



Data Use Partnership Journey



DATA USE PARTNERSHIP
THE JOURNEY TO BETTER DATA FOR
BETTER HEALTH IN TANZANIA

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1. Overview

The Data Use Partnership (DUP) is a government-led initiative that is improving the national health care system through better use of health information. Under DUP, the government is working with PATH to strengthen digital health and build local capacity so that everyone—from government officials to health workers to patients—can have better access to data and make more informed decisions, leading to a healthier Tanzania. The DUP initiative is laying the foundation for digital transformation by launching new digital health systems, establishing governance bodies, and introducing policy reform.



1.1 A disconnected digital health system

At all levels of Tanzania's health system, people often do not have the right data to make informed decisions. This leads to uninformed decisions about patient care, a reactive approach to disease outbreaks, stockouts of essential medicines and supplies, and the misallocation of limited health budgets.

1.2 Building for Tanzania's digital future

The DUP initiative is working at every level of the health system to unlock better health care for Tanzanians. In early 2016, the government of Tanzania, with support from the Bill & Melinda Gates Foundation and PATH, conducted a thorough landscape and gap analysis to identify the greatest opportunities to address key challenges impeding health system performance. Through this landscape and gap analysis, the government produced a Digital Health Investment Roadmap, which was updated in 2021 and consists of 17 strategic investment recommendations for using data to improve health services and outcomes. The DUP initiative is a direct response to this roadmap, working across four main areas to achieve digital transformation.

1.2.1 Strengthening digital governance and policy: An effective digital health system requires the collection, processing, and interpretation of vast amounts of complex data. Tanzania is designing and implementing new ways to manage and govern coordination, development, deployment, and institutionalization of digital health initiatives, systems, and large volumes of health data. Under the DUP initiative, the government is developing a series of policies, guidelines, and strategies to determine who can take what action, upon what data, in what situations, and using what methods.

1.2.2 Building health worker capacity for the future: The DUP initiative is also equipping Tanzania's health sector with skills for the country's changing digital landscape. This includes training existing and future generations of health workers to make better use of digital platforms and data, updating curricula, developing digital and data use toolkits, and employing eLearning platforms to reach the most remote individuals. Under DUP, the government of Tanzania developed the Capacity Building Consortium, composed of universities, health research and training institutes, and zonal health training centers to foster a culture of data use.

1.2.3 Digitalizing primary health care: The government of Tanzania, through DUP, is working to digitalize primary health care so that when a child visits a clinic, the health worker can electronically access their complete health history to learn what services are needed. After the visit, the health worker can easily determine when the child needs to return for a follow-up, and the digital system will issue an alert if the patient misses that appointment. Digitalizing primary health care involves a suite of user-friendly software designed to support a range of health sector processes, from provision of health services, to monitoring health facility performance and tracking commodities and health worker credentials.

1.2.4 Coordinating the digital health ecosystem and investments: DUP is working to ensure that Tanzania's more than 160+ digital health systems are connected and interoperable. Under DUP, the government has established a Centre for Digital Health to oversee new digital initiatives and created new systems to better coordinate the systems and health policies in place.

2. Case Studies

2.1 CASE STUDY: AFYA SUPPORTIVE SUPERVISION SYSTEM

Developing digital solutions with the experts—end users

Digital health tools can optimize and strengthen national health systems. But to be sustainable and effective, they must be designed and implemented in partnership with users. Learn how a new supervision system, developed using human-centered design principles, is contributing to a culture of care.



CHALLENGE

How can health workers monitor the performance of their facilities with a paper-based system?

SOLUTION

By using a participatory human-centered design process to deliver an appropriate digital solution.

LOCATION(S)

Tanzania

PARTNERS

Government of Tanzania

PATH EXPERTISE AREAS

- Problem Definition
- Innovation
- Design and Development
- Prototype Evaluation
- Product Validation
- Program Implementation

The challenge

To enable a strong health system, health workers must be able to monitor the performance of their facilities. Until recently in Tanzania, this process was fragmented and paper based. Health managers and frontline health workers had limited visibility into how their hospitals and clinics were performing against health system targets, with few opportunities to track progress and understand where improvements were needed.

In the past, health facilities were subject to frequent supportive supervision visits by different actors, for a range of purposes—including implementing partners, donors, representatives of the Ministry of Health, and officials from the President’s Office Regional Administration and Local Government. These visits were often uncoordinated and resulted in health facilities receiving numerous paper feedback reports and checklists that were hard to manage, track, and put into action. Supervisory visits sometimes didn’t happen, or the findings wouldn’t be shared back with health facilities, leading to broken feedback loops. As a result, supervisors and health workers were often unaware of the feedback delivered during past supervision visits and struggled to monitor progress and implement improvements.

The approach

Under the Data Use Partnership, the government of Tanzania partnered with PATH to digitalize this performance monitoring process. A cornerstone of the Data Use Partnership has been the development of a digital facility supportive supervision system used by health managers, district health officials, and frontline health workers to systematically link performance data and supervision recommendations. AfyaSS, as the system is called, uses a single dashboard to consolidate supervisory checklists, feedback forms, recommendations, and action plans across all health areas. In the past, different health areas used different checklists to monitor performance data, which made it difficult to track a health facility’s overall performance. Consolidating these into a single, shared checklist made it easier to evaluate and strengthen service delivery.

AfyaSS was designed using a human-centered design approach. Beginning in 2018, the government of Tanzania and PATH embarked on a participatory design process that included a desk review of existing guidelines and paper-based and digital tools, field visits, stakeholder workshops, and user advisory groups to identify common challenges and system requirements of the future AfyaSS.

The government employed user advisory groups composed of key health actors, software designers, and engineers to map the previous paper-based systems and redefine workflows in support of health system strengthening. It also used an iterative design process to elicit feedback, applying phases or sprints to validate system features with the user advisory groups.

Health actors, for example, revealed that supervisory visits would often only focus on malaria-specific indicators or maternal and child health, rather than looking holistically at a facility's performance. Based on that feedback, they reviewed multiple health area-specific checklists and helped consolidate them into a single, synthesized digital format.

Input from users also indicated that health managers often struggled to verify if a supervision visit occurred. Supervisors sometimes falsely reported visits, and paper-based systems did not allow for any means of accountability. In response to this persistent challenge, AfyaSS was designed to include geotagging features that log the start and end locations of a visit, prompting users to begin their evaluation when they are in the vicinity of their assigned health facility. These quality control measures help to validate supervision visits and promote accountability.

“The technology is what makes the supportive supervision system appealing and pushes us to make sure we’re frequently logging in to see the supervisions conducted, action items, and [to] follow up to see if the issues were resolved.”

– Dr. Charles Migunga, Regional Quality Improvement Focal Person for Arusha Region, Tanzania’s Ministry of Health



The solution

AfyaSS ensures that health workers at the facility level, managers at the regional level, and policymakers at the national level have reliable, real-time access to information on the performance of Tanzania's health system. AfyaSS includes checklists for different health areas, system notifications to remind health workers about facility targets, dashboard features to monitor progress toward health system goals, and action plans linked to data from previous visits. Offline components allow for use of the system in remote areas with limited connectivity. Together, these features enable health workers to act on the performance data made available to them.

The impact of using human-centered design

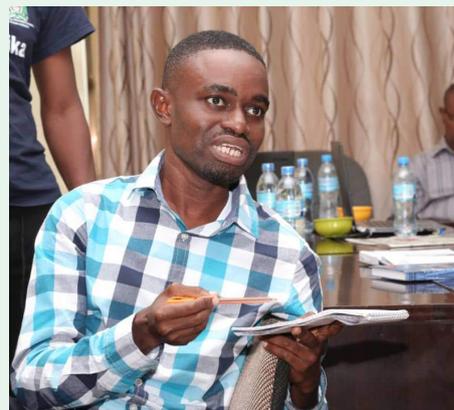
As a result of the human-centered design process, AfyaSS is helping to contribute to a culture of care that is focused on addressing user pain points and data-driven quality improvement. AfyaSS has been rolled out to all 26 regions in Tanzania and is actively in use in 24, with plans to continue training users and implementing change management strategies to increase system use.

Understanding the needs, desires, and behaviors of all key stakeholders and delivering an appropriate solution has been instrumental in improving its uptake and adoption.

2.2 CASE STUDY: TANZANIA'S HEALTH SECTOR ENTERPRISE ARCHITECTURE

Tanzania builds a blueprint for change

As countries embrace new digital and data tools, they must ensure they are being used to their full potential to improve health outcomes and advance health equity. But digital health tools are often introduced without any regard for the larger digital health landscape. A dynamic partnership between PATH and Tanzania's Ministry of Health, called the Data Use Partnership, led the government to pioneer an enterprise architecture approach that maps the country's current data use ecosystem and its potential future state.



CHALLENGE

A health system composed of fragmented and disconnected digital tools can limit its potential to produce more accurate, timely, and accessible health data. A lack of guidance on what digital tools and systems to invest in can also lead to duplicative technologies.

SOLUTION

Tanzania's Health Enterprise Architecture (TZHEA) serves as a conceptual blueprint that helps to describe the structure and operation of the country's digital health ecosystem, while planning for a more connected and interoperable health information system. Tanzania is among the first countries in the world to apply this approach to its health system.

LOCATION(S)

Tanzania

PARTNERS

Government of Tanzania

PATH EXPERTISE AREAS

- Problem Definition
- Design and Development
- Program Implementation

The challenge

Currently, Tanzania has more than 160 digital health or health-related systems, many of which cannot connect with each other because of different business procedures, data definitions, and IT architecture. This leads to inconsistencies in reporting, in which different levels of the health system report different numbers for the same data points. At the same time, health workers must often enter similar information into duplicative systems.

This leads to a time-consuming and burdensome data collection process for health workers and misaligned health dashboards for managers monitoring disease trends, coverage rates, and patient histories. Ministry of Health officials, implementers, and software developers require a clear snapshot of Tanzania's complete web of digital and data tools to map how they connect, where they don't, and where there may be gaps or a need for future digital systems.

The approach

Tanzania's Health Enterprise Architecture (TZHEA) is a systematic approach to charting these digital solutions. Like the architectural blueprint of a house, it provides a floor plan or overview of how the country's health sector currently operates, including what health information systems exist, how they interface, and where there may be gaps in services.

To develop the TZHEA, the DUP initiative assembled a task team and subject matter experts representing the health system's six main building blocks: service delivery, health commodities, health financing, human resources, health information systems, and leadership and governance.

The blueprint defined guiding principles, data standards, governance mechanisms, and related digital health solutions needed to facilitate health information exchange within Tanzania's digital health ecosystem. It will help to reduce duplication in Tanzania's digital landscape, which contains more than 160 digital health solutions.

The blueprint has four main domains:

- **Business architecture** involves mapping the health sector’s existing business processes—the workflows and services that different health actors are responsible for—to determine how they can be improved. It helps to answer key questions like: What services are provided? What are the health sector’s processes? How do they currently work, and how can they be improved?
- **Data architecture** maps how data flows throughout the health sector to improve the availability of health data and the quality of health services. Data architecture helps to answer questions like: How is health information shared between data users? How can digital systems facilitate better sharing of information?
- **Applications architecture** maps the different software applications in use across Tanzania’s health system and how they interact within the health sector. This component answers questions like: How could different applications exchange data better? Could some applications be streamlined to avoid duplication?
- **Technology architecture** maps how technology will facilitate interactions between health sector functions, services, processes, and applications. It answers questions like: What technology could best serve multiple applications and user scenarios?

New guidance and policies are only effective if there’s a mechanism to enforce them. In keeping with the National Digital Health Strategy (2019–2024), the blueprint established a TZHEA subcommittee to ensure the use and application of defined principles, standards, and guidelines within the health sector.

“The enterprise architecture will offer a big-picture view of the constraints, limitations, and strengths of Tanzania’s health information systems. With this blueprint for change, we’ll be able to unlock the true potential of digital health.”

– Eden Tarimo, Digital Health Lead,
Data Use Partnership, PATH



The solution

Tanzania’s Health Enterprise Architecture provides guidance on how health sector systems and tools should operate to support data-driven decision-making and improve quality of care. The blueprint identifies important interrelationships between Tanzania’s digital systems and aligns components of these systems to avoid fragmentation, duplication, and a lack of interoperability. The TZHEA can then be used to determine how to strengthen and optimize the country’s national digital health ecosystem, so that Tanzania’s many different ministries, departments, and donors are all working toward the same vision.

The impact of Tanzania’s Health Enterprise Architecture

The TZHEA will ensure the country’s digital health systems are all working together in concert. In the coming months, PATH and the government of Tanzania will use this blueprint to assess each digital solution to determine which are additive and which should be merged, phased out, or updated to contribute to the strongest possible digital health system.

The result will be a more sustainable and connected digital ecosystem, leading to data-informed health workers and more positive patient experiences. As one of the first countries in the world to apply the enterprise architecture approach to health information systems, Tanzania is paving the way for other governments interested in the innovation.

2.3 CASE STUDY: HUMAN RESOURCE FOR HEALTH INFORMATION SYSTEM

Tanzania commits to strengthening its health worker registry

Health workers are a country's most important asset in their health system. But workforce shortages and the inability for countries to access data on human resources create barriers to adequately staffing health facilities. Under the Data Use Partnership (DUP), the government of Tanzania partnered with PATH to update its Human Resource for Health Information System (HRHIS) to facilitate better tracking of health worker credentials—from training throughout their employment.

CHALLENGE

Tanzania's outdated system for health worker information exists in several unlinked databases, and users cannot uniquely identify health workers and their qualifications to accurately resource the workforce.

SOLUTION

The improved HRHIS provides a centralized digital system to access professionals and employment information for health workers across Tanzania, resulting in greater visibility for resource planning.

LOCATION(S)

Tanzania

PARTNERS

Government of Tanzania

The challenge

In 2009, the government of Tanzania established a Human Resource for Health Information System (HRHIS) to collect educational and employment data on health workers in the country's public and private facilities. Though the HRHIS was well designed and has a strong foundation, it was outdated. It was used infrequently and required duplicative data entry. Health managers had to use a web of disconnected systems to consult data on training, professional development, and other employment details. Without unique identification for individual health workers, tracking them across their careers was difficult. Faced with health worker shortages and surging demand, governments must have a clear picture of their current workforce to respond to gaps in services and evolving health trends.

The approach

Using a "health worker registry" approach, the Data Use Partnership (DUP) updated the system to track health worker credentials, training, professional registration status, and employer and employment location. The improved HRHIS is based on a data exchange model using an application programming interface (API) to ensure that other digital systems can uniformly and securely report and access health data. Before, this data was fragmented in different systems. The system now links and pulls data from other systems, including the regulatory professional councils, government, training, and university databases, centralizing the data in a singular database.

To achieve this vision, we used the Collaborative Requirements Development Methodology to gather requirements through a series of workshops conducted with the stakeholders and users at various levels of the health system in Tanzania. This methodology is one approach to defining functional architecture and requirements based on collaboration with the stakeholders/users of the system to develop a shared understanding of and agreement on what the system must do. The process ensures the result accurately reflects the reality and needs of the users and buy-in and agreement from stakeholders.

Additionally, we applied the agile software development methodology throughout the development of the improved HRHIS. This approach relies on several iterations. Each iteration involves design, development, integration, testing, and deployment of one or more of the improved HRHIS features in a staging environment. Using this approach enabled timely feedback from users through regular review sessions.

“A strong health workforce is the backbone of every health system. We need accurate and timely health workforce data for planning, training, regulatory licensing, employment, and deployment of our health professionals. Data challenges lead to difficulties planning for a well-trained and well-allocated workforce.”

– Martin Mapunda, Assistant Director of the Department of Human Resources and Planning, Tanzania’s Ministry of Health



The new system was also tested with the user advisory group to ensure that the functionality will meet the needs of the range of stakeholders using it.

The solution

The improved HRHIS ensures that other digital systems can uniformly and securely report and access health data. The updated HRHIS facilitates continuous tracking of health workers, providing an uninterrupted record of their work histories and certifications.

For example, the data received from the university informs the government about how many students are enrolled and have graduated, which helps inform future staffing plans. This will provide accurate, up-to-date information for human resources for health planning, while providing verification services across organizations. It will also serve as a communications platform for health workers for updates on the latest health guidance and peer learning opportunities. Health workers will soon benefit from trainings through new eLearning platforms that will ensure they are equipped with the latest data quality and use skills.

The impact

Together, these and other digital initiatives under DUP are bringing about unparalleled change. The system will benefit a range of national and subnational stakeholders, including members of the Ministry of Health, public and private health facilities, training institutions, and universities, among others. With more visibility into the health workforce and increased use of human resource for health data to support decision-making, facilities can be adequately resourced and program managers at the national level can effectively plan recruitment and distribution of the workforce and track the credentials and professional development of in-service health workers. For health workers, they can self-report changes to their employment and information and leverage the platform to receive broader health worker communications. Collectively, the improved system will result in better working conditions for health workers and better service for patients.

2.4 CASE STUDY: NATIONAL DIGITAL HEALTH STRATEGY

Aligning digital health initiatives

Digital health tools and data use are accelerating progress toward more efficient health systems and better health outcomes. But to be successful, countries need to align their digital health initiatives. Under the Data Use Partnership, PATH partnered with the government of Tanzania to create its National Digital Health Strategy.

CHALLENGE How can countries achieve digital health transformation to avoid fragmentation, funding continuity risks, and workforce capacity restraints and promote effective collaboration?	SOLUTION Harnessing digital technologies for health requires a strategic and integrated approach at a national level in order to provide a solid foundation for investment and innovation. Tanzania's National Digital Health Strategy (2019–2024) will guide the implementation of digital health initiatives, enabling a health system that is patient centric, data driven, and healthier as a result.	LOCATION(S) Tanzania
		PARTNERS Government of Tanzania

The challenge

Digital health and data innovations have tremendous potential to accelerate the quality of life and livelihoods of Tanzanians by ensuring access to high-quality primary health care for all. However, there are more than 160 digital health or health-related systems in Tanzania today, ranging in scope, efficacy, and reach. While some systems have been scaled nationally, others are still in the piloting phase. As technology outpaces health systems at lightning speed, a national health strategy offers necessary guidance and a clear path forward.

The approach

Tanzania's National Digital Health Strategy will help to transform the country's health system in a holistic and systematic manner. This strategy, developed as a result of strong government leadership, helps to secure financing, establish effective governance mechanisms, and facilitate alignment between Tanzania's digital health initiatives. The strategy also helps to build consensus on policy, facilitate better use of shared resources, and ensure investment in digital skills and infrastructure, ultimately leading to a more efficient health system and better health outcomes.

The National Digital Health Strategy emerges from the broader national health and development goals—the Tanzania Development Vision 2025 and Health Policy (2019).

Tanzania's National Digital Health Strategy (2019–2024) has been developed based on findings from an assessment of the previous strategy (2013–2018). It was also informed by a review of national and international health sector documents, as well as several consultative workshops and key informant interviews, involving training institutions and multidisciplinary stakeholders at national, zonal, regional, and district levels.

The solution

The overarching goal of the Digital Health Strategy 2019–2024 is to accelerate increased access to and improved quality of effective and efficient health care to all Tanzanians through digitally enabled transformation of the health system.

The strategy identifies five strategic goals and ten strategic priorities, including the need to strengthen digital governance and leadership; improve supply chain management of health commodities; strengthen disease surveillance, reporting, and response; and use telehealth to build health worker capacity in a changing digital landscape. The implementation of the strategy is guided by patient-centric design, data-driven initiatives, interoperability, open standards, and stakeholder engagement.

The strategy also clearly lays out an implementation plan and develops several governing structures that will oversee activities. These range from a National Digital Health Steering Committee composed of about 20 voting members and 16 co-opted members, to health facility digital health committees that will coordinate activities at the facility level, provide mentorship, and create awareness about digital health. The strategy will also be reinforced by a strong monitoring and evaluation (M&E) plan to build an evidence base for the impact and benefits of digital technologies.



The impact

The strategy will benefit health sector professionals and other stakeholders throughout the system by improving access to and use of health information and the availability of health services. It will improve the patient experience, helping to reimagine care by placing people at the center of their health systems.

- The government will be able to track and coordinate digital health initiatives across the health sector and will be able to monitor the performance of health systems and the quality of service delivery.
- The health sector will securely and safely use digital health technologies, provide equitable access to specialized health care services, link data systems to ensure interoperability, and uniquely identify patients across health services, ensuring a continuity of care.
- Health workers at all levels will efficiently deliver quality health care for a better patient experience and have access to continuous professional development programs at their convenience.
- Patients will be able to access health information, education, and communication materials to promote healthier behavior.

2.5 CASE STUDY: CAPACITY BUILDING CONSORTIUM

Building the health workforce of tomorrow—equipping health managers to become data users

Preparing a pipeline of health workers for Tanzania’s digital future will require strong capacity building and a skilled workforce. PATH and the government of Tanzania are planning for this future digital state with a new consortium composed of universities, training institutions, and academic leaders working to prepare nurses, frontline health workers, and health managers to act on health data to deliver better patient care.

CHALLENGE As Tanzania introduces new digital and data tools to deliver more timely, accurate, and targeted health data, the training and change management requirements of digital transformation are often overlooked.	SOLUTION Tanzania’s Capacity Building Consortium is developing new trainings, coursework, and digital tools to enable its health workforce to make optimal use of new digital tools.	LOCATION(S) Tanzania	PATH EXPERTISE AREAS <ul style="list-style-type: none">■ Design and Development■ Stakeholder Engagement■ Capacity Building
		PARTNERS Government of Tanzania	

The challenge

Digital and data tools present great potential to improve patient outcomes, but they are only effective if health workers know how to make the most of information. For health workers who have spent their entire careers using pen and paper to record patient data, new digital health systems require retraining and digital literacy skills.

Digital health systems are often introduced without regard for the capacity building and change management required to integrate them into existing processes and promote consistent use. What’s more, a strong health system must promote a culture of data use at every tier—from the highest rungs of the Minister of Health to the frontline health workers recording patient data. A persistent challenge for many digital solutions is that they begin and end with data collection. Beyond understanding the mechanics of a digital system, health actors have to understand how best to translate health data into better patient care.



The approach

Under the Data Use Partnership (DUP), the government of Tanzania and PATH developed the Capacity Building Consortium (CBC), representing the Tanzania Training Centre for International Health, Ifakara Health Institute, Mzumbe University, and Muhimbili University of Health and Allied Sciences, among other academic bodies. Together, the CBC aims to equip the country’s health workforce for its changing digital landscape.

The CBC is growing health worker capacity through a multipronged approach. First, new trainings and innovative platforms are reaching health workers in even the most remote corners of Tanzania. Under the DUP initiative, an improved eLearning platform has been strengthened, synchronized, and scaled nationally to reach both current and incoming health workers. The platform replaces what used to be a patchwork of eLearning modules for different health areas that made for an incongruous learning experience. The updated platform standardizes learning and makes it easier track health worker credentials and school records.

To determine where there may be gaps or areas for improvement in coursework, the DUP initiative also evaluated the current curricula for its data use content. Finding that most curricula focused on data collection and not use, PATH and the government of Tanzania developed a data use toolkit to supplement trainings. The toolkit will be used by implementing partners, funders, and other digital health practitioners to teach data analytics skills.

“In the health sector, a lot of data are collected, but aren’t necessarily put into efficient use when making crucial decisions. The consortium was formed to build the capacity of health workers through both in-service and pre-service training.”

– Professor Flora Lucas Kessy, Secretariat Chairperson of the Capacity Building Consortium



The solution

The Capacity Building Consortium is a dynamic partnership reshaping how Tanzania’s health workforce is trained and prepared to meet the health challenges of tomorrow. As the past few years under COVID-19 have reinforced, health trends can quickly change and demand for global skillsets can shift.

The new eLearning platform will enable faster curriculum updates to keep pace with an evolving evidence base. It will also create a more inclusive learning experience—reaching students in the most remote corners of the country, who’d previously had to travel for trainings, while allowing for more personalized, self-paced content.

A data use toolkit will underpin health worker curricula with critical lesson planning on how health workers can apply newly accessible data to avoid medical stockouts, deliver more targeted care, and make more informed decisions about their community’s health needs. With more than 136 Tanzanian institutions offering certificates and diplomas in health and related fields, it’s critical that students graduate with a shared understanding, appreciation for, and skillset for data use. The CBC’s standardized curricula for data analytics training will help the health workforce operate from a place of common experience.

Maybe most importantly, the CBC represents a country-led initiative that delivers trainings, innovative new learning models, and educational tools by peers and experts within Tanzania’s health system, leading to more sustainable, long-term capacity building efforts.

The impact of using human-centered design

Collectively, this work will create a culture and work environment in which health workers prioritize data—whether it is the Minister of Health allocating budgets or frontline health workers consulting electronic health records to determine if a patient has missed a recent vaccine. The CBC hopes to continue fostering learning exchanges and stronger academic programming to build a health workforce equipped for the new digital tools at their fingertips. By preparing a pipeline of future talent, the health workforce will be able to make optimal use of digital tools, ultimately leading to better patient care.

3. Digital Champion Profiles

3.1 FUNDER PERSPECTIVE: BILL & MELINDA GATES FOUNDATION

Marty Gross, Senior Program Officer

While the hypothesis that better data use will lead to better health seems simple, Marty Gross knows just how complex it is—because most investments in better data use start with technology, and the real impact comes from building and understanding the needs of the data users.

Marty explained, “All too often, we see that people are layering on complication to a health care worker or district manager job, rather than helping them do their job simpler, better. We have learned that if we want to see this impact, we need to ground all tech in their needs. That has to be our ethos.”

As a senior leader at the Bill & Melinda Gates Foundation, his work through the Data Use Partnership (DUP) with PATH and the government of Tanzania focuses on providing resources in a way that reflect and respond to national priorities under the guidance of the government leadership to achieve digital and data transformation. The DUP approach sought input from the government on how they would design the investment to support their own capacity and systems, putting them in the driver’s seat in a more consultative process.

Although the Gates Foundation has partnered with several countries to learn lessons on how to achieve digital transformation of health outcomes, Tanzania was well positioned to make a significant impact by aligning its digital health initiatives to strengthen health programs. Over the years, Tanzania has benefited from several donor investments. However, this often comes with a lot of fragmentation, creating incompatible and parallel systems that impede harmonization.

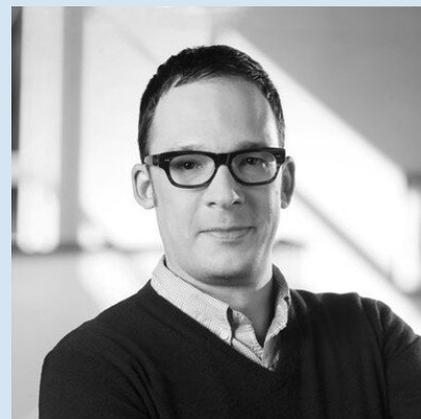
“If done well,” Marty said, “the investment could bolster capacity for data use for other investments in HIV, maternal health, family planning, and neglected tropical diseases.”

Fortunately, Tanzania has seen several digital health successes since the inception of DUP. What Marty, the DUP team, and the government always point to is the work in articulating a national digital health strategy and investment roadmap—a first-of-its-kind achievement in the digital health field, in part because of its broad, system-wide approach.

“While other countries have created one, they aren’t put into action or reducing fragmentation,” Marty explained. “Tanzania took the next step to make the roadmap actionable and investable.”

Marty has had the opportunity to travel to Dar es Salaam, Tanzania, several times to meet with the DUP team and the Tanzania government. But one visit stands out in particular—when Bill Gates visited along with him.

“Visiting Tanzania to see the work happening on the ground is always illuminating. The team was launching their Digital Health Investment Roadmap, and Bill was the keynote speaker and cut the ribbon to signal the fruitful collaboration. It was a fantastic speech, and the crowd was excited and proud of the Tanzania leadership to reorient their data systems and become a regional leader,” said Marty.



While DUP has developed and improved several systems within the Tanzania digital health ecosystem, the innovation at the core of the project stands out most to Marty. To him, a true innovation is in the sociopolitical architecture that is put into place. This work to enable the government mechanism to effectively coordinate across agencies and data systems is exciting. To support this work, the Centre for Digital Health was established within the government but functions separately to manage and coordinate the flow of investments. This will ensure that initiatives comply and adhere to national structures and policies. DUP and the government of Tanzania are working closely to create bylaws and mandates.

“My hope,” Marty said, “is that this work becomes an integral component of how the Tanzania government works—that these efforts really stand up the structure and all other investments, so donors see these structures as the most effective way to support these countries.”

Throughout his journey over the last five years on DUP, Marty has learned that his role requires flexibility and adaptation with resources based on what is learned and shifting dynamics in Tanzania. As a digital health champion, he helps elevate these lessons from Tanzania to other countries. He believes the DUP model can be replicated in other countries if leaders and implementers are adequately prepared and if stakeholder engagement is robust. If communities and countries have the right data, in the right hands, to make informed health decisions, it will lead to better outcomes and healthier populations around the world.

3.2 IMPLEMENTING PARTNER PERSPECTIVE: TANZANIA TRAINING CENTER FOR INTERNATIONAL HEALTH

Zabron Abel, Business Development and Digital Health Manager

As health systems around the world reeled from COVID-19—struggling under the strain of new patients and the challenges of mass vaccination campaigns—Tanzania’s Capacity Building Consortium (CBC) saw an opportunity. Social distancing requirements presented the chance to launch and build momentum for eLearning platforms.

A strong health workforce requires regular trainings to ensure workers keep on top of the current evidence base and grow to meet the evolving health landscape. New digital and data tools have been a critical part of this retooling. For Zabron Abel, Project Manager of the CBC and Business Development and Digital Health Manager for the Tanzanian Training Centre for International Health (TTCIH), eLearning platforms are an invaluable tool made more urgent by the COVID-19 pandemic.

“The pandemic was a trigger that helped to build excitement and momentum for eLearning among health care workers,” said Zabron. “For students stuck at home for more than three months, they could still learn from the safety and comfort of their own homes. That is hugely important for ensuring we can continue to grow our health workforce and respond to the changing demands of the health system.”

In 2021 the CBC celebrated the launch of a national eLearning platform that synchronizes and integrates with other existing in-service modules. It accompanies data use modules to equip health workers as critical thinkers, capable of using health data to make informed decisions about patient care. Though there have been a number of eLearning initiatives that supported both in-service and pre-service students for different health siloes, they were scaled to different degrees and often were not interoperable with one another. This made it difficult for students to navigate their lesson plans and even harder for universities and training institutions to track accreditations and school records.

For Zabron, the newly synchronized eLearning platform is a game-changer, capable of ensuring more health workers can access education and learn at a pace that matches their skills and needs. The improved platform is currently available nationally.

“This milestone signals Tanzania’s true digital health leadership,” Zabron said. “Adopting digital health tools to train future generations of health workers will ensure we’re using the most cutting-edge technology and are building thoughtful, analytical data users.”



It’s also personal for Zabron, who has been involved in the CBC from the earliest days, when PATH and the government of Tanzania first conceived of the idea for a consortium dedicated to preparing the country’s future health workforce for the new demands and potential of digital health.

Today, the CBC is a dynamic partnership between the government, TTCIH, Ifakara Health Institute, Mzumbe University, University of Dodoma, and Muhimbili University of Health and Allied Sciences, among other institutions. It aims to train the health workforce for the health challenges of today and tomorrow.

For Zabron, active data users are an essential component of a well-trained health workforce. Digital health tools may make health data more pervasive and accessible, but health workers must also be empowered and incentivized to analyze and interpret data so they know which patients to prioritize, where additional outreach may be needed, and where they are falling behind in certain targets.

“Now health workers are [graduating] from universities and training institutions as capable data users,” said Zabron.

He hopes the CBC will continue to convene well into the future. Zabron said the consortium is helping to harmonize educational requirements and standardize curricula so that all future health workers are starting from the same data-enabled baseline.

“A well-equipped health workforce comprised of data users can lead to more resilient health systems,” said Zabron.

3.3 REGIONAL HEALTH MANAGER PERSPECTIVE: MINISTRY OF HEALTH AND PRESIDENT'S OFFICE REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

Johanes N. Rwenyagira, Regional Quality Improvement Focal Personnel, Morogoro Region

Johanes N. Rwenyagira remembers what it used to be like to conduct supervisory visits in his region of Morogoro. As the country's second largest region, located in Eastern Tanzania, supervisory visits were a necessary part of assessing the performance and current health trends of the area. But the fragmented, paper-based process was riddled with challenges.

As the Regional Quality Improvement Officer for Morogoro, Johanes is responsible for conducting supportive supervision and mentorship to nine councils. Every Monday, he sits down with 23 other members of the Regional Health Management Team to map out their schedule for the week. Together, they determine the status and quality of health services, the current burden of disease, and related determinants before determining how best to mitigate the situation. They also decide what facilities they will visit, who will conduct the assessments, and what the previous week's evaluations revealed about the performance of health facilities in the region.

Despite this planning, conducting these visits used to be a complicated, uncoordinated, and time-consuming process.

"We were forced to print a lot of papers—different checklists—and we faced a lot of challenges, like [stocking the right] stationary and transporting them manually," remembers Johanes. "Service delivery was challenging, and it was not cost-effective."

Supervisory visits are a critical part of strengthening health system performance. They provide insights into how health facilities are performing against regional targets, where more resourcing or training may be needed, and how health trends may be shifting and new needs emerging. They can also improve the motivation of health workers and the quality of care. But the process often differs by actor and health area, creating a dizzying number of paper feedback forms that can be difficult to reconcile between visits and health areas. For example, the checklist for reviewing a health facility's maternal and newborn health programming may differ from the checklist for immunization.

It was common for supervisors to miss visits or for Johanes to struggle to make sense of an evaluator's



notes. Without that continuity of feedback, health workers didn't stand a chance—they couldn't improve upon what they didn't know.

When PATH and the government of Tanzania introduced a new digital health system to streamline and standardize the supportive supervision process under the Data Use Partnership (DUP), Johanes became one of its earliest adopters.

The AfyaSS digitalizes the process, using a single dashboard to consolidate supervisory checklists, feedback forms, and action plans.

"AfyaSS has reduced a lot of work on my part," explained Johanes. "With AfyaSS, tools like smartphones and tablets help to view previous visits and plan accordingly. This brings about continuous support to areas that need attention."

The results are night and day. Johanes doesn't need to print and carry stacks of feedback forms because they are integrated into the system. Supervisors are no longer randomly assigned to far-off councils because AfyaSS assigns upcoming visits to the right coordinator. Health care workers know to expect upcoming visits because of the systems scheduling features. And Johanes and his team can make meaningful use of the data collected during supervisory visits.

"This function was impossible prior to AfyaSS. One checklist for a hospital had 564 papers to print. It was too time-consuming to sit down and analyze this data," he

said. “With AfyaSS, we are able to develop action plans quickly and easily while on site, because the system is scoring [the health facility] as you are carrying out the supervision.”

Maybe most importantly, the new AfyaSS system is contributing to a data-driven culture of care. Johanes and his team are able to analyze health facility data to deliver constructive feedback to health care workers that issues clear recommendations and outlines an action plan for improvement.

It’s also contributing to more ambitious data analyses and quality improvement efforts. Johanes recently used data

from the system to develop a presentation about infection prevention and control and other supportive supervision findings for a quarterly maternal and perinatal death surveillance and review meeting in Morogoro. Because of the ease of navigating AfyaSS, health care workers had access to the same datasets, so he could share which areas had struggled with high maternal and perinatal mortality and better pinpoint trends. Johanes has also helped to introduce an award system for high-performing councils in the region. He hopes that this will further contribute to a culture of performance-based care.

In the meantime, Johanes is encouraging health actors across Tanzania to adopt AfyaSS for themselves.

4. Tanzania's digital future

4.1 The impact of the DUP initiative

The Data Use Partnership (DUP) initiative demonstrates Tanzania's commitment to building for scale, sustainability, and health impact by developing a holistic digital health ecosystem that considers the country's health system, all of its parts, and how they work together. DUP is an example of an innovative new model of partnership that places the government—instead of donors and implementing partners—squarely in the driver's seat.

The DUP initiative is enabling accurate and accessible data to improve health outcomes. Better data:

- **Supports high-quality service delivery:** With access to real-time data, health workers and decision-makers have a truer picture of health trends, needs, and priorities. That means patients will get the care they need, health providers can determine where there are gaps in care, and policymakers can make smart decisions about health spending.
 - **Enhances health care support systems:** DUP is also digitalizing health facility supervision tools and processes to allow for a coordinated and systematic approach to data-driven performance management. Digitalizing facility supervision will enable health workers and managers to take evidence-based actions to improve quality of care.
 - **Enables better data management and use:** With access to better-quality data and decision-support tools, health workers are more empowered to act on the information available to them. Instead of relying on aggregate monthly reports, health workers can determine in real time if certain districts have lower health coverage than others, and they can arrange for more targeted outreach to low-coverage areas.

An end-to-end digital health system means the government will be able to accurately allocate resources according to Tanzania's true birth cohort, decision-makers will be able to anticipate disease outbreaks before they occur, and frontline health workers will be able to provide a continuum of care.

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DATA USE PARTNERSHIP

THE JOURNEY TO BETTER DATA FOR
BETTER HEALTH IN TANZANIA