

Mapping of Digital Health Tools and Technologies: **Somalia Country Brief**

April 2022



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Joint regional mapping of digital health tools
and technologies for Reproductive, Maternal,
Newborn, Child and Adolescent Health

WHO EMRO

UNFPA ASRO

UNICEF MENARO

Table of Contents

Abbreviations and Acronyms	4
Overview	6
Introduction	6
Methodology	6
Analysis Overview	7
Digital Health Tools and Technologies	8
DHIS2	8
OGOW EMR	11
Integrated Disease Surveillance and Response (IDSR) Somalia	12
Electronic Disease Early Warning System (eDEWS)	13
Vital Registration System	13
Free Press Unlimited (RapidPro)	14
Toto Health	14
Auxiliary tools	15
Enabling Environment	17
Infrastructure	17
Leadership and Governance	17
Legal Framework for Data Protection and Security	17
Laws or Regulations for Privacy, Confidentiality, and Access to Health Information	17
Mechanism to monitor/ measure the implementation of digital solutions on RMNCAH including specific indicators	17
The Way Forward	18
Appendix: Use Case Definitions	19
Additional Resources	22

Abbreviations and Acronyms

ANC	Antenatal Consultation
AVF	Africa's voices Foundation
CHW	Community Health Worker
CO	Country Office
COD	Common Operational Datasets
CRVS	Civil Registration and Vital Statistics
DHA	Digital Health Atlas
DHIS2	District Health Information System 2
DIAL	Digital Impact Alliance
DICE	Digital Health Center of Excellence
DIIG	Digital Implementation Investment Guide
eDEWS	Electronic Disease Early Warning System
EIR	Electronic Immunization Record
EMR	Electronic Medical Record
FHW	Frontline Health Worker
HF	Health Facility
HMIS	Health Management Information System
HNQIS	Health Network Quality Improvement System
IDSR	Integrated Disease Surveillance and Response
INGO	International Non-governmental Organization
LMIS	Logistics Management Information System
MOH	Ministry of Health
NGO	Non-governmental organization
NICU	Neonatal Intensive Care Unit
RCCE	Risk Communication and Community Engagement
RMNCAH	Reproductive, Maternal, Newborn, Child, and Adolescent Health
RO	Regional Office
SBA	Skilled Birth Attendant
UN	United Nations
UNFPA	United Nations Population Fund
UNICEF	United Children's Fund
USAID	United States Aid

WB World Bank

WHO World Health Organization

Overview

Introduction

Somalia is one of the most fragile and vulnerable countries in Africa and has suffered protracted conflicts, longstanding war, and political instability, all of which have weakened the health system in the country. Somalia has different, and sometimes complex political entities, adding to the complexities already existing in the country¹. In recent years, the Ministry of Health (MOH) has sought to strengthen the healthcare system through the deployment of digital health tools, and most recently the District Health Information System 2 (DHIS2) is being rolled out at national scale in a comprehensive manner.

The current COVID-19 pandemic has only more acutely brought forth the urgency of the presence of a strong and integrated digital health ecosystem. It has also brought forth the urgency of the presence of a strong and integrated digital health ecosystem because this pandemic has necessitated the use of alternative mechanisms for delivering essential Reproductive, Maternal, Newborn, Child, and Adolescent Health (RMNCAH) and reaching the affected populations. The need to reduce unnecessary face-to-face contact with health care providers and the increased demand for many innovations that could offer safer and better-quality health services has been increasing.

From the perspective of RMNCAH, the aim of this mapping is to chart and review the situation on the use of digital solutions in RMNCAH program implementation, utilization, and provision of RMNCAH services and its enabling environments such as digital health infrastructure in the member states of the World Health Organization (WHO) Eastern Mediterranean Region (also including countries covered by United Nations Population Fund (UNFPA) Arab States Regional Office) and UNICEF Middle East and North Africa Regional Office and to find about opportunities for effective adoption, integration, and scale-up of digital solutions in RMNCAH so that women, mothers, newborn babies, children, and adolescents can reach and utilize essential RMNCAH services and health care providers can provide those services effectively and efficiently while they protect their own safety in the context of COVID-19 and beyond. Following this overview, this report presents the digital health tools that are in use in Somalia with details of their usage and scale, and, where available, information about implementing agencies, donors, etc; briefly presents the enabling environment for digital health in Somalia; a proposed path forward; and a word of acknowledgement. The report concludes with appendices that provide additional resources and information.

Methodology and Analysis Overview

A joint regional questionnaire for mapping has been developed based on the UNICEF Digital Health Mapping tool, WHO AFRO “Understanding the use of digital health for mitigating the effects of COVID-19 on continuity of essential SRMNCAAH services” and Global Digital Health Index.

The main sources of information are the personnel working at each WHO/ UNFPA/ UNICEF country office along with other main actors and champions in the field of digital health in the country including the Ministry of Health. The questionnaire has been sent out from UNICEF MENARO focal point on behalf of three organizations to the country focal points (RMNCAH and digital health). At the country level, one focal point should be assigned as a team lead to follow up the process. The country office colleagues communicate internally and among the organizations before jointly reaching out to the Ministry of Health about this mapping. The

¹ https://drive.google.com/file/d/1IGtR426_d9F11hvMP4YHV3i4Dg6VK1_z/view?usp=sharing

county could choose 1) doing an online interview with all relevant stakeholders (UNICEF HQ and MENARO conduct the interview), 2) filling out the questionnaire by all relevant stakeholders using a face-to-face meeting (including relevant technical working group) or 3) filling out the questionnaire shared online. The content should be answered, reviewed and endorsed by the Ministry of Health, WHO, UNFPA, UNICEF, and other relevant stakeholders in the country.

Somalia opted for option 1) and UNICEF MENARO and Headquarter did an online interview with colleagues at UNICEF Somalia's country office (CO), UNFPA Somalia's CO, WHO Somalia's CO. After the interview, UNICEF MENARO and Headquarter requested the COs to review and ask MOH partners and other relevant stakeholders to review the contents during the fourth quarter of 2021 and first quarter of 2022. The information gathered was supplemented with data (when available) from the World Bank's Digital Health Landscaping assessment, the [Map & Match exercise](#) by Digital Square, the [Digital Health Atlas \(DHA\)](#), [INVENT](#), and the [Digital Impact Alliance \(DIAL\) Catalog of Digital Solutions](#). The collated data was entered in the [Mapping of Digital Health Tools and Technologies tool](#).

There are 7 digital health implementations currently being used in Somalia, four of them are implemented at the national level and three at the subnational level. Two of them (DHIS2 and RapidPro) are considered [global digital public goods](#) while the rest are either proprietary tools or custom-made.

Strengths

- There is a strong commitment from Somalia's MOH to invest in modernizing their health management information system.
- DHIS2 is being scaled up and applied to multiple use cases seeking to establish a strong, coherent, and interoperable digital health ecosystem.

Gaps

- Although the implementation of DHIS2 is comprehensive and will likely be strong, Somalia still lacks a digital health strategy that can guide the long-term efforts of establishing a mature and interoperable digital health ecosystem.
- It is acknowledged that the mapping tool reflects the knowledge of the stakeholders included in the interview(s) and may be excluding systems not known to them. It would be imperative to engage with all organizations operating in the health space for a more comprehensive view.

Opportunities

- Develop a digital health strategy that can guide the long-term digital health vision for Somalia.
- Continue to consider the potential advantages of adopting systems that are considered global digital public goods as new tools are being implemented.
- Continue to invest in human resources capacity and infrastructure.
- Foster coordination with other UN agencies, INGOs, and entities engaged in digital health interventions as well as with the MOH to ensure a more comprehensive mapping of the digital health ecosystem

Digital Health Tools and Technologies

National	Subnational
<ul style="list-style-type: none"> • DHIS2 • Integrated Disease Surveillance and Response (IDSR) Somalia • Electronic Disease Early Warning System (eDEWS) • Free Press Unlimited (RapidPro) 	<ul style="list-style-type: none"> • OGOW EMR • Vital Registration System • Toto Health

Digital Health Tool	DHIS2
Description	<p>DHIS2 is used as a national health information system platform for integrated data management and analysis for program monitoring and evaluation in 70+ countries. It is primarily used for reporting and analysis of routine health data; but also serves as a de facto facility registry, can be deployed for service availability mapping and other periodic survey activities, and as a data warehouse to facilitate integrated analysis. Increasingly, it is also used as a 'last-mile' solution for logistics monitoring, particularly at health facility level.</p> <p>DHIS2 comes with three data models 1) aggregate, 2) single events (e.g. for line-listing data) and 3) longitudinal tracking of any entity (patient or otherwise) over time. The core DHIS2 software includes a number of web apps for data capture, analysis, reports, maintenance, user management, data quality, etc. The tracker model supports use cases such as case-based surveillance and patient follow-up and can be used in tandem with other data models. In addition, an Android app is a core component of the platform to enable out-of-the-box mobile data collection with no interoperability layers required. A DHIS2 Android Software Development Kit (SDK) enables developers to customize mobile application interfaces that integrate natively with DHIS2, supporting all three data models (aggregate, event, tracker). DHIS2 is entirely generic and configurable through a web interface, which means it can be used for any number of use cases.</p> <p>In Somalia, DHIS2 collects data on individual clients as part of the IDSR and HIV Tracker, information on curative services, information on preventive services, resource management including inventories (staff list, health facility list including health services provided, cold-chain equipment), logistics and commodities.</p> <p>In terms of the inventories, DHIS2 in Somalia includes a master facility list that also details the health services provided. This list will be updated at least once a year and survey data such as SARA as well as data from supervision visits. In addition, each health facility will also be required to complete an HR module each quarter which will then update staff</p>

numbers for each staff category at health facility level.

In Somalia, DHIS2 platform will also provide staffing levels per staff category at health facility level (number of staff (MD, Nurse, Midwife, Cleaner, etc.) on a quarterly basis. Although this will include information on qualifications, staff names or any other personal details will not be collected / available.

It is also linked to the Health Network Quality Improvement System (HNQIS), an Android-based application that supports Regional / District Health Officers / Program Managers in their supportive supervision visit activities. It is composed of 4 modules: 1) plan supervision visits (a prioritization matrix compares a facility's patient volume along with their competency class to determine where managers should prioritize their support to maximize the impact of their supervision), 2) assess health providers' quality against clinical standards (managers conduct assessments by way of checklists which are developed and benchmarked based on national quality standards), 3) improve providers' quality of care through tailored feedback based on clinical rationale to promote behaviour change (real-time scoring and auto-populated action plans ensure the most critical areas of improvement are addressed immediately). Action plans can also be shared with the provider via email, SMS, WhatsApp, etc.), and 4) monitor facility performance and the status of action plans through dashboards that are built into the app. More information about the HNQIS app can be found [here](#).

<u>Current Use Case(s)</u>	Health Management Information System (HMIS), Community Based Information System, HIV Registry, Logistic Management Information Systems (LMIS), Cold Chain Equipment Monitoring, Public Health and Disease Surveillance System, Health Worker Registry, Master Facility Registry, Data Visualization, Social Monitoring
Scale	National
Implementer(s)	MOH
Donor(s)/Funding Source	UNICEF(Global Fund), World Bank
Licensing	Open Source
Website	https://dhis2.org/
Covid-19 Specific Functions	<p>Digital packages for COVID-19 capitalize on the core functionality of DHIS2 and the DHIS2 Android Capture app to support COVID-19 surveillance and response activities. COVID-19 metadata packages are modular and can be installed together or separately in a country's DHIS2 system:</p> <p>COVID-19 Case-based surveillance [tracker data model]: enrols & tracks suspected cases; captures symptoms, demographics, risk factors & exposures; creates lab requests and captures laboratory data about the case; links confirmed cases with contacts, and monitors patient outcomes. This package can be installed as a standalone COVID-19</p>

	<p>form or can be integrated into a country's existing integrated disease surveillance & response tracker.</p> <p>Contact registration & follow-up program [tracker data model]: strengthens active case detection through contact tracing activities, such as identification and follow-up of contacts of a suspected or confirmed COVID-19 case.</p> <p>Ports of Entry screening & follow-up program [tracker]: enrolls travellers who have visited high-risk locations at Ports of Entry for 14-day monitoring and follow-up.</p> <p>COVID-19 Surveillance Event Program [event]: a simplified line-list that captures a subset of minimum critical data points to facilitate rapid analysis & response, particularly useful when caseloads or burden of reporting exceeds capacity for case-based surveillance tracker</p> <p>COVID-19 Aggregate Surveillance [aggregate]: an aggregate reporting dataset that captures minimum necessary data points for daily or weekly reporting. Core DHIS2 functionality to support COVID-19 includes longitudinal tracking of suspected and confirmed COVID-19 cases (through Tracker data model), line-listing (through Event data model), alerts & notifications (e.g. thresholds), working lists, DHIS2 Android App for seamless mobile data capture, automated dashboards, on-the-fly calculation of key indicators and data-push features for exporting and sharing COVID-19 data.</p>
RMNCAH Functions	<p>RMNCAH indicators are collected monthly.</p> <p>The following indicators are collected through the HMIS:</p> <ul style="list-style-type: none"> • Number of live births • Number of maternal deaths (upcoming) • Number of pregnant women who attended 1st antenatal consultation (ANC) • Number of pregnant women who attended 4th ANC • Number of total deliveries (currently, the system only provides the number of assisted deliveries in health facilities. Going forward, the number of assisted deliveries both at health facility (HF) level (Hospital / HC) and at home will be recorded. Currently, all deliveries recorded in DHIS2 have been assisted by skilled birth attendants (SBAs); the unassisted deliveries are not recorded at present. Going forward, FHWs / CHWs will record deliveries / babies born without assistance as part of community services & reporting and the data will be available on DHIS2) • Number of delivery with cesarean section • Number of newborn deaths (upcoming) • Number of newborns who received early postnatal care in first 48 hours • Number of under-five deaths • Number of newborns who are admitted to neonatal intensive care unit (NICU) (upcoming) • Under-five mortality rate/ number of under-five deaths (upcoming) • Number of children under 5 with diarrhea who received treatment according to national guidelines (upcoming) • Number of children under 5 diagnosed with pneumonia that were treated with antibiotics (upcoming)

The LMIS module encompasses all medicines listed in Somalia's essential medicines list which was drafted with WHO assistance based on WHO guidelines.

The Health Worker Registry module has data on

- Obstetricians
- Pediatricians
- Midwives
- Nurses
- Healthcare providers' continuing education training

The Master Facility Registry module includes information on the number of beds in delivery rooms, NICU, and pediatric wards.

Digital Health Tool	OGOW EMR
Description	<p>OGOW EMR was designed to improve the delivery of immunizations in Somalia by empowering and equipping practitioners and caregivers with digital solutions that are easy to use, customizable and in the Somali language. The solution is owned by OGOW EMR, a Somali based for-profit social enterprise startup.</p> <p>OGOW EMR is an award-winning e-health system that aims to rebuild Somalia's medical system through the implementation of a community and caregiver centred e-health program. OGOW EMR is designed to improve patient access to records, enhance understanding and adherence to healthcare plans, and build patient trust in health systems through innovative and community-centric methods. The system exists as a desktop and mobile app for storing medical records and creating a medical inventory of patient information. OGOW EMR's system is highly customizable, and in addition to basic health information for the patient, it possesses an immunization component allowing for an individualized immunization schedule and SMS Nudge Program. This component stores a digital copy of a case's immunization records, along with a calendar schedule for adherence, and informational/educational materials about immunization and its benefits.</p> <p>In addition to the electronic application component of the system, it also has a community-centred workshop component, composed of modules aimed at training and creating community champions to support local education and increase initial uptake and subsequent adherence to the system. OGOW EMR strengthens health systems and policy, enhances conditions that promote health, and builds community capacity to ensure equitable health opportunities for all.</p> <p>Additionally, OGOW EMR offers organizations a customized portal and dashboard intended to make strategic and effective use of quantitative and qualitative data to monitor, learn, and communicate health surveillance key measures and metrics.</p> <p>Currently only supporting immunization and defaulter tracking only. Not scaled up for non-immunization use cases.</p>

<u>Current Use Case(s)</u>	Electronic Medical Records (EMR), Electronic Immunization Record (EIR)
Scale	Subnational (Puntland)
Implementer(s)	-
Donor(s)/Funding Source	-
Licensing	Proprietary
Website	https://ogowhealth.com/
Covid-19 Specific Functions	In an effort to support Somalia's preparedness and response to COVID-19, OGOW HEALTH launched a feature within our mobile health application to address concerns, misinformation and rumours around the novel coronavirus (Covid-19). The tool includes a contextualized self-assessment video. This was a participatory process of co-creation that had input from the government, humanitarian actors, the private sector and academia. All of the content has been endorsed by the Somali government, and it can also be found in the official Repository of COVID-19 Resources under the joint coordination body between the Ministry of Health and the UN, the Risk Communication and Community Engagement (RCCE) taskforce
RMNCAH Functions	-

Digital Health Tool	Integrated Disease Surveillance and Response (IDSR) Somalia
Description	Integrated Disease Surveillance and Response (IDSR) is a systematic data management system that supports surveillance and response of epidemic-prone diseases, diseases targeted for eradication/ elimination and selected diseases of public health importance within the IDSR strategy. It is perceived as being part of the HMIS. In Somalia, IDSR will be launched as part of the new DHIS2 platform and collect data via the IDSR tracker app as well as daily and weekly mobile reporting via an IDSR android app.
<u>Current Use Case(s)</u>	Public Health and Disease Surveillance System
Scale	National
Implementer(s)	MOH
Donor(s)/Funding Source	UNICEF (integration into DHIS2) WHO (supporting the operational costs)
Licensing	-
Website	-

Covid-19 Specific Functions	-
RMNCAH Functions	-

Digital Health Tool	Electronic Disease Early Warning System (eDEWS)
Description	<p>The Electronic Diseases Early Warning System (eDEWS) is a health facility-based disease surveillance system using electronic tools and platform for effective data collection, management, analysis and visualizations using a dashboard. It is used for outbreak detection including immediate alert reporting, investigation, timely response and weekly data collection. It is an initiative that promotes the use of data and information system standards to advance the development of efficient, integrated, and interoperable surveillance systems at all levels. A primary goal of eDEWS is to capture data using mobile software and secure automatic electronic transmission and analysis of data, alert generation and dissemination of information to main stakeholders.</p> <p>In Somalia, the MOH has decided to abolish all parallel health reporting once the new DHIS2 platform goes live. This includes the WHO EWARN system, meaning IDSR data will only be reported via DHIS2 from QTR1/2, 2022 onwards and the “old” EWARN data will be imported and become available via the new DHIS2 platform.</p>
Current Use Case(s)	Public Health and Disease Surveillance System
Scale	National
Implementer(s)	MOH
Donor(s)/Funding Source	-
Licensing	-
Website	-
Covid-19 Specific Functions	-
RMNCAH Functions	-

Digital Health Tool	Vital Registration System
Description	<p>Vital registration system will be established to enable the recording of births and deaths in health facilities and in the communities.</p> <p>Currently, the system is not in place across the country. However, multiple ministries are working on the establishment and piloting of the vital registration system.</p>

<u>Current Use Case(s)</u>	Civil Registration and Vital Statistics (CRVS)
Scale	Subnational
Implementer(s)	-
Donor(s)/Funding Source	-
Licensing	-
Website	-
Covid-19 Specific Functions	-
RMNCAH Functions	Health facilities – and going forward CHWs / FHWs – will record the number of maternal deaths and stillbirths but no patient details, hence no formal patient-related death record exists. The MoH / Department of Planning / Office of Statistics is coming up with a roadmap on how to officially record births and deaths.

Digital Health Tool	Free Press Unlimited (RapidPro)
Description	Free Press Unlimited is a pilot project implemented by UNICEF Somalia and Africa's Voices Foundation (AVF) to explore the potential of interactive radio and messaging for gathering data on Somali people's views on polio and measles immunization and maternal, neonatal, and child health care.
<u>Current Use Case(s)</u>	RapidPro, Traditional Media (radio)
Scale	National
Implementer(s)	UNICEF, Africa Voices Foundation (AVF)
Donor(s)/Funding Source	-
Licensing	Open Source
Website	https://www.freepressunlimited.org/en/countries/somalia
Covid-19 Specific Functions	-
RMNCAH Functions	It gathers data on immunizations and maternal, neonatal, and child health care.

Digital Health Tool	Toto Health
Description	Totohealth is a social enterprise that aims to reduce maternal and

<p>newborn mortality rates through sending personalized and targeted SMS and voice messages on time at their child's age or stage of pregnancy. These messages can highlight any warning signs in a child's health/development, and equip you with knowledge on nutrition, reproductive health, parenting and developmental stimulation to parents living in marginalized communities.</p> <p>Totohealth enables organizations and counties to register parents to start receiving Totohealth timely text messages, and schedule and send reminders, appointments, surveys and announcements to parents in a convenient and affordable way.</p>	
<u>Current Use Case(s)</u>	Social Media for Risk Communication and Community Engagement (RCCE), Core Mobile Services
Scale	Subnational
Implementer(s)	-
Donor(s)/Funding Source	-
Licensing	-
Website	-
Covid-19 Specific Functions	-
RMNCAH Functions	-

Auxiliary tools

Tool	Common Operational Datasets (COD)
Description	CODs are authoritative reference datasets used to support operations and decision-making in the initial response of humanitarian emergencies as well as to enable activities such as microplaning. Frequently collected and used CODs are geographical shapefiles, health facility catchment areas, settlements, population estimates, satellite imagery, and ancillary geospatial layers.
<u>Current Use Case(s)</u>	Common Operational Datasets, Geographic Information Systems (GIS), Emergency Response, Visualization
Scale	National
Access to CODs	Somalia's CODs

Digital Health Tool	SMS Shortcode
Description	A short code is a special telephone number designed for high-throughput, two-way messaging. Short codes are used to send and

receive SMS and MMS messages to and from mobile phones.

<u>Current Use Case(s)</u>	Core Mobile Services
Scale	National
Implementer(s)	-
Covid-19 Specific Functions	Core mobile services can be used by governments and MOHs for a variety of purposes related to COVID-19 such as to provide health advice; where to access care, testing, and vaccination; get COVID-19 test results back, etc. Currently, the government of Mongolia is using it for COVID-19 vaccination.

Tool	TV and Radio
Description	TV and radio used for health messaging and/or risk communication and community engagement. Also used for community health worker training.
<u>Current Use Case(s)</u>	Traditional Media, RCCE
Scale	National
Implementer(s)	UNICEF, AVF

Enabling Environment

Infrastructure

- According to the 2016 SARA, 28% of health facilities had stable power supply. More (proportion unknown) rely on solar power, whilst the remainder might not have stable electricity. A new SARA (now called harmonized health facility assessment) will be done in 2022.
- The health and demographic survey for Somalia can be accessed [here](#).
- A few health facilities are covered by stable electricity at district and regional levels.
- There is a good mobile 3G network even in rural areas.
- According to [data from the WB](#), only 2% of the population of Somalia in 2017 were using the internet. A report from 2021 estimates that 45% of the population has a mobile connection and 12% of the population are internet users (99% of those users use the internet via their phones).
- The majority of men (head of household) have mobile phones, including in rural areas. However, women in rural areas might not have access to mobile devices. Also, low literacy, predominately in rural areas, may keep some from using mobile phones and the internet.

Leadership and Governance

- [SPIDER together with the Federal Ministry of Health, has partnered with the two Somali organizations, Kasmodev and SIDRA](#), to support the HADDA project. The purpose of the project is to apply and utilize digital development tools for the planning, management, and strengthening of the health system in Somalia. This will increase the capacity and quality of health service delivery and support robust evidence-based decision making in Somalia. The initial phase of the programme is to support the Ministry of Health to develop the strategy for the Health Management Information Systems (HMIS), Electrical Medical Record or Patient Registry, to map and engage key stakeholders and to establish HMIS that connect the entire care pathway within Maternal and Child Health Clinics and referral services in three Somali regions, Banadir, Galmudug and Puntland. The three regions suggested by the government all have the Essential Package of Health Services (EPHS) and make suitable choices for piloting a comprehensive HMIS. In these efforts, KasmoDev is the implementing partner who will engage and coordinate stakeholders. KasmoDev will also perform a technical audit of and start gathering system requirements that will inform the development of a masterplan for the stages of HADDA. Research partner SIDRA will map existing HMIS and projects in Somalia, establish a project baseline and assess the capacity needs of HMIS in Somalia's health sector.

Legal Framework for Data Protection and Security

- Currently, there is no legal framework for data protection and security. In general, the concept of privacy is not known or valued.

Laws or Regulations for Privacy, Confidentiality, and Access to Health Information

- None/Unknown

Mechanism to monitor/ measure the implementation of digital solutions on RMNCAH including specific indicators

- The new DHIS2 platform will monitor the use of certain data elements/indicators but not the wider planning and monitoring.

The Way Forward

Somalia has been implementing seven digital health tools. The mapping exercise explores a part of seven key categories of the enabling environments recommended by the Global Digital Health Index: Leadership and governance, Legislation, Policy, and Compliance, and Infrastructure.

In terms of Infrastructure, Somalia has a good mobile 3G network even in rural areas and the report in 2021 showed that 45% of the population had a mobile connection and 12% of the population were internet users. The women, especially in rural areas, may not have access to mobile devices while the majority of men (head of household) have mobile phones. This could lead to less access to pregnant and lactating women, mothers, adolescent girls and young women as the key informants have pointed out as it is still a challenge to bring digital health tools and applications and services provided by digital health tools closer to beneficiaries especially in rural areas. One of the solutions may be to equip and train community health workers and female health workers with digital devices with digital applications (e.g. telemedicine, RCCE, etc.). This could build the capacity of those health care workers and could lead to empower women and children even though it needs additional investment in Wifi networks, cost of mobile communication and incentives for health care workers.

For Leadership and Governance, the Ministry of Health (MOH) has a strong commitment to strengthening the healthcare system through the deployment of digital health tools starting out from its Health Management Information System. A plan is ongoing to integrate the digital health tools into a new DHIS2 platform (IDSR and eDEWS) to avoid implementing parallel systems. The MOH is also working with SPIDER, which is an independent centre focusing on the digitalization of International development, and two other Somali organizations, to implement the project to apply and utilize digital development tools for the planning, management, and strengthening of the health system in Somalia. It would be a perfect moment to consider developing a national digital health policy/strategy to reinforce the current direction on digital health and planning to ensure interoperability, and to explore where to invest, to ensure standards and interoperability of digital health tools to avoid fragmentation and siloed implementations as the existing digital health tools are scaled up or more digital health tools are deployed. Legislation, policy and compliance for data protection, privacy and security should be included in policy and strategy.

The currently available digital health tools have been addressing several health system challenges: information, availability, quality, acceptability, utilization, efficiency, and accountability (Table 2). The current focus seems to be to address a challenge in information as the new DHIS2 platform is being implemented and integrating other functions. Out of seven digital health tools implemented, four of them are implemented at the national level (Table 2). The thematic areas addressed by those tools cover communicable diseases, immunization, public or humanitarian emergencies, risk communication and community engagement and RMNCAH (Table 3). However, it does not seem to be a focus of digital health to maintain essential RMNCAH and potential initiatives which can contribute to maintaining RMNCAH cares and services should be piloted for contextualisation and scale-up. For a way forward, the key categories of the enabling environment could be strengthened and invested in, especially Strategy and Investment, Legislation, Policy, and Compliance, and Infrastructure (including access to pregnant and lactating women, mothers, adolescent girls and young women). The use of global digital public goods like the ongoing plan on integrating the functions to DHIS2 should be considered to enable scale-up in terms of both geographical and thematic coverage and ensure interoperability in the future. As

Somalia moves forward on a scale-up of digital health, documentation of the process could be very beneficial to the other countries who are planning to invest in digital health.

Figure1. Key seven categories of the enabling environment



Table 1. Health system challenges possibly addressed by digital health tools

Health system challenges	Digital health tools	Levels of implementation
Information	DHIS2* (Global public goods) OGOW EMR Integrated Disease Surveillance and Response (IDSR) eDEWS Vital Registration System Free press unlimited (RapidPro) (Global public goods)	National Subnational National National Subnational National
Availability	DHIS2 (Global public goods)	National
Quality	DHIS2 (Global public goods) OGOW EMR (community centred workshop)	National Subnational
Acceptability	OGOW EMR Free press unlimited (RapidPro) (Global public goods) Toto Health	Subnational National Subnational
Utilisation	DHIS2 (Global public goods) OGOW EMR Toto Health	National Subnational Subnational
Efficiency	DHIS2 (Global public goods)	National
Cost		
Accountability	OGOW EMR Free press unlimited (RapidPro) (Global public goods) Toto Health	Subnational National Subnational

Table 2. Thematic areas and use of digital health tools

Thematic areas	Somalia
RMNCAH	DHIS2(a part of RMNCAH indicators) Free press unlimited Toto Health
Communicable diseases	DHIS2 (HIV, COVID19) Integrated Disease Surveillance and Response
Immunization	DHIS2 (Cold chain equipment) OGOW EMR Free press unlimited
Public Health Emergency & humanitarian emergencies	DHIS2 (COVID19) IDSR eDEWS
Risk Communication and Community Engagement	Toto Health

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In addition to this, recently UNICEF and the World Health Organization (WHO) have co-founded the COVID-19 [Digital Health Center of Excellence \(DICE\)](#) to provide coordinated, standardized support and technical assistance to national governments and partners on digital health implementations and solutions, including COVID-19, COVID-19 vaccine delivery, and beyond. If you would like to request support from the DICE, please write to contact@digitalhealthcoe.org.

Appendix: Use Case Definitions

Use Case	Description
Civil Registration and Vital Statistics (CRVS)	Digital systems used to record statistics on vital events, such as births, deaths, marriages, divorces and fetal deaths
Cold Chain Equipment Inventory	Technology to continually keep track of cold chain equipment status (inventory and working status)
Cold Chain Monitoring	Technology to continually monitor temperature-sensitive products being transported in a “cold chain”—that is, a supply chain of perishable and/or temperature-sensitive
Common Operational Datasets	Authoritative reference datasets needed to support operations and decision-making for all actors in a humanitarian response.
Community Based Information System (CBIS)	Family-centered health information system designed for CHWs to manage their work in educating households and delivering an integrated package of promotive, preventive, and basic curative health services
Comorbidity Registry	The presence of comorbidities can significantly affect a patient's treatment options, quality of life, and survival. Comorbidity registries keep track of comorbidities which help inform medical decisions
Contact Tracing	Contact tracing is the process of identifying all people that a positive patient has come in contact with
Core Mobile Services	Services used by GSM cellular phones (feature phones) (SMS Aggregator, SMS Shortcode, IVR Shortcode, USSD Services)
Data Visualization	Digital tools used for graphical representation of information and data
Digital Yellow Card	Digital credentialing for vaccinations
Electronic Medical Record (EMR)	Electronic record for patients - includes information about a patient's health history, such as diagnoses, medicines, tests, allergies, immunizations, and treatment plans
Geographic Information System	Framework for gathering, managing, and analyzing data
Health Management Information Systems (HMIS)	Data collection system to support planning, management, and decision making in health facilities and organizations. It can provide reliable and timely info on health system performance
Health Worker Registry	A registry of all the health workers in the country
Immunization Delivery Monitoring	Digital tools that are used for vaccine handling, distribution, and tracking of vaccines
Immunization Forecasting	The Immunization Calculation Engine (ICE) is an immunization evaluation and forecasting system, whose default immunization schedule supports all routine childhood, adolescent, and adult immunizations. ICE evaluates a patient's immunization history and

	generates the appropriate immunization recommendations for patients
Immunization Stock Forecasting	System or platforms that can forecast vaccine orders based on utilization which can enable COs to identify risks of stock outs or overstocking and take action before they occur
Interactive Voice Response (IVR)	Automated phone system technology that allows incoming callers to access information via a voice response system of pre-recorded messages
Laboratory and Diagnostics Information Systems (LDIS)	Software system that records, manages, and stores data for laboratories and can send laboratory test orders to lab instruments, tracking those orders, and then recording the results
Logistics Management Information System (LMIS)	System of records and reports used to aggregate, analyze, validate, and display data (from all levels of the logistics system) that can be used to make logistics decisions and manage the supply chain. Includes stock on hand, losses and adjustments, consumption, demand, issues, shipment status, and information about the cost of commodities managed in the system
Master Facility Registry	Comprehensive repository of health facilities of the country - would include all admin information and the status of the facility, staff, CCes, etc.
Mobile Community Health Worker Learning Management System (CHW LMS)	Learning management systems functioning in the country for community health workers
National ID	Digital national identity systems
Patient Registry	A patient registry is an organized system that uses observational study methods to collect uniform data (clinical and other) to evaluate specified outcomes for a population defined by a particular disease, condition, or exposure, and that serves one or more predetermined scientific, clinical, or policy purposes.
Pharmacy Information System	Supports the distribution and management of drugs, shows drug and medical device inventory, and facilitates preparing needed reports
Public Health and Disease Surveillance	Contributes data and information to assess and characterize the burden and distribution of adverse health events, prioritize public health actions, monitor the impact of control measures, and identify emerging health conditions that may have a significant impact upon population health
RapidPro	RapidPro is a software product that allows you to visually build the workflow logic for running mobile-based services. This software includes features for managing your users' contacts dynamically, graphically analyzing the data your service receives, connecting to multiple communication channels (ie SMS, voice, USSD, and social media), sending messages in multiple languages, and interoperating

	with external systems
Social Media for Risk Communication and Community Engagement (RCCE)	Utilization of social media for health messaging dissemination
Social Monitoring	Capture of what is said in social media platforms
Telemedicine	Platform used by providers to connect with patients and share video and images. It can be integrated with a provider's electronic health record and scheduling systems
Track and Trace System	Track and Trace systems enable the traceability/visibility of products from origin through various distribution processes down to patient
Traditional Media	Traditional media that may be used for outreach and messaging (TV, radio, other)

Additional Resources

Resources	Description	Website
Mapping of Digital Health Tools and Technologies in Countries (View only)	This workbook indicates the presence of tools and digital technologies being used for health initiatives and other sectors in UNICEF Country Offices (COs)	http://uni.cf/mapping-digital-health
M&M Global goods possible use cases	This document provides a list of Digital Square approved global goods mapped across the use cases visualized in the DATEC. The global goods are grouped by those that have already been adapted to match a use case and those that could be adapted to match a use case (i.e., simple, easy, low-lift adaptations).	https://static1.squarespace.com/static/59bc3457ccc5c5890fe7cacd/t/60522885399dca3568666606/1615997063979/Global+Goods+COVID+Map.pdf
Digital Implementation Investment Guide (DIIG): Integrating Digital Interventions into Health Programmes	This practical Guide provides a systematic process for countries to develop a costed implementation plan for digital health within one or more health programme areas, drawing guidance from the WHO guideline-recommended digital health interventions, providing direction to ensure investments are needs-based and contribute effective and interoperable systems aligned with national digital architecture, country readiness, health system and policy goals.	https://www.who.int/publications/item/9789240010567
Digital Health Atlas	The Digital Health Atlas is a WHO global technology registry platform aiming to strengthen the value and impact of digital health investments, improve coordination, and facilitate institutionalization and scale.	https://digitalhealthatlas.org/en/
Global Digital Health Index Country Profile	The Global Digital Health Index is an interactive digital resource that tracks, monitors, and evaluates the use of digital technology for health across countries.	http://index.digitalhealthindex.org/map

Assessing country readiness for COVID-19 vaccines	The country readiness assessments for COVID-19 vaccines are undertaken jointly by governments; the World Bank; Gavi, the Global Vaccine Alliance; the Global Fund to Fight AIDS, Malaria and Tuberculosis; UNICEF and the World Health Organization. This report presents initial findings of 128 countries as of March 2021	https://documents1.worldbank.org/curated/en/467291615997445437/pdf/Assessing-Country-Readiness-for-COVID-19-Vaccines-First-Insights-from-the-Assessment-Rollout.pdf
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