensure a continuity of high quality health care for their clients.

The goal of these recommended investments is to ensure that health workers across the country have the data and tools they need to track resources, understand clients needs, and provide the best quality services to people seeking care.



Definition of Key Term

CLIENT: *A person who receives health care services.*

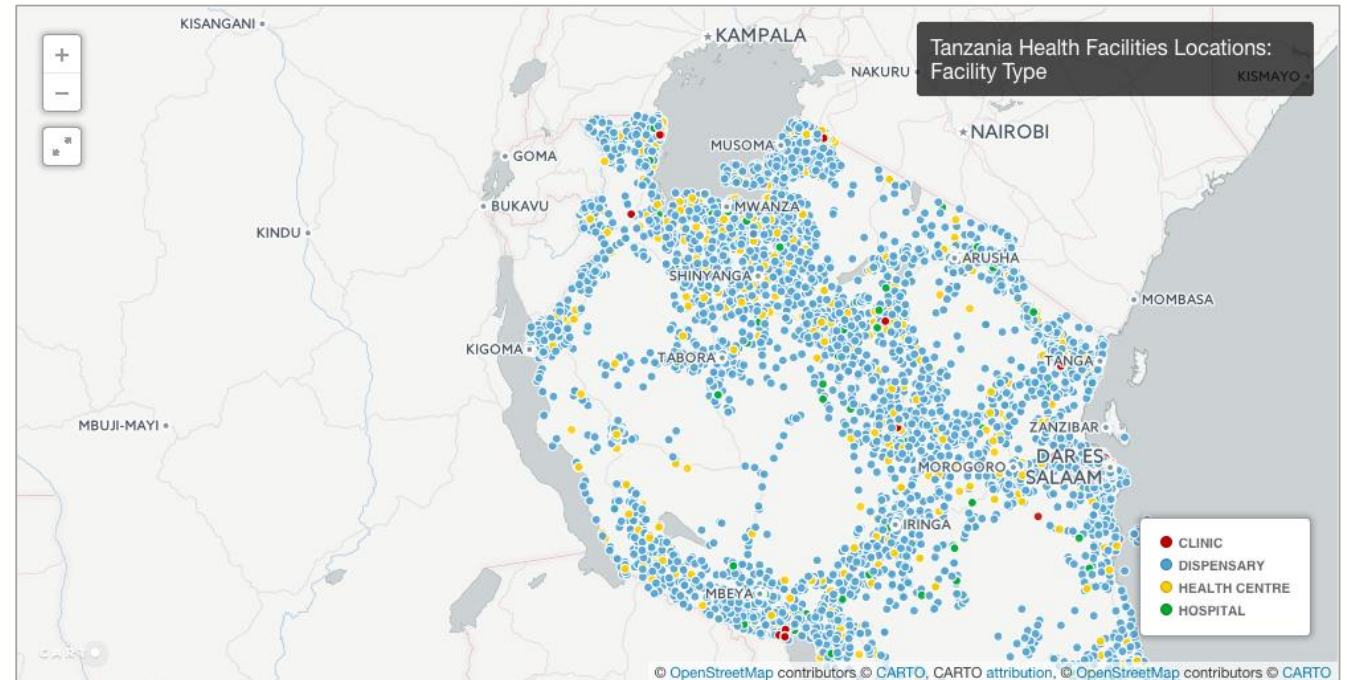
KEY GAPS:

- Health workers have burdensome tools for data collection and use at the point of care.
- Inadequate client record keeping at the facility level impedes the ability to provide continuity of care.
- Data at the facility level are not generally perceived as useful to those who collect it.
- Health facilities are unable to track revenue and the consumption of supplies effectively.
- Client payments are subject to financial leakages.
- Few health facilities are computerised.

TYPES OF HEALTH FACILITIES

As defined by the government of Tanzania:

- **Clinic:** Where outpatients are given medical treatment or advice, especially of a specialist nature.
- **Dispensary:** A primary health facility which offers outpatient services including reproductive and child health services, and diagnostic services.
- **Health Centre:** A primary health facility which offers outpatient and in-patient services, maternity care, laboratory, and dispensing and mortuary services.
- **Hospital:** Provides all medical services including surgical treatment and specialised care.



Source: <http://opendata.go.tz/en/indicator/f1200fbc-48a2-11e5-b84d-0e0c41326911>

ONGOING EFFORTS AND KEY SUCCESSES

Publishing Guidelines:

- The MOHCDGEC published standards and guidelines for electronic management systems for health facilities in January 2016.
- The Care Delivery Task Team is adding more detail on electronic medical-record guidelines as of September 2016.

Using Electronic Data Systems in Hospitals:





- National and referral hospitals are using a variety of hospital administration and laboratory data systems (e.g., Jeeva, WebERP, Care2X, Harmony, Bumi expert, Daisa). Many are locally owned, designed, customised, and supported.
- Most regional hospital laboratories use Labnet.
- Several hospitals have started to use electronic client-payment systems, and are seeing increased revenue ranging from 12 percent at Lushoto to 900 percent at Mbeya.
- Some fund their own systems (e.g., National Health Insurance Fund purchased Seven Hills' system source code), while others receive external support. (e.g., AfyaPro is supported by Netherlands IICD and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)).

Existing initiatives have demonstrated **positive impact from data use at the point of care**. For example:

- Electronic immunisation registry and approaches to building data use capacity and adoption of new systems (BID Initiative).
- Clinical decision-support tools such as Moby and Mobilising Maternal Health.
- An HIV/AIDS client records database—the National AIDS control Programme (NACP) CTC2—has scaled to more than 900 facilities, improving record keeping for tracking of HIV/AIDS clients.

The government of Tanzania has recently introduced a cadre of community health workers and the first batch of trainees will graduate this year and will be paid a salary. This is a marked departure from the reliance on volunteers and partner support for community health workers, although those volunteer workers will continue while government workers are phased in over time.

INVESTMENT RECOMMENDATION SUMMARY TABLE

Investment Recommendation	Estimated Cost (US\$)/Timing	Key Outputs	Capability Unlocked
Computerise primary health care data	 \$34.27m Test: \$2.48m Roll out: \$31.79m	<ul style="list-style-type: none"> • Integrated software solution for primary health care facilities and community health workers, with the following functionality: <ul style="list-style-type: none"> ○ Clinical decision support, guiding workers through proven care guidelines ○ Longitudinal tracking and record keeping ○ Revenue collection, informal sector insurance (community health fund) management, and stock management ○ Report production on primary health care management, aggregate reports feed into HMIS ○ Implemented on tablets and smartphones with solar power; works offline but syncs to central database of primary health care records • Documented system requirements, technical documentation, user guide, and training material • Training and mentorship for health workers • Sustainability plan 	Health workers at the primary health care level can produce and use high-quality data to efficiently manage resources and improve care.
	 6 Years		
Computerise hospital data	 \$13.05m	<ul style="list-style-type: none"> • Expanded standards and guidelines for hospital information systems • Mechanism for accreditation against standards • Guidance and support on planning and implementation • Improved infrastructure (i.e., hardware and networking) • Movement from cash to e-payments • Training and mentorship for health workers 	Health workers in hospitals can produce and use high-quality data to efficiently manage resources and improve care.
	 3 Years		

 INVESTMENT RECOMMENDATION

Computerise primary health care data

GAPS:

- Primary health care workers lack tools and training that enable them to use data for decision-making to improve the quality of care.
- Paper tools and registers are designed to collect data for reporting, rather than serve as useful tools for health workers to provide and track client care.
- Tool design often does not support collecting data that is valuable for day-to-day work.
- Staff are overburdened by manual data processing and tallying to produce reports.
- Data collected at the primary health care level are not often of high-enough quality to be useful.

Existing work that investment should build on:

- The MOHCDGEC published standards and guidelines for electronic management systems for health facilities in January 2016. More detailed work on medical records requirements is currently being completed with support from RTI and funding from US Centers for Disease Control and Prevention (CDC).
- The electronic registry tool from the BID Initiative could be expanded to other health areas, as well as an on-the-job, cascading training model that integrates product-skills training with change-management principles.
- Decision-support algorithms based on national guidelines have been piloted for smartphone-based decision-support tools for primary facilities and community health workers (mainly for reproductive and child health) by Pathfinder, Jhpiego, Elizabeth Glaser Pediatric AIDS Foundation, D-tree funded by USAID and others.

Links to government strategies:

- **eHealth strategy:** Enhance ICT infrastructure and services at all levels.
- **M&E strategy (draft):** Enhance ICT infrastructure in health facilities to enable client tracking and monitoring, and to provide clinical decision support.
- **DDU strategy (draft):** Strengthen availability and accessibility of information/data at the community level.

INVESTMENT RECOMMENDATION

Computerise primary health care data

\$34.27m
Test: \$2.48m
Roll out: \$31.79m

6 Years

Capability Unlocked

Health workers at the primary health care level can produce and use high-quality data to efficiently manage resources and improve care.

Outputs

- Integrated software solution for primary health care facilities and community health workers, with the following functionality:
 - Clinical decision support, guiding workers through proven care guidelines
 - Longitudinal tracking and record keeping
 - Revenue collection, informal sector insurance, and stock management.
 - Aggregate report production to feed into HMIS
 - Report production on primary health care management
 - Works offline but syncs to central database of primary health care records
- Documented system requirements, technical documentation, user guide, and training material
- Hardware (tablets, smartphones, solar chargers) and data bundles for primary health care facilities and community health workers
- Sustainability plan

Activities

TEST—NATIONAL	COST
Develop requirements for an integrated suite of software tools for the primary health care level.	\$380,000
Review existing electronic tools for the primary health care level to produce a "way forward" report.	\$100,000
Develop/enhance/adapt existing software tools based on identified gaps and requirements.	\$1.17m

TEST—REGIONAL AND LOCAL	COST
Procure hardware (tablets, smartphones), data bundles, and associated maintenance services for primary health facilities.	\$320,000
Test software solution within primary health care in three districts.	\$510,000

ROLL OUT—NATIONAL	COST
Enhance "how-to-computerise primary health care" guidelines.	\$80,000
<ul style="list-style-type: none"> • Recruit and train national coordinators. • Facilitate discussions between ministries and private sector about connectivity expansion. • Provide support and guidance to district-level primary-care computerization advisors. 	\$610,000
ROLL OUT—REGIONAL AND LOCAL	COST
Procure and distribute hardware (tablets, smartphones, solar chargers), as well as data bundles and hardware insurance for primary health care facilities and community health workers.	\$14.09m
Recruit and train district-level primary health care computerization advisors on how to computerise primary health care data.	\$470,000
Provide support and guidance to primary health care workers and other district personnel on how to use software tools and resulting data.	\$8.12m
Train primary health care workers on how to use software tools and resulting data.	\$8.42m

➤ INVESTMENT RECOMMENDATION

Computerise hospital data

GAPS:

Inadequate data systems and use in hospitals lead to resource-management challenges, including leakages from cash payments, inefficient workflows, inadequate continuity of care, and generation of inaccurate reports for use at the point of collection or submitted to higher levels of the health system.

- The national hospital and three zonal referral hospitals have computerised systems in place.
- Only 46 of 212 regional and district hospitals have electronic systems in place, mostly for managing client payments (hospital management information system ePay) rather than full hospital computerization.
- Many systems do not include the full range of necessary functionality specified in guidelines. For example, some focus only on revenue collection rather than being comprehensive hospital systems. Many do not include adequate data quality checks and controls.
- No institutionalised system accreditation scheme exists to ensure procured systems meet requirements and necessary functionality.
- Hospital systems are not linked to lab systems, which can cause problems with ensuring accurate and timely orders and test results for clients.

Existing work that investment should build on:

- The MOHCDGEC published standards and guidelines for electronic management systems for health facilities in January 2016. More detailed work on medical records requirements is currently being completed with support from RTI and funding from CDC.
- The MOHCDGEC has produced standards and guidelines for facility systems.
- National and referral hospitals have systems in place (Jeeva, WebERP, Care2X, Harmony, Bumi expert, Daisa).
- Forty-six regional and district hospitals have some electronic system in place, although most of these systems are focused only on revenue management.
- Several hospitals have started to use electronic client payment system and are seeing increased revenue ranging from 12 percent at Lushoto to 900 percent at Mbeya
- Many hospital systems are locally owned, designed, customised, and supported. Some hospitals fund their own software; some receive donor funding (e.g., AfyaPro supported by Netherlands IICD and GIZ.).
- NHIF has purchased Seven Hills system source code from India for deployment in hospitals.
- The Labnet system is in place in most regional hospital laboratories and Basic Laboratory Information System is implemented in some district hospital laboratories. Laboratory sample referral and tracking systems have been piloted with support from CDC, United Nations Children's Fund (UNICEF), Clinton Health Access Initiative (CHAI), UNITAID, and others.

Links to government strategies:

- **eHealth strategy:** Implement a hospital management information system to manage health financial and HR information in the health facilities.
- **DDU strategy (draft):** Strengthen availability and accessibility of information/data at community level.

>> INVESTMENT RECOMMENDATION

Computerise hospital data

 \$13.05m

 6 Years

Capability Unlocked

Health workers in hospitals can produce and use high-quality data to effectively manage resources and improve care.

Outputs

- Expanded standards and guidelines for hospital information systems
- Accreditation mechanism to certify hospital systems against standards and guidelines
- Guidance and support on planning and implementation
- Improved infrastructure (i.e., hardware and networking)
- Training and mentorship for health workers
- Conducive environment for movement from cash to ePayments

Activities

NATIONAL	COST
Enhance hospital systems standards and guidelines.	\$150,000
Further develop a “how-to-computerise” guide for hospitals.	\$170,000
Establish and implement an accreditation mechanism to review hospital systems on the market to ensure they meet developed standards and guidelines.	\$560,000
Facilitate discussions on business models for mobile and electronic payments.	\$40,000
<ul style="list-style-type: none"> • Support rollout of the computerisation guideline (support and manage regional staff). • Support coordination between the government and private stakeholders on connectivity and networking expansion. 	\$30,000

LOCAL	COST
Train regional hospital computerisation advisors on the computerisation guide.	\$1.34m
Roll out the computerisation guide through the regional hospital computerisation advisors.	\$1.2m
Provide hospitals with hardware, networking, connectivity, and infrastructure maintenance contracts.	\$6.47m
Provide hospitals with software support through software-as-a-service model.	\$2.98m
Train facility management on hospital computerisation management.	\$110,000

AFTER INVESTMENT

Health workers are equipped with the information and resources needed to provide prompt, appropriate, and high-quality health care to meet client needs, including:

- Adhering to clinical guidelines.
- Tracking and managing payments and supplies.
- Maintaining client information for continuum of care.



Strengthen Health System Performance

BEFORE INVESTMENT

There is no efficient way to monitor health system performance and no mechanism to increase accountability to its clients.

The goal of these recommended investments is to ensure clients are able to hold their health providers accountable for the quality of their services, and managers have the tools they need to track and support improvement in health worker and facility performance.



Definition of Key Term

PROVIDER: *Someone who is authorised to provide health services (e.g., a doctor of medicine or osteopathy, podiatrist, dentist, chiropractor, clinical psychologist, optometrist, nurse practitioner, nurse-midwife, or a clinical social worker)*





KEY GAPS:

- Ineffective mechanisms for clients to provide feedback on services received.
- Limited and uncoordinated mechanisms for assessing and addressing accountability; limited capacity and confidence to use these mechanisms.
- Limited understanding of the value of accurate reporting decreases incentive to comply with standards.
- Limited ability to track performance against targets, provide feedback, and ensure accountability.

ONGOING EFFORTS AND KEY SUCCESSES

- The Star Rating system assesses the strengths and weaknesses of health facilities, scores and rates their performance in terms of level of health services provided, and formulates a performance-improvement action plan. It is coordinated by the MOHCDGEC Department of Quality Assurance.
- The President's Office of Public Service Management (POPSM) issued guidelines on Open Performance Review and Appraisal System (OPRAS) in 2011 and introduced it to all ministries, departments, agencies, and local government authorities.
- District Council Health Management Teams (CHMTs) regularly visit health facilities to provide supervision support.
- Some facilities have suggestion boxes for collecting feedback from clients.
- Efforts are being made to establish governing committees to hold health facilities accountable.

INVESTMENT RECOMMENDATION SUMMARY TABLE

Investment Recommendation	Estimated Cost (US\$)/Timing	Key Outputs	Capability Unlocked
Strengthen systems for facility performance management and supervision	 \$1.4m	<ul style="list-style-type: none"> • Performance management tool that facilitates on-site data collection and use to formulate performance improvement action plans • District Health Information System (DHIS2) and PlanRep enhancements that streamline supervision/assessment planning, data, and data use • Documented system requirements, technical documentation, user guide, and training material • Sustainability plan 	Facilities can act upon supervisions and assessments to improve performance.
	 1.5 Years		
Implement systems for client feedback management	 \$1.02m	<ul style="list-style-type: none"> • Electronic client feedback platform enabling comments on service availability and provision, and tracking of feedback processing • Guidance on how to provide, acknowledge, and act on feedback • Client service charters to display in health facilities • Documented system requirements, technical documentation, user guide, and training material • Sustainability plan 	Health workers can collect and be responsive and accountable to client feedback and needs.
	 2 Years		

 INVESTMENT RECOMMENDATION

Strengthen systems for facility performance management and supervision

GAPS:

- Assessments and supervision are not always effectively translated into follow-up action plans to improve performance.
- There is inadequate coordination between different assessments and supervision (and their respective data collection and reporting systems) to ensure results are shared and acted upon.
- Some data are in DHIS2, some in other databases [e.g., SafeCare, Electronic Tool to Improve Quality of health care (eTIQH)], or not in any database at all.
- Recommendations from one assessment team do not systematically feed into the next assessment of the same facility, creating a lack of continuity in managing performance.

Existing work that investment should build on:

- Performance management assessments of facilities using the Star Rating system.
- Facility accreditation assessments under the SafeCare scheme supported by PharmAccess Foundation.
- Routine supervision of facilities conducted by district CHMTs.
- Some districts maintain a matrix to track supervisions. Electronic Tool to Improve Quality of health care (eTIQH) software is used in some districts to collect data during supervisions supported by Novartis Foundation, Swiss Tropical and Public Health Institute, and Tanzania Training Center for International Health.
- A large range of different assessments and routine supervisory visits are carried out by national-level institutions to samples of facilities, including vertical programs, logistics/supply chain supervisions, vertical-program data quality assessments, MTUHA data quality assessments, and partner-led supervisions.
- The National Bureau of Statistics (NBS) conducts health facility surveys to assess service provision.

Links to government strategies:

- **HSSP IV:** Operationalise performance-management systems in all health facilities.
- **M&E strategy (draft):** Improve data quality through supportive supervision; improve and harmonise supportive supervision tools for all disease programs.

➔ INVESTMENT RECOMMENDATION**Strengthen systems for facility performance management and supervision** **\$1.4m** **1.5 years****Capability Unlocked**

Facilities can act upon supervisions and assessments to improve performance.

Outputs

- Improved coordination of supervisions and assessments (including enhancements to PlanRep)
- Performance management tool that:
 - Facilitates on-site data collection and use for performance assessment and quality improvement
 - Enables streamlined data management of all supervisions and assessments to formulate performance-improvement action plans
- Centralised electronic HMIS and PlanRep enhancements that streamline supervision/assessment planning, data, and data use
- Documented system requirements, technical documentation, user guide, and training material for all software enhancements
- Sustainability plan

Activities

NATIONAL	COST
Review guidelines/policies/processes linked to performance management/supervision of facilities to produce harmonised guidelines.	\$120,000
Develop requirements for an on-site supervision/performance-management tool for use by supervisors or assessors who visit facilities.	\$60,000
Develop/adapt an on-site supervision/performance-management tool in line with requirements.	\$260,000
Enhance centralised electronic HMIS to incorporate all supervision/assessment data.	\$30,000
Enhance PlanRep to facilitate the scheduling of supervision/assessments.	\$60,000
Train national personnel on revised supervision/assessment procedure and tools.	\$170,000

REGIONAL AND LOCAL	COST
Procure tablets for national/district-level supervisors/assessors to use during facility supervisions/assessments.	\$230,000
Train district-level personnel on revised supervision/assessment procedures.	\$470,000

 INVESTMENT RECOMMENDATION

Implement systems for client feedback management

GAPS:

- Clients have no systematic way of giving feedback on the quality of service they receive.
- Health workers lack feedback data and tools to monitor performance to inform how they can improve service delivery.

Existing work that investment should build on:


- Some facilities have suggestion boxes, though there are no systematic ways of processing that feedback and communicating it to relevant people to take action.
- The MOHCDGEC has planned for introduction of a platform for receiving feedback.
- Several partners are piloting feedback initiatives, including GIZ, Pathfinder, Intel.

Links to government strategies:

- **HSSP IV:** Increase community engagement and partnership in ensuring high-quality public-health services are delivered.

 INVESTMENT RECOMMENDATION

Implement systems for client feedback management

 \$1.02m

 2 years

Capability Unlocked

Health workers can collect and be responsive and accountable to client feedback and needs.

Outputs

- Electronic platform for client feedback collection and response regarding service availability and provision
- Guidance and established processes for providing, acknowledging, and acting on feedback
- Client service charters to display in health facilities
- Documented system requirements, technical documentation, user guide, and training material
- Sustainability plan

Activities

NATIONAL	COST
Develop a guideline and strategy for feedback collection, processing workflows, and follow-up.	\$240,000
Develop an Unstructured Supplementary Service Data (USSD)/Short message service (SMS) feedback tool and feedback-processing interface and liaise with mobile-network operators.	\$30,000
Support and train the feedback-reception team who will: <ul style="list-style-type: none"> • Categorise incoming feedback. • Channel feedback to relevant parties through periodic feedback summaries sent out to national, district, and facility levels, as relevant. • Send phone and SMS feedback to relevant parties on urgent issues. • Give the client acknowledgment and information on steps being taken. 	\$170,000

NATIONAL—Continued	COST
Train the feedback processing team.	\$30,000
Develop and launch marketing campaign for the general public.	\$90,000
Socialise the feedback system at the national level through a launch event and briefing meetings.	\$30,000
Develop a plan for sustainability and ownership of the system.	\$30,000

REGIONAL AND LOCAL	COST
Socialise the feedback system among health workers and district personnel through district meetings.	\$400,000

AFTER INVESTMENT

Tanzania is able to continuously identify and act on ways to improve health system performance and services to clients through effective performance-management systems and practices, including a stronger emphasis on capacity-building, supervision, and accountability.

- Clients are able to provide feedback.
- Facilities are able to monitor performance.
- Higher levels are able to support facilities to improve performance.



Optimise Resource Management

BEFORE INVESTMENT

Managers struggle to assess resource needs and availability, and have difficulty identifying ways to improve public administration and service delivery in the health sector. Multiple, disconnected systems for human resources, health financing, and supply chains make it challenging to efficaciously manage and deploy resources to meet health sector needs.

The goal of these recommended investments is to ensure that human, supply, and financial resources are effectively allocated according to needs.

KEY GAPS:

Human Resources:

- Multiple, disconnected human resources for health (HRH) systems exist, impeding the ability to effectively identify and address staffing and skill shortages across the country, and to eliminate ghost workers.
- Uneven distribution of human resources to provide services nation-wide.

Supplies:

- No reliable source of data that shows where the stockouts and bottleneck are, which impacts order-fulfillment rates.
- Lack of integration between different supply chain systems, leading to inefficiencies.







Finance:

- Inefficiencies in processing insurance claims at the facility level.

ONGOING EFFORTS AND KEY SUCCESSES

- POPSM's Human Capital Management Information System (HCMIS)/Lawson system has human resource data on government employees (health sector and non-health sector).
- The MOHCDGEC's Human Resources for Health Information System (HRHIS), supported by the Japanese International Cooperation Agency, aims at capturing data on all health sector workers.
- Regulatory councils (Medical Council of Tanganyika, Nurses and Midwives Council, Pharmacy Council, etc.) are responsible for registering and regulating public and private health workers.
- In the domain of the supply chain, the key institutions involved from the government side are Medical Stores Department (MSD), the MOHCDGEC, and PORALG. Supply chain systems are in place and used nationally, including the Electronic Logistics Management Information System (eLMIS) and MSD Epicor. There is some existing funding and support for eLMIS and the Vaccine Information Management System (VIMS, intended to replace the District Vaccination Data Management Tool [DVDMT] and Stock Management Tool [SMT]), but more support is needed to fully integrate and operationalise an effective supply chain system.
- Multiple health insurance schemes are in place (National Health Insurance Fund [NHIF], National Social Security Fund [NSSF] Insurance Benefit, private insurers), with each having established systems for claims management and membership management, often built in-house or in-country.

INVESTMENT RECOMMENDATION SUMMARY TABLE

Investment Recommendation	Estimated Cost (US\$)/Timing	Key Outputs	Capability Unlocked
Implement a health and social services workers registry	 \$1.18m	<ul style="list-style-type: none"> Registry that: <ul style="list-style-type: none"> Links multiple human resource and training systems Stores basic identification and contact details, qualifications, and employment location and history Serves as a platform on which other applications to support health workers can be built (e.g., eLearning, telemedicine) Protocols for updates, defining regulatory and worker roles, imports from POPSM's HCMIS, and an interface for workers to update some of their own details Documented system requirements, technical documentation, user guide, and training material Sustainability plan 	Decision-makers can access high-quality, integrated data on health workers to support planning.
	 2 Years		
Enhance systems for management of supply chain data	 \$1.47m	<ul style="list-style-type: none"> Supply chain system strategy Major supply chain systems enhanced Documented system requirements, technical documentation, user guide, and training material Sustainability plan 	Decision-makers at health facilities can better understand and solve supply chain challenges.
	 2 Years		
Develop standards for health insurance eClaims	 \$410,000	<ul style="list-style-type: none"> eClaims standards for submitting an insurance claim no matter who is the payer (i.e., insurer) or who is the service provider (i.e., health facility) Governance structure to maintain and oversee standards 	Health facilities can more efficiently process insurance claims, leading to increased financial resources for health facilities.
	 1.5 Years		

» INVESTMENT RECOMMENDATION

Implement a health and social services workers registry

GAPS:

- Multiple ministries, departments, and agencies maintain their own, disconnected HRH systems (e.g., HCMIS, HRHIS, regulatory council databases, training databases), leading to a lack of accessible, high-quality data for personnel decision-making and planning, including staffing distributions.
- There is no common way of referencing health workers across systems, impeding the ability to share data and manage user credentials of health workers in different systems.
- Potential innovations in workforce communications, telemedicine, and eLearning are impeded by lack of an up-to-date, comprehensive workers registry.

Existing work that investment should build on:

- POPSIM's HCMIS/Lawson system has HR data on government employees, but not on health workers from private or faith-based facilities or community volunteers. The Public Sector Strengthening project (funded by USAID) is planning additional support for HR data.
- The MOHCDGEC's HRHIS aims at capturing all health sector workers, but is not kept up to date and data quality is poor. HRHIS does not currently include key registry functionality, but could be transformed into a registry. It was supported by Japanese International Cooperation Agency funding and University of Dar es Salaam.
- The eHealth Steering Committee established a task team to develop requirements for a workers registry, but it has not yet met. There is also a HRH TWG.
- This should build on investments in the Data Use Partnership recommendations under the *Connect and Harmonise Data Systems* section.

Links to government strategies:

- **The Five Year Development Plan:** Address the gap in skilled workers to achieve middle-income country status. Ensure adequate health information systems to facilitate planning and programs.
- **Human Resource for Health and Social Welfare Strategic Plan:** Strengthen policy, planning, research, utilisation, retention, and development of human resources.
- **Primary health care Services Development Program:** Strengthen and maintain human resource database.
- **eHealth strategy:** Establish comprehensive health facility, provider, and client registries.
- **HSSP IV:** Improve data for human resource allocations, distributions, and trainings.
- **DDU strategy (draft):** Ensure availability of sufficient numbers of local, skilled human resources to guarantee sustainability of the DDU solutions.

INVESTMENT RECOMMENDATION

Implement a health and social services workers registry

 \$1.18m

 2 years

Capability Unlocked

Decision-makers can access high-quality, integrated data on health workers to support planning.

Outputs

- Registry that:
 - Links multiple human resource and training systems
 - Stores basic identification and contact details, qualifications, and employment location and history
 - Serves as a platform on which other applications to support health workers can be built (e.g., eLearning, telemedicine)
- Protocols for updates, including roles for regulatory councils, imports from POPSM's HCMIS, and an interface for workers to update some of their own details
- Documented system requirements, technical documentation, user guide, and training material
- Sustainability plan

Activities

NATIONAL	COST
Develop business requirements and governance processes for a workforce registry.	\$230,000
Develop the workforce registry software, and set up the application programming interface (API) and interoperability with other systems.	\$300,000
Train national data users (regulatory councils, POPSM, the MOHCDGEC, and partners who manage volunteer community workers) and district-level training facilitators.	\$170,000
Launch and socialise the workforce registry.	\$10,000
Familiarise software developers in the health care sector with how to link existing systems to, and develop add-on applications for, the workforce registry.	\$30,000

NATIONAL—Continued	COST
Provide ongoing review, maintenance, and user support and communications.	\$70,000
Develop a sustainability plan.	\$30,000

REGIONAL AND LOCAL	COST
Train district users.	\$340,000

>> INVESTMENT RECOMMENDATION**Enhance systems for management of supply chain data****GAPS:**

Key systems for supply chain management still require improvements to address challenges:

- There are inadequate availability and visibility of data to identify bottlenecks-(e.g., what adjustments were made to a facility's order, whether or not the order was fulfilled, whether there are transport or delivery issues, and if so, where the problems occurred).
- Facilities send paper orders and reports, not accessing eLMIS directly; eLMIS facility-friendly features are limited.
- Stock transfers between facilities are not fully captured.
- Need further integration of different supply chain systems.

Existing that investment should build on:

- Funding for development and implementation of systems from USAID, the Gates Foundation through John Snow, Inc. (JSI), PATH, VillageReach, CHAI, UNICEF, World Health Organisation.
 - eLMIS and MSD Epicor are used nationally.
 - A new vaccine supply chain system, VIMS, is replacing the DVDMT and SMT.
- Integration of Immunisation Registry and VIMS to facilitate transfer of stock balance and consumptions from health facilities and stock distribution from district vaccine store to health facility.

Links to government strategies:

- **HSSP IV:** Improve governance and accountability to the health commodity supply chain.
- **eHealth strategy:** Enable an electronic logistics and supplies system to ensure adequate quality and quantities of health commodities; implement a nationwide eLMIS, leveraging existing systems. Integrate the system with existing ERP, WMS, eHealth, and HMIS systems.
- **Pharmaceutical section action plan 2020:** Implement eLMIS integrated with existing systems to improve data accuracy, visibility, and use from council to national level.

INVESTMENT RECOMMENDATION

Enhance systems for management of supply chain data

 \$1.47m

 2 years

Capability Unlocked

Decision-makers at health facilities can better understand and solve supply chain challenges.

Outputs

- Supply chain system strategy
- Enhanced major supply chain systems, including:
 - Facility-friendly and smartphone-/tablet-friendly access and features
 - Enhanced features for data use (e.g., proof of delivery, visibility of stocks at the facility level, visibility of order status, sustainable eLMIS code updates compatible with OpenLMIS)
 - Linkages to centralised electronic HMIS and health facility registry
- Documented system requirements, technical documentation, user guide, and training material for all enhancements
- Sustainability plan

Activities

NATIONAL	COST
Develop a supply chain system strategy (10-year).	\$180,000
Develop detailed requirements for further development and linking of eLMIS, VIMS, MSD Epicor, and other supply chain systems.	\$140,000
Develop enhanced features for major supply chain systems.	\$790,000
Provide ongoing review, maintenance, and user support.	\$50,000

REGIONAL AND LOCAL	COST
Train district users on how to monitor supply chain challenges using data.	\$310,000

>> INVESTMENT RECOMMENDATION**Develop standards for health insurance eClaims****GAPS:**

- Some health facilities have to log-in in to each insurer's system to file claims; other facilities submit paper-based claims.
- There is no standard claims format. Some hospitals are entering different formats of the same data in their own internal systems as well as multiple insurers' systems.
- Insurers spend significant resources verifying claims, which could be reduced by more automation and data standards.

Existing work that investment should build on:

- Multiple health insurance schemes are in place (NHIF, NSSF Insurance Benefit, private insurers), regulated by the Tanzania Insurance Regulatory Association.
- Insurers have established systems for claims management and membership management, often built in-house or in-country.
- Informal-sector insurance (community health fund) is currently being re-designed. Mobile-application pilots for the community health fund have been supported by Swiss Development Cooperation, GIZ, EPOS, PharmAccess Foundation, and KfW Development Bank.
- Kenya and Ghana, with support from the Joint Learning Network for Universal Health Coverage, developed eClaims standards that could be adapted.

 INVESTMENT RECOMMENDATION

Develop standards for health insurance eClaims

 \$410,000

 1.5 years

Capability Unlocked

Health facilities and insurers can more efficiently process insurance claims, leading to increased financial resources for health facilities.

Outputs

- eClaims standards for submitting an insurance claim no matter who is the payer (i.e., insurer) or who is the service provider (i.e., health facility)
- Governance structure to maintain and oversee standards

Activities

NATIONAL	COST
Develop eClaims standards.	\$230,000
Launch and socialise eClaims standards.	\$10,000
Familiarise software developers of hospital and insurance-claims systems with how to operationalise eClaims standards.	\$10,000
Develop a governance structure to maintain eClaims standards.	\$160,000

AFTER INVESTMENT

Decision-makers and health workers have the **data and tools they need** to allocate and manage resources to provide the highest-quality services for an **efficient and effective public health system**.



Improve Data Supply and Demand

BEFORE INVESTMENT

Skills, motivation, and practices around data use are not yet institutionalised, affecting data quality and limiting the ability to make evidence-based decisions.

The goal of these recommended investments is to ensure decision-makers have access to high-quality health surveillance and service-monitoring data, and they value and routinely use these data for decision-making.









KEY GAPS:

- Inadequate incentives, culture, and capacity to use data for decision-making.
- Inadequate staff training and capacity for all aspects of data use and management to inform planning, management, and clinical decisions.
- Inefficient use of available professionals with expertise in data analysis (i.e., statisticians).
- Lack of harmonised indicators for data collection and analysis.
- Notifiable surveillance data systems have not been deployed in all regions.
- Lack of perceived benefits to the data collector. Staff are overburdened, spend too much time on data recording, and lack motivation and skills to produce and use high-quality data (e.g., data are only reported up).
- Lack of community-level data (e.g., data on births and deaths that take place outside health facilities), leading to lack of data on maternal and infant mortality and burden of disease.

ONGOING EFFORTS AND KEY SUCCESSES

- The MOHCDGEC M&E unit, and the health M&E technical working group (TWG) (with technical support from the University of Dar es Salaam computer science and RTI, and funding from the CDC and The Global Fund to Fight AIDS, Tuberculosis and Malaria) have made substantive progress at:
 - Integrating some vertical program reports into the HMIS.
 - Rolling out the web-based DHIS2 nationwide; DHIS2 is now used in all districts.
 - Supporting facilities to achieve high reporting rates.
- Health Training Institutes incorporate some data management and data use topics in their training of health workers.
- The NBS is working with the Eastern African Statistical Training Centre to increase data use and statistics capacity.
- There is a health M&E master's degree program at Mzumbe University, initially supported by the University of California San Francisco.
- MEASURE Evaluation (funded by USAID) has been a key support partner in the area of data use in the health sector. Recently launched, the USAID-funded Public Sector Strengthening project is working directly with district councils and planning capacity-building efforts.
- "District health profiles" are now produced by some districts using HMIS data.
- The electronic integrated disease surveillance reporting (eIDSR) system has been developed and rolled out to part of the country, led by the MOHCDGEC HMIS unit (supported by the CDC).
- There is work ongoing in select regions to improve the recording and registration of births and deaths by the Registration, Insolvency and Trusteeship Agency (RITA), the MOHCDGEC, PORALG, and the NBS (supported by UNICEF, the World Bank, Bloomberg Philanthropies, Ifakara Health Institute, and PATH's BID Initiative).

INVESTMENT RECOMMENDATION SUMMARY TABLE

Investment Recommendation	Estimated Cost (US\$)/Timing	Key Outputs	Capability Unlocked
Improve HMIS indicators and reporting	 \$6.91m	High-quality and usable aggregate surveillance and service-delivery data are available to decision-makers through: <ul style="list-style-type: none"> Improved and streamlined standard report formats and indicators which are useful and integrated Clear policy guidelines for the HMIS Centralised electronic HMIS receiving aggregated data from other electronic data systems 	Decision-makers can access high-quality service delivery and health surveillance data.
	 3 Years		
Institute data use practices and capacity	 \$1.51m	<ul style="list-style-type: none"> Data use culture instituted in the health sector through development and roll out of a “data use practices toolkit” and forums for sharing best practices in data use Capacity and skills for data use expanded through data use topics being mainstreamed into existing health sector training curricula 	Decision-makers and policy-makers have skills to use data in daily activities.
	 4 Years		
Enhance and scale notifiable disease surveillance	 \$4.11m	<ul style="list-style-type: none"> Enhanced electronic disease surveillance system (eIDSR) Integrated disease surveillance reporting (IDSR) rolled out nationwide Documented system requirements, technical documentation, user guide, and training material 	Health workers can quickly and effectively respond to notifiable disease outbreaks.
	 1.5 Years		
Implement notification systems for birth and death recording	 \$1.74m	<ul style="list-style-type: none"> Applications to capture birth and death events and notify key ministries/departments/agencies (e.g., RITA) Documented system requirements, technical documentation, user guide, and training material Training and roll-out of tools, including to local leaders Sustainability plan 	Health workers and local leaders can capture birth and death events taking place in communities and health facilities.
	 2 Years		

>> INVESTMENT RECOMMENDATION**Improve HMIS indicators and reporting****GAPS:**

- Data quality is a key constraint in MTUHA.
- Some vertical programs still request substantive reports outside MTUHA (e.g., laboratory, immunisation).
- Report formats are not always designed to be useful for facility managers to use data.
- Where source data systems exist, data are being re-entered into DHIS2 rather than transferred electronically, with lack of guidance on how to do so.
- Lack of clear guidelines about roles and responsibilities, reporting, and data access.

Existing work that investment should build on:


- The MOHCDGEC M&E unit, and the health M&E TWG (with technical support from the University of Dar es Salaam computer science and RTI, and funding from the CDC and the Global Fund) have made substantive progress:
 - Integrating some vertical program reports into HMIS.
 - Rolling out the web-based DHIS2 nationwide; DHIS2 is now used in all districts
 - Planning a mobile reporting tool pilot, with support from UNICEF and CDC.
- Supporting facilities to achieve high reporting rates.
- Bloomberg Philanthropies' Data for Health initiative plans to support the formulation of a health data policy.
- Ifakara Health Institute has implemented Sentinel Panel of Districts which includes support to facilities to collect routine HMIS data.
- Many implementing partners are supporting the use of MTUHA and DHIS2 as part of their broader support to health facilities and districts.

Links to government strategies:

- **eHealth strategy:** Strengthen MTUHA for evidence-based decision-making and care, establish master registries, integrate data from other sources (e.g., hospital referrals, disease verticals).
- **M&E strategy (draft):** Integrate administrative systems in DHIS2 for monthly reports; additional training at regional and local levels.
- **DDU strategy (draft):** Harmonise and disseminate data quality definitions.

>> INVESTMENT RECOMMENDATION

Improve HMIS indicators and reporting

 \$6.91m

 3 years

Capability Unlocked

Decision-makers can access high-quality service delivery and health surveillance data.

Outputs

High-quality and usable aggregate surveillance and service-delivery data are available to decision-makers through:

- Improved and streamlined standard report formats and indicators that are useful and integrated at the point of data collection
- Data policy guidelines, including data collection, storage, retention, privacy, reporting, access, feedback, data use, roles and responsibilities, and supervision
- DHIS2 receives aggregated data from other electronic data systems, and is enhanced to include revisions to forms, a mobile reporting feature, updated data quality checks, and additional data visualisations

Activities

NATIONAL	COST
Develop HMIS data policy guidelines.	\$120,000
<ul style="list-style-type: none"> • Review, update, and standardise the HMIS indicators and report formats, ensuring the report formats encourage local data use, and removing any excess indicators. • Complete integration of vertical programs into HMIS. • Validate and update the rules for data quality checks. 	\$1.95m
Enhance centralised electronic HMIS.	\$550,000
Develop guidelines on how data can be transferred from point-of-care systems and other source systems into centralised electronic HMIS.	\$70,000

NATIONAL—Continued	COST
Facilitate the upgrade of existing point-of-care systems and other systems to allow data transfer into centralised electronic HMIS.	\$30,000
Train national users and district-level trainers on improved HMIS indicators and system.	\$130,000
REGIONAL AND LOCAL	COST
Train district users improved HMIS indicators and system.	\$2.24m
Train facility staff on how to compile and use revised report formats.	\$1.82m

 INVESTMENT RECOMMENDATION

Institute data use practices and capacity

GAPS:

- There is a need to further develop data use practices built into decision-making processes.
- Lack of incentives, culture, and capacity to use data for decision-making. Limited capacity to convert data into usable information to inform planning, management, and clinical decisions. Lack of understanding of the value of ensuring accurate data and using it.
- Gaps in data use skills exist, particularly at lower levels (e.g., skills to transform data into information, critically examine and interpret data, and use data to make a decision or present an argument).

Existing work that investment should build on:

- The health M&E TWG, supported by RTI and with funding from the CDC and the Global Fund, coordinates work in DDU.
- “District health profiles” are now produced by some districts using HMIS data, supported by the Global Fund.
- MEASURE Evaluation (funded by USAID) supports the development and piloting of national, standard, data quality assessment tools, as well as national and subnational efforts to improve data use.
- USAID's Public Sector Strengthening project and Millennium Challenge Corporation Open Data Initiative include substantial data use components
- Bloomberg Philanthropies’ Data for Health initiative plans to support the formulation of a road map for the DDU strategy (draft).
- Health training institutes incorporate limited data management and data use topics in their training of health workers (e.g., the NBS is working with the Eastern African Statistical Training Centre to increase data capacity, and there is a health M&E master’s degree program at Mzumbe University, supported by the University of California San Francisco).

Links to government strategies:

- **M&E strategy (draft)** and **DDU strategy (draft)**: Institute data use culture and build data use capacity and accountability.
- **M&E strategy (draft)**: Conduct regular data quality audits and include as part of a routine supportive-supervision checklist.

>> INVESTMENT RECOMMENDATION

Institute data use practices and capacity

 \$1.51m

 4 years

Capability Unlocked

Decision-makers have skills to use data in daily activities.

Outputs

- Data use culture instituted in the health sector through development and roll out of a data use practices toolkit and forums for sharing best practices in data use
- Capacity and skills for data use expanded through data use topics being mainstreamed into existing health sector training curricula

Activities

NATIONAL	COST
<ul style="list-style-type: none"> • Develop a data use toolkit, including guidelines and change management practices, for all levels of the health system. • Coordinate leadership of the health data governance structure. 	\$220,000
<ul style="list-style-type: none"> • Review and strengthen data use practices in pre-service and in-service training curricula for all health care workers. • Provide ongoing support to training institutions to use updated pre-service and in-service training curricula. 	\$280,000
<ul style="list-style-type: none"> • Assess job descriptions in roles that should be primary data users and provide recommendations on revisions to explicitly require the use of data. • Enhance existing skill-development tools and resources to include data use practices. 	\$210,000
Sensitise national policymakers and train national leaders and facilitators on the data use toolkit and mentorship.	\$130,000
Hold national-level stakeholder workshops to socialise the data use toolkit and the health data governance structure.	\$30,000

NATIONAL—Continued	COST
Conduct meetings and other outreach to prospective data use champions and provide speaking opportunities for champions at community workshops.	\$100,000
Conduct an assessment of rollout and uptake of the data use toolkit and changes in health data governance.	\$60,000
Monitor the compliance level of health care training institutes with the updated data use curricula.	\$110,000

REGIONAL AND LOCAL	COST
<ul style="list-style-type: none"> • Train regional and district leaders, HMIS leads, and statisticians on the data use toolkit. • Identify and contract with training institutions to organise in-service trainings for health workers on data use practices in target regions. 	\$290,000
Conduct refresher trainings with regional staff, including new policies, guidelines, and best practices (e.g., every two years).	\$80,000

**>> INVESTMENT RECOMMENDATION**

Enhance and scale notifiable disease surveillance

GAPS:

- eIDSR, a data system for disease surveillance, has not been rolled out nationwide due to resource constraints.
- Users of the eIDSR platform are experiencing technical difficulties (e.g., intermittent connectivity).

Existing work that investment should build on:

- The MOHCDGEC HMIS unit has led development and rollout of IDSR, including its electronic reporting tool, eIDSR, to 17 regions (with funding from the CDC). They need additional resources to roll out IDSR nationwide.

Links to government strategies:

- **eHealth strategy** and **M&E strategy (draft)**: Continue to roll out eIDSR across the country and support national scale-up.

INVESTMENT RECOMMENDATION

Enhance and scale notifiable disease surveillance

 \$4.11m

 1.5 years

Capability Unlocked

Health workers can quickly and effectively respond to notifiable disease outbreaks.

Outputs

- Enhanced electronic disease surveillance system (eIDSR)
- Notifiable disease surveillance (IDSR) rolled out nationwide
- Documented system requirements, technical documentation, user guide, and training material

Activities

NATIONAL	COST
Review eIDSR performance in ten regions to identify gaps.	\$20,000
Enhance eIDSR design to address identified gaps.	\$60,000

REGIONAL AND LOCAL	COST
<ul style="list-style-type: none"> • Roll out IDSR in the remaining 15 regions, including enhanced eIDSR. • Conduct refresher training in existing ten regions. 	\$4.03m

INVESTMENT RECOMMENDATION

Implement notification systems for birth and death recording

GAPS:

- Lack of high-quality data on recording of births and deaths. While immunisation has a coverage rate of 93 percent (TDHS 2015) or 96 percent (MOHCDGEC Official Statistics), birth registration and certification stands at 13.4 percent (National Population and Housing Census 2012).
- Lack of accurate, routine data on births and deaths, especially those that occur outside health facilities.
- Severe data quality challenges for important indicators: maternal mortality, infant mortality, and burden of disease.
- There are multiple pilots and tools that contribute to birth and death registration, but no single, comprehensive system accessible to all relevant government agencies.

Existing work that investment should build on:


- RITA is responsible for legal registration of births and deaths, but relies on the health sector and local government structures for notifications of births and deaths. The National Identification Authority in turn depends on RITA for birth and death information. There is a Civil Registration and Vital Statistics (CRVS) High-Level Coordinating Committee chaired by the Prime Minister's Office which includes the eGovernment Agency, NBS, and other institutions.
- RITA has piloted mobile birth-registration applications in Mbeya and Mwanza (supported by UNICEF). PATH's BID Initiative has mobile birth notifications for the purposes of the immunisation registry, and various other electronic systems in the health domain also record births and deaths.
- The World Bank is funding a redesign of RITA's system, though its funding does not cover national rollout of birth and death notification systems.
- RITA is working to establish a CRVS enterprise architecture and system requirements and pilot a tablet-based, verbal autopsy tool to record deaths in ten wards across five districts (supported by Bloomberg Philanthropies' Data for Health Initiative, UNICEF, and the Canadian International Development Agency).
- Ifakara Health Institute has implemented Sentinel Panel of Districts which includes Sample Vital Registration with Verbal Autopsy (SAVVY), a demographic surveillance system that provides nationally representative estimates of mortalities based on age, sex, residence, and zone.
- PORALG and the NBS are planning to re-establish paper "village registries" of village residents.

Links to government strategies:

- **National Strategy for Civil Registration and Vital Statistics for Mainland Tanzania, and M&E strategy (draft):** Strengthen and roll out electronic birth and death registration systems, including interoperability between RITA and the SAVVY system.

➔ INVESTMENT RECOMMENDATION

Implement notification systems for birth and death recording

 \$1.74m

 2 years

Capability Unlocked

Health workers and local leaders can capture birth and death events taking place in communities and health facilities.

Outputs

- Applications to capture birth and death events and send notifications to key ministries, departments, and agencies (e.g., RITA)
- Documented system requirements, technical documentation, user guide, and training material
- Sustainability plan

Activities

NATIONAL	COST
Develop requirements for applications for birth and death notifications from communities and health facilities to the legal birth registration system, village registries, and the client registry.	\$180,000
Develop or enhance applications for birth and death notifications.	\$310,000

REGIONAL AND LOCAL	COST
Train district facilitators in the use of applications at the ward and village levels.	\$310,000
Train community leaders on the use of applications.	\$940,000

AFTER INVESTMENT

The value of data is widely recognised and understood, and health workers are able and motivated to collect and use data accurately and effectively in their daily work.



Connect and Harmonise Data Systems

BEFORE INVESTMENT

Without strong governance structures, enterprise architecture, and standards, leaders in the health sector struggle with disparate data systems and digital health projects that collect data in slightly different ways. This makes it difficult to share and use data.

The goal of these recommended investments is to ensure digital health systems in Tanzania are appropriately linked and compatible according to a national enterprise architecture and standards.

KEY GAPS:







- Lack of enterprise architecture that outlines how different eHealth components communicate and link with each other.
- Lack of common, structured standards for terminology in data systems.
- Lack of ability to exchange data across systems, causing health workers to use burdensome and redundant systems for data collection.
- Lack of a client registry to identify clients across the health and social services sector and track their health records over time.
- Lack of routinely updated, accurate, and accessible lists of administrative areas (i.e., districts, wards, villages).
- Lack of harmonisation of data collection and use policies at PORALG, MOHCDGEC, the eGovernance Agency (eGA), and NSB.

ONGOING EFFORTS AND KEY SUCCESSES

Under the MOHCDGEC and the eGA, the government of Tanzania has initiated work to establish the standards and building blocks to harmonise data across systems, and make the data more accessible and usable. More investment is needed to complete key ICT building blocks to connect and harmonise data systems and the data itself.

- The eGA has published some standards and guidance on interoperability between government systems, but these are not specific to the health sector. The eGA also plans to establish an Enterprise Service Bus to mediate data exchange between government systems, but the health sector requires specialised mediation services.
- The eGA (with support from the World Bank under the Open Government Partnership) coordinates work to make data more open to the public, and has established an open data dashboard which includes health data.
- The MOHCDGEC has established a public portal to the centralised electronic HMIS.
- The eHealth Steering Committee has a mandate to implement the eHealth strategy and perform coordination and governance functions for the eHealth Strategy.
- There are several public-private TWGs and task teams assisting with implementing strategies and coordinating investments. Some are highly active with frequent meetings, broad and engaged participation, and programs of work. The Enterprise Architecture TWG consists of several task teams:
 - Care Delivery (supported by RTI and the CDC, focusing on standards for client-level data and electronic medical records, and a way forward for a client registry).
 - Decision Support (supported by JSI and USAID, developing initial requirements for a health data warehouse).
 - Health Information Access (supported by JSI and USAID, developing initial requirements for a health information mediator).
 - Health Care Resources (has not yet met).







INVESTMENT RECOMMENDATION SUMMARY TABLE

Investment Recommendation	Estimated Cost (US\$)/Timing	Key Outputs	Capability Unlocked
Enhance government coordination of data systems and use initiatives	 \$220,000	<ul style="list-style-type: none"> Updated the MOHCDGEC/PORALG website incorporating: <ul style="list-style-type: none"> Continuously-updated systems inventory Comprehensive digital library of data systems and data use Project implementation guidelines for partners working in data systems and data use Enhanced coordination between different committees and TWGs 	Government can track and coordinate data systems and use initiatives in the health sector.
	 6 Months		
Put in place an enterprise architecture, including governance, guidelines, and standards for interoperability	 \$1.21m	<ul style="list-style-type: none"> National eHealth standards framework including: <ul style="list-style-type: none"> eHealth architecture building blocks Business process maps and their linkages Business, information, and technology architectures Governance framework for enterprise architecture Enhanced enterprise architecture capacity in the MOHCDGEC and PORALG Software refinements to key systems to align them with enterprise architecture 	Health sector stakeholders can link data systems together.
	 2 Years		
Implement a client registry	 \$970,000	<ul style="list-style-type: none"> A client registry of all individuals served by health and social services sector. This registry will: <ul style="list-style-type: none"> Allow read-and-write access by a range of systems across the health and social services sector in accordance with defined rules on privacy and consent Store only data useful in identifying clients and a list of places they have been seen System requirements and technical documentation, user guide, and training material Sustainability plan 	Health and social services providers can track individual clients over time and across multiple points of service.
	 2 Years		

Continued...

INVESTMENT RECOMMENDATION SUMMARY TABLE

Continued from previous slide

Investment Recommendation	Estimated Cost (USD) / Timing	Key Outputs	Capability Unlocked
Implement a terminology service	 \$1.23m	<ul style="list-style-type: none"> • Terminology standards, including for diagnoses, drugs, and medical supplies • Terminology registry, including lists and classifications of medical terminology made available as an update service to other data systems • System requirements and technical documentation, user guide, and training material • Sustainability plan 	Health workers can transfer and analyze data easily across systems through well defined, consistent health terminology.
	 2 Years		
Implement an administrative-area registry	 \$1.22m	<ul style="list-style-type: none"> • An administrative-area (e.g., villages, wards) registry that will: <ul style="list-style-type: none"> ○ Be publically accessible and available to other systems via an API ○ Include details of local government leaders ○ Include shape files, enabling display of data in maps ○ Continually updated by PORALG and districts • System requirements and technical documentation, user guide, and training material • Sustainability plan 	The government and the public can compare and analyze data structured by geographic administrative areas.
	 2 Years		
Implement a health data warehouse	 \$2.08m	<ul style="list-style-type: none"> • Centralised data warehouse software with analytics and visualisation tools to transform data from multiple sources into accessible, analyzable, and actionable information • System requirements and technical documentation, user guide, and training material • Sustainability plan 	Decision-makers can easily access data analysis tools and data from a range of source systems.
	 2.5 Years		

» INVESTMENT RECOMMENDATION

Enhance government coordination of data systems and use initiatives

GAPS:

- There are more than 120 digital health-related data systems and applications owned or approved by different ministries, departments, and agencies, making coordination difficult. Some projects are led by partners, the private health sector, civil society, the technology sector, or coalitions.
- There is a range of TWGs and task teams working in data systems and data use in the health sector and more broadly (e.g., M&E TWG, Enterprise Architecture TWG, mHealth Community of Practice). Terms of reference, mandates, and how committees and task teams can work together are unclear.
- Lack of effective coordination and sharing of lessons learned to help inform public-sector funding decisions.
- Lack of clarity for partners on which departments of central and local governments to work with; some partners are not adequately involving the government.
- Relevant policies, guidelines, tools, reports, and documents are not consistently organised, accessible, and adhered to.
- Systems inventories are not accessible and maintained online and quickly fall out of date.

Existing work that investment should build on:

- The Sector Wide Approach committee, which holds the Joint Annual Health Sector Review, is a coordinating mechanism for the entire health sector.
- eHealth Steering Committee meets regularly to ensure that the eHealth strategy components are financed and implemented. This committee has an Enterprise Architecture TWG.
- The health M&E TWG has been active since 2010 with broad participation (supported by the CDC and the Global Fund).
- The mHealth Community of Practice is an active, partner-led initiative to share experiences in aligning and implementing mHealth applications.
- The MOHCDGEC website includes a document library where some documents can be found.
- Previous attempts at designing standardised forms for eHealth/mHealth partners to fill in and submit, though these have not been broadly adopted or institutionalised.

Links to government strategies:

- **eHealth strategy:** Establish and institutionalise an eHealth governance structure and mechanism to ensure effective management and oversight of eHealth strategy implementation.
- **HSSP IV:** Establish a functional and updated MOHCDGEC website accessible for health workers and the general public.

 INVESTMENT RECOMMENDATION

Enhance government coordination of data systems and use initiatives

 \$220,000

 6 Months

Capability Unlocked

The government can track and coordinate data systems and data use initiatives in the health sector.

Outputs

- Updated MOHCDGEC/PORALG website incorporating:
 - Continuously updated systems inventory
 - Comprehensive digital library, including documentation of data systems and use (i.e., policies, legislation, guidelines, and tools)
- Project implementation guidelines for partners working in data systems and use
- Enhanced coordination between different committees and TWGs

Activities

NATIONAL	COST
Develop project implementation guidelines for partners working in data systems and use, including how to communicate with the government.	\$10,000
<ul style="list-style-type: none"> • Design a systems inventory (comprehensive, accessible, and continuously-updated), and add to the MOHCDGEC/PORALG website. • Enhance the digital library on the MOHCDGEC/PORALG website to ensure policies, legislation, and guidelines are accessible. • Design and implement mechanisms to keep inventory and library up to date. 	\$130,000
Review the roles of different working groups and committees to avoid duplication of mandates and improve coordination.	\$80,000

>> INVESTMENT RECOMMENDATION

Put in place an enterprise architecture, including governance, guidelines, and standards for interoperability

GAPS:

Governance structures, guidelines, and standards are not yet in place to facilitate interoperability.

- System developers and partners indicate willingness to make the systems they support be more interoperable, but there is inadequate guidance on how to do this.
- Governance structures are needed to:
 - Prioritise interoperability use cases.
 - Monitor compliance with standards.

Existing work that investment should build on:

- The eHealth Steering Committee was established with mandate to perform governance functions for interoperability, but has not yet developed interoperability guidelines or standards, or put in place mechanisms to monitor systems for compliance with standards.
- The eGA has published some standards and guidance in the area of interoperability between government systems, but these are not specific enough for the health sector.
- The eGA plans to establish a government mediation service called Enterprise Service Bus to mediate data exchange between government systems, but the health sector also requires specialised mediation services specific for its needs.
- There is a task team under the Enterprise Architecture TWG of the eHealth Steering Committee working on a health sector interoperability layer (supported by JSI).
- A national health facility registry has been developed (supported by University Computing Center, InSTEDD, and RTI with funding from CDC and Global Fund).
- See Appendix 4: Systems Mapping.

Links to government strategies:

- **eHealth strategy:** Address lack of compliance with eHealth standards and system interoperability; integrate existing information systems.

➔ INVESTMENT RECOMMENDATION

Put in place an enterprise architecture, including governance, guidelines, and standards for interoperability

 **\$1.21m**

 **2 Years**

Capability Unlocked

Health sector stakeholders can link data systems together.

Outputs

- National eHealth architecture and standards framework, including:
 - eHealth architecture building blocks
 - Business process maps and their linkages
 - Business, information, and technology architectures
- Governance framework for enterprise architecture
- Enhanced enterprise architecture capacity in the MOHCDGEC and PORALG
- Software refinements to key systems to ensure compliance with architecture

Activities

NATIONAL	COST
<ul style="list-style-type: none"> • Develop a national eHealth architecture framework, including: <ul style="list-style-type: none"> • Identify building blocks for an eHealth architecture. • Document business processes and how they link together. • Develop standards, policies, and guidelines for a national eHealth architecture. • Develop requirements for national interoperability. • Identify and establish a governance structure for the eHealth architecture. • Develop a gap analysis and road map for implementation. • Build the capacity of health system leaders to understand and advocate for a national eHealth architecture. • Facilitate the upgrade of existing systems to make them compliant with the enterprise architecture. 	\$930,000
Facilitate the upgrade of existing systems to make them interoperable.	\$280,000

 INVESTMENT RECOMMENDATION

Implement a client registry

GAPS:

Different health information systems have different ways of identifying the same clients, so establishing a comprehensive electronic medical record for clients is very difficult. Challenges include:

- Extreme difficulty exchanging client data between systems.
- Poor continuity of care as clients move from one service-provision point to another.
- Inadequate ability to track and follow up with clients over time.
- Constraint on the efficient operation of health insurance schemes.
- Impacts on the data quality of aggregated surveillance and service-provision indicators due to double counting.

Existing work that investment should build on:


- Progress is being made in legal identification systems (the National Identification Authority, the Electoral Commission, RITA, the Prime Minister's Office, and the eGA); however, the need for identification of health and social services sector clients is separate from but linked to legal identification because:
 - The health sector encounters people before the legal sector does (infants, unregistered persons).
 - Legal identification cannot be a prerequisite to providing health and social services.
 - The health and social-services sector identification needs to be less stringent than legal identification.
- A “way forward for client registry” document that is being drafted by the Care Delivery Task Team (with CDC support) under the Enterprise Architecture TWG of the eHealth Steering Committee, but more substantial requirements analysis is needed.
- PATH's BID Initiative has a client registry as a demonstration intervention.
- The Tanzania Social Action Fund has a large database of individual recipients of social security support.

Links to government strategies:

- **eHealth strategy:** Establish a comprehensive client registry with complete and current information that meets stakeholders' needs.

 INVESTMENT RECOMMENDATION

Implement a client registry

 \$970,000

 2 Years

Capability Unlocked

Health and social services providers can track individual clients over time and across multiple points of service.

Outputs

- Client registry of all individuals served by the health and social services sector. This registry will:
 - Allow read-and-write access by a range of systems across the health and social services sector in accordance with defined rules on privacy and consent.
 - Store only data useful in identifying clients and a list of places they have been seen.
- Documented system requirements, technical documentation, user guide, and training material
- Sustainability plan

Activities

NATIONAL	COST
Develop requirements and business and governance processes for a client registry.	\$330,000
Develop client registry software.	\$300,000
Train MOHCDGEC staff who will perform data administration and de-duplication tasks.	\$50,000
Support dedicated data administration and de-duplication staff for the first year.	\$90,000
Familiarise software developers working in the health sector with how to connect their systems to the client registry.	\$30,000
Support the connection of existing systems with the client registry (i.e., software adjustments needed to existing systems).	\$90,000
Perform ongoing review, maintenance, and user support.	\$50,000
Develop a plan for sustainability and ownership of the system.	\$30,000

>> INVESTMENT RECOMMENDATION**Implement a terminology service****GAPS:**

- There is no institutionalised way to refer to medical and health terminology, which is needed for data exchange and comparability between different data systems and sources.
 - Need to institutionalise common ways of referring to diagnoses (Tanzania's version of ICD10), procedures, and other medical data.
 - Different systems refer to drugs and medical supplies in different ways.
 - No way for people and systems to access terminology and terminology updates.
- No existing work or funding commitment to an accessible terminology-registry service.

Existing work that investment should build on:


- Tanzania has adopted a customised version of ICD10 for diagnoses, but it is not yet accessible online. Some training has been conducted (supported by the Data for Health initiative and Global Fund).
- The Tanzania Food and Drug Authority regulates drugs, and MSD manages the supply chain of drugs. Drug-coding systems are shared between MSD Epicor and eLMIS, but are different than those of the Tanzania Food and Drug Authority and vertical programs.
- The Enterprise Architecture TWG established a task team to look at this, but substantive work on terminology has not yet begun due to lack of funding.
- The Millennium Challenge Corporation is supporting a "Swahili Corpus for health terminology."

Links to government strategies:

- **eHealth strategy:** Establish eHealth standards, rules, and protocols for information exchange and protection; establish an entity to enforce standards.
- **M&E strategy (draft):** Strengthen guiding documents (policies, guidelines, standards, standard operating procedures, and roles and responsibilities) that facilitate data use and accountability for evidence-based decision-making.

➔ INVESTMENT RECOMMENDATION

Implement a terminology service

 **\$1.23m**

 **2 Years**

Capability Unlocked

Health workers can transfer and analyze data easily across systems through well-defined, consistent health terminology.

Outputs

- Terminology standards including for diagnoses, drugs, and medical supplies
- Terminology registry, including updated lists and classifications of medical terminology made available to other data systems
- System requirements and technical documentation, user guide, and training material
- Sustainability plan

Activities

NATIONAL	COST
Develop, adopt, and harmonise standards and coding systems for referencing drugs and medical supplies, diagnoses, procedures, etc.	\$470,000
Develop requirements for a terminology registry.	\$270,000
Develop a terminology registry and an API.	\$360,000
Train terminology management and administration staff at the MOHCDGEC.	\$30,000
Familiarise software developers working in the health sector with how to subscribe to the terminology service.	\$20,000
Provide ongoing review, maintenance, and user support.	\$50,000
Develop a plan for sustainability and ownership of the system.	\$30,000

» INVESTMENT RECOMMENDATION

Implement an administrative area registry

GAPS:

- Tanzania's administrative areas are often changed (e.g., merged or split up) through the issuance of government notices, but there is no central source recording data on current administrative areas.
 - There are no administrative area coding systems kept updated and consistent.
- Lack of routinely updated, accurate, and accessible lists of administrative areas results in several problems:
 - Geographic-based planning of health and other services is compromised.
 - Each electronic system maintains its own lists, which are often inconsistent, incomparable, and out of date.
 - Key health sector targets (e.g., Mpango wa Maendeleo ya Afya ya Msingi [MMAM] target of one health facility in each village) are not easily monitored due to the lack of lists of villages.
 - It is very difficult for data systems to display data in administrative-area maps for ease of use.
 - Key health sector systems are compromised: for example the health facility registry has problems retaining up-to-date mapping of health facilities to administrative areas, and other systems have problems identifying clients through places of residence.
- There is widespread acknowledgment of the need, but no current funding.
 - The need for an administrative-area registry has been discussed in various forums in the health sector and beyond for some time.
 - There is no concrete initiative, no existing funding or funding commitment initiative to take this forward.

Existing work that investment should build on:

- PORALG maintains lists of administrative areas in Excel files, with changes being made through legal government notices published in the *Government Gazette*.
- The NBS collects and processes shape files (i.e., area borders) at census time, every ten years.
- The Ministry of Lands leads work on GIS mapping, but not of administrative areas.
- The Tanzania Communications Regulatory Authority has an initiative in place to issue post codes.

Links to government strategies:

- **M&E strategy (draft):** Create a working group with PORALG, the NBS, the eGA, the Ministry of Lands, the Tanzania Communications Regulatory Authority, and other stakeholders to document processes for changing administrative areas and develop requirements for a single Geographic Administration Authority; identify how to implement this system.



Definition of Key Term

ADMINISTRATIVE AREA: *Main geographical division for organising government service, such as villages, wards, districts*

▶▶ INVESTMENT RECOMMENDATION

Implement an administrative area registry

 **\$1.22m**

 **2 years**

Capability Unlocked

The government and the public can compare and analyze data structured by geographic administrative areas.

Outputs

- An administrative-area registry (e.g., villages, wards, districts) that will:
 - Be continually updated by PORALG and districts
 - Be publically accessible and available to other systems via an API
 - Include details of local government leaders
 - Include shape files, enabling display of data in maps
- System requirements and technical documentation, user guide, and training material
- Sustainability plan

Activities

NATIONAL	COST
<ul style="list-style-type: none"> • Develop a governance structure to manage administrative-area data. • Develop requirements for the administrative-area registry. 	\$260,000
Develop software for an administrative-area registry.	\$520,000
Train users at the national level and train the trainers.	\$60,000
Launch and socialise the administrative-area registry.	\$10,000
Familiarise software developers working in the health sector with how to subscribe to the service and use shape files for mapping in their systems.	\$20,000
Perform ongoing review, maintenance, and user support.	\$50,000
Develop a plan for sustainability and ownership of the system.	\$30,000

REGIONAL AND LOCAL	COST
Train users at the district level.	\$270,000

>> INVESTMENT RECOMMENDATION

Implement a health data warehouse to house data from all relevant sources to facilitate decision-making

GAPS:

- Data are spread out across multiple systems owned by different government departments (e.g., surveillance data, financial data, human resources data, commodities and supply chain data, supervision and performance-management data, survey data) in different systems.
- Decision-makers do not have easy access to the data they need.
- There are challenges sharing data across different government departments and vertical programs.
- Some data are appropriate for public access but are not accessible to the public.
- There is a lack of tools to compare and triangulate data from different sources or systems, and there are inadequate tools to visualise and easily analyze and digest data (e.g., dashboards, maps, graphs, drill-down features, etc.).

Existing work that investment should build on:

- The MOHCDGEC commissioned a high-level requirements document (developed by Deloitte Consulting Limited). There is a task team under the Enterprise Architecture TWG developing these requirements further (supported by JSI).
- Exploration of whether the centralised electronic HMIS can and should be adapted for the data warehouse is important.

Links to government strategies:

- **eHealth strategy:** Implement a data warehouse to foster and support more highly informed decision-making by the MOHCDGEC and other stakeholders on health sector resources.
- **M&E strategy (draft):** Expand and maintain the decentralised and flexible HMIS data warehouse that is integrated with other data sources and related systems.

➔ INVESTMENT RECOMMENDATION

Implement a health data warehouse to house data from all relevant sources to facilitate decision-making

 **\$2.08m**

 **2.5 Years**

Capability Unlocked

Decision-makers can easily access data analysis tools and data from a range of source systems.

Outputs

- Centralised data warehouse software with analytics and visualisation tools to transform data from multiple sources into accessible, analyzable, and actionable information
- System requirements and technical documentation, user guide, and training material
- Sustainability plan

Activities

NATIONAL	COST
Build on existing requirements, including further specifying who the key users will be and what their data needs are (including features and visualisations) and identifying data sources.	\$220,000
Develop or adapt the data warehouse.	\$630,000
Train national decision-makers in the use of the data warehouse and train the trainers.	\$230,000
<ul style="list-style-type: none"> • Perform ongoing review to ensure the data warehouse is meeting evolving needs. • Perform ongoing maintenance, customisation, and user support. 	\$90,000
Develop a plan for sustainability and ownership of the system.	\$30,000

REGIONAL AND LOCAL	COST
Train regional and district decision-makers on the use of the data warehouse.	\$880,000

AFTER INVESTMENT

Tanzania has the digital health governance and infrastructure to ensure **data systems are standards-based and interoperable**, regardless of the underlying technology. There is agreement regarding content, coding, and communication formats, enabling more effective data sharing and use.



Investment Recommendation Cost Estimates

(US\$ millions)

TOTAL COST		
Investment Recommendation		Total
Computerise primary health care data	Testing	2.5
	Roll out	31.8
Computerise hospital data		13.1
Strengthen systems for facility performance management and supervision		1.4
Implement systems for client feedback management		1.0
Implement a health and social services workers registry		1.2
Enhance systems for management of supply chain data		1.5
Develop standards for health insurance eClaims		0.4
Improve HMIS indicators and reporting		6.9
Institute data use practices and capacity		1.5
Enhance and scale a surveillance system for notifiable diseases		4.1
Implement notification systems for birth and death recording		1.7
Enhance government coordination of data systems and use initiatives		0.2
Put in place an enterprise architecture, including governance, guidelines, and standards for interoperability		1.2
Implement a client registry		1.0
Implement a terminology service		1.2
Implement an administrative area registry		1.2
Implement a health data warehouse		2.1
Grand total		74.0

Breakdown by level	
National	Regional and local
1.7	0.8
0.7	31.1
1.0	12.1
0.7	0.7
0.6	0.4
0.8	0.3
1.2	0.3
0.4	-
2.9	4.1
1.2	0.3
0.1	4.0
0.5	1.3
0.2	-
1.2	-
1.0	-
1.2	-
1.0	0.3
1.2	0.9
17.4	56.6

Breakdown by cost type			
Level of effort	Workshops, trainings, meetings, etc.	Software development/support	Equipment
0.7	0.5	1.1	0.2
3.1	14.7	-	14.0
2.2	1.5	3.0	6.4
0.5	0.4	0.3	0.2
0.5	0.5	-	-
0.3	0.5	0.3	-
0.4	0.3	0.8	-
0.2	0.2	-	-
1.1	5.3	0.6	-
1.3	0.3	-	-
0.1	4.0	-	-
0.3	1.1	0.3	-
0.2	0.1	-	-
0.6	0.3	0.3	-
0.4	0.2	0.4	-
0.5	0.3	0.4	-
0.4	0.3	0.5	-
0.5	0.9	0.7	-
13.2	31.2	8.8	20.8

OTHER INVESTMENT RECOMMENDATIONS (UNCOSTED)

Investment Recommendation	Activities
Develop eLearning platform for health workers and provider communications and updates systems	<ul style="list-style-type: none"> • Develop accreditation mechanism for eLearning courses • Further develop and support blended distance learning courses • Develop/implement health eLearning Platform including online courses for continuous medical education, with accreditation • Develop mechanism to support ongoing communications for sending to health care providers e.g about policy or guidelines introduction or changes
Put in place provider-to-provider telemedicine processes	<ul style="list-style-type: none"> • Develop and establish roles, responsibilities, and workflows in provider-to-provider telemedicine • Develop guidelines on compensation/financing for remote provider-to-provider consultations. • Identify infrastructure requirements for provider-to-provider telemedicine. • Develop/adopt/customise platform to facilitate provider-to-provider telemedicine • Roll out provider-to-provider telemedicine
Enable two-way health information communications and provider-client telemedicine	<ul style="list-style-type: none"> • Develop requirements and business case for two-way health information communication, customised to client needs • Develop remote consultation guidelines - clinical guidelines/regulations for remote consultations.
Develop shared health records	<ul style="list-style-type: none"> • Develop requirement for shared health records to ensure sharing and privacy policy included within broader data policy • Develop review mechanisms to assess readiness of applications before being allowed to share data to shared health record • Develop requirements for linking SHR with BCC/IEC applications. • Develop SHR as a national system
Improve links between district health plans and expenditure	<ul style="list-style-type: none"> • Develop linkage between PlanRep and Epicor through an interoperability layer • Develop public portal to planning and expenditure data for accountability
Develop system for social welfare client data management	<ul style="list-style-type: none"> • Develop social welfare case management system • Provide linkage between social welfare case management system and client registry

OTHER INVESTMENT RECOMMENDATIONS

Investment Recommendation	Activities
Develop effective emergency services and transport	<ul style="list-style-type: none"> • Develop systems for emergency services and transport including women in labor, road accidents • Establish collaboration mechanisms between police and health facilities in cases of road accidents
Put in place systems for sample referral to remote laboratories and result communication	<ul style="list-style-type: none"> • Develop requirements for system to send test samples to higher level laboratories without sending client themselves, and to receive back results, building on the “Sample Referral and Transport System hub” for HIV early infant diagnosis. • Develop or enhance electronic system • Roll out system
Improve management of informal sector health insurance	<ul style="list-style-type: none"> • Develop requirements for applications to manage membership and payouts of informal sector health insurance (successors to community health funds), building on piloted Community Health Fund applications • Develop applications • Roll out applications
Improve existing electronic tools and systems to support data access	<ul style="list-style-type: none"> • Identify mechanisms to facilitate data access based on available policies and guidelines i.e which data should be accessible to whom, linked to open data policy guidelines • Develop mechanisms to establish which data from which systems should be more widely accessible, or open to the public, as appropriate • Devise a way to enable broader or public access to data as appropriate
Improve existing electronic tools and systems to support data use	<ul style="list-style-type: none"> • Identify requirements in collaboration with end users at all levels on reporting, data visualisation and dashboard requirements • Improve data use tools/features to fulfill identified requirements
Improve software project management	<ul style="list-style-type: none"> • Develop capacity of the government in business process mapping, requirements gathering, issues and bug tracking, testing, team-based software development, and system maintenance and management. • Put in place mechanisms to ensure that local software developers are involved in software projects, and software projects are well documented, for sustainability

DESTINATION:

WHERE WE ARE GOING

DESTINATION: WHERE WE ARE GOING

The government of Tanzania calls on development partners to join in taking up these investment recommendations to achieve its vision:

To have a healthy society with improved social wellbeing that will contribute effectively to individual and national development

This vision is made possible by having mechanisms in place to ensure data are appropriately managed (collected, stored, used), and new investments in digital health are coordinated and leveraged to strengthen health sector management and service delivery. Guiding architecture and standards, combined with better-coordinated investments, will lead to a better ecosystem of tools for data use. Tanzania will have the necessary tools, culture, and capacity to improve data use for decision-making.

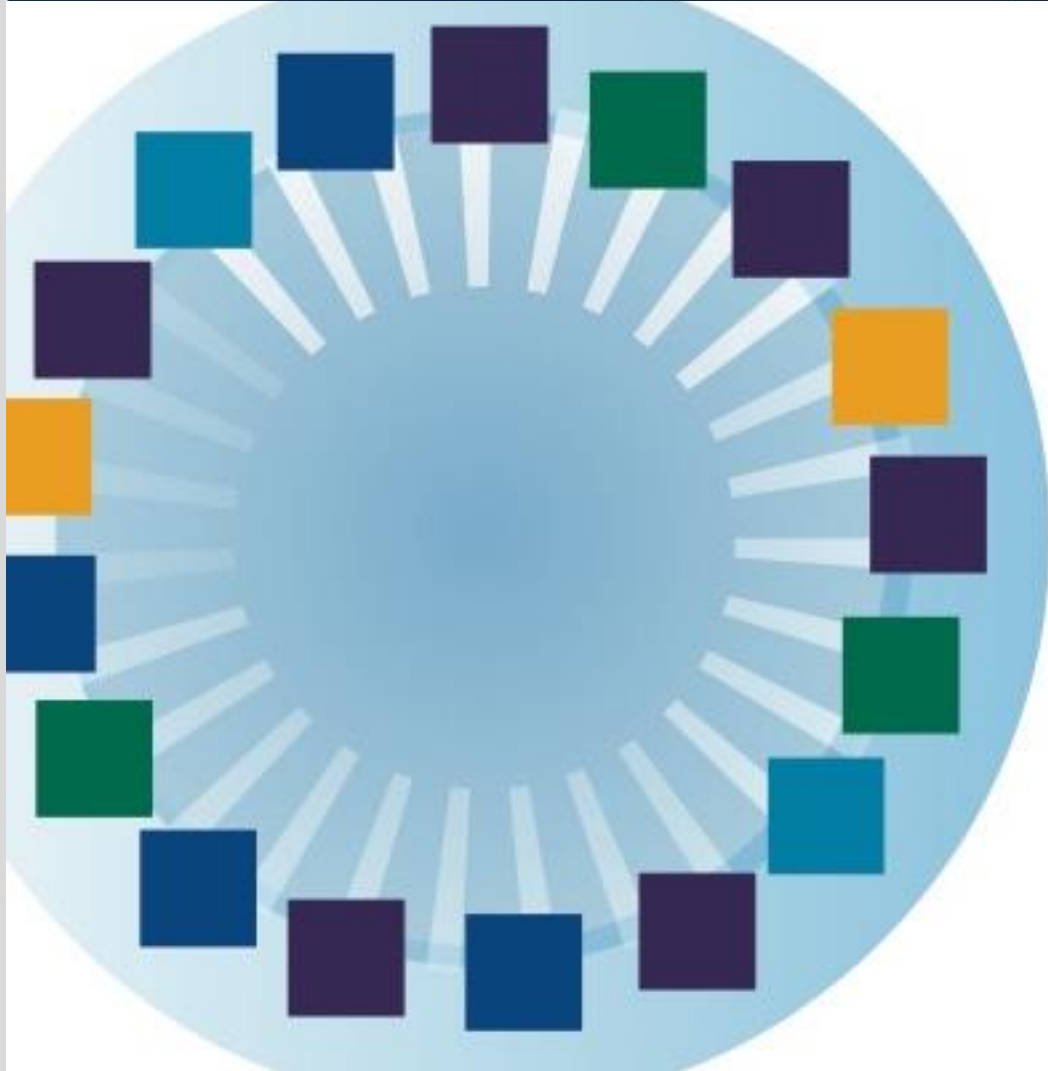


DESTINATION: WHERE WE ARE GOING

The government will be able to make evidence-based choices about how to best allocate health resources.

Funding these investment recommendations will unlock critical capabilities to:

- Respond to disease outbreaks.
- Track and monitor health insurance claims.
- Resolve supply chain challenges for vaccines, medicines, and equipment.
- Track patients over time and at different points of care.
- Determine which health facilities are performing well and which need improvement.
- Transfer and analyze data across systems and geographies.



DESTINATION: WHERE WE ARE GOING

Investment recommendations will allow the government of Tanzania to achieve important health goals:

- Improve health services in measurable ways.
- Expand access to health services by focusing on specific geographies and populations.
- Forge effective community partnerships.
- Achieve better return on health investments.
- Collaborate with other sectors on cross-cutting health initiatives.

Better data and data systems will make this vision a reality by allowing everyone—from government officials to health workers to patients—to make more informed decisions to improve health.



DESTINATION: WHERE WE ARE GOING

Tanzania wants to get to a place where high-quality, well-managed data can be used to guide health policies and practices.

This will lead to positive outcomes on every level of the health system:

- Health workers will have the data to better deliver services, track and manage supplies, and treat patients.
- Administrators will be able to target supplies and staff to the areas that need them most.
- Policymakers will be empowered to make informed budgeting and planning choices, and then measure the results.

End result: Tanzanians will access high-performing health care and enjoy better health.



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Tanzanian Ministry, department, or agency

eGovernment Agency
Medical Stores Department
Ministry of Health, Community Development, Gender, Elderly, and Children
National Health Insurance Fund
President's Office of Public Service Management
President's Office of Regional Administration and Local Government
President's Delivery Bureau
Registration, Insolvency and Trusteeship Agency
Commission for Science and Technology

Health management teams and health facilities

Babayu Dispensary
Chamwino Health Center
Dodoma Municipal Council Health Management Team
Dodoma Regional Health Management Team
Ifisi District Designated Hospital
Mbeya Referral Hospital
Mbeya Regional Hospital
Mbeya Rural Council Health Management Team
Mbeya Regional Health Management Team
Mbozi Mission Hospital
Mbozi Council Health Management Team
Rungwe Council Health Management Team

Health management teams and health facilities (continued)

Rungwe District Hospital
Simambwe Dispensary

Partners

Association of Public Health Laboratories
Bloomberg Philanthropies' Data for Health initiative
Christian Social Services Commission
Clinton Health Access Initiative
D-Tree
Elizabeth Glaser Pediatric AIDS Foundation
FHI360
GFA consulting
GIZ
The Global Fund to Fight AIDS, Tuberculosis and Malaria
Human Development Innovation Fund (Palladium)
Ifakara Health Institute
I-TECH
ITIDO
Jhpiego
John Snow, Inc. (JSI)
Management and Development for Health
Maxcom
MEASURE Evaluation (Palladium, JSI)

Partners (continued)

mHealth Public Private Partnership (Cardno)
Millennium Challenge Corporation
Minerva Strategies
Mkapa Foundation
NPK Technologies
PATH
Pathfinder International
Public Sector Systems Strengthening (PS3) project (Abt Associates)
Research Triangle Institute
Smart Decision
Swiss Tropical and Public Health Institute
Touch Foundation
Twiga Consulting
United Nations Children's Fund
United Nations Population Fund
University of Dar es Salaam
US Agency for International Development
US Centers for Disease Control and Prevention
World Health Organization

Training institutions

Ifakara Tanzanian Training Center for International Health
Mbeya Referral College of Nursing
Mbozi Mission Nursing School

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TERMINOLOGY

Key Term	Definition
Administrative area	Main geographical division for organising government service, such as villages, wards, districts.
Client	A person who receives health care services.
Data Use Partnership	A one-year commitment by the Bill & Melinda Gates Foundation, PATH, and Vital Wave to work with select, national governments and partners in sub-Saharan Africa to identify how their health system management and performance can be improved through increased investments in national data systems and use.
Data Production	Part of the data use cycle comprised of harmonised, standardised, and systematic design for data capture; high-quality data collection; and data transformed into information at all levels.
Data Systems	Paper and digital tools to collect, manage, and communicate information. Data systems include: eHealth technologies, health information systems, and national data systems.
Data Use	The behavior (e.g., by clients, citizens, health workers, program managers, and policymakers) of using information to inform decisions and actions.
Infrastructure	Electricity, connectivity, and server infrastructure necessary for data systems to function effectively.
Leadership and Governance	Political champions who promote data use, and ministries/agencies/departments/organizations who oversee management and regulation of data systems and use.
Legislation, Policy, and Compliance	Formalised norms that govern how programs are planned, executed, and evaluated.

TERMINOLOGY

Key Term	Definition
Provider	Someone who is authorised to provide health services (e.g., a doctor of medicine or osteopathy, podiatrist, dentist, chiropractor, clinical psychologist, optometrist, nurse practitioner, nurse-midwife, or a clinical social worker).
Services and Applications	Point-of-service and administrative tools and systems facilitating data production and use.
Strategy and Investment	Official, published strategies articulating how to use data in the health system; trends and plans for investment in data systems and use in the health sector.
Standards and Interoperability	Guidelines and standards governing data terminology and exchange.

ACRONYMS

API	Application Programming Interface
CDC	Center for Disease Control and Prevention
CHAI	Clinton Health Access Initiative
CHMT	Council Health Management Team
CRVS	Civil Registration and Vital Statistics
DCS	Department of Curative Services
DDU	Data Dissemination and Use
DHIS2	District Health Information System 2
DHRDT	Department of Human Resources Development and Training
DNS	Directorate of Nursing Services
DPS	Department of Preventative Services

DQA	Health Services Inspectorate and Quality Assurance Department
DSS	Diagnostics Services Section
DVDMT	District Vaccination Data Management Tool
eGA	eGovernance Agency
eidrs	Electronic integrated disease surveillance reporting
eLMIS	Electronic Logistics Management Information Systems
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HMIS	Health Management Information System
HOMIS	Hospital Management Information System
HRH	Human Resources for Health
HRHIS	Human Resources for Health Information System

ACRONYMS

HSSP	Health Sector Strategic Plan
ICT	Information and communication technology
IDSR	Integrated disease surveillance reporting
IVD	Department of Vaccines and Immunizations
JSI	John Snow, Inc.
MDU	Ministerial Delivery Unit for Big Results Now
M&E	Monitoring and evaluation
MOH	Ministry of Health
MOHCDGEC	Ministry of Health, Community Development, Gender, Elderly and Children
MSD	Medical Stores Department

MTUHA	Mfumo wa Taarifa za Uendeshaji wa Huduma za Afya
NACP	National AIDS control Programme
NBS	National Bureau of Statistics
NHIF	National Health Insurance Fund
NSSF	National Social Security Fund
OPRAS	Open Performance Review and Appraisal System
POPSM	President's Office of Public Service Management
PORALG	President's Office of Regional Administration and Local Government
PSU	Pharmaceutical Services Section
RCHS	Reproductive and Child Health Services

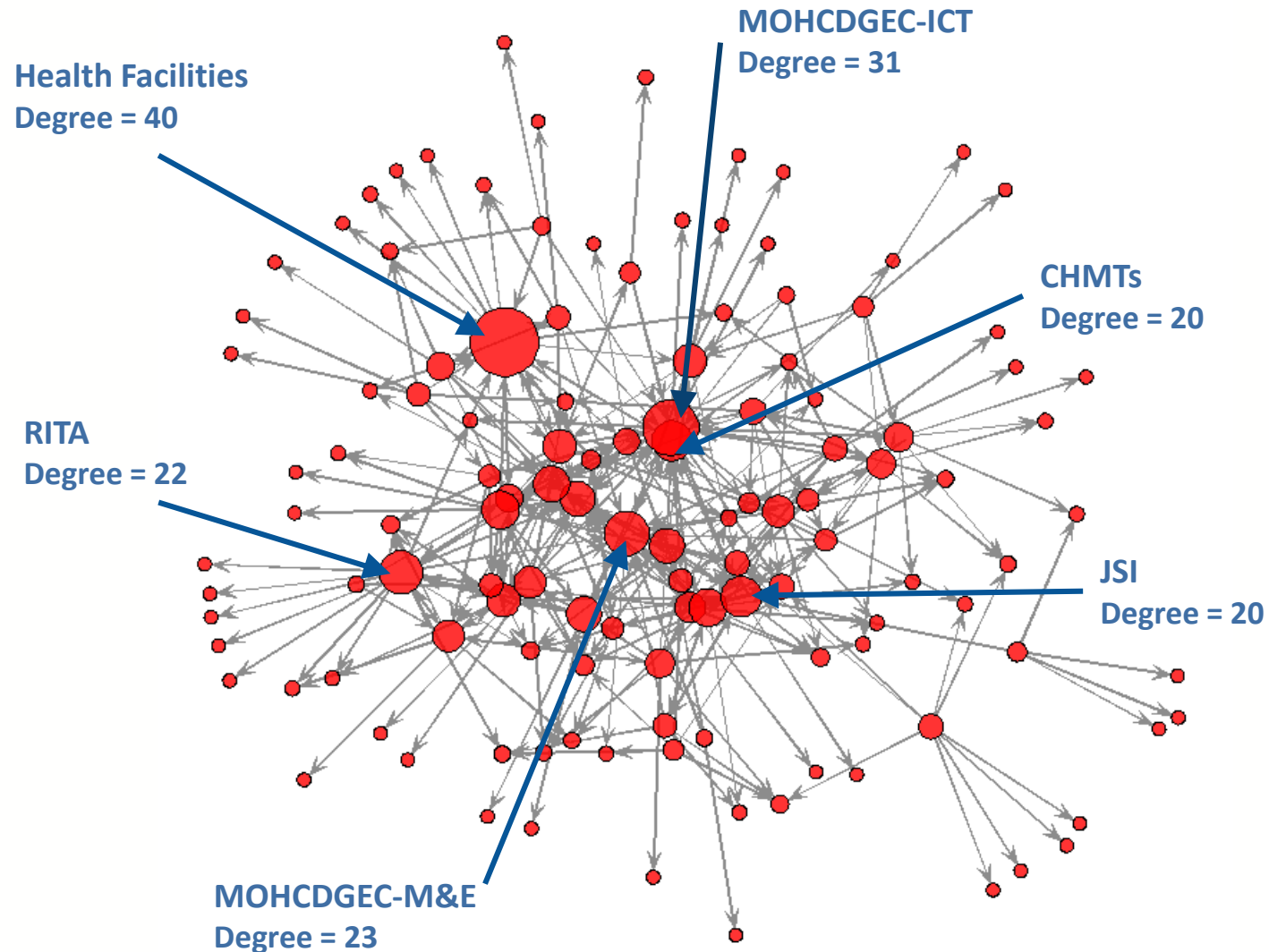
ACRONYMS

RITA	Registration Insolvency and Trusteeship Agency
SAVVY	Sample Vital Registration with Verbal Autopsy
SMT	Stock Management Tool
SW	Social Welfare
TB	Tuberculosis and Leprosy
TOC	Theory of Change
TWG	Technical Working Group
UNICEF	United Nations Children's Fund
USAID	US Agency for International Development
VIMS	Vaccine Information Management System

APPENDICES

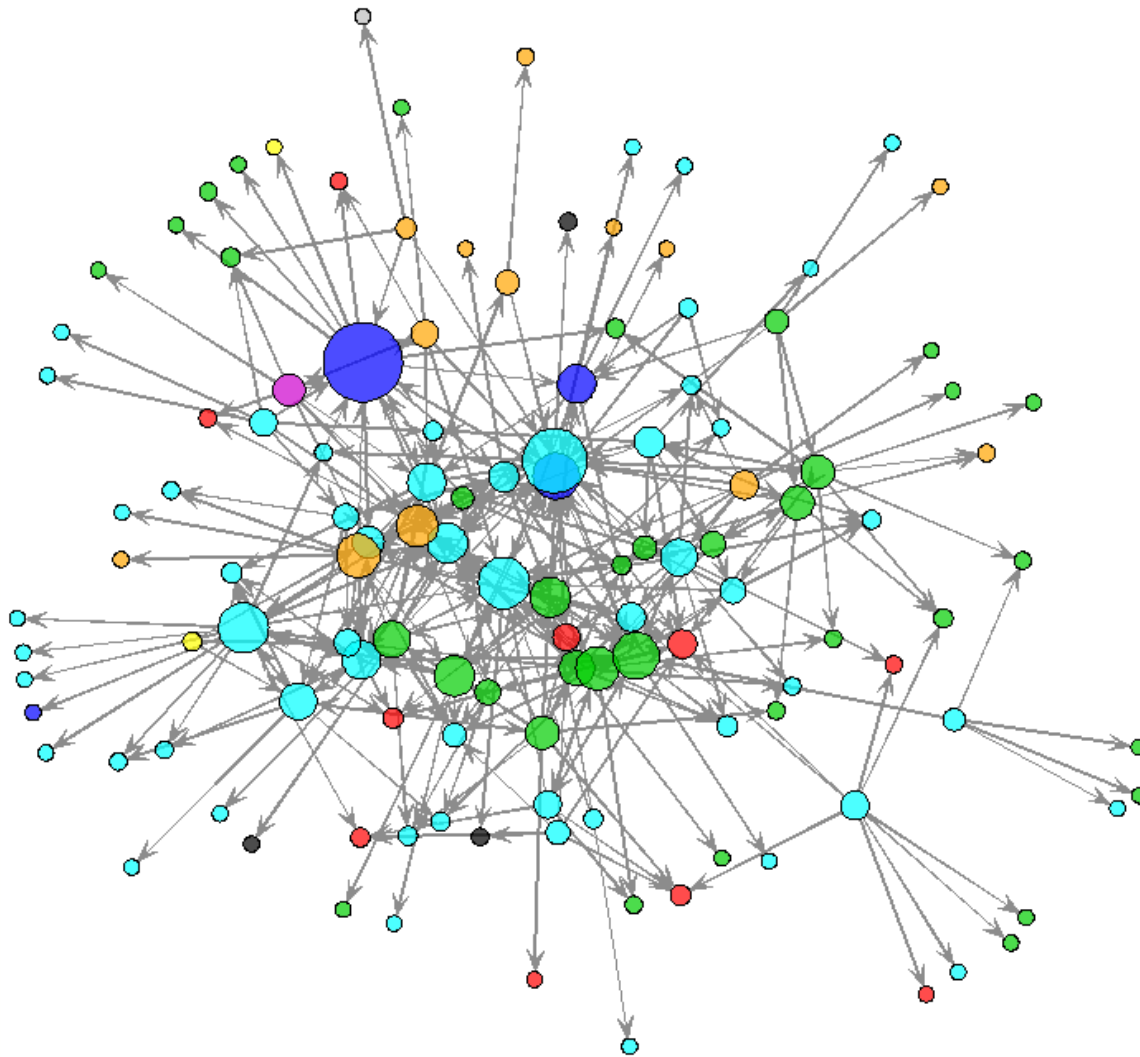
Appendix 1: Stakeholder Network Analysis

Key stakeholders of the data systems and use network in Tanzania



- Network Analysis provides a systematic and detailed mapping of who the key stakeholders are in data systems and data use in Tanzania and allows us to understand key players to work with to strengthen systems and disseminate practices and information.
- Fifty network interviews were completed identifying 124 unique stakeholder organizations.
- Health facilities, MOHCDGEC-ICT, MOHCDGEC-M&E, CHMTs, and RITA stand out as key players in the network of data systems and data users in Tanzania.
- This network graph is sized on degree (a measure of the number of connections each player has with other players in the network). To get a complete picture of the connectedness, each of the 124 organizations in the network would need to be interviewed; however, even through the 50 interviews conducted, some key players were highlighted as particularly connected when it comes to data use and data systems in Tanzania.

Key stakeholders of the data systems and use network in Tanzania

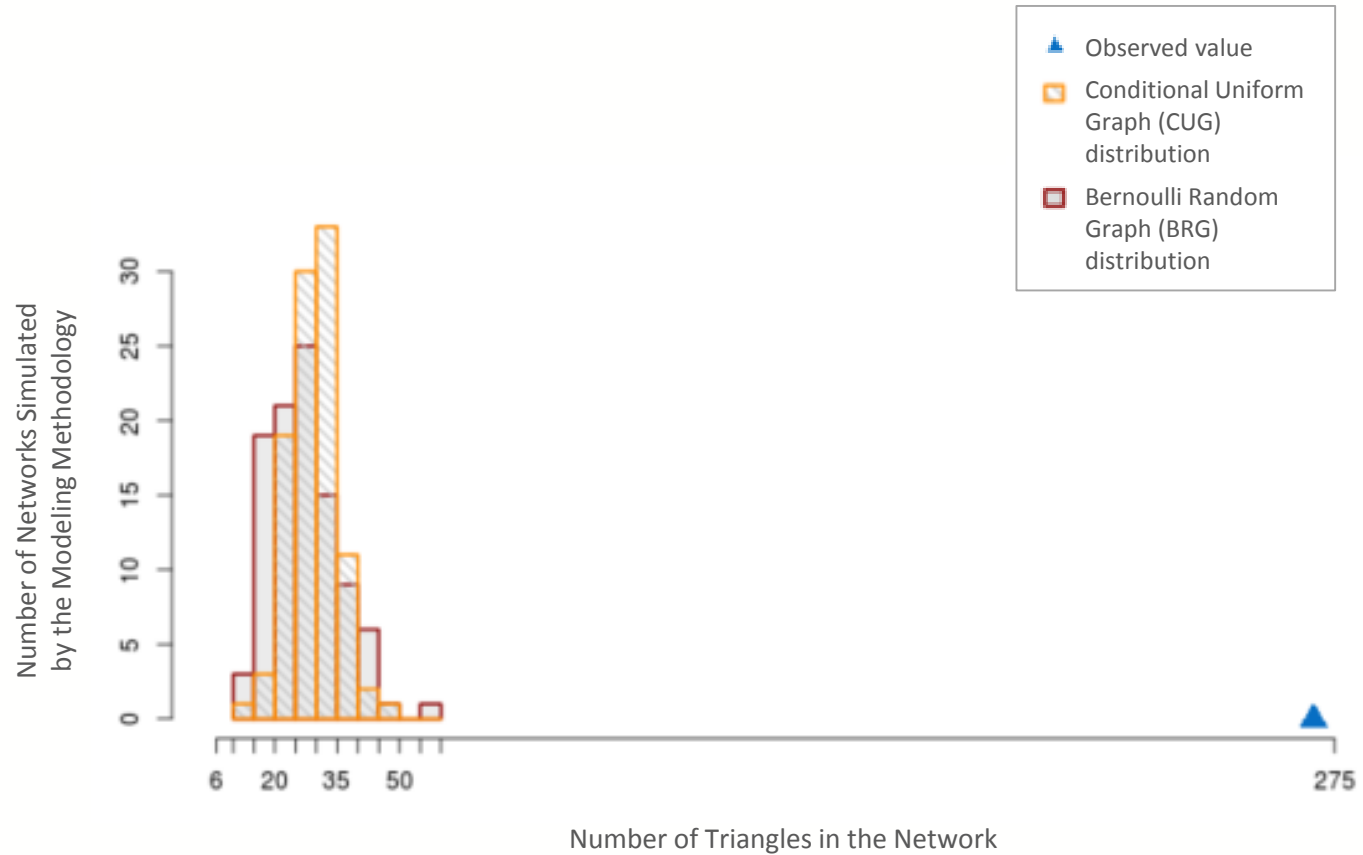


- **Health facilities** play a key, central role and have many connections throughout the network.
- Some **Ministry units** and other **central-government agencies** are also central, but others sit on the periphery with little connection to the core network.
- **Implementing partners** are dispersed throughout the network.

Organization Type

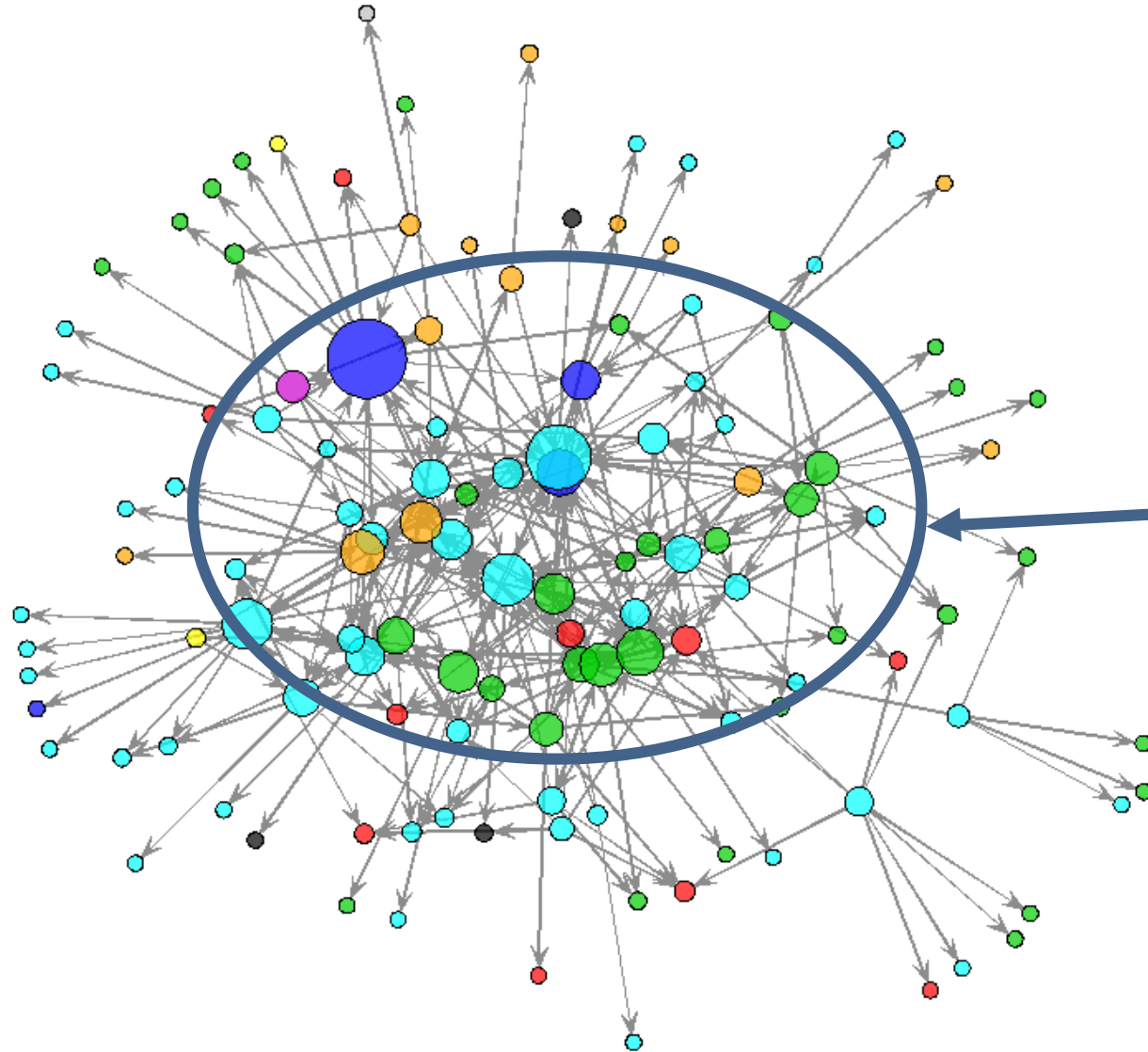
- Donor
- Health facility or health service provider
- Health implementing partner
- Ministry, department, or agency of the central government
- Other: Umbrella org., Christian health facilities, and other social services
- Regional or local government entity
- Technology service provider
- University/education
- Other

The network is cohesive and closed, which means it is effective in sharing information



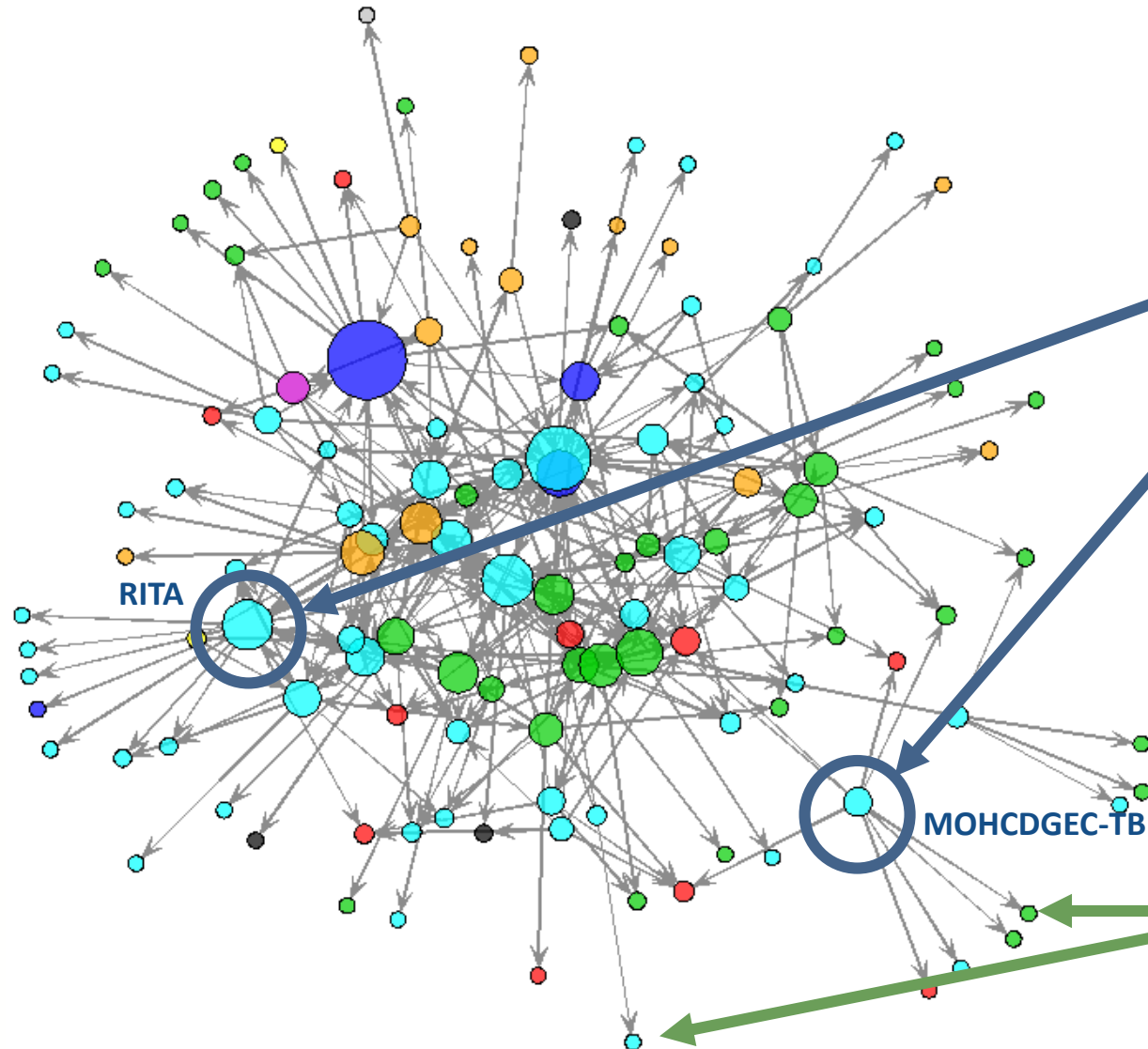
- **The network is very cohesive and closed and should be very effective in sharing and disseminating information.**
- Triangles are groups of three organizations where each of the three organizations has a relationship with both of the other two organizations.
- Triangles in networks indicate cohesive, closed networks.
- The network of data users in Tanzania has 275 triangles, many more triangles than would be predicted through statistical simulations of this network.

Closed Core



Many tightly connected players are centered in the middle of the network. This “closed core” is effective and efficient in sharing information and ideas throughout the network. However, if there is a need to encourage new ideas, be innovative, or increase flexibility and adaptability, the network may need to open up to new actors.

Important gatekeepers

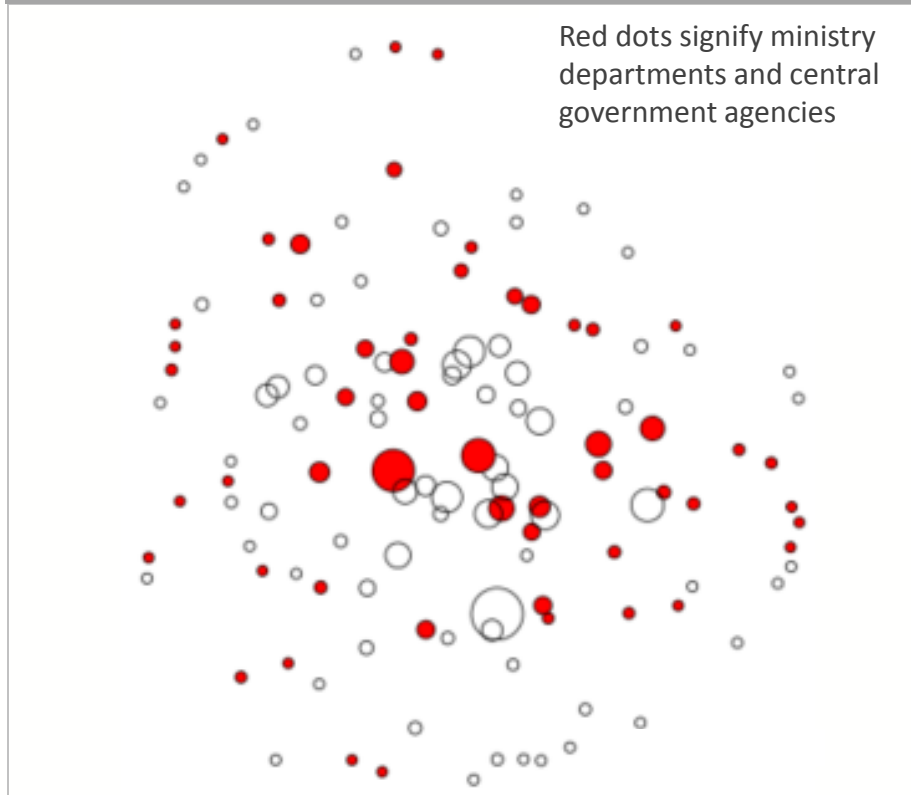


Some players (examples circled here in blue) act as gatekeepers, meaning they create a link to the network for other organizations who are on the periphery. Without these gatekeepers, the peripheral players would be entirely disconnected from the network. For example, RITA acts as a gatekeeper, connecting the Prime Minister's Office, Ward Executive Officers, Ministry of Justice, Ministry of Home Affairs-Immigration, and Ministry of Education and Science to the data use network. Similarly, MOHCDGEC-Tuberculosis (TB) connects TB-related implementing partners and donors to the network.

Peripheral players are connected with only one other member of the network. While part of the network, these organizations will have less influence.

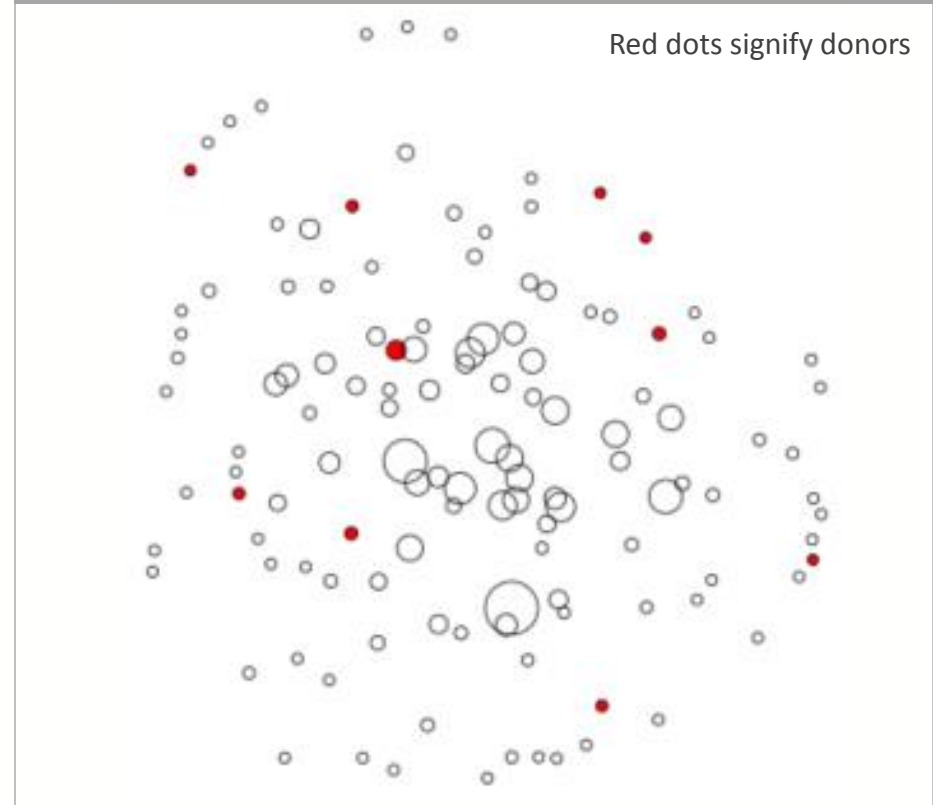
Government holds a central role

Ministry and agencies of the central government



Government actors are present in very central positions as well as on the periphery of the network.

Donors



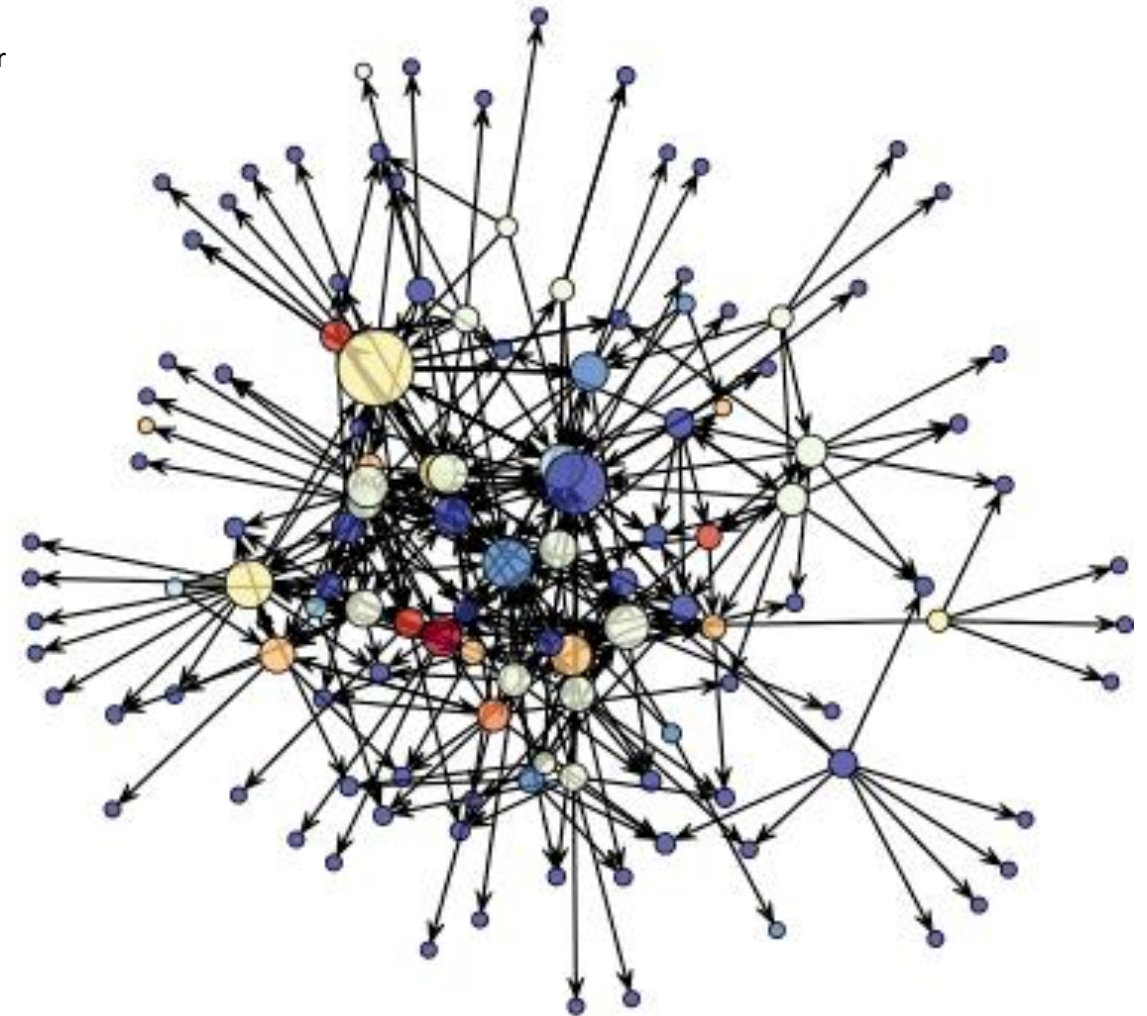
Donors seem to be surprisingly peripheral to this network, with only a few organizations reporting that they have data systems- and data use-related relationships with donors.

Prominent Data Roles

- Only the interviewees who worked in health facilities, National Health Insurance Fund, RITA, and MOHCDGEC-DQA reported being responsible for all four data roles: data producer, manager, translator, and user.
- Data managers and users are very central in the network.
- Distribution of data-related roles amongst those interviewed:
 - 76 percent of respondents, considered themselves to be data managers.
 - Fifty percent considered themselves to be data users.
 - Thirty-three percent considered themselves to be data translators.
 - Fourteen percent considered themselves to be data producers.

Data Roles

- Manager, translator
- Manager, user
- Translator, user
- Manager, translator, user
- Producer, manager, translator, user
- Data manager
- Data producer
- Data translator
- Data user
- Not known



Appendix 2: Investment Recommendation Costing

Costing methodology

PATH worked with the Touch Foundation to:

- Draft activities for each investment recommendation.
- Review activities and cost assumptions (e.g., personnel, others) with technical experts and government stakeholders.
- Conduct desk research to apply dollar amounts to cost assumptions.
- Validate cost assumptions and finalise estimates.

The following section contains:

- Unit cost assumptions
- Investment recommendation deep dives, showing activity costs.



Unit Cost Assumptions

Unit Cost Summary Assumptions

Cost type	Key Assumptions
LOE	<ul style="list-style-type: none"> • Defined LOE costs for international vs local staff, and for short term vs long term positions • Estimated direct Project Management LOE as a proportion of Technical LOE
Workshop/Training	<ul style="list-style-type: none"> • Workshop costs include per diems, venue costs, refreshment, accommodation, and transport • National level workshops incur additional accommodation costs with respect to Regional and local workshops, as well as higher unit costs (e.g. venue)
Day event	<ul style="list-style-type: none"> • No per diems paid, but local transport allowance and refreshments provided • One-day meetings may be organised at Ministry or partner offices with no venue costs, or at a conference centres with extra venue costs
Field work	<ul style="list-style-type: none"> • Costs include per diem and travel
Equipment	<ul style="list-style-type: none"> • Computerisation requires different resources across different facility types: <ul style="list-style-type: none"> ○ Hospitals (regional and district): desktop computers, printers, and local network ○ Primary health facilities (health centres and dispensaries): tablets and data packages ○ Community health workers: smart phones and data packages • Computerisation IRs assume internet connection availability at each hospital. At primary health facilities, mobile network data bundles are used • All IRs assume Government backbone systems (e.g. servers) have spare capacity to accommodate updated national-level systems
Software	<ul style="list-style-type: none"> • Software development costs are estimated based on the required LOE of technical experts to develop new or customise existing systems • Software development accounts for additional costs for building capacity in local software development through additional LOE allocated and support from international experts

Unit Cost Summary

Cost type	Cost sub-type	USD/person day	TSh /person day	
1 LOE	International short term	1,545	3,399,000	
	Local short term	580	1,276,000	
	Local long term (National level)	208	456,923	
	Local long term (Region/district level)	104	228,462	
	Project manager	641	1,410,877	
2 Workshop/ Training	Per diem	National, regional, district participants	55	120,000
		Health facility participants	36	80,000
		Dispensary/ village leader participants	27	60,000
		Facilitator - National location	197	433,400
		Facilitator - District location	106	232,700
	Venue, refreshments, accommodation, etc.	National location	91	201,200
		District location	16	35,000
	Transport	National location	37	80,375
		District location	24	52,588
	3 Day event	1-day meeting	46	100,600
Launch event		69	151,200	
Private sector training days		46	101,200	
Major city to rural area		104	228,300	
4 Field work	Govt. official/healthcare worker	Within region/district	75	164,000
		International trip	125	274,000
		Major city to rural area	206	453,700
	Partner	Within region/district	177	389,400
		International trip	227	499,400
5 Equipment	See detailed page for information on specific equipment unit costs			

1 Unit Cost - Level of Effort

US dollars

LoE differentiated into 5 types

		Component	Cost
LoE	International	Short-term / Project management	<ul style="list-style-type: none"> Daily rate: 800 per day Per diem: 309 per day Flight: ~1,500 for every 2 weeks work in country Indirect cost rate: 35% of daily rate
		Local	<ul style="list-style-type: none"> Short-term Long-term (National level) Long-term (Region/district levels) Project management
		Short-term	<ul style="list-style-type: none"> Daily rate: 400 per day Overhead: 35% of day rate
		Long-term (National level)	<ul style="list-style-type: none"> Salary: 40,000 annual Indirect cost rate: 35% of salary
		Long-term (Region/district levels)	<ul style="list-style-type: none"> Salary: 20,000 annual Indirect cost rate: 35% of salary
		Project management	<ul style="list-style-type: none"> Salary: 80,000 annual Indirect cost rate: 35% of salary

Project management costs calculated using broad assumption across IRs

- To account for direct project management, a percentage was added on top of non-management LoE
- Rate of 20% for field based teams, thus assuming an average of 1 manager for every 5 employees
- Assumption that 80% project managers will be local, 20% international

2 Unit Cost - Workshop/Training¹

US dollars, per person per day; (1 USD/2200 TSH)

Facilitator and participant per diems²

Potential people involved	Per diem	Source
• Facilitators ³	197/157 ⁴	USG
• National, Regional, District	55	GOT ⁵
• Health facility	36	GOT
• Dispensary/ village leader	27	GOT

Other costs

	National location ⁶		District location ⁶	
	Rate	Source	Rate	Source
Venue, refreshment, stationary	46	Conference package actuals ⁷	16	Past actuals ¹⁰
Accommodation	45	Hotel actuals ⁸	0	Past actuals
Transport	36	Costing team ⁹	24	Costing team ¹¹

Methodology

- For each workshop/training, the following will be described:
 - The number of participants at each level (e.g. 15 National-level participants only)
 - The place of the training will be categorised (e.g. Bagamoyo, National)
- The number of facilitators will then be calculated³
- Per diems will be calculated using the rates detailed in the top left box
- Other costs will be calculated by adding the number of facilitators and participants and multiplying that number by either the 'National' or 'Regional/ District' cost items

Assumptions

- 1 Assumption that all workshops/trainings take place outside of place of work (e.g. never in Dar Es Salaam centre)
- 2 Per diems given for workshop length plus one day (to cover realities of travel)
- 3 1 facilitator for every 20 participants assumed
- 4 At National level, Facilitators costed at Partner rates; US Government maximum per diems used: Morogoro rate (\$197) for National locations; 'Other' rate (\$157) for District locations; At District level, 50% of Facilitators costed at Partner rates, 50% costed at Government of Tanzania rates (\$55)
- 5 Conservative estimate: maximum Government of Tanzania rate
- 6 National workshops usually take place near major cities (e.g. Bagamoyo) at facilities that are more costly than those used at regional/district level
- 7 Calculated from sample of typical venues (to include venue + 2 small break outs (50 people), catering (3 x tea/coffee and lunch), generators + stationary)
- 8 Comprised of residential workshops (TSh250k) and non-residential workshops (TSh0) at a ratio of 2 residential for every 3 non-residential
- 9 1 litre of fuel covers 6km and costs TSh1.9k; Each vehicle carries 4 participants/facilitators; Drivers get TSh80k per diem; 50% of participants travel 450km to attend workshop/training (Dar Es Salaam to Dodoma equivalent), 50% travel 60km (Dar Es Salaam to Bagomoyo equivalent)
- 10 Venue TSh10k per person (TSh300k spread over 30 people); Refreshments allowance of TSh20k per person; Stationary TSh5k per person
- 11 Same as transport to National location, but assumed that only facilitators travel long distance, thus 5% of participants travel 450km to attend workshop/training (Dar Es Salaam to Dodoma equivalent), while 95% travel 60km (Dar Es Salaam to Bagomoyo equivalent)

3 Unit Cost - Day events

US dollars, per person per day; (1 USD/2200 TSH)

Cost type	Cost	Source	Key Assumptions	One day-meeting ^{3,4}	Launch event	Training for private sector ¹
Travel allowance	27	GOT	Half per diem ²	✓	✓	✗
Conference package	46	Conference centers	2016 actuals	✓	✓	✓
Lunch	17	Path	Previous actuals	✓	✗	✗
Printing and Stationery	5	Touch Foundation	Previous actuals			

Assumptions

- 1 For example, for hospital system developers and insurance claims system developers, where session will enable them to make their systems compliant with the standards. No per diems paid.
- 2 Conservative estimate – maximum Government of Tanzania per diem rate TSh120,000
- 3 For one-day meeting 50% participants do not require travel allowance (because they normally work at the location of event, or because the attendees are from partner organisations who do not get a travel allowance)
- 4 Assumption that 50% of one-day meetings happen at a conference centre (incurring conference package costs), while the other 50% happen at the Ministry or partner office (incurring lunch, printing and stationary costs only)

4 Unit Cost - Field work

US dollars, per person per day; (1 USD/2200 TSH)

Per diem			Travel				
Participant	Per diem	Source	Destination	Travel to area (one-off) ³		Travel within area (daily)	
				Cost	Source	Cost	Source
Government official	55	GOT ¹	Domestic	73	Costing team ⁴	20	Assumption
Partner organisation	157	USG ²	International	250	KAYAK ⁵	20	Assumption

Assumptions

- 1 Government of Tanzania maximum per diem rate TSh120,000
- 2 US Department of State maximum per diem rate for Tanzania in "Other" (non-major city) region
- 3 Average length of trip assumed to be 5 days; thus one-off travel costs are divided by 5 to calculate the per person day unit cost
- 4 1 litre of fuel covers 6km and costs TSh1.9k; Each vehicle carries 2 participants/facilitators; Drivers get TSh80k per diem; 50% of participants travel 450km to attend workshop/training (Dar Es Salaam to Dodoma equivalent), 50% travel 60km (Dar Es Salaam to Bagomoyo equivalent)
- 5 Typical return flight to nearby regions, e.g. Nairobi

5 Unit Cost - Equipment

Item	Cost/USD ¹	Quantity per health care facility				
		Regional hospital	District hospital	Health centre	Dispensary	Community health worker
Tablet and case	414	-	-	5	2	-
Date bundle for tablet (per month)	7	-	-	5	2	-
Wireless keyboards	16	-	-	1	1	-
Solar charger	35	-	-	1	1	1
Padlocks	30	-	-	1	1	1
Smart phones	200	-	-	-	-	1
Data bundle for smart phone (per month)	2	-	-	-	-	1
Router	600	1	1	-	-	-
Smart switch	450	3	1	-	-	-
Power back up	8,000	1	1	-	-	-
Application servers	4,500	2	1	-	-	-
Document printers	400	5	2	-	-	-
Label printers	250	4	2	-	-	-
Desktop PCs	600	15	10	-	-	-
Data Cabinet 9U	300	3	2	-	-	-
LAN Switch 16 Ports	100	10	6	-	-	-
Cost/Facility (USD)		\$33,000	\$22,000	\$2,200	\$1,000	\$300

Number of each health facility type

25

178

672

5,566

12,443²



Investment Recommendation Deep Dives

Enhance government coordination of data systems and use initiatives

USD thousands

\$
220

6 Months

Level	Activities	Resource Requirements and Rationale	Cost	
National	<ul style="list-style-type: none"> Develop project implementation guidelines for partners working in data systems and use including eHealth and mHealth, including how to communicate with Government 	<ul style="list-style-type: none"> 4 weeks local technical 2 one-day meetings x 25 people 	<ul style="list-style-type: none"> One consultant to develop guidelines and facilitate meetings One to gather ideas and launch, 1 to build consensus and finalise 	10
Regional and local	<ul style="list-style-type: none"> Improve MOH/PORALG website to incorporate a systems inventory which is comprehensive, organised, accessible and easily updateable. Design mechanisms to keep inventory and library up to date. Improve digital library on MOH/PORALG website including ensuring policies, legislation, and guidelines are available in organised accessible way with contact person for printed copy 	<ul style="list-style-type: none"> 5 weeks local technical 14 weeks local software 2 one-day meetings x 20 people 	<ul style="list-style-type: none"> One person to develop requirements and gather content and another person to code the website (digital library and systems inventory) One meeting of Ministry staff to gather inputs and second meeting of Ministry staff to review and finalise 	130
	<ul style="list-style-type: none"> Review the roles of different TWGs/committees to minimise duplication of roles/mandates, improve coordination between different steering committees and TWG (dealing with health data and data systems under both PORALG and MOH) 	<ul style="list-style-type: none"> 6 weeks local technical 1 week international 	<ul style="list-style-type: none"> One person to attend the meetings and interview people in order to make recommendations International LOE to bring external independent perspective 	30
		<ul style="list-style-type: none"> 3 workshops x 30 people x 2 days 	<ul style="list-style-type: none"> Workshops to discuss existing TWGs etc... and work out way they should coordinate or fit together 	50

Institute data use practices and capacity (1/3)

USD thousands



1,510



4 years

Level	Activities	Resource Requirements and Rationale	Cost
National	<ul style="list-style-type: none"> Recruit local person to be seconded to the ministry Develop a toolkit/guide on how to encourage data use culture in the health care system including reviewing any existing data use guidelines. Examples of topics to be covered in toolkit: how to encourage/enforce data use in meetings, how to establish and leverage technical teams to prepare data before meetings, how to use wallcharts, how to compile district health profiles Coordinate leadership of health data governance structure 	<ul style="list-style-type: none"> 2 people (at least one local) x 100% x 7 months to develop toolkit; 1 month x 50% - local graphic design services 2 months local recruiter 1 senior local person at 25% for 12 months 	180
	<ul style="list-style-type: none"> Define data proficiency levels for select health worker roles Review pre-service and in-service training curriculums for all health workers (training institutes, zonal resource centres and universities) and provide recommendations for how to strengthen them. Assess needs for additional job aids/guidelines for how to use data for certain job tasks. Work with training institutions to bolster/Improve training curriculums as needed Provide ongoing support to zonal centres and universities to use updated pre-service and in-service training curriculums 	<ul style="list-style-type: none"> 3 three-day local workshops: meeting facility cost plus catering for 20 participants. 1 one-day local meeting (as follow up) meeting facility cost plus catering for 10 people. 1 local person x 50% x 6 months to assess and recommend revisions to job descriptions 1 senior local person 75% x 12 months & 1 mid-level local person at 50% to research and write job aids/guidelines. 	40
	<ul style="list-style-type: none"> Create a tool that links data proficiency levels and relevant competencies with job roles (common positions, not specific people) and resources for professional development/capacity building (e.g., eLearning, toolkits, trainings, etc.) to build those competencies and achieve the appropriate proficiency levels. Activities: (1) landscape and compile resources; (2) link resources to proficiencies/competencies; develop tool (website or something); launch and promote tool; gather feedback from users; maintain and update tool. Health worker can go to the tool to access resources for the competencies they want to improve; similarly, managers can use the tool to provide constructive feedback and capacity-building resources to their employees Assess job descriptions in roles that should be primary data users and provide recommendations on revisions to explicitly require the use of data in those roles (and required skills a la data proficiency levels in SIR2 	<ul style="list-style-type: none"> 6 months local 3 months international 3 weeks x 50% - local translation services to Swahili Website/tool development 	280
			210

Institute data use practices and capacity (2/3)

USD thousands



1,510



4 years

Level	Activities	Resource Requirements and Rationale	Cost	
National	<ul style="list-style-type: none"> Develop curricula for a) national leadership training and b) 'training of trainers' on health data system Conduct trainings of national and regional level personnel in building a data use culture, using the toolkit and existing policies/guidelines Identify participants for national leadership (One from each health vertical, at least one from each national health data governance structure/office, e.g. the eGA, mHealth TWG) Conduct "training of trainers" to facilitate district and regional level mentorship in data use culture. (To include: leads from zonal resource institutes, plus one individual from each region.) 	<ul style="list-style-type: none"> 100% LOE for 6 months for 1 person to develop both curricula 	90	
	<ul style="list-style-type: none"> 1 3-day local training for representatives from each health vertical area, for 20 people 2 4-day local "training of trainers" for educational institute leads and regional leads for 20 people each 		40	
	<ul style="list-style-type: none"> Set up routine mechanism to update health worker training curriculum Conduct refresher trainings with regional staff including new policies/guidelines/best practices (e.g. every 2 years) 	<ul style="list-style-type: none"> 100% of 3 months over 3 years LOE of local staff member to set up update mechanism and manage implementation 	50	
		<ul style="list-style-type: none"> 2 3-day local refresher trainings for 20 staff each 		30
	<ul style="list-style-type: none"> Hold national-level workshops for stakeholders to socialise new health data system policies, and any changes in government structure. Speak at forums to share best practices/learning networks Create posters and factsheets encouraging data use and distribute to all health facilities and health offices from local to national level. 	<ul style="list-style-type: none"> 1 infographic creator (design and write) at 50% for 2 months to create posters and fact sheets. 	20	
		<ul style="list-style-type: none"> 4 workshop meetings, in capitol, with meeting facility and catering costs - 2 hours, 30 people each Printing for infographic/poster and postage/delivery to all offices 		10
	<ul style="list-style-type: none"> Identify 1-2 parliamentary and 2-3 ministry champions to support new data culture Conduct meetings and other outreach to prospective champions Develop fact sheets on impact of health data system in each region Lead one in-country study tour where potential champions participate Provide speaking opportunities for champions or potential at community workshops outlined above. 	<ul style="list-style-type: none"> 50% LOE local project manager for 1 year for meetings, develop fact sheets, input on communications products listed above, etc.. 	90	
		<ul style="list-style-type: none"> One 3-day study tour trip for 10 people (lodging, per diem, food, transport, etc.) travel Conference fees for three international conferences \$5000 training fee. 		10

Institute data use practices and capacity (3/3)

\$
1,510

4 years

USD thousands

Level	Activities	Resource Requirements and Rationale	Cost
National	<ul style="list-style-type: none"> Conduct an assessment of roll out and uptake of toolkit/uptake of data use policies in daily work and amongst employees at regional and district level Assess how data use best practices are included in new policies at national level Assess trends in political leadership for data use culture. 	<ul style="list-style-type: none"> 1 local M&E specialist at 25% over 15 months Baseline 2 months before launch of toolkit, then evaluation 1 year after trainings. 	60
	<ul style="list-style-type: none"> Establish results framework Monitor compliance level of health care training institutes, based on levels of data proficiency defined earlier Subcontract to educational institute mentioned above to conduct assessment of health system employee uptake 	<ul style="list-style-type: none"> 1 Intl M&E education specialist at 25% for 12 months. (Housed at local educational institute.) Baseline 2 months before launch of toolkit, then evaluation 1 year after trainings 	110
Regional and local	<ul style="list-style-type: none"> Develop health care worker training curricula for trainers to use Conduct district level trainings for HMIS leads and statisticians, using trained trainers to hold regional trainings, sharing the toolkit Assess if some regions have significant needs for capacity building and hire training institution to organise targeted, in-service training Use trainings of health care workers to socialise new policies and governing structures with each district As part of refresher training, include half-day 'forum' to share best practices Establish guideline for data reporting and analysis in regular progress reports and team meetings (will be part of toolkit). 	<ul style="list-style-type: none"> Accounted for in national guideline LOE 2 x 1 year LOE for lead facilitators 	170
		<ul style="list-style-type: none"> Region-level trainings for district leads, 1 per region (15 people each, travel for district representatives to regional training), facilitated by a local training institution. 	120

Implement a health data warehouse to house data from all relevant sources to facilitate decision-making (1/2)

USD thousands

 2,080

 2.5 Years

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Further develop requirements, including further specifying who the key users will be, focusing on the specific data needs of key users and how they want their data displayed incl. data use features and visualisations, identifying data sources (e.g. DHIS, HRHIS, eLMIS, OpenLDR, Epicor, Insurance etc..) 	<ul style="list-style-type: none"> 6 months local technical 2 months international 	<ul style="list-style-type: none"> Interview users, facilitate workshops and write up requirements 	160
		<ul style="list-style-type: none"> 3 workshops x 30 people x 3 days 	<ul style="list-style-type: none"> 1 workshop to gather requirements and a second to finalise requirements and build consensus 	60
	<ul style="list-style-type: none"> Develop or adapt data warehouse 	<ul style="list-style-type: none"> 18 months local 9 months international 	<ul style="list-style-type: none"> Software development/customisation and software project management, including facilitating of user acceptance testing and capacity building 	600
		<ul style="list-style-type: none"> 3 workshops x 15 people x 3 days 	<ul style="list-style-type: none"> 1 User acceptance testing workshop for policy makers, 1 UAT for decision makers, 1 UAT for subject matter experts 	30

Implement a health data warehouse to house data from all relevant sources to facilitate decision-making (2/2)

USD thousands

\$
2,080

2.5 Years

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Capacity building for national decision makers in use of data warehouse and also train trainers 	<ul style="list-style-type: none"> 4 months local technical 1 month international 	<ul style="list-style-type: none"> Preparation of training materials, facilitation of national level trainings and Training of trainers, supervision of zonal trainings 	100
		<ul style="list-style-type: none"> 1 workshop x 20 people x 2 days 5 workshops x 20 people x 5 days 	<ul style="list-style-type: none"> 1 workshop for senior managers orientation 3 workshops for technical people (divide them into three groups to keep class size small) 1 workshop is a Training of trainers taking 2 people from each zone 	130
	<ul style="list-style-type: none"> Ongoing review to ensure data warehouse is meeting evolving needs Ongoing maintenance and customization Ongoing user support 	<ul style="list-style-type: none"> 25 weeks local software 	<ul style="list-style-type: none"> 2 people approx. 25% of time over a year 	90
National	<ul style="list-style-type: none"> Develop a plan for sustainability and ownership of the system 	<ul style="list-style-type: none"> 4 weeks local 	<ul style="list-style-type: none"> Person to interview stakeholders and draft sustainability plan 	10
		<ul style="list-style-type: none"> 1 workshop x 40 people x 2 days 	<ul style="list-style-type: none"> Workshop to review and finalise plan 	20
Regional and local	<ul style="list-style-type: none"> Capacity building for regional and district decision makers in use of data warehouse 	<ul style="list-style-type: none"> 300 days local technical 	<ul style="list-style-type: none"> 20 zonal trainers for 15 days each (including preparation and report writing) 	210
		<ul style="list-style-type: none"> 178 workshops x 3 days x 16 people 25 workshops x 3 days x 16 people 	<ul style="list-style-type: none"> Train 16 people per districts and 16 people per region. 3 days. 	1,010

Upgrade HMIS indicators and reporting (1/2)

USD thousands



6,910



3 Years

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Develop data policy guidelines for HMIS (covering data collection, storage, retention, privacy, reporting, access, feedback, data use, roles, responsibilities and supervision) 	<ul style="list-style-type: none"> 6 weeks local 6 weeks international 	<ul style="list-style-type: none"> International for best practice and local expert for local background and continuity 	70
	<ul style="list-style-type: none"> 2 workshop x 40 people x 3 days 	<ul style="list-style-type: none"> 1 workshop to gather ideas 1 workshop to review and finalise 	50	
	<ul style="list-style-type: none"> Review, update and standardise MTUHA/HMIS indicators and report formats, ensuring report formats encourage local data use, and removing any excess indicators Integrate remaining vertical programs into MTUHA/HMIS Review rules for data quality checks 	<ul style="list-style-type: none"> 3 years local (1 year short-term, 2 years long-term)9 months international 	<ul style="list-style-type: none"> Large quantity of reports and indicators to go review and build consensus Inter-national best practice and local expert for local background and continuity Large multi-year effort to achieve harmonisation and consensus across programs 	690
		<ul style="list-style-type: none"> 7 one-day meetings x 45 people 21 5-day workshops x 45 people 7 3-day workshops x 45 people 	<ul style="list-style-type: none"> For each vertical: one 1-day meeting, three detailed technical 5- day workshops x 45 people, and one workshop finalisation 3 days 	1,260
	<ul style="list-style-type: none"> Further development and configuration of DHIS, including making revisions to forms, a mobile reporting feature, implementing further data quality checks and developing more dashboards and analysis 	<ul style="list-style-type: none"> 36 months local software 	<ul style="list-style-type: none"> Configuration of DHIS in line with revised HMIS, including data entry screens and dashboards to promote data use. Two people 50% of time over three years. 	550
	<ul style="list-style-type: none"> Develop guidelines on how data can be transferred from point of care systems and other source systems (e.g. pharmacy council data from ADDOs) into electronic MTUHA/HMIS (DHIS) as part of broader interoperability guidelines 	<ul style="list-style-type: none"> 6 weeks local 2 weeks international 2 x 1 day meetings x 20 people 1 workshop x 45 people x 2 days 	<ul style="list-style-type: none"> International DHIS experts plus local experts in source data systems Small meetings of technical experts plus Ministry officials 	40
			30	

Upgrade HMIS indicators and reporting (2/2)

USD thousands

\$
6,910

3 Years

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Facilitate upgrade of existing systems to allow them to transfer data into DHIS 	<ul style="list-style-type: none"> 8 weeks local 	<ul style="list-style-type: none"> Local software developers who can work on source data systems and local software supporters of DHIS 	30
	<ul style="list-style-type: none"> Capability building for national level in revised HMIS, and training of trainers 	<ul style="list-style-type: none"> 4 months local technical 	<ul style="list-style-type: none"> Preparation of training materials, facilitation of national level trainings and Training of trainers, supervision of zonal trainings 	60
		<ul style="list-style-type: none"> 1 workshop x 45 people x 2 days 1 workshop x 45 people x 5 days 	<ul style="list-style-type: none"> One workshop for senior managers orientation. A workshop is a Training of trainers taking 5 people from each zone. 	70
Regional and local	<ul style="list-style-type: none"> Training for district personnel in revised system, including extracting data from other systems into DHIS 	<ul style="list-style-type: none"> 300 days local technical 	<ul style="list-style-type: none"> 20 zonal trainers for 15 days each (including preparation and report writing) 	210
		<ul style="list-style-type: none"> 178 workshops x 3 days x 32 people 25 workshops x 3 days x 32 people 	<ul style="list-style-type: none"> Train 32 people per district and region. 3 days. 	2,030
	<ul style="list-style-type: none"> Training for facility staff in how to compile and use revised report formats 	<ul style="list-style-type: none"> 294 workshops x 3 days x 30 people 	<ul style="list-style-type: none"> Train 1 person per dispensary, 2 people per health centre, and 3 people per hospital. 3 days. 	2,130

Enhance and scale notifiable disease surveillance

 **4,110**

 **1.5 Years**

USD thousands

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Review eIDSR performance in 10 regions and review the quality of notifiable disease data to identify gaps and areas of improvements 	<ul style="list-style-type: none"> 3 weeks local technical 1 week international 	<ul style="list-style-type: none"> Conduct in-depth field review and analysis 	20
		<ul style="list-style-type: none"> 2 weeks field travel for 2 people 	<ul style="list-style-type: none"> Observe how eIDSR is working in the field 	
	<ul style="list-style-type: none"> Revise and refine eIDSR design to address identified gaps 	<ul style="list-style-type: none"> 6 weeks local software 2 weeks international 	<ul style="list-style-type: none"> Software development/refinement 	40
		<ul style="list-style-type: none"> 1 UAT workshop of 2 days x 30 people 	<ul style="list-style-type: none"> User acceptance testing 	20
Regional and local	<ul style="list-style-type: none"> Roll out the revised IDSR and eIDSR in the remaining 15 regions and conduct top-up training in existing 10 regions 	<ul style="list-style-type: none"> 18 weeks local 	<ul style="list-style-type: none"> Develop curriculum, formulate cascade training plan, facilitate national Training of trainers, mentor MOH trainers in regional trainings 	60
		<ul style="list-style-type: none"> 7637 participants at 200+ trainings; 100 trainings of 1 day in 10 regions, 100 trainings of 2 days in 17 regions 	<ul style="list-style-type: none"> One person from each health care facility 10 regions have already received some training and received 1-day top-up 17 regions need 2-day training from scratch 	4,610

Strengthen systems for facility performance management supervision (1/2)

USD thousands

\$
1,400

1.5 years

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Review guidelines/policies/processes linked to performance management/supervision of facilities and produce harmonised guidelines 	<ul style="list-style-type: none"> 4 months local LOE plus 2 weeks international LOE 	<ul style="list-style-type: none"> International expert to develop and QA work plan carried out by local experts 	80
		<ul style="list-style-type: none"> 2 workshops x 40 people x 2 days Travel to regions 4 trips x 5 days 	<ul style="list-style-type: none"> One workshop to gather information and ideas, second workshop to present report and finalise travel to shadow supervisions/assessments to see how they work in practice 	40
	<ul style="list-style-type: none"> Develop requirements for offline supervision/performance management tool for use by national and district level supervisors or assessors who visit facilities for supervisions or assessments to jointly formulate performance improvement action plans with facilities 	<ul style="list-style-type: none"> 4 months local LOE 	<ul style="list-style-type: none"> Local expertise is available 2 persons x 2 months 	60
	<ul style="list-style-type: none"> Develop offline supervision/performance management tool in line with requirements 	<ul style="list-style-type: none"> 15 months local software LOE 	<ul style="list-style-type: none"> 2 or 3 people on software development team, each one 70% of time over period of 6 months 	230
		<ul style="list-style-type: none"> UAT workshop 40 people x 3 days 	<ul style="list-style-type: none"> UAT workshop to ensure user buy-in 	30
	<ul style="list-style-type: none"> Configure DHIS to incorporate all supervision/assessment data 	<ul style="list-style-type: none"> 2 months Local software LOE 	<ul style="list-style-type: none"> Local DHIS software expert 	30
	<ul style="list-style-type: none"> Enhance PlanRep to facilitate scheduling of supervision/assessments 	<ul style="list-style-type: none"> 5 months software LOE 	<ul style="list-style-type: none"> Local planrep software expert 	60

Strengthen systems for facility performance management supervision (2/2)

USD thousands

\$ 1,400	🕒 TBD
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Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Train national personnel (assessors/supervisors including representatives of vertical programs) on revised supervision procedure and how the performance management tool, DHIS and PlanRep should be used to facilitate this 	<ul style="list-style-type: none"> 6 months local LOE 	<ul style="list-style-type: none"> Time to develop the training, train multiple groups, follow up on effectiveness of training/address challenges 	90
		<ul style="list-style-type: none"> 2 training workshops x 40 people x 5 days 	<ul style="list-style-type: none"> Training of national level people and Training of trainers 	80
Regional and local	<ul style="list-style-type: none"> Procure tablet/PC/Cellphones for national/district level supervisors/assessor to use during facility supervisions/assessments 	<ul style="list-style-type: none"> 1 month local LOE 	<ul style="list-style-type: none"> Write specifications and coordinate procurement of tablets 	20
		<ul style="list-style-type: none"> 2 tablets per district 	<ul style="list-style-type: none"> Pool of tablets which stay at district offices which any supervisor/assessor can take when doing assessments/supervisions 	210
	<ul style="list-style-type: none"> Train district level personnel (assessors/supervisors including representatives of vertical programs) on revised supervision procedure and how the performance management tool, DHIS and PlanRep should be used to facilitate this 	<ul style="list-style-type: none"> 300 days local technical 	<ul style="list-style-type: none"> 20 zonal trainers for 15 days each (including preparation and report writing). Time to develop the training, train multiple groups, follow up on effectiveness of training/address challenges. Same trainers as national level. 	210
		<ul style="list-style-type: none"> 36 training workshops x 30 people x 2 days 	<ul style="list-style-type: none"> 4 trainings in each of 9 zones covering 120 people in each zone (30 people per training) 	260

Implement systems for client feedback management (1/2)

 1,020

 2 Years

USD thousands

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Develop guideline and strategy for feedback collection (including client service charters as benchmark for feedback, feedback questions to be asked, feedback classification system), feedback processing workflows and how follow up actions based on feedback are followed through 	<ul style="list-style-type: none"> 12 months local LOE plus 1 month international LOE 	<ul style="list-style-type: none"> Time to conduct assessment of existing guidelines, best practices, and propose feedback guidelines. 	120
		<ul style="list-style-type: none"> 4 workshops x 30 people x 5 days 	<ul style="list-style-type: none"> Gather ideas, establish feedback processing workflows. Involves large number of people from across MOH and PORALG 	120
	<ul style="list-style-type: none"> Develop USSD/SMS feedback tool and feedback processing interface- Liaise with mobile network operators to set up USSD interfaces and negotiate on SMS/USSD costs 	<ul style="list-style-type: none"> 2 months local LOE 	<ul style="list-style-type: none"> Relatively simple 	30
	<ul style="list-style-type: none"> Support and train feedback reception team who; categorise incoming feedback; channel feedback to relevant party through periodic feedback summaries sent out to national, district and facility levels as relevant; send phone and SMS feedback to relevant parties on urgent issues; give client acknowledgement and information on steps being taken 	<ul style="list-style-type: none"> 24 months local LOE 	<ul style="list-style-type: none"> 2 people full time for a year 	170
	<ul style="list-style-type: none"> Training of feedback processing team 	<ul style="list-style-type: none"> 2 weeks local LOE 	<ul style="list-style-type: none"> Training preparation and facilitation 	10
		<ul style="list-style-type: none"> Workshop for 20 people for 5 days 	<ul style="list-style-type: none"> National feedback team requires 20 people who will require a 1 week training 	20

Implement systems for client feedback management (2/2)



1,020



2 Years

USD thousands

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Marketing campaign for general public 	<ul style="list-style-type: none"> 6 weeks local LOE 	<ul style="list-style-type: none"> Develop and disseminate socialization materials/ reference guides, 	20
		<ul style="list-style-type: none"> Design and printing of 100,000 posters for putting up at health facilities 	<ul style="list-style-type: none"> Required 	70
	<ul style="list-style-type: none"> Socialisation of feedback system at national level through launch event and briefing meetings 	<ul style="list-style-type: none"> 6 weeks local LOE 	<ul style="list-style-type: none"> Facilitate launch and briefing meetings 	20
		<ul style="list-style-type: none"> 1 day public launch event x 60 people. 6 1 day briefing meetings for 20 people. 	<ul style="list-style-type: none"> hold briefings for different department manager groups 	10
	<ul style="list-style-type: none"> Develop a plan for sustainability and ownership of the system 	<ul style="list-style-type: none"> 100 weeks 2 local LOE 	<ul style="list-style-type: none"> Person to interview stakeholders and draft sustainability plan 	10
		<ul style="list-style-type: none"> 1 workshop x 40 people x 2 days 	<ul style="list-style-type: none"> Workshop to review and finalise plan 	20
Regional and local	<ul style="list-style-type: none"> Socialisation of feedback system among health workers and district personnel through teams which travel to districts to facilitate meetings to introduce the feedback system 	<ul style="list-style-type: none"> 4 weeks local LOE 	<ul style="list-style-type: none"> Facilitate socialisation workshops for people at each district. 	170
		<ul style="list-style-type: none"> 2 day workshop x number of districts x 40 people 	<ul style="list-style-type: none"> Workshop to review and finalise plan 	230

Implement a terminology service

USD thousands

\$
1,230

2 Years

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Develop, adopt and harmonise standards and coding systems for referencing drugs and medical supplies, diagnosis, procedures 	<ul style="list-style-type: none"> 12 months local 6 months international 	<ul style="list-style-type: none"> International LOE to support adoption and customisation of international terminology standards Local LOE for working through standardisation and coding systems with stake-holders (especially for drug terminology) 	300
		<ul style="list-style-type: none"> 6 1 day meetings x 40 people 6 3 day workshops x 40 people 	<ul style="list-style-type: none"> Each workshop focuses on a different set of terminology e.g., 1 for drugs, 1 for diagnosis, 1 for another set TBD 	170
	<ul style="list-style-type: none"> Develop business requirements for terminology registry including update processes, defining fields, how systems can subscribe to updates via API, and required interfaces 	<ul style="list-style-type: none"> 6 months local 3 months international 	<ul style="list-style-type: none"> International LOE for international best practice 	200
		<ul style="list-style-type: none"> 4 one-day meetings x 25 people 4 3-day workshop x 25 people 	<ul style="list-style-type: none"> Meetings for consultation plus workshop to gather inputs, present and finalise 	70
	<ul style="list-style-type: none"> Develop terminology registry software (technical specifications, coding, testing, technical document-tation including API documentation, user manual) 	<ul style="list-style-type: none"> 12 months local 4 month international 	<ul style="list-style-type: none"> Local software development team (at least 2 people part time) International technical TA 	330
		<ul style="list-style-type: none"> 2 3-day workshop x 25 people 	<ul style="list-style-type: none"> Workshop for user acceptance testing 	30
	<ul style="list-style-type: none"> Train terminology management and administration staff at Ministry 	<ul style="list-style-type: none"> 2 weeks local 	<ul style="list-style-type: none"> Preparation of materials, organisation of and facilitation of training 	10
		<ul style="list-style-type: none"> 1 3-day training x 25 people 	<ul style="list-style-type: none"> Training workshop for users responsible for updating data 	20
	<ul style="list-style-type: none"> Familiarise software developers working in the health sector in how to subscribe to the terminology service 	<ul style="list-style-type: none"> 2 weeks local 	<ul style="list-style-type: none"> Preparation of materials and facilitation 	10
		<ul style="list-style-type: none"> 5 private sector training days x 30 people 	<ul style="list-style-type: none"> Software developers working in the health sector invited but not paid any costs or per diems. This will enable them to link their systems with the terminology registry 	10
<ul style="list-style-type: none"> Ongoing review, maintenance and user support 	<ul style="list-style-type: none"> 3 months local 	<ul style="list-style-type: none"> 1 local LOE 25% of time over a year 	50	
<ul style="list-style-type: none"> Develop a plan for sustainability and ownership of the system 	<ul style="list-style-type: none"> 4 weeks local 	<ul style="list-style-type: none"> Person to interview stakeholders and draft sustainability plan 	10	
	<ul style="list-style-type: none"> 1 workshop x 40 people x 2 days 	<ul style="list-style-type: none"> Workshop to review and finalise plan 	20	

Put in place an enterprise architecture, including governance guidelines, and standards for interoperability

USD thousands

\$
1,210

2 Years

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Develop a national eHealth standards framework, comprising: <ul style="list-style-type: none"> Collaboratively develop standards, policies, and guidelines for interoperability implementations Develop requirements for national interoperability Establish prioritised interoperability use cases Identify and establish governance structures for interoperability Develop mechanism for monitoring and supporting compliance with interoperability standards. Develop capacity of health sector leaders to understand interoperability to provide effective leadership 	<ul style="list-style-type: none"> 2 years of local technical (18 months long-term, 6 months short-term) 3 months international 	<ul style="list-style-type: none"> Steps 1-6 requires a consistent (local) technical guidance over 18 months plus additional (local) supporting expertise over 6 months. International consultants to advise on best practice 	330
	<ul style="list-style-type: none"> Establish national interoperability layer or health information mediator services 	<ul style="list-style-type: none"> 7 workshops x 3 days x 30 people6 one-day meetings for 45 people Publish document on EA – 1000 copies 	<ul style="list-style-type: none"> 1 workshop per quarter over a course of a year, plus a capacity building workshop for high level leaders First workshop to introduce ideas, second to agree on high level way forward on governance, and then a series of workshops to agree on details of each identified workstream One day meetings every quarter - last one is a launch of the official EA document Official document on enterprise architecture to be published 	150
	<ul style="list-style-type: none"> Facilitate upgrade of existing systems to make them interoperable 	<ul style="list-style-type: none"> 12 months local software 4 months international 	<ul style="list-style-type: none"> International software developers plus local software organisations working together Software development or customisation and deployment 	330
		<ul style="list-style-type: none"> 3 years local software 	<ul style="list-style-type: none"> Local software developers who work on existing systems plus local work on the health facility registry 	550

Implement an administrative area registry (1/2)

\$
1,220

2 Years

USD thousands

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Develop document which describes governance structure to manage administrative area data Develop business requirements for administrative area registry software to manage and make available geographic and administrative data on villages, wards, districts, etc., as well as their personnel (VEOs, WEOs, etc.) 	<ul style="list-style-type: none"> 6 months local 3 months international 	<ul style="list-style-type: none"> International LOE to show what is possible or international best practice 	200
		<ul style="list-style-type: none"> 3 one-day meetings x 20 people 6 2-day workshops x 20 people 	<ul style="list-style-type: none"> Meetings for consultation Workshops to build consensus and then to present and finalise 	60
	<ul style="list-style-type: none"> Develop administrative area registry software (technical specifications, coding, testing, technical documentation including API documentation, user manual) 	<ul style="list-style-type: none"> 18 months local 6 month international 	<ul style="list-style-type: none"> Local software development team (at least 2 people part time) plus international technical TA 	490
		<ul style="list-style-type: none"> 2 3-day workshop for 25 people 	<ul style="list-style-type: none"> Workshop for user acceptance testing 	20
	<ul style="list-style-type: none"> Train users at national level, and Training of trainers 	<ul style="list-style-type: none"> 2 months local technical 	<ul style="list-style-type: none"> Preparation of training materials, facilitation of national level trainings and Training of trainers, supervision of zonal trainings 	30
		<ul style="list-style-type: none"> 1 workshop x 20 people x 2 days 1 workshop x 20 people x 3 days 	<ul style="list-style-type: none"> 1 workshop for senior managers orientation 1 workshop is a Training of trainers taking 2 people from each zone. 	30
<ul style="list-style-type: none"> Launch and socialisation 	<ul style="list-style-type: none"> 1 week local 	<ul style="list-style-type: none"> Preparation of materials and organisation of launch 	10	
	<ul style="list-style-type: none"> 1 day public launch event x 100 people 	<ul style="list-style-type: none"> To raise awareness about the availability of this service among the wider professional world 		

Implement an administrative area registry (2/2)



1,220



2 Years

USD thousands

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Familiarise software developers working in the health sector in how to subscribe to the service and use shape files for mapping in their systems 	<ul style="list-style-type: none"> 2 weeks local 	<ul style="list-style-type: none"> Preparation of materials and facilitation 	10
		<ul style="list-style-type: none"> 5 x private sector training days x 30 people 	<ul style="list-style-type: none"> Software developers working in the health sector invited but not paid any costs or per diems This will enable them to link their systems with this service and incorporate GIS/mapping features into their systems. 	10
	<ul style="list-style-type: none"> Ongoing review, maintenance and user support 	<ul style="list-style-type: none"> 3 months local 	<ul style="list-style-type: none"> 1 local LOE 25% of time over a year 	50
	<ul style="list-style-type: none"> Develop a plan for sustainability and ownership of the system 	<ul style="list-style-type: none"> 4 weeks local 	<ul style="list-style-type: none"> Person to interview stakeholders and draft sustainability plan 	10
<ul style="list-style-type: none"> 1 workshop x 40 people x 2 days 		<ul style="list-style-type: none"> Workshop to review and finalise plan 	20	
Regional and local	<ul style="list-style-type: none"> Train users at district level 	<ul style="list-style-type: none"> 200 days local technical 	<ul style="list-style-type: none"> 18 training workshops x 30 people x 2 days 	140
		<ul style="list-style-type: none"> 20 zonal trainers for 10 days each (including preparation and report writing) 	<ul style="list-style-type: none"> 2 trainings in each of 9 zones covering 60 people in each zone (30 people per training) 	130

Develop standards for health insurance eClaims

USD thousands



410



1.5 Years

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Develop standards for eClaims 	<ul style="list-style-type: none"> 6 months local 2 months inter-national 	<ul style="list-style-type: none"> Produce standards documents and data dictionary 	160
		<ul style="list-style-type: none"> 4 2-day workshops x 35 people 	<ul style="list-style-type: none"> Workshops includes insurers, MOH, TIRA, regulatory bodies, sample of health facilities 	70
	<ul style="list-style-type: none"> Launch and socialization of eClaims standard 	<ul style="list-style-type: none"> 1 week local 	<ul style="list-style-type: none"> Preparation of materials and organisation of launch 	10
		<ul style="list-style-type: none"> 1 day public launch event x 60 people 	<ul style="list-style-type: none"> To raise awareness about the standards 	
	<ul style="list-style-type: none"> Familiarise software developers working in the health sector (hospital system developers and insurance claims system developers) with how to operationalise eClaims 	<ul style="list-style-type: none"> 1 week local 	<ul style="list-style-type: none"> Preparation of materials and facilitation 	10
		<ul style="list-style-type: none"> 1 private sector training days x 30 people 	<ul style="list-style-type: none"> Software developers working in the health sector invited but not paid any costs or per diems This will enable them to make their systems compliant with the standards 	
<ul style="list-style-type: none"> Develop governance structure to maintain eClaims standards 	<ul style="list-style-type: none"> 2 months local 4 weeks international 	<ul style="list-style-type: none"> In line with shortly-to-be-introduced national insurance scheme for informal sector replacing CHF 	70	
	<ul style="list-style-type: none"> 4 4-day workshop x 25 people 4 1-day meetings x 25 people 	<ul style="list-style-type: none"> Workshop to gather inputs and review standards Meetings for syndication and review requirements 	90	

Implement a health and social services workers registry (1/2)

USD thousands



1,180



2 Years

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Develop business requirements and governance processes for workforce registry, which will involve substantive requirements gathering, including establishing roles for CRUD (create, read, update, delete), defining what data may be imported from HCMIS, defining fields (along lines of WHO minimum data set for health workers registry), defining which "user" systems will connect and how, what standalone interfaces there will be, matching and de-duplication algorithms and processes, establishing how an authentication service for external applications could work 	<ul style="list-style-type: none"> 6 months local 4 weeks international 	<ul style="list-style-type: none"> International LOE for international best practice High level of local LOE because of lack of consensus between institutions (POPSM, MOH, regulatory councils) and need to build consensus 	130
		<ul style="list-style-type: none"> 4 one-day meetings x 30 people 6 2-day workshops x 30 people 	<ul style="list-style-type: none"> Meetings for consultation Workshops for consensus on overall direction Workshop to present and finalise requirements 	100
	<ul style="list-style-type: none"> Develop workers registry software (technical specifications, coding, testing, setting up inter-operability with POPSM HCMIS Lawson, technical documentation including API documentation, user manual) 	<ul style="list-style-type: none"> 9 months local LOE 4 month international 	<ul style="list-style-type: none"> Local software development team (at least 2 people) plus international technical TA 	280
		<ul style="list-style-type: none"> 1 3-day workshop x 30 people 	<ul style="list-style-type: none"> Workshop for user acceptance testing 	20
	<ul style="list-style-type: none"> Train data source users at national level (regulatory councils, POPSM, MOH, partners who manage volunteer community workers), and Training of trainers 	<ul style="list-style-type: none"> 2 months local technical 	<ul style="list-style-type: none"> Preparation of training materials, facilitation of national level trainings and Training of trainers, and supervision of zonal trainings 	30
		<ul style="list-style-type: none"> 1 workshop x 20 people x 2 days 3 workshops x 30 people x 3 days 	<ul style="list-style-type: none"> 1 workshop for senior managers orientation 1 workshop for government and regulatory authorities 1 workshop for partners who supervise community health workers and associations 1 workshop is a Training of trainers taking 2 people from each zone 	140

Implement a health and social services workers registry (2/2)

USD thousands



1,180



2 Years

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Launch and socialisation 	<ul style="list-style-type: none"> 1 week local 1 day public launch event x 60 people 	<ul style="list-style-type: none"> Preparation of materials and organisation of launch To raise awareness about the availability of this service among the wider partners 	10
	<ul style="list-style-type: none"> Familiarise software developers working in the health sector in how to make use of workers registry 	<ul style="list-style-type: none"> 2 weeks local 1 week international 	<ul style="list-style-type: none"> Preparation of materials and facilitation 	20
		<ul style="list-style-type: none"> 5 private sector training days x 30 people 	<ul style="list-style-type: none"> Software developers working in the health sector invited but not paid any costs or per diems This will enable them to link their systems with the workers registry and use the workers registry authentication for their own systems 	10
	<ul style="list-style-type: none"> Ongoing review, maintenance and user support, including ongoing communications with workers (e.g. reminders to update details etc..) 	<ul style="list-style-type: none"> 3 months local 	<ul style="list-style-type: none"> 1 local LOE 25% of time over a year 	50
		<ul style="list-style-type: none"> 1 500,000 SMSes for a year 	<ul style="list-style-type: none"> Assumption of several hundred thousand frontline workers in country 	20
<ul style="list-style-type: none"> Develop a plan for sustainability and ownership of the system 	<ul style="list-style-type: none"> 4 weeks local 	<ul style="list-style-type: none"> Person to interview stakeholders and draft sustainability plan 	10	
	<ul style="list-style-type: none"> 1 workshop x 40 people x 2 days 	<ul style="list-style-type: none"> Workshop to review and finalise plan 	20	
Regional and local	<ul style="list-style-type: none"> Train users at district level 	<ul style="list-style-type: none"> 200 days local technical 	<ul style="list-style-type: none"> 20 zonal trainers for 10 days each (including preparation and report writing) 	140
		<ul style="list-style-type: none"> 18 training workshops x 35 people x 3 days 	<ul style="list-style-type: none"> 2 trainings in each of 9 zones covering 70 people in each zone (35 people per training) 	200

Enhance systems for management of supply chain data

USD thousands



1,470



2 Years

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Develop supply chain system strategy (10 year) 	<ul style="list-style-type: none"> 4 months local 1 month international 	<ul style="list-style-type: none"> International for best practice and local expert for local background and continuity 	100
		<ul style="list-style-type: none"> 3 3-day workshops x 25 people 	<ul style="list-style-type: none"> Workshop to gather inputs, review and finalise requirements report 	50
	<ul style="list-style-type: none"> Develop detailed requirements for further development and linking of eLMIS, VIMS, VAN, MSD Epicor, and other supply chain systems¹ 	<ul style="list-style-type: none"> 3 months local 1 month international 	<ul style="list-style-type: none"> International for best practice and local expert for local background and continuity 	80
		<ul style="list-style-type: none"> 3 3-day workshops x 30 people 	<ul style="list-style-type: none"> Workshop to gather inputs, review and finalise requirements report 	60
	<ul style="list-style-type: none"> Development of enhanced features led by local software developers with international support 	<ul style="list-style-type: none"> 3 years local 6 months international 	<ul style="list-style-type: none"> Local software developers begin to take the lead, while being supported by existing international developers 	770
Regional and local	<ul style="list-style-type: none"> Ongoing review, maintenance and user support 	<ul style="list-style-type: none"> 1 3-day workshop x 30 people 	<ul style="list-style-type: none"> Workshop for user acceptance testing 	20
		<ul style="list-style-type: none"> 3 months local 	<ul style="list-style-type: none"> 1 local LOE 25% of time over a year 	50
	<ul style="list-style-type: none"> Train users at district level in how to monitor supply chain bottlenecks through eLMIS 	<ul style="list-style-type: none"> 200 days local technical 	<ul style="list-style-type: none"> 20 zonal trainers for 10 days each (including preparation and report writing) 	140
<ul style="list-style-type: none"> 18 training workshops x 30 people x 3 days 		<ul style="list-style-type: none"> 2 trainings in each of 9 zones covering 60 people in each zone 	170	

¹ This will include features needed for Visibility Analytics Network approach, facility-friendly and smartphone/tablet friendly access and features, proof of delivery, visibility of stocks at facility level, visibility of order adjustments, order fulfilment rates, track and trace, analysis and visibility of bottlenecks and enhancement of data use features, linkages to DHIS and Health facility registry, and how to ensure eLMIS code base updates are sustainable and compatible with broader OpenLMIS.

Implement a client registry (1/2)

USD thousands

\$ 970

2 Years

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Develop business requirements and governance processes for client registry¹ 	<ul style="list-style-type: none"> 6 months local 3 months international 	<ul style="list-style-type: none"> International LOE to show what is possible or international best practice. 	200
		<ul style="list-style-type: none"> 4 one-day meetings x 30 people 6 3-day workshops x 30 people 	<ul style="list-style-type: none"> Meetings for consultation, workshop to present and finalise requirements 	130
	<ul style="list-style-type: none"> Develop client registry software (technical specifications, coding, testing, setting up interoperability interfaces for "user" systems, technical documentation including API documentation, user manual) 	<ul style="list-style-type: none"> 9 months local 4 month international 	<ul style="list-style-type: none"> Local software development team (at least 2 people part time) plus international technical TA 	280
		<ul style="list-style-type: none"> 1 3-day workshop x 25 people 	<ul style="list-style-type: none"> Workshop for user acceptance testing 	20
	<ul style="list-style-type: none"> Train data administration users at national level (MOH staff who will perform de-duplication and other data administration tasks) 	<ul style="list-style-type: none"> 6 weeks local 	<ul style="list-style-type: none"> Preparation for and facilitation of training 	20
		<ul style="list-style-type: none"> 2 3-day workshop x 25 people 	<ul style="list-style-type: none"> Training for users who are closely involved with administration of the system 	30
	<ul style="list-style-type: none"> Support dedicated administration/de-duplication staff for first year at MOH 	<ul style="list-style-type: none"> 12 months local 	<ul style="list-style-type: none"> 1 person to lead the client registry administration team at the Ministry for the first year 	90

¹ This will include establishing roles for CRUD (create, read, update, delete), privacy requirements, defining fields, defining relationship with RITA/NIDA systems, defining which systems will connect and how, what standalone interfaces there will be, matching and de-duplication algorithms and processes etc.

Implement a client registry (2/2)

\$
970

2 Years

USD thousands

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Familiarise software developers working in the health sector in how to connect their systems to client registry 	<ul style="list-style-type: none"> 2 weeks local 1 week international 5 private sector training days x 30 people 	<ul style="list-style-type: none"> Preparation of materials and facilitation Software developers working in the health sector invited but not paid any costs or per diems This will enable them to link their systems with the client registry 	<div style="border: 1px solid black; border-radius: 50%; width: 30px; height: 30px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">20</div>
	<ul style="list-style-type: none"> Connection of "lead" systems with client registry (i.e., software adjustments needed to existing systems) 	<ul style="list-style-type: none"> 6 months local 	<ul style="list-style-type: none"> Fund work of software development people of some "lead" systems to connect their systems to the client registry 	<div style="border: 1px solid black; border-radius: 50%; width: 30px; height: 30px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">90</div>
	<ul style="list-style-type: none"> Ongoing review, maintenance and user support 	<ul style="list-style-type: none"> 3 months local 	<ul style="list-style-type: none"> 1 local LOE 25% of time over a year 	<div style="border: 1px solid black; border-radius: 50%; width: 30px; height: 30px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">50</div>
	<ul style="list-style-type: none"> Develop a plan for sustainability and ownership of the system 	<ul style="list-style-type: none"> 4 weeks local 1 workshop x 40 people x 2 days 	<ul style="list-style-type: none"> Person to interview stakeholders and draft sustainability plan Workshop to review and finalise plan 	<div style="border: 1px solid black; border-radius: 50%; width: 30px; height: 30px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">10</div> <div style="border: 1px solid black; border-radius: 50%; width: 30px; height: 30px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">20</div>

Computerise hospital data (1/3)

USD thousands



13,050



3 Years

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Further enhance existing hospital systems standards and guidelines, including more detailed guidelines on the different functionalities (pharmacy and stock management, laboratory, medical records, revenue/payments management including use of mobile and electronic money, in-facility HR management) 	<ul style="list-style-type: none"> 2 weeks international LOE, Local LOE 2 months 	<ul style="list-style-type: none"> Local LOE supported by international expertise 	50
		<ul style="list-style-type: none"> 3 workshops x 4 days x 25 people 	<ul style="list-style-type: none"> Workshops to gather inputs, mid way review, finalise 	60
	<ul style="list-style-type: none"> Further develop "how-to-computerise" guide for hospitals covering system-choice, system-financing (discussion of business models and contracting mechanisms), how to operationalise use of mobile and electronic payments, how to upgrade infrastructure (power, hardware and internal networking), and change management and implementation 	<ul style="list-style-type: none"> 2 weeks international LOE, Local LOE 2 months 	<ul style="list-style-type: none"> Local LOE supported by international expertise 	50
		<ul style="list-style-type: none"> 3 workshops x 5 days x 25 people 	<ul style="list-style-type: none"> Workshops to gather inputs, mid way review, finalise 	80
	<ul style="list-style-type: none"> Develop and support accreditation mechanisms to monitor quality of hospital systems on the market to ensure they meet developed standards and guidelines (certification scheme) 	<ul style="list-style-type: none"> 6 years local LOE covering this line and the three lines below it 	<ul style="list-style-type: none"> 2 people for 3 years do all these activities (this line plus three lines below it) 	520
		<ul style="list-style-type: none"> Certification: 1 x workshop x 2 days x 50 people plus quarterly 1-day meetings for 30 people plus 15 4-day trips to the regions for 10 people 	<ul style="list-style-type: none"> Certification: workshop to establish certification scheme. Meetings to review and coordinate certification processes. Travel for team to visit hospitals to see system in use and interview users (approx. 15 systems) 	40

Computerise hospital data (2/3)

USD thousands



13,050



3 Years

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Facilitate discussions between mobile money operators, banks, hospital administration system software developers and hospitals on potential business models for mobile money payments as replacement for cash for hospital services, and support negotiations of fees and access rates with e- and m-payment providers 	<ul style="list-style-type: none"> LOE covered in "Develop and support mechanisms..." Electronic payments: Workshop to facilitate mobile money etc... 	<ul style="list-style-type: none"> N/A Electronic payments: workshop to facilitate discussions 	40
	<ul style="list-style-type: none"> Support coordination of MOH and PORALG with other relevant Ministries (e.g. infrastructure) and private stakeholders (e.g. infrastructure companies, telcos, etc.) on connectivity and networking expansion 	<ul style="list-style-type: none"> LOE covered in "Develop and support mechanisms..." 	<ul style="list-style-type: none"> N/A 	
	<ul style="list-style-type: none"> Support computerisation guideline rollout (support and manage the regional staff mentioned below) 	<ul style="list-style-type: none"> LOE covered in "Develop and support mechanisms..." Support computerisation: Travel to regions for 1 person for 4 days a month for three years 	<ul style="list-style-type: none"> N/A Support computerisation: travel for team to visit regions 	30
Regional and local	<ul style="list-style-type: none"> Training of regional hospital computerisation advisors and other regional support staff in the "how to computerise guide", in linkages with mobile and electronic payments, and in hardware and networking support 	<ul style="list-style-type: none"> 3 years local LOE 	<ul style="list-style-type: none"> Training preparation and facilitation in all 23 regions. Could be one or two national level people dedicated full time to this task 	260
		<ul style="list-style-type: none"> Training workshops: 35 people x 2 trainings per region x 2 weeks x 27 regions 	<ul style="list-style-type: none"> Ensure hospital staff are able to utilise hardware and software effectively with specific relation to IR objectives 	2,030

Computerise hospital data (3/3)

USD thousands



13,050



3 Years

Level	Activities	Resource Requirements	Rationale	Cost
Regional and local	<ul style="list-style-type: none"> Roll out of computerisation guide through regional hospital computerization advisors. These advisors work with each hospital to select system/vendor, negotiate with system vendor on software support and maintenance, formulate hospital computerization plan and drive implementation of plans, including operationalising electronic and mobile money links to hospital systems, supervising hardware installation, manage hardware maintenance contracts and plan for sustainable financing 	<ul style="list-style-type: none"> 1.5 years x [number of regions/ 2] local regional LOE (Local hire) Travel 4 days x 1.5 years x [number of regions/ 2] 	<ul style="list-style-type: none"> 1 person for every 2 regions full time for three years phased over time Travel from region to hospitals - every month for years phased over time - 4 days for each regional officer 	<div style="border: 1px solid black; border-radius: 50%; padding: 5px; width: 40px; margin: auto;">1,130</div> <hr style="border-top: 1px dashed black;"/> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; width: 40px; margin: auto;">70</div>
	<ul style="list-style-type: none"> Provide hospitals with hardware, networking, connectivity and infrastructure maintenance contracts, through national level procurement and distribution and/or funding for hospital level procurement as appropriate 	<ul style="list-style-type: none"> 2 months local LOE 6 months local LOE 	<ul style="list-style-type: none"> Work involved in supervising procurement process and supervising infrastructure sub-contractor 	<div style="border: 1px solid black; border-radius: 50%; padding: 5px; width: 40px; margin: auto;">120</div> <hr style="border-top: 1px dashed black;"/> <div style="border: 1px solid black; border-radius: 50%; padding: 5px; width: 40px; margin: auto;">6,630</div>
	<ul style="list-style-type: none"> Equipment: ~9,000 computers, ~4,000 DotMatrix printers, ~1,300 LaserJet printers Associated network costs (e.g. server room and LAN) 	<ul style="list-style-type: none"> ~46 computers, 36 DM printers and 5 LJ printers at regional hospitals ~34 computers, 13 DM printers and 5 LJ printers at district hospitals Installation, Maintenance and support contracts needed 		
	<ul style="list-style-type: none"> Provide hospitals with software support and training 	<ul style="list-style-type: none"> Per Hospital: 25 days training 8 days for customisation 5 days software support p.a. 	<ul style="list-style-type: none"> 262 Hospital staff must be trained in basic computer skills and on new software 	<div style="border: 1px solid black; border-radius: 50%; padding: 5px; width: 40px; margin: auto;">3,680</div>
	<ul style="list-style-type: none"> Train facility management in hospital computerisation management 	<ul style="list-style-type: none"> N/A Training workshop 20 people x 2 days x [number of regions] 	<ul style="list-style-type: none"> No additional LOE for facilitation - covered under regional advisor's time Training for Hospital managers 	<div style="border: 1px solid black; border-radius: 50%; padding: 5px; width: 40px; margin: auto;">110</div>

Stage 1 (testing)–Computerise primary health care data (1/2)

USD thousands

 2,480

 **Test: 3 Years**
Roll-out: 3 Years

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Detailed review and evaluation of existing electronic tools at primary care level (from both technical and impact viewpoint) to produce detailed "way forward" report 	<ul style="list-style-type: none"> 3 months local LOE plus 1 month international LOE 	<ul style="list-style-type: none"> Local content experts supplemented by international expertise 	80
		<ul style="list-style-type: none"> Travel for 5 people to regions for 2 x 10 days 	<ul style="list-style-type: none"> Visit implementations of existing primary care electronic systems - delegation including Government plus the people facilitating the review 	20
	<ul style="list-style-type: none"> Develop requirements for an integrated cross-vertical system or suite of tools for primary care level (Government small health centres, dispensaries and their attached community health workers and ADDOs), including requirements for: clinical/point-of-care decision support, longitudinal patient/client tracking, production of aggregate (MTUHA) reports, and revenue and stock management suitable for primary care level 	<ul style="list-style-type: none"> 18 months local LOE plus 2 months international LOE 	<ul style="list-style-type: none"> one or two local LOE plus international technical support 	200
		<ul style="list-style-type: none"> 9 workshops x 30 people x 3 days 	<ul style="list-style-type: none"> Workshops to gather and review detailed requirements including from various vertical programs and supply chain people etc.. 	180
	<ul style="list-style-type: none"> Improve and integrate existing tools or develop new tools based on identified requirements using teams of international (for expertise) and local (for sustainability) software developers, and with core code being open source 	<ul style="list-style-type: none"> 6 years local LOE plus 6 months international LOE 	<ul style="list-style-type: none"> Substantive difficult project with lots of functionality, needing team of local developers with international support 	1,100
		<ul style="list-style-type: none"> 2 workshops x 30 people x 3 days 	<ul style="list-style-type: none"> 2 user acceptance workshops at different stages of development 	40
	<ul style="list-style-type: none"> Launch event 	<ul style="list-style-type: none"> 2 months local LOE 	<ul style="list-style-type: none"> Communications work 	30
		<ul style="list-style-type: none"> 1 day public launch event x 60 people 	<ul style="list-style-type: none"> Launch event 	

Testing)–Computerise primary e data (2/2)

USD thousands

 **2,480**

 **Test: 3 Years
Roll-out: 3 Years**

Level	Activities	Resource Requirements	Rationale	Cost
Regional and local	<ul style="list-style-type: none"> Provide hardware (tablets, smartphones), connectivity and hardware maintenance contracts for primary health facilities and workers in testing districts 	<ul style="list-style-type: none"> 2 months local LOE for specifications 3 months local LOE for managing 	<ul style="list-style-type: none"> Work involved in developing specs, supervising procurement process and supervising infrastructure for 	80
		<ul style="list-style-type: none"> ~230 tablets and data bundles, ~100 wireless keyboards and padlocks, ~170 smart phones and data bundles, ~270 solar charging units 	<ul style="list-style-type: none"> testing only 3 districts: 1 tablet per 2 qualified staff i.e. 2 tablets per dispensary & 5 tablets per health centre, 1 keyboard and padlock per PHC facility, 1 smart phone for each community health worker 1 solar charging unit of for each dispensary health centre, community worker 	270
	<ul style="list-style-type: none"> Test primary care system district-wide in 3 districts - national level implementation support staff 	<ul style="list-style-type: none"> 1 year local LOE 	<ul style="list-style-type: none"> One implementation support person who sits at national level - work starts after software developed and equipment procured 	90
		<ul style="list-style-type: none"> Travel for 1 person to regions 12 trips x 5 days 	<ul style="list-style-type: none"> One 5 day trip every month for a year 	10
	<ul style="list-style-type: none"> Test primary care system district-wide in 3 districts - district level implementation support staff who regularly visits clinics for on the job training and support 	<ul style="list-style-type: none"> 1 year x [3] districts local LOE 	<ul style="list-style-type: none"> 1 person full time for a year in each testing district 	90
		<ul style="list-style-type: none"> Travel 5 days x 12 months x [3] districts 	<ul style="list-style-type: none"> Travel from district to clinic - every month 5 days for each district support staff 	10
	<ul style="list-style-type: none"> Test primary care system district-wide in 3 districts - trainings for facilities 	<ul style="list-style-type: none"> 6 months local LOE 	<ul style="list-style-type: none"> Preparation for and co-facilitation of trainings together with support people 	90
		<ul style="list-style-type: none"> 4 workshops per district x 3 districts x 40 people x 5 days 	<ul style="list-style-type: none"> Off job trainings to complement on job mentorship. Different participants at each training to cover whole district 	220

Stage 2 (Roll out)—Computerise primary health care data (1/2)

USD thousands

 31,790

 Test: 3 Years
Roll-out: 3 Years

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Further develop “how-to-computerise primary health care” guide for districts including guidance on managing power, hardware and connectivity, and guidance on change management and implementation 	<ul style="list-style-type: none"> Computerisation guide: 2 weeks international LOE, Local LOE 2 months 	<ul style="list-style-type: none"> Local LOE supported by international expertise 	50
		<ul style="list-style-type: none"> Computerisation guide: 1 workshop x 5 days x 25 people 	<ul style="list-style-type: none"> Workshop to review guide 	30
	<ul style="list-style-type: none"> Support coordination of MOH and PORALG with other relevant Ministries (e.g. infrastructure) and private stakeholders (e.g. telcos) on connectivity expansion * Roll out of “how to computerise primary care” guide through national support to the district primary care computerisation advisors below 	<ul style="list-style-type: none"> 6 years local LOE 	<ul style="list-style-type: none"> 2 people for 3 years do these activities 	520
		<ul style="list-style-type: none"> Support computerisation: Travel to regions for 2 people for 4 days a month for three years 	<ul style="list-style-type: none"> support computerisation: travel for team to visit regions 	60
	<ul style="list-style-type: none"> Develop a plan for sustainability and ownership of the system 	<ul style="list-style-type: none"> 6 months local LOE 	<ul style="list-style-type: none"> Person to interview stakeholders and draft sustainability plan 	10
		<ul style="list-style-type: none"> 1 workshop x 40 people x 2 days 	<ul style="list-style-type: none"> Workshop to review and finalise plan 	20
Regional and local	<ul style="list-style-type: none"> Provide hardware (tablets, smartphones), connectivity and hardware maintenance contracts, through national level procurement and distribution and/or funding for district level procurement and distribution as appropriate 	<ul style="list-style-type: none"> 6 months local LOE 	<ul style="list-style-type: none"> Work involved in supervising procurement process and supervising infrastructure 	90
		<ul style="list-style-type: none"> ~17,000 tablets and data bundles, ~7,300 wireless key-boards, ~7,300 padlocks, ~12,400 smart phones and data bundles, ~20,000 solar charging units 	<ul style="list-style-type: none"> 1 tablet per 2 qualified staff i.e. 2 tablets per dispensary & 5 tablets per health centre, 1 keyboard and padlock per PHC facility, 1 smart phone for each community health worker 1 solar charging unit of for each dispensary health centre, community worker 	15,840

Stage 2 (Roll out)—Computerise primary health care data (2/2)

USD thousands

 31,790

 **Test: 3 Years**
Roll-out: 3 Years

Level	Activities	Resource Requirements	Rationale	Cost
Regional and local	<ul style="list-style-type: none"> Recruit and train district primary health care computerization advisors on how to computerise primary health care data 	<ul style="list-style-type: none"> 3000 days local technical LOE 	<ul style="list-style-type: none"> 20 zonal trainers for 15 days each (including preparation and report writing). Time to develop the training, train multiple groups, follow up on effectiveness of training/ address challenges. Same trainers as national level 	210
		<ul style="list-style-type: none"> 36 training workshops x 30 people x 2 days 	<ul style="list-style-type: none"> 4 trainings in each of 9 zones covering 120 people in each zone (30 people per training). Equivalent to 6 people per district. 	260
	<ul style="list-style-type: none"> Provide support and guidance to primary health care workers and other district personnel on how to use software tools and resulting data 	<ul style="list-style-type: none"> 1.5 years x 25 regions local regional level LOE (local hire) 	<ul style="list-style-type: none"> 1 person full time for three years (phased in over time) in each region 	2,260
		<ul style="list-style-type: none"> Travel 2 days/month x 12 months/year x 1.5 years x 178 districts 	<ul style="list-style-type: none"> Travel from district to clinic - every month for 3 years phased over time - 2 days for each district support staff 	1,130
	<ul style="list-style-type: none"> Training and mentorship of primary health care workers in use of computerised system, including both on-job trainings and off-job trainings 	<ul style="list-style-type: none"> 4 workshops per district x [number of districts] x 40 people x 5 days 	<ul style="list-style-type: none"> Off job trainings to complement on job mentorship. Different participants at each training to cover whole district. 	8,420

Implement notification systems for birth and death recording

USD thousands



1,740



2 Years

Level	Activities	Resource Requirements	Rationale	Cost
National	<ul style="list-style-type: none"> Further develop requirements for applications for birth and death notifications from community and health facility levels to legal birth registration system, "village registries" and client registry, building on existing work 	<ul style="list-style-type: none"> 6 months local 4 weeks international 	<ul style="list-style-type: none"> International LOE to demonstrate best practice 	130
		<ul style="list-style-type: none"> 2 3-day workshop x 40 people 	<ul style="list-style-type: none"> Workshop to gather inputs and review requirements 	50
	<ul style="list-style-type: none"> Develop or enhance apps for birth and death notification 	<ul style="list-style-type: none"> 12 months local 3 month international 	<ul style="list-style-type: none"> Local software development team (at least 2 people part-time) plus international technical TA 	290
		<ul style="list-style-type: none"> 1 3-day workshop x 25 people 	<ul style="list-style-type: none"> Workshop for user acceptance testing 	20
Regional and local	<ul style="list-style-type: none"> Training of trainers for districts in use of applications at ward and village level for birth and death notification 	<ul style="list-style-type: none"> 200 days local technical 	<ul style="list-style-type: none"> 20 zonal trainers for 10 days each (including preparation and report writing) 	140
		<ul style="list-style-type: none"> 18 training workshops x 30 people x 3 days 	<ul style="list-style-type: none"> 2 trainings in each of 9 zones covering 60 people in each zone 	170
	<ul style="list-style-type: none"> Train community leaders in use of applications for birth and death notification 	<ul style="list-style-type: none"> 18 weeks local 	<ul style="list-style-type: none"> Develop curriculum, formulate cascade training plan, facilitate national Training of trainers, mentor PORALG trainers in regional trainings 	60
		<ul style="list-style-type: none"> 220 x 1 day meetings x 35 people 	<ul style="list-style-type: none"> Trainings take place at district HQ (220 districts) 	280

Appendix 3: Donor Investment Mapping

Donor Investment Mapping

Purpose

To facilitate Government and donor discussions around alignment of future investments with existing initiatives to support data systems and use.

Methodology

- Work with the Ministry to identify the key donors to interview.
- Conduct a web-based literature review.
- Support the government outreach to donors to initiate the exercise, and follow-up with the donors to schedule interviews.
- Provide summary background information to donors, conduct the interviews and share back the meeting notes to donors for validation.
- Follow-up with donors for detail on activities not initially available.

Donor Mapping Output

The current work in data use (listed below) is specific to the 17 investment recommendations and not a compilation of all work being done in data. **The list includes only current (on-going) data initiatives and does not include activities not directly related to the purpose of the current investment recommendations.** For example, many donors provide support to the MTUHA by funding the costly printing of registers and tools. However, the IR is for updating the indicators and automation so the printing support is not listed.

The activities listed were identified by donor representatives as key supports for the Government to build on going forward. The volume of current activity varies greatly between the investment recommendations.

Existing work the Investment Recommendations should build on

Investment Recommendation (IR)	Existing work the IR should build on:	Donor
Computerise PHC Data	<ul style="list-style-type: none"> • Solar power supporting electronic data systems installed at comprehensive emergency maternal, obstetric and neo-natal care (CEMONC) health facilities. • Support for the CTC2 database and medical records requirement gathering • Decision-support software for smartphone-based decision support tools at the PHC and CHW levels. Electronic registry tool developed for EPI. 	UNICEF CDC USAID
Computerise hospital data	<ul style="list-style-type: none"> • Computers, related equipment and hospital management software (Afya Pro) and capacity building for use of data for decision making for regional and district level hospitals in four regions (Mbeya, Tanga, Mtwarra and Lindi). • Solar power supporting data use installed at HIV/AIDS Care and Treatment Centers with > 500 clients under the TUNAJALI project. Electronic payment. • Supported computerization of medical records system at 3 hospitals. • Support for lab information systems in 55 district hospitals, and lab sample tracking • Support to NACP for point of care diagnostics 	GIZ USAID WHO CDC UNICEF

Existing work the Investment Recommendations should build on *(continued)*

Investment Recommendation (IR)	Existing work the IR should build on:	Donor
Strengthen facility performance management and supervision systems	<ul style="list-style-type: none"> • Support MOH supervision and facility DQA and service availability visits. • Initiated a project in 2016 to ensure the regional and district hospitals in the 4 focal regions (Tanga, Mbeya, Mtwarra and Lindi) achieve a “3 star” rating. • Support to enhance DHIS to capture supervision data • Support for vertical program and function (i.e. supply chain) supervision and data use systems. 	BMGF GIZ CDC USAID
Implement Client feedback management system	<ul style="list-style-type: none"> • Supporting the MOH in piloting a client feedback system in Mbeya and Njombe that focuses on child health care and using SMS, USSD and cell phone voice mechanisms. • Providing capacity building support for regional and district managers to manage a client feedback system and use the data to implement change in 4 focal regions. Also supporting implementation of a community score card. • Support for the mHealth PPP platform which may be used by MOH for planned feedback system 	UNICEF CDC

Existing work the Investment Recommendations should build on *(continued)*

Investment Recommendation (IR)	Existing work the IR should build on:	Donor
Enhance supply chain data management system	<ul style="list-style-type: none"> • Sustained support for the development and updates to the eLMIS system supporting commodity availability for HFs nationwide under the DELIVER project. Current emphasis on addition of vaccines under VIMS module. • Support to develop vertical program capabilities to collect, report and use logistics data for annual forecasting and to improve commodity availability. • Building capacities of CHMTs in 4 focal regions to better identify and mitigate supply challenges. Development of plans and back up stores to ensure full supply. • Support for vaccine bar coding (VIMS) 	USAID WHO UNFPA UNICEF GIZ
Improve HMIS Indicators and Reporting	<ul style="list-style-type: none"> • Support to the MOH M&E unit and technical working group in rolling out the DHIS2 system nationwide and to improve on rates of reporting completeness and timeliness as well as a public portal to DHIS2. 	CDC GF UNICEF

Existing work the Investment Recommendations should build on *(continued)*

Investment Recommendation (IR)	Existing work the IR should build on:	Donor
<p>Institute data use practices and capacity</p>	<ul style="list-style-type: none"> • Support for building Ministry capacity for data use through a venture with UDSM. Support to embed 2 national advisors in data systems at NBS for one year. • Support to MOH in supporting data quality (DQAs), data use and data systems through the MEASURE Evaluation project. • Supporting collection, analysis and use of data by managers in diverse vertical programs. • Capacity building for MOH national managers in use of data for management and planning purposes. • Support for implementation of district health management course, including data, through zonal health resource centers. • Support provided to MOH for development of the M&E Strategy and the DDU and support for the M&E technical working group. Support to NACP for data triangulation in 15 districts. 	<p>MCC World Bank USAID</p> <p>WHO UNFPA UNICEF Global Fund GIZ</p> <p>CDC</p>

Existing work the Investment Recommendations should build on *(continued)*

Investment Recommendation (IR)	Existing work the IR should build on:	Donor
Enhance/scale notifiable disease surveillance system	<ul style="list-style-type: none"> • Provided support to the MOHCDGEC for development and implementation of the electronic IDSR (eIDSR) in 17 districts. • Support for CRVS strategy and for maternal/perinatal death reviews 	CDC UNICEF
Implement notification system for birth and death recording	<ul style="list-style-type: none"> • Provided technical support to RITA in formulation of new CRVS strategy to include vital event reporting from CHWs and community leaders, as well as health facilities. Pilot of mobile birth registration applications in Mbeya and Mwanza. • Support provided for capacity building in mortality analysis and in verbal autopsy, • Support in 4 focal regions for implementation of a death audit system – particularly for maternal mortality. 	UNICEF Global Fund GIZ

Existing work the Investment Recommendations should build on *(continued)*

Investment Recommendation (IR)	Existing work the IR should build on:	Donor
<p>Enhance Government coordination of data system and use initiatives</p>	<ul style="list-style-type: none"> • Support provided for the development and operation of the Health Monitoring and Evaluation technical working group (M&E TWG) which helps drive and coordinate activities in data systems and use. • Support for mHealth Community of Practice to promote mHealth 	<p>Global Fund CDC Multi-Donor</p>
<p>Put in place enterprise architecture, including governance, guidelines and standards for interoperability</p>	<ul style="list-style-type: none"> • Providing support funding the secondment of an EA expert to the MOH, in funding workshops for developing standards, and providing technical expertise for development of the interoperability layer under the MCSP project. • Supports MOH through roll out of Afya Pro – which supports linking data from multiple data bases such as finance, HR, service delivery) at hospitals in the 4 focal regions 	<p>USAID GIZ</p>

Existing work the Investment Recommendations should build on *(continued)*

Investment Recommendation (IR)	Existing work the IR should build on:	Donor
Implement a client registry	<ul style="list-style-type: none"> • Support provided to the EA TWG Care Delivery Task team to draft a “Way Forward for client registry documentation”. • Support to develop a client registry for national immunization data. 	CDC USAID
Implement a terminology service	<ul style="list-style-type: none"> • Providing support to the Tanzania Food and Drug Authority (TFDA) which codifies drug names. • Supports capacity building in ICD-10 (diagnosis) coding system for 165 regional and district hospitals 	UNFPA Global Fund
Implement Administrative area registry	<ul style="list-style-type: none"> • Providing support to NBS in capturing changes to administrative areas. • A legal process for changing administrative areas is in place. National Bureau of Statistics collects and processes shape files (area borders) at each census. 	UNFPA
Implement health data warehouse	<ul style="list-style-type: none"> • Providing support to the Government in implementing a Data Index system that will house both official and non-official health data. • Support for laboratory data repository 	MCC World Bank, CDC

Appendix 4: Mapping of Data Use Systems

Tanzania's existing ecosystem of health data systems is crowded and fragmented

The central system for data on health facilities is the **health facility registry**, but other relevant data on facilities (e.g., performance assessments) are stored in DHIS2, SafeCare and other databases.

Multiple systems host data on **human resources and training**. HCMIS manages data on government workers across sectors and HRHIS has data on public and private health sector workers. Regulatory councils each have separate databases.

These systems manage **aggregated health data**.

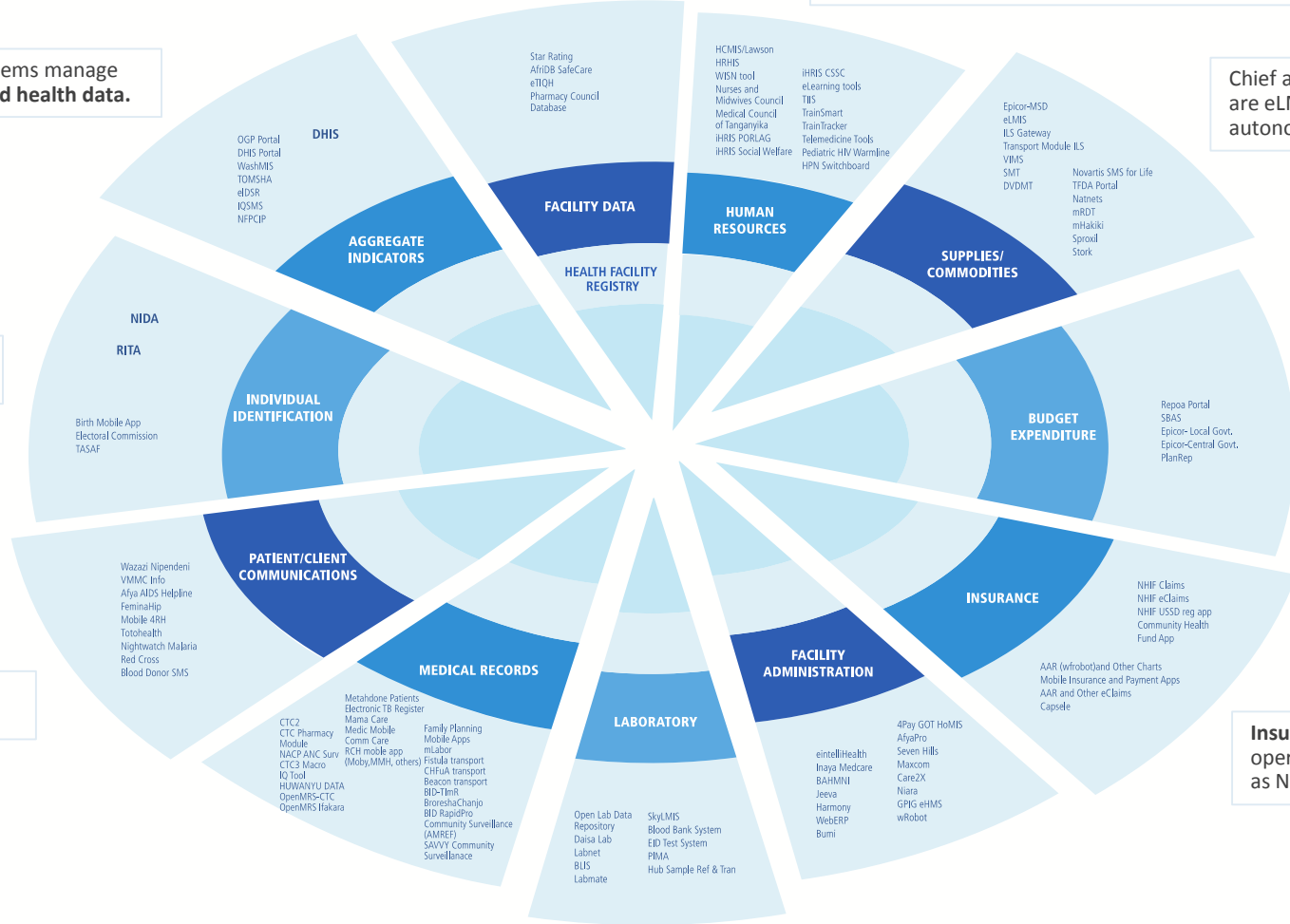
Chief among these **supply chain** data systems are eLMIS and MSD Epicor. There are also semi-autonomous modules of eLMIS, such as VIMS.

These are various databases and systems which **identify individuals**.

These systems manage **public budget and expenditure** data. Epicor and PlanRep are the primary ones.

These systems are designed to **educate and communicate with clients**.

Insurance claims systems are operated by various insurers, such as NHIF, NSSF, and private insurers.



There are a large number of different hospital or health **facility administration systems, laboratory systems, medical records systems and applications used at the point of care**. Many focus on a particular functionality, such as workflow administration, revenue administration, medical records of a particular vertical program, or clinical decision support.

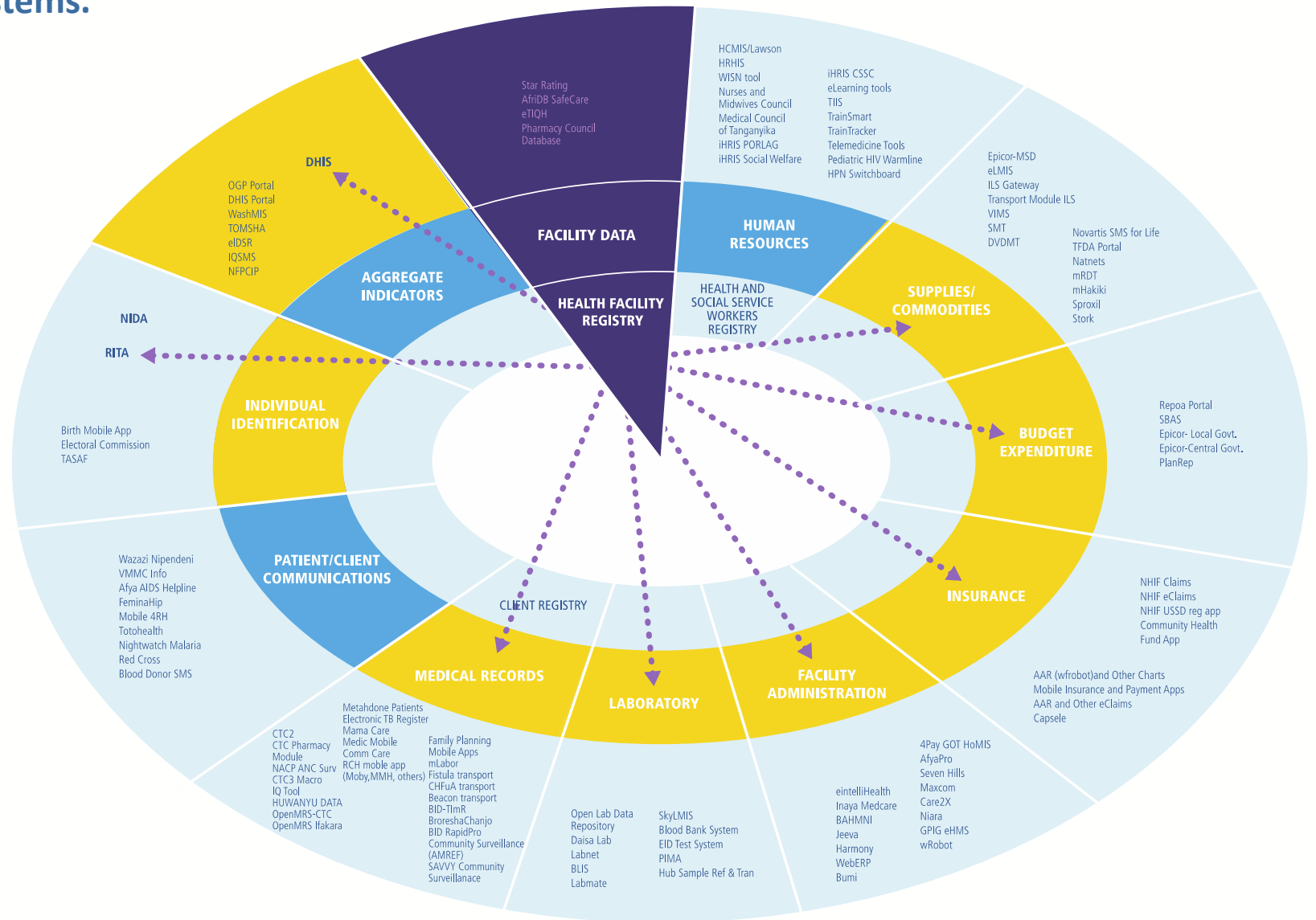
Recommendation: Enterprise architecture that links Health Facility Registry and other systems.

Tanzania's national **health facility registry is operational** and routinely-updated by the districts and the MOHCDGEC Department of Curative Services.

Connection of the health facility registry to **DHIS2** is in final stages. However, the health facility registry has not yet been connected to other systems.

Benefits of enterprise architecture includes linking health facility registry to other key systems:

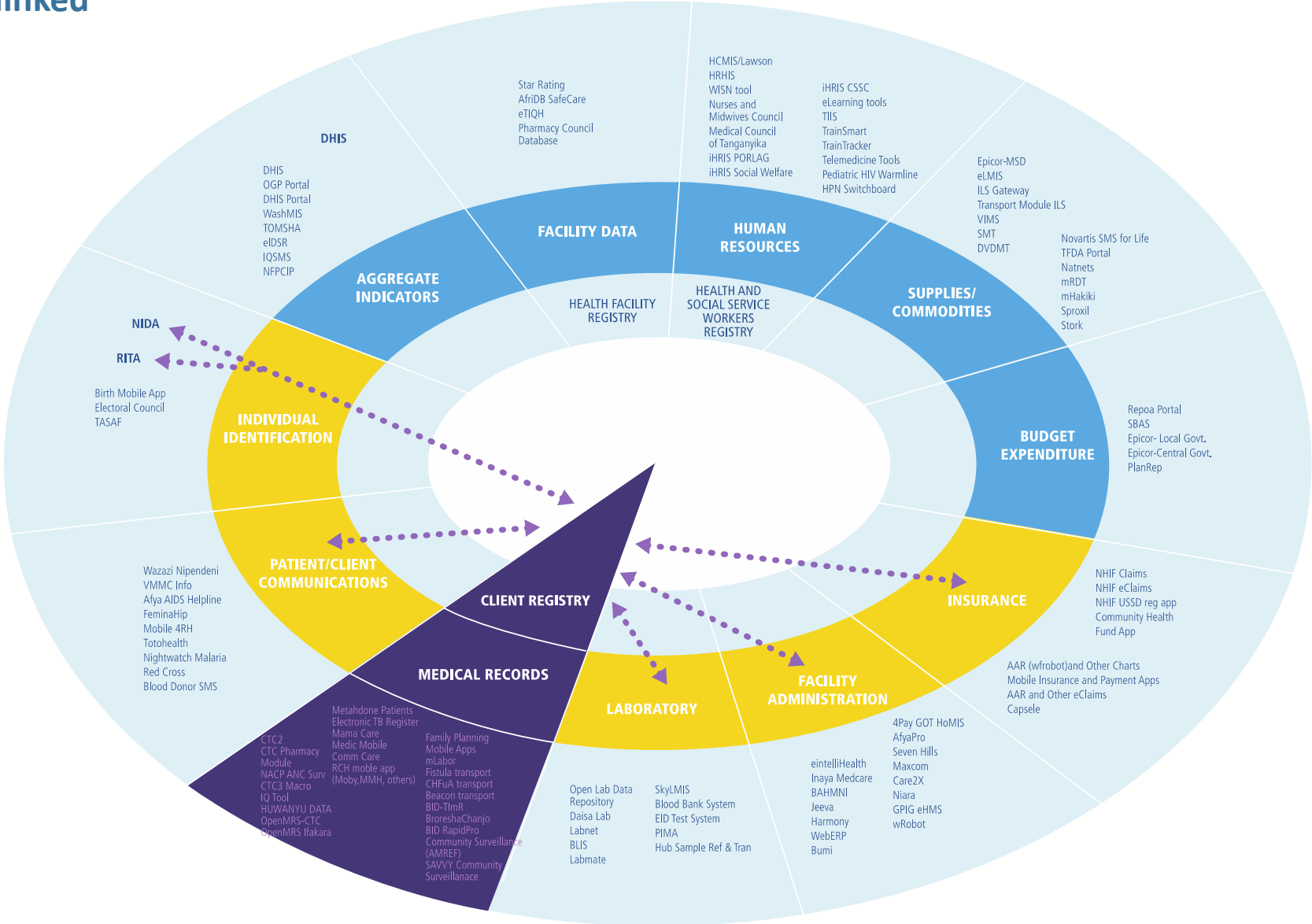
- Containing **facility assessment and supervision data**, such as SafeCare.
- **Supply chain systems**, as they refer to drug orders from and deliveries to facilities.
- Government **budgets and expenditure** for health facilities.
- **Insurance claims systems.**
- **Facility administration, laboratory, medical records and point-of-care applications** need to use health facility registry to identify the facility sending or receiving data.
- The RITA system needs to use the health facility registry to identify where facility-based births and deaths occur.



Recommendation: Client Registry, linked to other systems.

Benefits of client Registry:

- Medical records systems and point-of-care applications which record births and deaths will feed this data to RITA's birth and death registration systems and to the client registry. These notification mechanisms will be strengthened through the "birth and death notification" investment recommendation.
- The client registry will also link data as it refers to clients in **client education applications, point-of-care applications, medical records systems, laboratory and facility administration systems and insurance claims systems.** These systems will feed data to the client registry which would in turn provide de-duplication and matching services to these systems.



Additional recommendations

Through this enterprise architecture:

- Medical records, facility administration, point-of-care and laboratory systems can exchange medical data and “orders” (tests, prescriptions) with each other.
- Medical records, facility administration and point-of-care systems can connect with insurance systems.
- Facility administration and laboratory systems can place orders and send stock data to supply chain systems.

Links to other investment recommendations:

- **Terminology registry**, ensure systems can communicate consistently about medical terminology such as diagnosis and drugs.
- **Administrative area registry** ensure systems can communicate and display data in geographic related areas such as villages, wards, and districts.
- **Health data warehouse investment recommendation**, human resources, supply chain, budget and expenditure, insurance, laboratory (through the laboratory repository), and medical records systems can send data to a data warehouse, and the data warehouse can provide data for decision making to budgeting and planning systems (such as PlanRep budget tool and WISN HR planning tool).