

Digital health systems to support pandemic response in Niger

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

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Introduction

Niger's Ministry of Health (MSP) outlines its vision to use information and communications technologies (ICTs) effectively in all rural, landlocked areas by 2030 to improve the health of the Nigerien population in its Stratégie Nationale E-Santé 2019–2023. The document acknowledges the existing health equity gap between the capital and remote areas that can be lessened by the strategic use of ICTs. Niger intends to use ICTs at all levels of the health system to ensure reliable, secure, and up-to-date health information is available and used to improve the quality and accessibility of health care for all. The COVID-19 pandemic intensified the need for all Nigeriens to be able to access high-quality care. Leveraging digital health tools is a rapid, cost-effective strategy to accelerate Niger's COVID-19 response while at the same time reinforcing the vision in the MSP's national eHealth strategy.

Background

Digital Square conducted a landscape analysis of Niger's digital systems in the ten-year period from 2010–2020 with information validated by tool implementers and designers, digital health experts, and MSP stakeholders as part of the USAID-funded Map and Match project. The purpose was to identify the existing digital tools utilized in Niger, 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 Niger's health system uses 15 digital health tools, with at least 9 already deployed for COVID-19 response. This brief identifies opportunities for existing digital tools to be adapted to pandemic use case needs for the COVID-19 response and potential future epidemics. Mapping tools to the use cases revealed where there are strengths and opportunities in Niger's digital health systems response to COVID-19. Many use case gaps exist in the pandemic response, including tools to support diagnostics, health facility and provider administration, infection and prevention control, learning and training, One Health, supply chain, and vaccine delivery and planning. Strategic adaptation of existing digital health tools to fill these gaps, where possible, will accelerate the country's 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 Niger.



Figure 1 illustrates that number of digital health tools that currently address each pandemic use case as part of Niger's COVID-19 response.

Table 1. Mapping and matching digital health tools to strengthen Niger’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 system is supporting Niger’s COVID-19 response. Digital Square matched opportunities for tool adaptation across the pandemic use cases in **green** to reveal places where Niger 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	Community Health Toolkit	Blue	Green	Blue		Green	Green	Green		Green		Blue	Green	Green		Green
	Coronavirus.ne											Blue				
	Country HMIS (DHIS2)	Blue	Blue	Green		Blue			Green		Green	Green		Blue	Green	Green
	DataToCare			Blue					Blue					Blue		
	ISS (Integrated Supportive Supervision) (ODK)					Blue										
	Logiak	Blue														
	Plateforme de suivi des contacts des cas de COVID-19	Blue	Blue													
	Viamo’s 3-2-1 Service												Blue			
	VigiFlow					Blue										
	Amplio Talking Book												Green			
	AVADAR (Auto-Visual AFP Detection and Reporting) (ODK)					Green										
	CommCare		Green	Green		Green			Green						Green	
	mSupply, mSupply ColdChain & mSupply mobile vaccines			Green											Green	Green

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

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 nine use case gaps. Digital Square performed key informant interviews to learn more about the use case gaps and Niger’s priorities. For example, MSP communicated that health facility and provider administration, defined as a system for managing facility accounting and human resources, is currently paper based in Niger and that the country would like to move to using an open source digital health tool that is interoperable with its existing digital health systems. Many of the tools below that can be adapted for COVID-19 response can be streamlined 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.

Diagnostic tools		One Health	
Country HMIS (DHIS2)		Country HMIS (DHIS2)	
Health facility and provider administration		Points of entry	
Community Health Toolkit		Community Health Toolkit	Country HMIS (DHIS2)
Infection prevention and control		Supply chain	
Community Health Toolkit		CommCare	Country HMIS (DHIS2)
Laboratory systems		mSupply, mSupply ColdChain, and mSupply mobile vaccines	
DataToCare	CommCare		
Country HMIS (DHIS2)		Vaccine delivery and planning	
Learning and training		Community Health Toolkit	Country HMIS (DHIS2)
Community Health Toolkit		mSupply, mSupply ColdChain, and mSupply mobile vaccines	

“The MSP has a national strategic plan. Our challenge is executing and scaling this plan for the entire population. As a landlocked country, Niger has a big difference in equity of care across the country, with those in the capital having better quality and access to care than those 1,000 kilometers away. Telemedicine has greatly improved this equity gap. In many cases, even if someone is 1,000 kilometers away, they can still get the health care they need. Our goal is to provide all health centers with adequate tools to continue closing this equity gap.”

—Mamane Alassane Ahmed, Niger’s MSP

Example of a global good deployed and ready for adaptation to support COVID-19 response in Niger

Community Health Toolkit

Community Health Toolkit (CHT) is a collection of open source technologies and open access design, technical, and implementer resources and is a community of practice for digitally supported care delivery. It is designed to support community health systems and teams delivering care in the hardest-to-reach communities. Medic Mobile serves as the technical lead and initial steward—building and supporting the CHT as a global public good and facilitating contributions from others.

CHT-powered tools are supporting COVID-19 response efforts in the Democratic Republic of the Congo, Kenya, Malawi, Mali, Nepal, and Niger among others. CHT supports adaptations to primary care in response to COVID-19. CHT provides a remote training on COVID-19 for community health workers. CHT delivers routine health checks for community health workers, including mental health, well-being, and regarding adequate protective equipment.

11
PANDEMIC
USE CASES

3
USE CASES
UTILIZED

11
ADAPTATION
OPPORTUNITIES
IDENTIFIED

- Case management
- Coordination and operations
- Contact tracing
- Event-based surveillance
- Health facility and provider administration
- Infection prevention and control
- Learning and training
- Points of entry
- Risk communication and community engagement
- Routine surveillance
- 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
Community Health Toolkit (CHT)	CHT is a collection of open source technologies and open access design, technical, and implementer resources and is a community of practice for digitally supported care delivery. It is designed to support community health systems and teams delivering care in the hardest-to-reach communities. The CHT adapted for COVID-19 response to better facilitate investigation of COVID-19 alerts, as well as to effectively triage to ensure that those most at risk can access appropriate care in a timely manner.	Case management, contact tracing, coordination and operations, event-based surveillance, health facility and provider administration, infection prevention and control, learning and training, points of entry, risk communication and community engagement, routine surveillance, vaccine delivery and planning	CDC, Epicentre, Gates Foundation, Global Fund, Johnson and Johnson, MSF, World Bank	Epicentre Research, Medic Mobile, MSF Foundation, MSP,	Open source	National
Coronavirus.ne	This is an interactive website of information that enables follow-up of COVID-19 cases in real time.	Risk communication and community engagement				National
Country HMIS (DHIS2)	DHIS2 is an open source, web-based platform that serves as Niger's national health information system. It enables data management and analysis, health program monitoring and evaluation, service availability mapping, and logistics management. Niger's instance includes a facility registry. DHIS2 supports the collection, analysis, visualization, and sharing of both aggregate and individual-level data, including mobile and offline data collection using the DHIS2 Android app. For COVID-19 response, DHIS2 is used to accelerate case detection, situation reporting, and active surveillance.	Case management, contact tracing, coordination and operations, event-based surveillance, laboratory systems, One Health, points of entry, routine surveillance, supply chain, vaccine delivery and planning	DHIS2, Gavi, Global Fund, MSP, Norad	DHIS2, HISP West Africa, ICF, Measure Evaluation, MSP	Open source	National
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 Niger 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.	Coordination and operations, laboratory systems, routine surveillance		Savics, WHO		Subnational
ISS (Integrated Supportive Supervision) (ODK)	ISS is an electronic checklist used for supervision during active case search and routine immunization.	Event-based surveillance			Open source	National
Logiak	Logiak is a tool used for screening, triage, and management by the MSF's COVID-19 hospital.	Case management		MSF	Proprietary	Subnational
Plateforme de suivi des contacts des cas de COVID-19 (COVID-19 case contact tracking platform)	Niger's surveillance management uses this platform at the central level to collect information about COVID-19 cases. Health workers input information about patients with COVID-19 into the platform.	Case management, contact tracing				
Viamo's 3-2-1 Service	Viamo's flagship product, the 3-2-1 Service, is a free information service available in 18 countries globally. Users can access prerecorded audio messages in local languages for free. Users can also play interactive audio games, which are engaging, pathway-based games that allow them to think through decisions on relevant topics. Niger used Viamo's 3-2-1 service to deliver COVID-19 prevention messages through communication campaigns to 1,720 beneficiaries.	Risk communication and community engagement		Viamo, World Vision		

 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
Amplio Talking Book	The Amplio Talking Book is a rugged, battery-powered audio device for low-literate adults and youth that delivers local language messaging. Governments and development organizations use Talking Book to amplify their reach and share knowledge in rural remote communities. Talking Book overcomes barriers such as lack of infrastructure, illiteracy, and traditional gender norms and biases that often limit access to information. Talking Book has a cloud-based technology platform, an app to load new content and collect usage data and user feedback in the field, and a dashboard for monitoring and evaluating data for each community.	Risk communication and community engagement	ANSI, ITU, World Bank	Amplio, ANSI, government	Proprietary	Subnational
AVADAR (Auto-Visual AFP Detection and Reporting) (ODK)	AVADAR is an SMS-based mobile technology innovation to improve completeness, timeliness, and availability of acute flaccid paralysis (AFP) reporting data. AVADAR widens the net of disease reporters, making data available in near real time, sending automatic case alerts to disease surveillance officers, and automatically aggregating and visualizing case alerts and investigations on a dashboard.	Event-based surveillance	Gates Foundation	eHealth Africa, Novel-T Solutions	Proprietary	
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.	Contact tracing, coordination and operations, event-based surveillance, laboratory systems, supply chain		Dimagi, REGIS-ER, Tdh, URC Benin, World Vision	Open source	Subnational
mSupply, mSupply ColdChain, and mSupply mobile vaccines	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	Chemonics, The mSupply Foundation, USAID	Chemonics, The mSupply Foundation	Open source	Subnational

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“Internal infrastructure is a problem. We want to use digital health tools, but there are places where Niger lacks electricity, digital network signal, and/or the telecommunications systems needed to use them.”

—Mamane Alassane Ahmed, Niger’s MSP

At a glance

Figure 2 shows that Niger's digital health tools rely on different software licensing types for sustainability. Figure 3 demonstrates that Niger has six digital health tools deployed on a national scale while six operate on a subnational scale. These figures are not specific to COVID-19 response, but they provide an overall picture of Niger's digital health infrastructure.

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

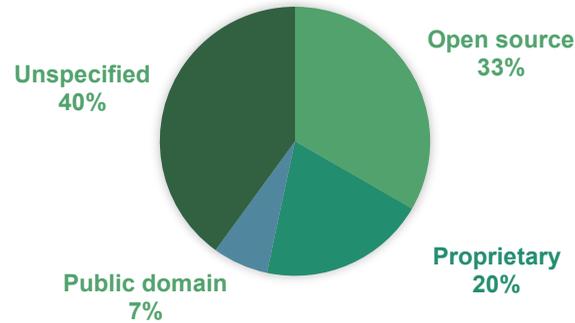
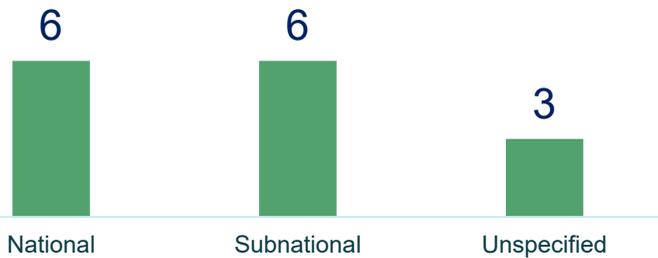


Figure 3. Number of digital tools deployed at scale in Niger.



Conclusion

Digital Square mapped 15 existing, adaptable digital health tools in Niger. The analysis found gaps in use cases and several opportunities where existing tools can meet these gaps to support the country's COVID-19 response and simultaneously strengthen its health system. This brief underpins how critical it is to align funding to Niger'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 Niger'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 Niger's digital health systems and their role in the COVID-19 response by reviewing Niger'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.

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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
AFP	Acute Flaccid Paralysis
ANSI	L'Agence Nationale pour la Société de l'Information/National Agency for the Information Society
AVADAR	Auto Visual AFP Detection and Reporting
CDC	Centers for Disease Control and Prevention
CMAM	Community-Based Management of Acute Malnutrition
DHIS2	District Health Information Software 2
EMR	electronic medical record
Gavi	The Vaccine Alliance
ICF	International Finance Corporation
ICTs	information and communications technologies
ITU	International Telecommunication Union
MSF	Médecins Sans Frontières/Doctors without Borders
MSP	Ministry of Public Health
Norad	Norwegian Agency for Development Cooperation
ODK	Open Data Kit
REGIS-ER	Resilience and Economic Growth in the Sahel – Enhanced Resilience
SMS	short message service
Tdh	Terre des hommes
UNICEF	United Nations Children's Fund
URC	University Research Co., LLC
USAID	United States Agency for International Development
WHO	World Health Organization

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.