

Digital health systems to support pandemic response in Zambia

Mapping digital health tools and matching deployment opportunities in response to COVID-19

May 2021

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Introduction

In the National eHealth Strategy: 2017–2021, Zambia's Ministry of Health (MOH) describes its vision to have quality, timely, secure, and accessible health information through an integrated national eHealth system by 2021. The COVID-19 pandemic brought a new level of urgency to achieving this vision. The three pillars of the Zambian eHealth strategy are service delivery, research, and learning. Leveraging digital health tools is a rapid, cost-effective strategy to accelerate Zambia's COVID-19 response while at the same time reinforcing the pillars outlined in the eHealth strategy.

Background

Digital Square conducted a landscape analysis of Zambia's digital systems in the ten-year period from 2010–2020 with information validated by tool implementers and designers, digital health experts, and MOH stakeholders as part of the USAID-funded Map and Match project. The purpose was to identify the existing digital tools utilized in Zambia, map the tools already deployed for COVID-19 response to relevant uses cases, and highlight opportunities where existing tools can quickly be adapted and deployed to support COVID-19 response.



Analysis overview

Map and Match's analysis found that Zambia's health system uses 64 digital health tools, with at least 17 already deployed for COVID-19 response. This brief identifies opportunities for existing digital tools to be adapted to pandemic use cases to respond to needs for the COVID-19 response and potential future epidemics. Mapping of the existing tools to the use cases revealed where there are strengths and opportunities in Zambia's digital health system's response to COVID-19. For example, the analysis identified four total use case gaps, including health facility and provider administration, One Health, points of entry, and vaccine delivery and planning. Map and Match identified existing tools ready for adaptation to fulfill these use cases to bolster the response without needing to introduce new tools. Strategic adaptation of existing digital health tools will accelerate the COVID-19 response, offering greater efficiency and more robust support to the government, health workers, clients, and other stakeholders.

Key definitions

Pandemic use case refers to the specific type of information collected, stored, tracked, analyzed, or visualized as it relates to the functional response to an epidemiological event, specifically COVID-19.

Digital health tool refers to a website, application, or other computer or mobile technology that supports data collection, storage, tracking, analysis, or visualization. The tool must have an electronic interface. One digital tool can address multiple use cases.

Application refers to components of digital tools that are primarily designed for use by clients of the health system or by health workers. Applications can be reused to address more than one use case, or applications can be uniquely used for only one use case.

Adaptation refers to making improvements to existing digital tools to improve their applicability and impact in the context of COVID-19.

Figure 1. Current number of digital health tool deployments mapped to pandemic use cases in Zambia.



Figure 1 illustrates that many use cases are addressed using several tools in Zambia's COVID-19 response while other use cases are filled by a sole tool.

Table 1. Mapping and matching digital health tools to strengthen Zambia’s COVID-19 response.

Digital Square mapped the current state of tools’ functionality across the pandemic use cases in **blue** to illustrate how the digital health systems are supporting Zambia’s COVID-19 response. Digital Square matched opportunities for tool adaptation across the pandemic use cases in **green** to reveal places where Zambia can reuse parts of its existing digital health systems to strengthen its COVID-19 response.

		PANDEMIC USE CASES														
		Case management	Contact tracing	Coordination and operations	Diagnostic tools	Event-based surveillance (including rapid response teams, case investigation)	Health facility and provider administration	Infection prevention and control	Laboratory systems	Learning and training	One Health	Points of entry	Risk communication and community engagement	Routine surveillance	Supply chain	Vaccine delivery and planning
DIGITAL HEALTH TOOLS	Amplio Talking Book / Moodle															
	ArcGIS															
	Computer Aided Detection for COVID-19 (CAD4COVID)															
	CommCare															
	DelphiCare															
	Electronic Integrated Disease Surveillance Response system (eIDSR) (DHIS2)															
	electronic Logistics Management Information System (eLMIS) (OpenLMIS)															
	Facebook															
	Geo-Referenced Infrastructure and Demographic Data for Development (GRID3)															
	MOH Zambia COVID-19 Information Chatbot															
	RECOVER (ODK)															
	Safe Delivery App															
	SmartCare															
	Viamo 3-2-1 Service															
	WhatsApp															

■ Digital tools deployed for COVID-19 response
 ■ Opportunities to adapt tools for pandemic response

Table 1. Mapping and matching digital health tools to strengthen Zambia’s COVID-19 response, continued.

		PANDEMIC USE CASES														
		Case management	Contact tracing	Coordination and operations	Diagnostic tools	Event-based surveillance (including rapid response teams, case investigation)	Health facility and provider administration	Infection prevention and control	Laboratory systems	Learning and training	One Health	Points of entry	Risk communication and community engagement	Routine surveillance	Supply chain	Vaccine delivery and planning
DIGITAL HEALTH TOOLS	World Continuing Education Alliance (WCEA)									Deployed						
	Zambia HMIS (DHIS2 + Tracker + COVID-19 Module)	Deployed	Deployed	Opportunity	Opportunity	Deployed			Opportunity		Opportunity	Opportunity		Deployed	Opportunity	Opportunity
	Bahmni	Opportunity	Opportunity		Opportunity		Opportunity		Opportunity						Opportunity	Opportunity
	Be He@lthy, Be Mobile												Opportunity			
	CommCare Supply														Opportunity	
	Community Led Total Sanitation Mobile Surveillance (DHIS2)			Opportunity		Opportunity								Opportunity		
	Connected Health AI Network (CHAIN)														Opportunity	Opportunity
	DataToCare	Opportunity		Opportunity		Opportunity			Opportunity					Opportunity		
	eLABS								Opportunity							
	GxAlert				Opportunity				Opportunity							
	iHRIS						Opportunity									Opportunity
	Logistimo														Opportunity	
	Mapbox			Opportunity												
	mSupply														Opportunity	Opportunity
	mVaccination												Opportunity		Opportunity	Opportunity
	OpenMRS	Opportunity	Opportunity			Opportunity	Opportunity							Opportunity		Opportunity
	Open Smart Register Platform (OpenSRP)	Opportunity	Opportunity		Opportunity	Opportunity	Opportunity	Opportunity		Opportunity				Opportunity	Opportunity	Opportunity
	OpenStreetMap			Opportunity												
	Quantimed			Opportunity											Opportunity	

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Table 1. Mapping and matching digital health tools to strengthen Zambia’s COVID-19 response, continued.

PANDEMIC USE CASES

DIGITAL HEALTH TOOLS	PANDEMIC USE CASES														
	Case management	Contact tracing	Coordination and operations	Diagnostic tools	Event-based surveillance (including rapid response teams, case investigation)	Health facility and provider administration	Infection prevention and control	Laboratory systems	Learning and training	One Health	Points of entry	Risk communication and community engagement	Routine surveillance	Supply chain	Vaccine delivery and planning
Reveal (formally mSpray) (OpenSRP)		■	■		■		■								■
Simprints	■				■										■
Stock Visibility Solution (SVS)/ SMS for Life														■	
THINKMD							■								
Timed and Targeted mHealth application (mTTC) (CommCare)	■														
True Cover															■
U-Report											■				
Vantage			■												
Vaxiglobal Health and Immunisation Verification															■
VigiFlow							■								
Visualize No Malaria Dashboards			■		■								■		
Zambia Electronic Immunization Registry (ZEIR) (OpenSRP)	■				■	■	■	■			■	■	■	■	
Zambia Health Analytics Platform (ZHAP)			■		■								■	■	■
Zambia Master Health Facility List (ZMHFL)						■							■		

■ Digital tools deployed for COVID-19 response ■ Opportunities to adapt tools for pandemic response

“You need enough manpower for DHIS2 configurations, but during a pandemic, things need to be done quickly. We face challenges balancing service delivery and reporting—which takes precedence?”

—Sam Phiri, Zambian MOH

Matching digital health tools ready for adaptation to fill the pandemic use case gaps

The analysis identified existing digital tools that can be adapted to support COVID-19 response for several use case gaps below. Use case gaps are defined as use cases that have fewer than two tools addressing them. Map and Match’s analysis found existing digital tools ready for adaptation to fulfill the six use case gaps specific to Zambia. Many of these tools also provide opportunities to streamline the COVID-19 response across a range of use cases.

To learn more about the tools in the matrix below, please see Table 2 for more details to facilitate adaptations. To find out more about all the Digital Square approved global goods mapped across these pandemic use cases, please see [this Map and Match resource](#), which can provide decision-makers with targeted information to deploy and adapt global goods to fulfill gaps in the COVID-19 response.

Health facility and provider administration	
Bahmni	CommCare
iHRIS	OpenMRS
OpenSRP	Zambia Electronic Immunization Registry (ZEIR) (OpenSRP)
Zambia Master Health Facility List (ZMHFL)	

Laboratory systems	
eIDSR (DHIS2)	Bahmni
CommCare	DataToCare
eLABS	GxAlert
SmartCare	VigiFlow
Zambia Electronic Immunization Registry (ZEIR) (OpenSRP)	Zambia HMIS (DHIS2 + Tracker + COVID-19 Module)

One Health	
Zambia HMIS (DHIS2 + Tracker + COVID-19 Module)	

Points of entry	
CommCare	eIDSR (DHIS2)
SmartCare	Zambia Electronic Immunization Registry (ZEIR) (OpenSRP)
Zambia HMIS (DHIS2 + Tracker + COVID-19 Module)	

Supply chain	
eLMIS (OpenLMIS)	Bahmni
CHAIN	Commcare Supply
Logistimo	mSupply
mVaccination	OpenSRP
Quantimed	Stock Visibility Solution (SVS)/SMS for Life
Zambia Electronic Immunization Registry (ZEIR) (OpenSRP)	Zambia Health Analytics Platform (ZHAP)
Zambia HMIS (DHIS2 + Tracker + COVID-19 Module)	

Vaccine delivery and planning	
Bahmni	CHAIN
eLMIS (OpenLMIS)	iHRIS
mSupply	mVaccination
OpenMRS	OpenSRP
Reveal	Simprints
True Cover	Vaxiglobal Health and Immunisation Verification
Zambia Health Analytics Platform (ZHAP)	Zambia HMIS (DHIS2 + Tracker + COVID-19 Module)

“Change management is a very difficult part. Right now, we don’t have that culture.”

—Sam Phiri, Zambian MOH

Example of a global good ready for adaptation for COVID-19 response in Zambia

iHRIS

iHRIS is a free and open source software solution that forms an integrated human resources information system, enabling countries to more easily collect, maintain, and analyze health workforce data and manage health workforce resources at the MOH, district health offices, and health care facilities.

iHRIS is built on a flexible framework that can be adapted to meet a wide variety of needs for managing health workforce information. iHRIS supports the MOH and other service delivery organizations to:

- Track, manage, deploy, and map their health workforce.
- Predict workforce changes and needs under different scenarios.
- Plan and cost workforce retention interventions.
- Manage training activities, including pre-service and in-service education.

iHRIS can be adapted to support COVID-19 response to manage and track health workers’ vaccinations and to conduct workforce planning for COVID-19 hotspots and staffing needs (e.g., personal protective equipment). For example, the Kenya MOH has used iHRIS to identify potential workforce shortages and to plan for redeployment based on likely COVID-19 hotspots.



Health facility and provider administration

Vaccine delivery and planning

Table 2. An in-depth look at digital health tools to support the COVID-19 response.

Digital health tool	Purpose	Use case(s)	Funder(s)	Implementer(s)	Licensing	Scale
Amplio Talking Book / Moodle	The Amplio Talking Book is an audio device that promotes accurate and consistent messaging of specific content, including health, WASH, education, and agriculture. The device runs on dry cell batteries and works offline. It has a self-monitoring function that tracks usage statistics as well as user feedback. Zambia uploaded COVID-19 prevention audio messages to the Talking Book to raise awareness of COVID-19 and how to reduce the risk of infection and transmission. In Zambia, small groups in the communities listened to these messages and individuals also took the Talking Book home to listen with members of their households, helping reinforce and confirm accurate information.	Learning and training, risk communication and community engagement	Amplio Network	MOH, Planned Parenthood Association of Zambia, VSO	Open source	Subnational
ArcGIS	ArcGIS Online enables connection between people, locations, and data using interactive maps. As the situation surrounding COVID-19 continues to evolve, this technology provides geospatial data to users and communities with location intelligence, mapping services, and materials that people are using to help monitor, manage, and communicate the impact of the outbreak.	Coordination and operations, risk communication and community engagement	USAID	MOH, NSDI, ZNPHI	Proprietary	National
Computer Aided Detection for COVID-19 (CAD4COVID)	CAD4COVID is an artificial intelligence software that triages COVID-19 suspected cases on chest X-rays or CT images. In addition to supporting triaging of COVID-19 suspected cases, CAD4COVID provides additional information to clinicians to help them determine the next steps in the patient's care, particularly in resource-constrained settings and high-prevalence areas. Additionally, CAD4COVID quantifies disease progression and recovery to enable effective tracking. CAD4COVID is available at 120+ health facilities in 40+ countries and has screened more than 20,000 people. CAD4COVID can be adapted to triage COVID-19 cases before RT-PCR tests or can be used to check disease progression and recovery of patients.	Case management, diagnostic tools	EDCTP	TREATS consortium	Proprietary	Subnational
CommCare	CommCare is an offline-capable mobile data collection and service delivery platform used in more than 80 countries. CommCare is popular for its offline case management capabilities proven to be effective at scale. It is designed for everything from simple surveys to comprehensive longitudinal data tracking. It allows for easy digitization of surveys, has forms that are intuitive for end users, uses simple device deployment, and includes translation features. In Zambia, CommCare has been used to share nutrition and WASH materials with health promoters. CommCare has been used to digitize the Zambian government's screening protocols and response forms. A traveler's record transfers to the surveillance system if identified through symptoms or contact with another individual.	Case management, contact tracing, diagnostic tools, event-based surveillance, health facility and provider administration, infection prevention control, laboratory systems, learning and training, points of entry, risk communication and community engagement	USAID	JSI, MOH	Open source	Subnational
DelphiCare	DelphiCare is an Android app enabling health workers to provide longitudinal, expert-level patient management through monitoring, screening for illness, recommending tests, interpreting results, advising on drugs and dosages, and suggesting follow-up. The app is comprehensive, constituting both a clinical decision support system and an electronic client record. The use of the Logiak platform allows for transparent logic to be written and validated by clinicians. Changes in content and logic can be implemented across a health care system in near-real time with central access to all data. DelphiCare is used for HIV and TB and is currently being used as a screening tool for COVID-19 in health centers and hospitals.	Case management, diagnostic tools	CDC	CDC, D-tree International, Logiak, MOH, University of Maryland	Proprietary	Subnational
electronic Integrated Disease Surveillance Response system (eIDSR) (DHIS2)	Built on the DHIS2 platform, the tool collects surveillance data on all notifiable disease cases from Zambian districts in the eIDSR system to facilitate real-time detection and reporting. The application includes a border post health surveillance system, an eIDSR system management dashboard, and an integrated eIDSR system.	Coordination and operations, event-based surveillance, laboratory systems, points of entry, risk communication and community engagement, routine surveillance	Akros Research, MOH, Right to Care, USAID, World Bank	MOH, ZNPHI	Open source	Subnational

 Digital tools deployed for COVID-19 response  Opportunities to adapt tools for pandemic response

Table 2. An in-depth look at digital health tools to support the COVID-19 response, continued.

Digital health tool	Purpose	Use case(s)	Funder(s)	Implementer(s)	Licensing	Scale
electronic Logistics Management Information System (eLMIS) (OpenLMIS)	The electronic Logistics Management Information System (eLMIS) is a revolutionary and cost-effective system of health data management that ensures greater commodity security and better health outcomes for the people of Zambia. OpenLMIS is a powerful, open source, cloud-based eLMIS purpose-built to manage health commodity supply chains. OpenLMIS manages the electronic LMIS process at more than 11,000 health facilities in nine Africa countries, across all major health programs, including vaccines and COVID-19. OpenLMIS adapted its tool so countries can optimize their use of the software to encourage good supply chain management of COVID-19 supplies. OpenLMIS launched a separate, simplified instance called OpenLMIS COVID-19 Edition, which is a lighter-weight and quicker startup tool to help countries manage COVID-19-related commodities based on the WHO product list.	Event-based surveillance, routine surveillance, supply chain, vaccine delivery and planning	Gates Foundation, Rockefeller Foundation, USAID	JSI, MOH, VillageReach	Open source	National
Facebook	The key informants shared that Zambia uses Facebook as a primary tool for COVID-19 risk communication and community engagement.	Risk communication and community engagement			Proprietary	National
Geo-Referenced Infrastructure and Demographic Data for Development (GRID3)	GRID3 works with countries to generate, validate, and use geospatial data on populations, settlements, infrastructure, and boundaries.	Coordination and operations, routine surveillance	Gates Foundation, FCDO	Akros, MOH, Reveal	Open source	National
MOH Zambia COVID-19 Information Chatbot	The chatbot is the official Zambian government information service for COVID-19.	Risk communication and community engagement	USAID	eNgoma Solutions Ltd, JSI, MOH		National
RECOVR (ODK)	Tracking how people's lives are affected by the COVID-19 pandemic can enable policymakers to better understand the situation in their countries and make data-driven policy decisions. To respond to this need, the RECOVR survey can be deployed as a panel survey that will facilitate comparisons, document real-time trends of policy concern, and inform decision-makers about the communities that are hardest hit by the economic toll of the pandemic.	Coordination and operations	Gates Foundation, Northwestern University's Global Poverty Research Lab, UBS Optimus Foundation	IPA, SurveyCTO	Open source	
Safe Delivery App	The Safe Delivery App supports skilled birth attendants to quickly diagnose issues in pregnancy and with newborns, offering step-by-step guidelines to perform a treatment. It is free to download and can be preinstalled so that providers can watch the animated instruction videos and read the action cards and drug lists whether or not they have Wi-Fi. The Safe Delivery App includes the adaptation of a COVID-19 content module that provides skilled birth attendants (e.g., midwives) with key information, animated video instructions, and checklists to support them to limit the spread of COVID-19 in the health facilities, including information on infection prevention, breastfeeding, and vertical transmission. Zambia uses the COVID-19 module of this app.	Learning and training, infection prevention and control	Gates Foundation, Merck for Mothers, UNFPA	MOH, UNFPA, UNICEF	Proprietary	Subnational
SmartCare	The Zambia MOH uses SmartCare to provide continuity of care. SmartCare is a fully integrated EHR system, a clinical management information system at the facility and district levels, and a key component in the "one National M&E system." The patient-oriented system has data aggregation capabilities for reporting and analysis. SmartCare has been adapted to include a module for COVID-19 case management at isolation facilities. It can be further adapted to address other needs like screening and clinical management.	Case management, contact tracing, diagnostic tools, infection prevention and control, laboratory systems, points of entry, routine surveillance	Broadreach, CDC, PEPFAR	BroadReach, Catholic Relief Services, Churches Health Association, CIDRZ, EQUIP, FHI360, MOH, PATH, USAID, UTH HAP and provincial health offices	Open source	National

 Digital tools deployed for COVID-19 response  Opportunities to adapt tools for pandemic response

Table 2. An in-depth look at digital health tools to support the COVID-19 response, continued.

Digital health tool	Purpose	Use case(s)	Funder(s)	Implementer(s)	Licensing	Scale
Viamo 3-2-1 Service	Viamo leverages existing mobile infrastructure and local partnerships to provide mobile solutions that can be scaled nationally within weeks to effectively respond to rapidly evolving health emergencies. The 3-2-1 Service delivers free, trusted, life-enhancing information by local, regional, and international subject matter experts to people on mobile devices. Such information can overcome barriers to early detection of life-threatening diseases; provide diagnostic advice, including self-diagnostic services; and provide treatment options through IVR. Zambia added COVID-19 messages to the 3-2-1 Service in April 2020. COVID-19 services via Viamo include national and regional awareness campaigns, mobile surveys, social media chatbots, COVID-19 case reporting hotline, COVID-19 support call center, outbreak mapping and data visualizations, and remote training for health workers.	Diagnostic tools, event-based surveillance, learning and training, risk communication and community engagement, routine surveillance	FCDO, SIDA, USAID		Proprietary	National
WhatsApp	The key informants shared that Zambia uses WhatsApp as a primary tool for COVID-19 risk communication and community engagement.	Risk communication and community engagement			Proprietary	National
World Continuing Education Alliance (WCEA)	This learning management system is a multifield eLearning and mHealth system that supports virtual and blended learning linked to certifications for professional development and lifelong learning. Examples of content includes modules about nursing and midwifery and COVID-19 (both clinical and nonclinical). The platform generates reports on study habits and data of users (i.e., age, gender, location, qualification, role, employment status).	Learning and training		World Continuing Education Alliance	Proprietary	Subnational
Zambia HMIS (DHIS2 + Tracker + COVID-19 Module)	Zambia's HMIS is built on DHIS2, which is an open source, web-based HMIS platform. DHIS2 supports the collection, analysis, visualization, and sharing of both aggregate and individual-level data (using Tracker), including mobile and offline data collection using the DHIS2 Android app. DHIS2 has several ready-to-install digital data packages to support COVID-19 surveillance and response based on WHO guidelines. DHIS2 has a COVID-19 Surveillance Event Program (i.e., an event-based surveillance program), which is a simplified line list to capture a subset of minimum critical data points to facilitate rapid analysis and response. DHIS2 strengthens contact tracing by enabling identification and follow-up of contacts of a suspected or confirmed COVID-19 case. COVID-19 case-based surveillance enrolls and tracks suspected cases; captures symptoms, demographics, risk factors, and exposures; creates lab requests and captures laboratory data about the case; links confirmed cases with contacts; and monitors patient outcomes.	Case management, contact tracing, coordination and operations, diagnostic tools, event-based surveillance, laboratory systems, one health, points of entry, routine surveillance, supply chain, vaccine delivery and planning	DHIS2, Gavi, Global Fund, MOH, Norad	AOS.Health, Blue Frontier UK Ltd., eSHIFT Partner Network, HISP Uganda/South Africa, HISP Geneva, MOH	Open source	National
Bahmni	Bahmni is an open source electronic medical record and hospital information system developed in the global south to meet the needs of low-resource environments. It is currently deployed in 50+ countries. Bahmni is a distribution of the OpenMRS medical record platform. It manages patient information in a flexible fashion throughout the care cycle, including registration, various points of care, investigations, laboratory orders and results management, picture archiving and communication systems, and billing. To support its community of implementers, Bahmni released a set of preconfigured templates that can be adopted by any implementer and used for COVID-19 contact tracing. The Bahmni COVID-19 Starter Kit enables health workers to use Bahmni to capture COVID-19-specific data and report disease statistics. The Bahmni COVID-19 Vaccine Kit enables the capture of vaccination details of patients being vaccinated. Implementers in the community have built a teleconsulting module using Bahmni's appointment scheduling feature to reduce the strain on health systems due to patient inflow while maintaining continuity of care during the pandemic.	Case management, contact tracing, diagnostic tools, health facility and provider administration, laboratory systems, supply chain, vaccine delivery and planning			Open source	Subnational
Be He@lthy, Be Mobile	The Be He@lthy, Be Mobile initiative is an mHealth service to address NCDs and to educate people about their risk factors. Zambia has used this mHealth service to send more than 1 million messages on cervical cancer awareness.	Risk communication and community engagement	WHO	ITU, MOH, WHO		National
CommCare Supply	CommCare Supply is a web-based, SMS, and mobile app tool to support health workers and other mobile agents who manage commodities. Targeted, actionable information can be provided to supervisors and managers. It is a field-based, offline tool for recording drug transactions and can connect online to integrate them into the inventory tracking system.	Supply chain		Dimagi	Open source	

 Digital tools deployed for COVID-19 response  Opportunities to adapt tools for pandemic response

Table 2. An in-depth look at digital health tools to support the COVID-19 response, continued.

Digital health tool	Purpose	Use case(s)	Funder(s)	Implementer(s)	Licensing	Scale
Community Led Total Sanitation Mobile Surveillance (DHIS2)	A comprehensive WASH surveillance system that enables the rapid flow of village-based water and sanitation data.	Coordination and operations, event-based surveillance, routine surveillance	FCDO, UNICEF	Akros Research	Open source	Subnational
Connected Health AI Network (CHAIN)	CHAIN uses AI to support the supply chain. CHAIN is enterprise software that learns and builds the predictive supply chain for health from the ground up. CHAIN makes it possible for existing resources to serve more people in need, unlocking capacity and increasing access to care. In Zambia, the Ishango mobile application is providing access to real-time data utilization and verification for polio vaccines. The tool provides time-stamped, geo-tagged utilization and supply data for health workers.	Supply chain, vaccine delivery and planning	Gates Foundation	Macro-eyes, UNICEF	Proprietary	
DataToCare	DataToCare is a suite of integrated applications that collects and disseminates diagnostic and surveillance data from remote laboratories to regional and national stakeholders. It allows medical teams access to the data for decision-making. The DataToCare desktop is installed across Zambia in laboratories to collect and transfer diagnostic data and send via internet or SMS to the central server. The DataToCare server computes diagnostic or epidemiological data from points of care and remote laboratories.	Case management, coordination and operations, event-based surveillance, laboratory systems, routine surveillance	USAID	FHI 360, Savics	Proprietary	National
eLABS	eLABS is a mobile application that enables facility health workers to track laboratory value chains, tracking samples, cold chain, and results. eLABS improves laboratory processes and coordination and ensures efficiency by providing near real-time visibility into all transactions within the laboratory value chain, including facilities, couriers, and laboratories. Facility health workers use eLABS mobile to submit samples for pickup and processing, couriers use it to track logistics and temperature in transit, and laboratories use it to transmit electronic results directly to health workers. Information is linked to individual samples and patients using barcodes and efficient master data management. Existing laboratory information systems can be integrated with eLABS to reduce fragmentation and improve return on existing investments. Direct, targeted patient messaging is also available after patients enroll.	Laboratory systems		Wits Health Consortium	Open source	Subnational
GxAlert	GxAlert is a digital platform that facilitates country-level surveillance of viral load laboratory tests by allowing data to flow across the health system. GxAlert can connect to other electronic tuberculosis (eTB) managers or M&E systems. GxAlert can also send targeted SMS alerts to facility managers, health officers, and suppliers. GxAlert enabled a solution to address the following gaps: (1) device management, monitoring, and reporting; (2) calibration, maintenance, and procurement planning; (3) lab technologists' capacity, availability, and training; (4) real-time results notifications to respective stakeholders including rapid case notifications for all positive results to all relevant health care officers; and 5) inventory management and notifications to reduce stockouts and expires.	Diagnostic tools, event based surveillance, laboratory systems	TB REACH	SystemOne	Proprietary	National
iHRIS	iHRIS is free, open source software that helps countries around the world track and manage their health workforce data to improve access to services. Countries use it to capture and maintain high-quality information for health workforce planning, management, regulation, and training. iHRIS can be adapted for COVID-19 response to track of health workers' vaccinations and to execute workforce planning for COVID-19 hotspots and surge staffing needs.	Health facility and provider administration, vaccine delivery and planning	USAID	IntraHealth International, MOH	Open source	National
Logistimo	Logistimo is a fully mobile-enabled platform for supply chain management that enables a country to optimize supply chain performance across its network to achieve optimal service quality. It enables inventory management, order management, demand forecasting, inventory optimization, remote temperature monitoring for cold chains, and transportation logistics management.	Supply chain	MOH, UNICEF, WHO		Open source	Subnational
Mapbox	Mapbox is a mapping platform for custom designed maps. Mapbox's application programming interfaces and software development kits are building blocks to integrate location into any mobile or web application. Mapbox is part of the Visualize No Malaria project.	Coordination and operations		MOH, PATH	Proprietary	Subnational

 Digital tools deployed for COVID-19 response  Opportunities to adapt tools for pandemic response

Table 2. An in-depth look at digital health tools to support the COVID-19 response, continued.

Digital health tool	Purpose	Use case(s)	Funder(s)	Implementer(s)	Licensing	Scale
mSupply	mSupply can be used for inventory management. The tool can display aggregated data on dashboards about vaccine dispensation numbers and rates. The tool can produce a list of people to send SMS reminders to receive their vaccine doses and record adverse drug reactions. mSupply uses Bluetooth sensors to monitor cold chain equipment monitoring.	Supply chain, vaccine delivery and planning	Global Fund, mSupply Foundation	Churches Health Association, Sustainable Solutions	Open source	Subnational
mVaccination	The MOH is implementing an innovation for Reaching Every Child through the use of mobile technology. mVaccination is an SMS-based registration of under-5 children and a reminder system to support the vaccination program. The goal of the project is to increase immunization awareness and improve access to and sustain utilization of immunization services through RapidPro. The platform will enable health facilities to share updates on immunization including general knowledge and scheduling of services with the community/ caregivers, while enabling timely collection of immunization data and follow-up of caregivers to reduce dropout rates. In addition, RapidPro will also support vaccine stock management through real-time monitoring.	Case management, risk communication and community engagement, supply chain, vaccine delivery and planning	UNICEF	UNICEF, MOH	Open source	Subnational
OpenMRS	OpenMRS is a community, software platform, and reference application that enables design of a customized medical records system. OpenMRS has adapted its software to make it easier for 5,500 existing implementations to screen, test, and manage patients and to report data out efficiently to DHIS2 for public health surveillance. While not used for COVID-19 response in Zambia yet, OpenMRS has deployed an active COVID-19 Response Squad that is working to identify existing work within the OpenMRS community that can be rapidly adapted by implementers and packaged as a suite of COVID-19 Public Health Response Tools.	Case management, contact tracing, event-based surveillance, health facility and provider administration, routine surveillance, vaccine delivery and planning			Open source	
Open Smart Register Platform (OpenSRP)	OpenSRP is an offline-capable open source mobile health platform built to enable data-driven decision-making at all levels of the health system. OpenSRP supports health workers to prioritize point-of-care tasks, track service delivery, and simplify reporting. OpenSRP has been used to build localized applications for reproductive, maternal, newborn, child, and adolescent health; immunization; early childhood development; malaria rapid diagnosis and management; TB treatment management; and COVID-19 testing and screening. For COVID-19 response, OpenSRP can be used for microplanning, such as planning assignments for specific health workers/teams and allowing the health workers/teams to view plans for COVID-19 outreach and vaccinations. OpenSRP allows the user to perform the task and record that it has been completed, and then the task is then auto-reported (e.g., vaccinations administered, household risk-screening completed).	Case management, contact tracing, diagnostic tools, event-based surveillance, health facility and provider administration, infection prevention and control, learning and training, routine surveillance, supply chain, vaccine delivery and planning	PATH	BlueCode, PATH	Open source	Subnational
OpenStreetMap (OSM)	OSM Zambia is a nonprofit mapping organization that works with communities to collect geospatial data to create an open, free-to-use map of Zambia. It is associated with Cadasta, which provides a common global platform and set of technology and training tools that enable local organizations, government entities, and communities to document and map land and its occupants in a more quick, efficient, and affordable way. The technologies allow for migration of data into government systems. It is supported by a range of applications, including mobile and web-based tools to help users easily and securely document, visualize, analyze, and share crucial data. To support community resilience in the face of COVID-19, Cadasta provides community-level data concerning resources for response efforts, including to medical clinics, pharmacies, hospitals, testing sites, and other treatment centers. The Cadasta Platform is designed to be lean, agile, and easily configured for communities to use in response to a multitude of evolving needs.	Coordination and operations	GIZ	Cadasta	Proprietary	Subnational
Quantimed	Quantimed is a tool that provides quantification of essential medicines and supplies. Quantimed is designed to improve the accuracy of order planning and budgeting by providing a systematic approach to organizing and analyzing data. Quantimed facilitates the calculation of commodity needs using either a single method or a combination of any of the three primary quantification methods (i.e., past consumption, morbidity patterns, and proxy consumption).	Coordination and operations, supply chain	USAID	MSH, SIAPS/USAID	Open source	National

■ Digital tools deployed for COVID-19 response
 ■ Opportunities to adapt tools for pandemic response

Table 2. An in-depth look at digital health tools to support the COVID-19 response, continued.

Digital health tool	Purpose	Use case(s)	Funder(s)	Implementer(s)	Licensing	Scale
Reveal (formerly mSpray) (OpenSRP)	Reveal is an open source platform that uses smart maps and technology appropriate for resource-constrained settings to monitor coverage of interventions in real time. It is designed to optimize available resources. Reveal supports decision-makers by guiding and tracking delivery of field activities with precision and holding field teams accountable for action. Reveal has a mobile application that spatially guides field teams to planned areas and households for service delivery. This mobile application allows offline data collection and captures indicators to inform critical field decisions. Reveal also includes web user interface real-time dashboards to provide program managers with impactful coverage data to inform current activities and program progress. Reveal can be adapted for COVID-19 response to support COVAX mapping and quantification, resource planning, prioritization, and delivery and monitoring vaccine coverage.	Contact tracing, coordination and operations, event-based surveillance, infection prevention and control, vaccine delivery and planning	CHAI, Gates Foundation, IVCC, USAID	Akros, DSME Consortium, MOH, PATH, USAID	Open source	Subnational
Simprints	Simprints deploys biometric identification documents (IDs) on health and humanitarian projects to increase health care visits and quality while preventing fraud. The Simprints scanner scans fingerprints and hooks up to a mobile phone. Simprints' biometric solution is a desirable technology in the context of contact tracing and case management for COVID-19. Accurate identification supports effective response by ensuring that patients are correctly linked with their records, and that their records can be linked longitudinally. The Impact Network in Zambia enrolled all its students and consistently uses Simprints to monitor class attendance.	Case management, event-based surveillance, vaccine delivery and planning	FCDO, Gates Foundation	Impact Network, Simprints	Open source	Subnational
Stock Visibility Solution (SVS)/SMS for Life	The SVS enables clients to migrate from a paper-based model to an informed push-based model to access near real-time supply chain information from service points. SVS includes mobile and web-based applications and analytics, provided as a managed service. Using barcodes and efficient master data management, this information is used to prompt informed push replenishment management and other centralized supply chain functions across last-mile service points. Existing logistics management systems can be integrated with SVS to reduce fragmentation and improve return on existing investments.	Supply chain	Novartis, Right to Care, Vodacom	Wits Health Consortium	Proprietary	Subnational
THINKMD	Healthy Kids/Brighter Futures (HK/BF) is an organization based in Zambia that trains teachers to serve as frontline health workers in Zambian schools for their child and adolescent student populations. To streamline health worker training and data collection, HK/BF adopted THINKMD's clinical assessment software and data analytics offering. The software has functionality to guide clinical assessments and referrals. It has also been customized to support mass drug administrations and to report suspected cases of high-risk diseases. The platform includes 40 unique assessments, triage procedures, and instructions/monitoring for follow-up care.	Infection prevention and control	Healthy Learners	Healthy Kids/Brighter Futures (Healthy Learners), THINKMD	Proprietary	Subnational
Timed and Targeted Counselling mHealth application (mTTC) (CommCare)	The World Vision mTTC app is built in the common MOTECH Suite (CommCare), allowing easy adaptation and alignment to national data systems. The mTTC app is used by CHWs conducting Timed and Targeted Counselling (TTC) home visits to communicate and track health practices for maternal newborn and child health at the household level. The app collects real-time household-level data on practices, which can easily be assimilated and used in data-based feedback and supervision. The app ensures CHWs time home visits correctly by gestation/age of child, sending reminders on missed visits and follow-up, and improves workload management. It includes audiovisuals with multiple language settings and press-play messages to give accurate information to caregivers.	Case management	Irish Aid, USAID, World Vision	MOH, World Vision	Open source	Subnational
True Cover	This solution tracks the true immunization coverage in communities through satellite imagery. True Cover identifies all potential livable structures in a community using high-resolution satellite imagery and community mapping. Tasking algorithms automatically generate a random sample of structures for community surveillance teams to visit.	Vaccine delivery and planning	Gates Foundation, UNICEF			
U-Report	U-Report is an mHealth application developed to provide real-time mobile counseling and conducting of coordinated polls on HIV/AIDS among adolescents and young people. In Zambia, U-Report provides confidential, free-of-charge, individualized, and interactive 24/7 counseling services on HIV and sexually transmitted infections to around 193,000 users, mainly adolescents and youth. This open source SMS-based system is a vital doorway to information for young people who might not have access to an internet café or mobile data. U-Report was used to survey the youth about their willingness to volunteer during the COVID-19 pandemic.	Risk communication and community engagement	UNICEF	UNICEF, Zambia's National AIDS Council	Open source	National

 Digital tools deployed for COVID-19 response  Opportunities to adapt tools for pandemic response

Table 2. An in-depth look at digital health tools to support the COVID-19 response, continued.

Digital health tool	Purpose	Use case(s)	Funder(s)	Implementer(s)	Licensing	Scale
Vantage	Vantage is an AI-enabled cloud platform that empowers health care workers to make decisions. The cloud-based platform is able to instantaneously analyze data and communicate findings and direct meaningful actions through automatically generated dashboards and targeted push notifications.	Coordination and operations	BroadReach	BroadReach	Proprietary	
Vaxiglobal Health and Immunisation Verification	Vaxiglobal is working with laboratories in Zimbabwe and Zambia, airlines, and technology companies to build up a safe and approved digital verification system for travelers' immunization. Built on blockchain technology, a decentralized online record-keeping system, the database cannot be tampered with. After vaccination, the laboratories create a digital record in Vaxiglobal. The traveler gets a QR code on a mobile app or on paper, which is instantly verified by the border authorities, who can see where the traveler received the vaccine and who administered it to them, as well as the batch number of the vaccine, which protects the authenticity of each and every vaccine.	Vaccine delivery and planning	WHO		Proprietary	National
VigiFlow	VigiFlow is a management system for recording, processing, and sharing reports of adverse effects for medical products. VigiFlow enables maximum local control and provides an effective means for management review and analysis of national data. VigiFlow has a medicine track and trace system that will ensure that all medical products and health technologies in the market have a tracing number.	Laboratory systems	WHO		Open source	Subnational
Visualize No Malaria (VNM) Dashboards	Zambia adopted VNM as a malaria intelligence platform and power visualization engine that allows end users to create user-friendly dashboards to analyze the malaria situation in real time. VNM integrates data sources and provides health workers, supervisors, district offices, and NMEC with data to understand malaria epidemiological trends.	Coordination and operations, event-based surveillance, routine surveillance	Gates Foundation, PMI	MOH, PATH	Proprietary	Subnational
Zambia Electronic Immunization Registry (ZEIR) (OpenSRP)	The Zambian Electronic Immunization Registry platform provides an easy-to-use app for nurses at facilities to register children, capture their immunization records, and track growth monitoring. Health facilities have tablets that contain software for ZEIR that includes functionality for immunization registration, tallying, stock management and reporting, with the ability to feed aggregate reports to DHIS2. The electronic registry is integrated with data use interventions, including an online peer network platform on WhatsApp, and provision of data use job aids to health workers. District staff provided targeted supportive supervision for health workers. A barcode/quick response code has been added to child health cards so that health workers can scan the barcode to retrieve the vaccination record for any given child from the registry.	Case management, diagnostic tools, event-based surveillance, health facility and provider administration, infection prevention and control , laboratory systems, points of entry, risk communication and community engagement, routine surveillance, supply chain	Gates Foundation, Gavi, PATH	Blue Code, MOH, Ona, PATH, Zambia MCDSS	Open source	Subnational

■ Digital tools deployed for COVID-19 response
 ■ Opportunities to adapt tools for pandemic response

“We want to have a single vision of the truth using a data warehouse.”

—Sam Phiri, Zambian MOH

At a glance

Figure 2 shows that Zambia's digital health tools rely on different software licensing types for sustainability with open source being the most common. Figure 3 demonstrates that Zambia has 25 digital health tools deployed on a national scale while 30 operate on a subnational scale. These figures are not specific to COVID-19 response, but they provide an overall picture of Zambia's digital health infrastructure.

Figure 2. Software licensing types of Zambia's digital health tools.

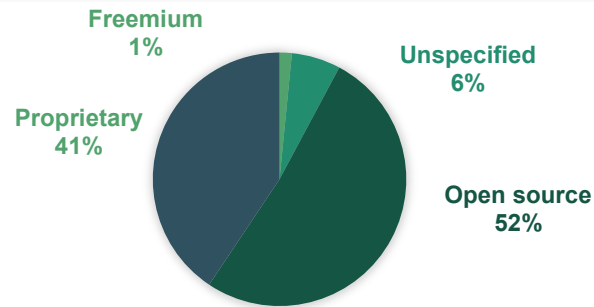
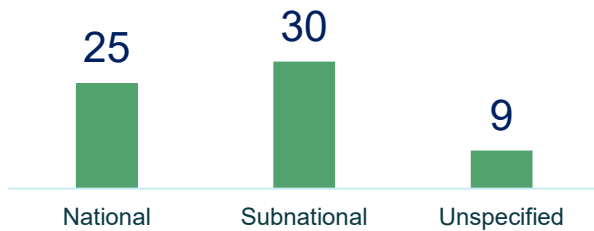






Figure 3. Number of digital tools deployed at scale in Zambia.



Conclusion

Digital Square mapped 64 existing, adaptable digital health tools in Zambia and matched them to help target investments to accelerate the country's COVID-19 response and simultaneously strengthen its health system. This brief underpins how critical it is to align funding to Zambia's existing digital health infrastructure to bolster its capacity to mitigate the effects of the current pandemic and prepare the country to respond to future outbreaks.

Take action

- 
Coordinate with all digital systems stakeholders to create a unified, robust digital health system that can strategically and rapidly be part of the ongoing COVID-19 response. It is paramount to support the government's lead and support its national digital health strategies and the tools it approves. Visit the [Digital Health Atlas](#) to see a complete, regularly updated snapshot of Zambia's digital health system. If you know of a digital system that is not identified in this brief, please add it to the [Digital Health Atlas](#).
- 
Reuse existing tools when possible. Do not invest in new systems if there are existing systems the government endorses that can effectively approach each of the pandemic use cases.
- 
Learn more about Zambia's digital health systems and their role in the COVID-19 response by reviewing Zambia's full Map and Match dataset.
- 
Apply GIZ's Assessment Tool for Digital Pandemic Preparedness to better understand the strengths and gaps in the country's COVID-19 response and to be well prepared for future disease outbreaks.

- 
Connect with additional relevant resources, including:

Digital Square continues to update its [wiki](#) with adaptations of Digital Square Global Goods and has a [COVID-19 resource page](#) that features hosted webinars that provide demos of tool adaptations.

The recently released [Global Goods Guidebook](#) (version 2.0) includes additional information about global goods deployment for COVID-19.

Map and Match's [project landing page](#) has many resources, including the Digital Applications and Tools Across an Epidemiological Curve, Global Goods Adaptations Across Use Cases, and other country briefs.

[Digital Solutions for COVID-19 Response](#), published by Johns Hopkins University, features digital platforms that have been adapted for COVID-19 case management and contact tracing needs. The assessment includes a review of nine tools that were selected based on their existing deployment, flexibility, and adaptability for COVID-19 use cases; their ability to support multiple languages; and stakeholder interest in how these applications can be leveraged in response to COVID-19.



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Annex 1. Abbreviations

Acronym	Definition
AI	artificial intelligence
CHAI	Clinton Health Access Initiative
CHW	community health worker
CIDRZ	Centre for Infectious Disease Research in Zambia
CT	computed tomography
DHIS2	District Health Information Software 2
DSME	Digital Solutions for Malaria Elimination
EDCTP	European & Developing Countries Clinical Trials Partnership
EMR	electronic medical record
eIDSR	electronic Integrated Disease Surveillance Response
FCDO	UK Foreign Commonwealth and Development Office
Gavi	Gavi, the Vaccine Alliance
HISP	Health Information Systems Programme
HMIS	health management information system
IPA	Innovations for Poverty Action
ITU	International Telecommunication Union
IVCC	Innovative Vector Control Consortium
IVR	interactive voice response
JSI	John Snow, Inc.
LMIS	logistics management information system
M&E	monitoring and evaluation
MCDSS	Zambia Ministry of Community Development and Social Services
MOH	Ministry of Health
MRRS	Malaria Rapid Reporting System
NCDs	noncommunicable diseases
NMEC	National Malaria Elimination Centre
Norad	Norwegian Agency for Development Cooperation

Acronym	Definition
NSDI	National Spatial Data Infrastructure of Zambia
ODK	Open Data Kit
PMI	US President's Malaria Initiative
RT-PCR	reverse transcription–polymerase chain reaction
SIAPS	Systems for Improved Access to Pharmaceuticals and Services
SIDA	Swedish International Development Agency
SMS	short message service
TB	tuberculosis
TREATS for Active TB	Tuberculosis Reduction through Expanded Antiretroviral Treatment and Screening
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
UTH HAP	University Teaching Hospital HIV/AIDS Program
VSO	Voluntary Service Overseas
WASH	water, sanitation, and hygiene
WHO	World Health Organization
ZNPHI	Zambia National Public Health Institute

Annex 2. Use case definitions

Category	Objective	Functional description
Case management	Systematic processing of suspected infected persons	Systems for documenting patient details and clinical interactions
Contact tracing	Reduction of epidemic reproduction rate	Identification and follow-up with people who have had high-risk interactions with infected persons
Coordination and operations (including emergency operations centers)	Preparedness and response plans, support for multisectoral responses	Systems to support cross-coordination for multisectoral response, emergency operations centers, and executing response plans
Data analytics, visualizations, and use	Efficient and effective response to validated outbreaks	Systems for enabling data-driven decision-making and communications to field teams
Diagnostic tools	Improve efficiency in clinical diagnosis and collection of data from diagnostic tools	Diagnostic tools with digital connectivity to support monitoring, documentation, and reporting of diagnoses
Event-based surveillance (including rapid response teams, case investigations)	Early detection of outbreaks and epidemics, case detection and investigation, national and subnational emergency operations to ensure rapid management of infectious disease	Systems with functionality or ability to monitor patterns indicative of infectious disease epidemic outbreak; systems to detect and document cases of emerging disease threats, investigate those threats, identify cases, and manage the response
Health facility and provider administration	Robust organizational underpinning for response	Systems for managing facility accounting and HR
Infection prevention and control	Prevent infection among patients and health workers	Systems that support triage, isolation, WASH, waste management to prevent transmission to staff, other patients, and the community
Interoperability	Improve effectiveness of tools	Provision of standardized interfaces to other software modules
Laboratory systems	Validation of infectious disease incidence	Systems with functionality to order lab tests, follow progress of patient sample, receive test results (confirm suspected case)
Learning and training	Support health worker readiness, including improve patient data collection and sample testing	Localized E-learning solutions for health workers and others
One Health	Prevent zoonotic disease outbreaks	Monitoring of potential vectors to humans by tracking infectious diseases in local wildlife and livestock
Points of entry	Detect and manage international spread of disease by identifying suspected infected persons at border entry points	Systems to strengthen border health security, screen, and follow-up with suspected infected persons at ports of entry and other border entry points
Risk communication and community engagement	Improved public awareness of facts and best practices for disease prevention	Systems for channeling messaging and communication to public to promote public awareness, counter misinformation, encourage treatment seeking behaviors, and encourage citizens to take appropriate actions to promote health
Routine surveillance	Routine health data monitoring to identify trends	Systems to manage health data and track trends on an ongoing basis, regardless of whether there is an outbreak or epidemic; systems usually include aggregate data
Supply chain	Support allocation of resources to aid in response	Systems for monitoring facility readiness and stock levels
Vaccine delivery and planning	Systematic monitoring of vaccinations in the population	Systems for documenting vaccinations for patients







Annex 3. Digital tools supporting vaccine deployment

Digital technologies can act as accelerators for the introduction, deployment, and scale-up of vaccines in countries to assist health workers, communities, and other stakeholders. The use of digital tools and the data they enable facilitate rapid, iterative, and scalable approaches to ensure vaccines are safely delivered to health facilities, that health workers are equipped to administer them, and that communities are informed and confident in their efficacy.

Through the Map and Match project, Digital Square mapped the existing functionality of approved global goods to COVID-19 use cases, including those supporting planning, delivery, administration, and monitoring of COVID-19 vaccines. These adaptations and supporting resources are listed on Digital Square's [wiki](#).

Table 3 illustrates how digital tools can support activities aligned to five use cases focused on vaccines. Digital Square has information about its approved global goods and how they align to these use cases currently as well as potential adaptations on its [website](#). This list does not include all digital public goods in the digital health ecosystem. Other tools like RapidPro and WelTel, which are not supported through Digital Square, can be included in these use cases.

Table 3. Global goods tools to support vaccine deployment use cases.

Description of vaccine deployment use cases	Digital Square approved global goods use cases
<p>Plan for vaccine introduction in country</p> <p>Digital tools can be used for planning and “microplanning” to inform how many vaccines are needed, where vaccines can be stored and monitored, who the most vulnerable populations are and where they are located, and other information essential to planning. Assessing the tools and data available throughout the health system, including patient data and health worker data, will inform this planning.</p> <p>As part of a vaccine introduction, governments need to build awareness of the vaccine and its benefits, and combat misinformation. Digital tools can be used for planning purposes to send messages to both health workers and communities about the vaccine.</p> <p>Training health workers is essential before introducing a new vaccine. Governments need to provide information to health workers on vaccine administration, possible side effects, and how to treat patients showing adverse reactions. Digital tools can be leveraged to rapidly share this information and offer virtual training.</p>	<p> Messaging</p> <p> Microplanning</p> <p> Training</p>
<p>Support vaccine introduction</p> <p>Digital tools can enhance the launching of a vaccination campaign. Communication tools like SMS and social media can support rapid information sharing with communities as the vaccine is made available.</p> <p>Pharmacies, hospitals, clinics, and other facilities use robust digital systems to ensure vaccines are stocked at facilities by tracking inventory and shelf life and ordering additional supplies when needed. Digital tools can manage the transactional movements of vaccines within multilevel supply chains. Supply chain systems can also ensure that syringes, diluents, and other materials needed for vaccine delivery are stocked.</p> <p>Digital tools can support temperature monitoring during transport and where vaccines are stored. Remote temperature monitoring can improve cold chain performance, giving health workers assurance that vaccines are safe and effective.</p> <p>Digital tools can track when clients receive vaccines as well as other data fields (e.g., vaccine type, immediate negative reactions, and longer-term potential adverse events). Countries can adapt existing electronic immunization registries (EIRs) for vaccine monitoring and follow-up.</p>	<p> Patient monitoring</p> <p> Supply chain</p> <p> Vaccine management</p>

Digital Square approved global goods use cases



Electronic immunization registries

DHIS2 Tracker, OpenSRP, OpenMRS, Tamanu



Messaging

CommCare, Community Health Toolkit, mHero, OpenSRP



Microplanning

Healthsites, OpenSRP, Reveal



Patient monitoring

CommCare, DHIS2 Tracker, OpenSRP, SORMAS



Supply chain

DHIS2, OpenLMIS, Logistimo, OpenBoxes, Product Catalogue Management Tool



Training












CommCare, Community Health Toolkit, mHero, OpenSRP, SORMAS



Vaccine management

CommCare, Community Health Toolkit, DHIS2, DHIS2 Tracker, Logistimo, OpenBoxes, OpenLMIS, OpenSRP, Tamanu

Table 3. Global goods tools to support vaccine deployment use cases, continued.

Description of vaccine deployment use cases	Digital Square approved global goods use cases
<p>Enhance roll-out of vaccine, support ongoing vaccine monitoring</p> <p>In this phase, scaling to vaccinate large portions of the population is a priority. Vaccine roll-outs can be enhanced by adapting digital tools to add workflows and functionality as vaccine coverage expands. Governments need to consider additional information communications technology (ICT) needs like larger cloud-hosting services and use of tools that are operational offline for areas that have limited mobile network coverage.</p> <p>Supply chain is critical as vaccines are transported to more sites across the country. Digital supply chain tools, especially when paired with vaccine delivery data (e.g., from electronic medical records/EIRs), can help forecast supply needs and include decision support to prompt vaccine orders when supply falls below a defined threshold.</p> <p>EIRs and other tools can help prevent overcrowding in clinics by scheduling specific clinic times for vaccines. This ensures more equitable distribution of health services.</p>	<ul style="list-style-type: none">  EIRs  Supply chain  Patient monitoring  Vaccine management
<p>Enhance communication to sustain vaccine demand</p> <p>Many COVID-19 vaccines are multi-dose shots. To ensure clients receive boosters, now and in the future, enhancing communication to sustain demand for the vaccine is important. Digital tools can be used to send messages to both health workers and communities about the vaccine. Communication tools can be linked with patient monitoring tools to automatically trigger direct communication to clients. Digital tools can continue to be used to increase vaccine demand and address misinformation, dispelling rumors and misinformation that cause vaccine hesitancy.</p> <p>Many EIRs include contact information and messaging features for patients' caregivers, allowing for direct communication to caregivers. These messaging features have historically been used to notify caregivers about upcoming immunization sessions or overdue vaccines. As the global community develops a greater understanding of COVID-19—including its transmission patterns, full range of symptoms, and treatment options—health workers also have the ability to share health promotion messages with patients.</p>	<ul style="list-style-type: none">  EIRs  Messaging  Patient monitoring
<p>Use data to inform vaccine-related decisions</p> <p>Patient monitoring and tracking tools as well as EIRs can help generate meaningful insights for future vaccination efforts and encourage data-driven decisions when countries are able to plan for catch-up campaigns. For example, some EIRs can quantify the number of missed vaccines and determine which areas have been under-vaccinated. This individual-level data will enable decision-makers to target immunization services and allocate funding to those areas most in need. For more information, this publication explains how Gavi and UNICEF are working to scale up use of digital tools for vaccination campaign performance monitoring.</p> <p>Interoperability is critical. As governments review the portfolio of tools and systems that are in place to support vaccine management, it is crucial that there is strong consideration given to the movement of data between systems to ensure a harmonized set of records for the population. This ensures that no individual is missed or counted twice.</p>	<ul style="list-style-type: none">  EIRs  Patient monitoring  Supply chain  Vaccine management

Digital Health Center of Excellence (DICE) to support the COVID-19 pandemic response

As countries operationalize their COVID-19 vaccine rollout plans, there is an opportunity to identify areas where digital health interventions can amplify these efforts, while improving service delivery and strengthening health systems more broadly.

The success of digital health solutions often correlates with the strength of the enabling environment for these technologies, such as ICT infrastructure readiness, workforce capacity, data standards, interoperability, and the policy and regulatory environment. Poorly designed or inappropriate digital interventions, as well as vertical approaches geared only toward COVID-19, risk undermining and ultimately weakening national systems.

To more effectively organize support to countries for COVID-19 response, a multiagency COVID-19 DICE, with a UNICEF-WHO cohosted secretariat, will launch in April 2021. The DICE will provide coordinated technical assistance to low- and middle-income countries to support sustainable and scalable deployment of carefully chosen digital health solutions that support COVID-19 pandemic response plans.

Areas the COVID-19 DICE covers include:

- Support countries to conduct a structural readiness assessment of their enabling environment, define business requirements, conduct platform analysis, and map partnerships, existing tools, and gaps. Along with support to countries, this will require standardizing approaches and tools across development partners.
- Coordinate surge support to countries to assist in their development of a rapid strategic approach to meet the imminent needs of the vaccine delivery and transition to a sustainable strengthened and digitally enabled health system.
- Foster capacity and partnership with regional and national digital health experts toward the development of capacity that can provide long-term technical support to the region.
- Strategically support developers and product owners to modify and optimize software products relevant for pandemic response and vaccine delivery toward interoperability, standardization, and vaccine-specific functionalities.
- Complement and operationalize WHO and UNICEF guidelines developed in the context of the Access to COVID-19 Tools Accelerator (ACT-A) to further clarify and identify mature options open to countries building health infrastructure.
- Support the transition, alignment, and integration of COVID-19-related digital health investments through a systems strengthening lens.
- Pilot and assess transformative approaches to digital health deployments, monitor global developments and opportunities for standardized approaches, increase south-south knowledge transfer, and compile lessons learned.