Zambia

Digital Health Case Study April 2025

Community health worker Barbra Mundulu with beneficiary Mailess Nyangu in Chongwe, Zambia.

The Global Fund/Jason Mulikita

Digital Health in Zambia

The Global Fund has invested in Zambia since 2002 and, since 2014, over US$23.7 million has gone toward digital health investments in Zambia's HIV, TB and health and community systems.[1] In 2023, Global Fund investments supported 1.27 million people on HIV antiretrovirals (ART), the treatment of 50,000 for tuberculosis (TB) and the distribution of 11.2 million mosquito nets to prevent malaria. Providing this data is largely made possible thanks to digital health investments.

While the digital health investments are a small part of Global Fund financing to Zambia, so many of the systems helping deliver these results are enabled through digital health investments – from providing health facilities with electrical power to disease surveillance databases to community health workers linking patients to care through mobile devices. Digital health investments can offer special impact for the patients who rely on facilities at the "last mile" and are often disadvantaged by the lack of power, internet and health system linkages.

An important contextual factor is Zambia's heavy dependence on hydropower, which accounts for approximately 83% of the country's total installed generation capacity. Power solutions, such as solarization, are therefore especially critical given Zambia's vulnerability to climate change and droughts caused by El Niño. These types of climate events prevent the use of hydroelectricity and have significantly impacted the power, internet connectivity and telecommunications availability at health facilities.

For the Global Fund's 2023-2025 grant cycle, Zambia is a priority country in the Digital Health Impact Accelerator, a Catalytic Fund that runs parallel to the country's dedicated HIV/TB and malaria grants.[2] Global Fund digital investments in Zambia across funding mechanisms for the 2023 to 2025 grant cycle include:

- Support solar power and internet connectivity for 650 priority health facilities.
- Data warehouse and hosting of digital data systems.
- Procurement of laptops and tablets for the roll-out of health management information systems.
- Upgrade and maintenance of the District Health Information System 2 (DHIS2)-based health management information system, as well as the custom-built electronic community health and logistics management information systems.
- Data quality assurance, other monitoring and evaluation activities and expansion of the electronic integrated disease surveillance and response system.
- Review of the health sector National Strategic Plan elements covering digital health.

[1] This tally includes:
- US$2.9 million of US$320.7 million total during the 2014-2016 grant cycle;
- US$9.1 million of US$496.73 million total during the 2017-2019 grant cycle; and
- US$11.7 million of US$362.1 million total during the 2020-2022 grant cycle.

[2] The Digital Health Impact Accelerator is supported by the Global Fund through donations from Anglo American, the Patrick J. McGovern Foundation, Medtronic LABS, Dimagi, Medic, Orange and Zenysis.

Governance

Digital health in Zambia operates within a robust legal framework governed by a series of legislative acts and guided by policies and standards that outline regulations for electronic government services, cyber security, data protection. Additional health-specific policies and plans complement the above through additions on patient confidentiality, health record access and system interoperability.

The government of Zambia has created a cross-ministry team called the Smart Zambia Institute to ensure all digitalization solutions are efficient, effective and designed to interoperate. The governance of digital health specifically is strategically anchored within the Ministry of Health through the Directorate of Information and Communications Technology, Policy and Planning. A multisectoral Digital Health Technical Working Group provides technical oversight, guidance, and coordination of digital health activities, and ensures alignment of partners' initiatives and investments to national health priorities.

Governance is a key aspect of the Global Fund's Digital Health Impact Accelerator being implemented in Zambia, which includes support for the Digital Health Applied Leadership Program and improved ways of implementing digital systems to improve patient-centered care. The Digital Health Applied Leadership Program is an on-the-job, immersive training program to enhance government management staff capacity to successfully lead, procure, and execute digital health programs. Learnings from these investments in Zambia will be applied to national digital health transformation across the Global Fund portfolio.

Foundational infrastructure

In the context of climate change and increasing droughts, Zambia's overreliance on hydroelectricity has reached a critical point, leading to extended 17-hour "load-shedding" schedules – as planned electricity outages are called – that severely disrupt daily life and economic activities, including health facilities and systems. The low electrification rate in Zambia – approximately 44.5% in 2023[3] – further compounds the issue of power and internet connectivity for Zambia's health facilities.

Without dependable energy, these health facilities struggle to operate essential medical equipment, store vaccines and medicines at appropriate temperatures, maintain basic lighting and water pumping systems, retain health care workers, and utilize digital data systems which are crucial to maintaining delivery of essential services with quality.

[3] Sector Analysis Zambia: Renewable Power Generation and Energy Storage Systems in the Commercial and Industrial Sector (GIZ, 2023) https://www.giz.de/de/downloads/giz2024-en-sector-analysis-zambia-re-and-energy-storage-for-ci.pdf

What difference do power and connectivity make for a health facility?

Power for a health facility means it has access to:

- Essential medical devices, including more possibilities for oxygen and refrigerators for cold chain commodities, such as vaccines.
- Advanced devices like GeneXpert machines for diagnostics.
- Lights for at-night patient emergencies and health worker safety and security.
- Internet.

Internet for a health facility means it has access to:

- Expanding human resource capacity, including via remote training.
- Telemedicine to supplement specialty gaps.
- Digitized data systems for faster surveillance, more patient-centered care and use of linked lab diagnostics.
- Modern supply chain and commodity management via digital systems to manage inventory and prevent stock-outs.
- Better community health care, including linkages between community and primary health care facilities.

Electrification and internet connectivity are viewed as national issues within Zambia and considered part of the national digital public infrastructure strategy. Notably, Zambia has been one of the first countries to authorize use of low earth orbit technology for internet connectivity allowing rural health facilities to explore this solution.

The Global Fund's Digital Health Impact Accelerator is working from 2025 onward, along with Gavi, WHO and UNICEF, to build upon health facility solarization and internet connectivity projects in Zambia. This will include studying the feasibility, cost effectiveness, and health impact of new business and technology solutions for power and internet connectivity in rural health facilities, to inform more efficient scaling of power and internet connectivity in similar facilities in additional countries.

Scale-up of power and internet connectivity for health facilities, led by the Smart Zambia Institute and Ministry of Health, is currently underway. Currently, out of Zambia's 3,540 health facilities:

- Approximately 650 priority health facilities have solar power financed by the Global Fund and an additional 1,050 facilities have solar back-up power.
- Internet connectivity is available in 883 health facilities in Zambia.

CASE STUDY

MODESTER CHYOTA

Health volunteer and lifeline to her community

Modester Chyota is a lifeline to her community. The 49-year-old mother and grandmother is a community health volunteer with Zambia's Ministry of Health.

Photo: The Global Fund/Jason Mulikita

Three days a week, Modester travels by foot bringing essential health care and advice to homes scattered across her district in Zambia's remote Rufunsa province. Modester, who has a slight limp, routinely walks for hours and sometimes an entire day to reach the families she serves.

"I am very passionate about helping the community," she says.

Modester is often first on the scene when a community member falls ill with malaria; she conducts rapid tests, administers medication for mild cases, and refers more severe cases to the nearest clinic. She also does pre- and post-natal checkups, educates families on disease prevention and accompanies people on hospital visits. Her dedication and knowledge have earned her great respect in the community, where people affectionately call her "nurse."

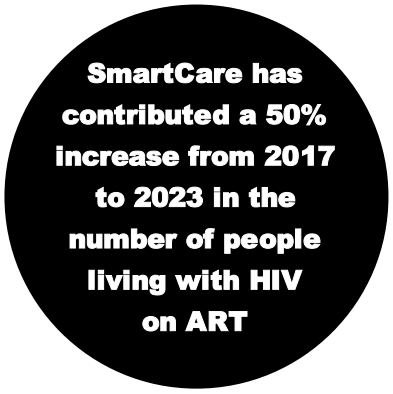
Modester is one of tens of thousands of community health volunteers in Zambia who deliver lifesaving care to millions of people across the country – and serve as a bridge between communities and the formal health system.

With private sector support, the Global Fund is working alongside Zambia's Ministry of Health to train 11,600 community health volunteers to strengthen their skills.

Community health volunteers receive mobile phones equipped with a digitized community health package – a set of digital tools and resources to support their work, including an application to transmit health data electronically into national health information systems. Community health assistants who supervise community health volunteers are receiving training on management and supportive supervision. •

Electronic medical records and other digital platforms

Zambia's Ministry of Health was among the first in Africa to begin developing an electronic health record system – called SmartCare. SmartCare, co-financed by the Global Fund, while originally intended to support the treatment monitoring of people living with HIV, has evolved for the purpose of any health facility in Zambia, enabling digital longitudinal, patient-level data collection and use across all facilities, contingent on power and internet connection availability. Recent upgrades to SmartCare Pro capture all data modules across outpatient and inpatient services in the national recording and reporting system, currently in use at 877 health facilities in Zambia, with further scale-up underway.



SmartCare's development and implementation helps all Zambians accessing health services but is especially critical for populations such as internal labor migrants whose data can now be accessed at SmartCare-enabled facilities across the nation. Even for people who live continuously in one place, digital systems can improve patient care by ensuring adequate medical supplies, timely access to and use of lab results and medical provider follow-up.

In addition to SmartCare, the Government of Zambia and partners have also strengthened the national health management information system for routine reporting of key health metrics, including for HIV, TB and malaria. Global Fund support for this has included:

- Scaling of digital reporting by the Zambia National Public Health Institute on integrated disease surveillance and response, resulting in approximately 90% of health facilities using the national DHIS2 platform for surveillance.
- Investment in the laboratory information system to track laboratory test results linked to clinical services and management.

AI

In 2024, Zambia launched its official Artificial Intelligence (AI) Policy, "a technological detailed and viable roadmap plan that will help the country's transformation achievements to a digital technology economy". This policy outlines a strong level of ambition and sets the stage for robust health-specific AI policies in the future.

Additionally, Zambia has a cross-sectoral digital public infrastructure model for implementing a single internet connectivity and power plan across the Ministries of Health, Energy, and Information and Communications Technology.

Currently, Zambia makes use of computer-aided detection of TB in x-rays through a fleet of seven mobile vans purchased with Global Fund support. AI CAD supported the

improvement of TB case notification rates from 36,010 cases in 2017 to 54,346 cases in 2023 – an increase of over 65%. The expansion of this fleet is one way Zambia hopes to increase AI use in health in the future.

Future Directions

Investments in digital health are aimed at advancing the national digital health strategy's objectives and major investment areas include:

- Improving internet connectivity to health facilities, particularly those that are remote and rural to ensure reliable, timely access to digital health systems
- Enhancement of data hosting, security, and resilience through localized cloud solutions and hybrid infrastructure;
- Improving adherence to data protection rules and regulations; and
- Expansion of the SmartCare electronic medical record system to all health facilities, including facilities that are operating on paper-based systems.