

Mapping of Digital Health Tools and Technologies: Pakistan Country Brief

April 2022



World Health
Organization



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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	3
Overview	4
Introduction	4
Methodology	4
Analysis Overview	4
Digital Health Tools and Technologies	6
DHIS2	7
Electronic Data Management System	9
Lady Health Worker Management Information System	10
Lifeline	11
Pakistan LMIS	12
Resource Management System (RMS)	13
COVIM	14
Sehat Express	14
Sehat Kahani	15
Yaran-e-Watan	16
COVID-19 Telehealth Portal	16
Integrated Disease Information Management System	17
Integrated Disease Surveillance Response (IDSR)	17
eVACC	18
Maternal and Perinatal Death Surveillance and Response (MPDSR) app	18
Human Resources Management Information System (HRMIS)	19
Zindagi Mehfooz	19
Child Electronic Registration and Vaccination app (CERV)	20
National Immunization Management System (NIMS)	21
Pakistan Health Information System (PHIS)	21
Microsoft Power BI	21
Data Science Platform	22
ArcGIS	23
QGIS	23
The Lives Saved Tool	24

Open Data Kit (ODK)	25
WhatsApp Chatbot	25
Sehat Tahaffuz Helpline	26
Keyhole	27
Ministry of Health’s Facebook Page	27
Twitter	28
Integrated Management of Neonatal and Childhood Illnesses (IMNCI)	28
We Care	29
RMNCAH Upskilling Course	30
Auxiliary tools	30
Enabling Environment	33
Infrastructure	33
Leadership and Governance	33
Legal Framework for Data Protection and Security	33
Laws or Regulations for Privacy, Confidentiality, and Access to Health Information	33
Mechanism to monitor/ measure the implementation of digital solutions on RMNCAH including specific indicators	33
The Way Forward	34
Acknowledgments	35
Appendix: Use Case Definitions	36
Additional Resources	39

Abbreviations and Acronyms

ANC	Antenatal Consultation
ASRO	Arab States Regional Office
BMGF	Bill and Melinda Gates Foundation
CCEM	Cold Chain Equipment Management
CDC	Centers for Disease Control
CERV	Child Electronic Registration and Vaccination
CHW	Community Health Worker
LMS	Learning Management System
CNIC	Computerized National Identity Card
CO	Country Office
COD	Common Operational Datasets
CRVS	Civil Registration and Vital Statistics
DHA	Digital Health Atlas
DHIS 2	District Health Information System 2
DIAL	Digital Impact Alliance
DICE	Digital Health Center of Excellence
EIR	Electronic Immunization Record
EMR	Electronic Medical Record
FHW	Frontline Health Worker
GIS	Geographic Information Systems
HMIS	Health Management Information System
HRMIS	Human Resources Management Information System
ICD	International Classification of Diseases
ICT	Information and Computer Technology
IDSR	Integrated Disease Surveillance Response
IMNCI	Integrated Management of Neonatal and Childhood Illness
INGO	International Non-Governmental Organization
JSI	John Snow Inc.
LHWP	Lady Health Worker Programme
LMIS	Logistics Management Information System
MDG	Millennium Development Goals
MENARO	Middle East and North Africa Regional Office

MoIB	Ministry of Information and Broadcasting
MoNHSRC	Ministry of National Health Services, Regulation, and Coordination
MPDSR	Maternal and Perinatal Death Surveillance and Response
NADRA	National Database and Registration Authority
NCOC	National Command Operation Center
NDMA	National Disaster Management Authority
NIH	National Institutes of Health
NIMS	National Immunization Management System
ODK	Open Data Kit
ODK	Open Data Kit
PHIS	Pakistan Health Information System
PTA	Pakistan Telecommunications Authority
RCCE	Risk Communication and Community Engagement
RFID	Radio Frequency Identification
RMNCAH	Reproductive, Maternal, Neonatal, Child, and Adolescent Health
RMS	Resource Management System
RO	Regional Office
SMS	Short Message Service
UHC	Universal Health Coverage
UN	United Nations
UNFPA	United Nations Population Fund
UNICEF	United Children's Fund
USAID	United States Aid
WHO	World Health Organization

Overview

Introduction

Pakistan currently holds the position of world's fifth most populous country with a population of almost 221 million in 2020¹. Its life expectancy at birth is 67 years old in 2020 with the latest maternal mortality ratio being 140 per 100,000 live births, under-five mortality rate being 65 per 1,000 live births and neonatal mortality rate being 40 per 1,000 live births².

There is limited access to life-saving interventions which is further complicated by geographical disparities, income levels and level of education³. Children including newborn babies are dying of conditions that could be cared at home and could be managed at health facilities with professional health care workers⁴.

[Pakistan's National Health Vision 2016-2025](#) seeks to “improve the health of all Pakistanis, particularly women and children, through universal access to affordable quality essential health services, and delivered through a resilient and responsive health system, ready to attain Sustainable Development Goals and fulfill its other global health responsibilities”. To do so, it places significant emphasis on “building coherence across health information systems” and investing on “innovative technologies... that can transform evidence into policy advice”.

The current COVID-19 pandemic has only more acutely brought forth the urgency of the presence of a strong and integrated digital health ecosystem since this pandemic has necessitated the use of alternative mechanisms for delivering essential Reproductive, Maternal, Newborn, Child, and Adolescent Health (RMNCAH) services in order to reach 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 in remote areas 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 WHO Eastern Mediterranean Region (also including countries covered by UNFPA Arab States Regional Office (ASRO) and UNICEF Middle East and North Africa Regional Office (MENARO)) 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 ensure 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 Pakistan 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 Pakistan; a proposed path forward; and a word of acknowledgment. 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.

¹ [Pakistan | Data \(worldbank.org\)](#)

² [UNICEF DATA - Child Statistics](#)

³ [Health | UNICEF Pakistan](#)

⁴ <https://www.unicef.org/pakistan/health>

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. The 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, and UNICEF and other relevant stakeholders in the country. Pakistan has opted for has opted out for option 3) and the self-assessment questionnaire was filled out by colleagues was filled out by colleagues at UNICEF Pakistan's country office (CO), United Nations Population Fund (UNFPA) Pakistan's CO, WHO Pakistan's CO, Ministry of National Health Services, Regulation, and Coordination (MoNHSRC) partners and other relevant stakeholders during the last quarter of 2021. The information gathered is reflected in this brief and was entered in the [Mapping of Digital Health Tools and Technologies tool](#). Further information about digital health tools being used in Pakistan can be found in [Pakistan's Map & Match country brief](#), the [Digital Health Atlas \(DHA\)](#), and the [Digital Impact Alliance \(DIAL\) Catalog of Digital Solutions](#).

There are 34 digital health implementations currently being used in Pakistan. Twenty-five are implemented at the national level and the other nine are implemented at the subnational level. Two of them (DHIS2 and RapidPro), is considered [a global digital public good](#) while the rest are either proprietary tools or custom made for the government of Pakistan.

Strengths

- The implementation and use of DHIS2 seem to have significant support from the MoNHSRC and other international organizations which can help in continuing to grow an interoperable and strong digital health foundation.
- The government of Pakistan is the primary owner and funding body of digital health technologies and tools in the country, increasing the likelihood of these tools to be utilized long-term and not being abandoned because of lack of funding or government involvement.
- The majority of the tools have already been scaled all the way to the national level, potentially bringing cohesion in reporting among the provinces.

Gaps

- Some of the enabling environments for digital health could be strengthened such as leadership and governance and the legal framework for data protection and security.
- It is acknowledged that the mapping tool reflects the knowledge of the stakeholders included in the interview(s) and self-assessment and maybe excludes 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

- Before deploying new tools, study the potential benefits global digital public goods may have over bespoke (custom made) or proprietary software to ensure interoperability and scalability.
- Continue to invest in human resources capacity, relevant infrastructure, and the overall enabling environment to establish a more robust foundation for the digital health ecosystem to grow.
- Foster coordination with other UN agencies, INGOs, and entities engaged in digital health interventions as well as with the MoNHSRC 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 	<ul style="list-style-type: none"> • Electronic Data Management System
<ul style="list-style-type: none"> • Lady Health Worker Management Information System 	<ul style="list-style-type: none"> • Lifeline
<ul style="list-style-type: none"> • Pakistan LMIS 	<ul style="list-style-type: none"> • Yaran-e-Watan
<ul style="list-style-type: none"> • Resource Management System (RMS) 	<ul style="list-style-type: none"> • COVID-19 Telehealth Portal
<ul style="list-style-type: none"> • COVIM 	<ul style="list-style-type: none"> • eVACC
<ul style="list-style-type: none"> • Sehat Express 	<ul style="list-style-type: none"> • Maternal and Perinatal Death Surveillance and Response (MPDSR)
<ul style="list-style-type: none"> • Integrated Disease Information Management System 	<ul style="list-style-type: none"> • Human Resources Management Information System (HRMIS)
<ul style="list-style-type: none"> • Integrated Disease Surveillance Response (IDSR) 	<ul style="list-style-type: none"> • Sehat Kahani
<ul style="list-style-type: none"> • Child Electronic Registration and Vaccination app (CERV) 	<ul style="list-style-type: none"> • Zindagi Mehfooz
<ul style="list-style-type: none"> • National Immunization Management System (NIMS) 	
<ul style="list-style-type: none"> • Pakistan Health Information System (PHIS) 	
<ul style="list-style-type: none"> • Microsoft Power BI 	
<ul style="list-style-type: none"> • Data Science Platform 	
<ul style="list-style-type: none"> • ArcGIS 	
<ul style="list-style-type: none"> • QGIS 	
<ul style="list-style-type: none"> • The Lives Saved Tool 	
<ul style="list-style-type: none"> • Open Data Kit (ODK) 	
<ul style="list-style-type: none"> • RapidPro 	
<ul style="list-style-type: none"> • Sehat Tahaffuz Helpline 	

- [Keyhole](#)
- [Ministry of Health's Facebook Page](#)
- [Twitter](#)
- [Integrated Management of Neonatal and Childhood Illnesses \(IMNCI\)](#)
- [We Care](#)
- [RMNCAH Upskilling Course](#)

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 the 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 several 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; it 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 Pakistan, DHIS and DHIS2 is being used at primary and secondary level health facilities as a health management information system (HMIS). DHIS and DHIS2 is also used to record deaths, administrative information regarding the status of each facility, and for graphical representation of data which is used for management activities and policy making at the government level.</p>
Current Use Case(s)	Health Management Information System (HMIS), Civil Registration and Vital Statistics (CRVS), Master Facility Registry, Data Visualization
Scale	National
Implementer(s)	Government of Pakistan

Donor(s)/Funding Source	Government of Pakistan
Licensing	Open Source
Website	https://dhis2.org/
Covid-19 Specific Functions	<p>Pakistan have not used DHIS2 for COVID19 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 in nature and can be installed together or separately in a country's DHIS2 system.</p> <p>COVID-19 Case-based surveillance [tracker data model]: enrolls & 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 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 travelers 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.</p> <p>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 ● Number of pregnant women who attended 1st antenatal

- consultation (ANC)
- Number of pregnant women who attended 4th ANC (This is being done in the provinces of Punjab, Khyber Pakhtunkhwa, and Sindh)
 - Number of total deliveries
 - Number of delivery with cesarean section
 - Number of newborn deaths
 - Number of newborns who received early postnatal care in first 48 hours
 - Number of under-five deaths
 - Number of children under 5 with diarrhea who received treatment according to national guidelines
 - Number of children under 5 diagnosed with pneumonia that were treated with amoxicillin

In DHIS and DHIS2, deaths (including RMNCAH deaths) are recorded using the International Classification of Diseases 10 (ICD-10)

Digital Health Tool	Electronic Data Management System
Description	<p>The Electronic Data Management System is used to record patients' health history, such as, diagnoses, medications prescribed, immunizations received, and treatment plans.</p> <p>The Electronic data Management System has been installed in three selected primary healthcare facilities in Islamabad Capital Territory as a pilot. It is now being rolled out in the remaining 13 facilities. The patient information is being electronically recorded and compiled. A dashboard has also been created.</p>
<u>Current Use Case(s)</u>	Electronic Medical Record (EMR)
Scale	Subnational (Islamabad capital territory only)
Implementer(s)	Government of Pakistan
Donor(s)/Funding Source	Government of Pakistan and WHO
Licensing	Open Source, copyrights are with GoPK
Website	http://edmis.nhsrsrc.pk/
Covid-19 Specific Functions	EMR would also record any cases of COVID-19 being reported in the pilot facilities with follow up on the said case and the family members.
RMNCAH Functions	<p>The following RMNCAH services are part of the EMR:</p> <ul style="list-style-type: none"> • Family planning • Screening for sexually transmitted infections • Treatment for sexually transmitted infections • Antenatal Care • Spontaneous Delivery • Cesarean section

- Immunization (BCG, Hepatitis B, DPT, and Measles)
- Treatment for communicable diseases for under-five children: Acute Respiratory Infections, treatment for diarrhea

Digital Health Tool	Lady Health Worker Management Information System
<p>Description</p>	<p>In 1994, Pakistan’s MoNHSRC implemented the Lady Health Worker Programme (LHWP) as part of a national strategy to reduce poverty and improve health by bringing health services to the doorsteps of underserved communities. Rooted in the concept of primary care, the LHWP plays a key role in Pakistan’s strategy to achieve the Millenium Development Goals (MDGs), strengthen its primary health care system, and achieve universal health care (UHC). LHWs are expected to be agents of change within their communities by providing integrated preventative and curative health services to their neighbors. Their status as community members, enables them to connect with patients and navigate local customs, languages, and social relationships more effectively than outsiders. In effect, these women are one of the most effective liaisons between the formal health system and their community. The MoNHSRC has currently deployed 110,000 LHWs, making it one of the largest community health worker (CHW) programmes in the world.</p> <p>Each LHW is associated with a government health facility within the community, where she receives training, a stipend, and medical supplies. LHWs are trained for 15 months in the prevention and treatment of common illnesses. The first three months take place in the classroom and the remaining 12 months are on-the-job training, excepting one week per month to work problem-based modules in the classroom. LHWs do not receive leadership training outside managing patient records and prescriptions. LHWs register the population in their service area and target groups, such as children under five and couples eligible for family planning. LHWs are each responsible for approximately 1,000 people within a catchment area of 200 houses. They work directly out of their homes, which are commonly called “health houses.” The government has placed a specific focus on training LHWs from rural areas, which often have poor access to care.</p> <p>The Lady Health Workers in the Islamabad Capital Territory have been provided with tablets, to record their own activities as well as the details of the families registered within their catchment areas. The LHWs were trained on the use of the tablets initially and a dashboard has been created that displays an overview of the data stored on their individual tablets.</p> <p>More information about LHWP can be found here and here.</p>
<p>Current Use Case(s)</p>	<p>Community Based Information System</p>
<p>Scale</p>	<p>National and subnational</p>
<p>Implementer(s)</p>	<p>Government of Pakistan</p>

Donor(s)/Funding Source	Government of Pakistan, John Snow Inc. (JSI)
Licensing	Open Source, copyrights are with GoPK
Website	-URLs are different for different provinces; can be accessed through http://nhsrc.pk/ and also listed below <ol style="list-style-type: none"> 1. http://lhwmis.sindhhealth.pk/ 2. http://irmnchlhw.pshealthpunjab.gov.pk/ 3. http://lhwmis.kphealth.pk/ 4. http://lhwict.nhsrc.pk/
Covid-19 Specific Functions	-The LHWs are trained specifically in providing RMNCAH services but since they are also providing health education to the catchment population, they played a crucial role in disseminating information on COVID-19 preventive measures to their respective catchment populations at the onset of the pandemic.
RMNCAH Functions	RMNCAH indicators are collected monthly. The following indicators are collected through the community-based system: <ul style="list-style-type: none"> • Number of live births • Number of maternal deaths • Number of pregnant women who attended 1st antenatal consultation (ANC) • Number of pregnant women who attended 4th ANC (This is being done in the provinces of Punjab, Khyber Pakhtunkhwa, and Sindh) • Number of total deliveries • Number of delivery with cesarean section • Number of newborn deaths • Number of newborns who received early postnatal care in first 48 hours • Number of under-five deaths • Number of children under 5 with diarrhea who received treatment according to national guidelines • Number of children under 5 diagnosed with pneumonia that were treated with amoxicillin

Digital Health Tool	Lifeline
Description	Lifeline is a pharmacy information system that supports stock management and prevention of stock-outs. Currently it is in pilot phase in three tertiary health facilities and at Health Department of Islamabad.
<u>Current Use Case(s)</u>	Pharmacy Information System
Scale	Subnational
Implementer(s)	MoNHSRC
Donor(s)	Government of Pakistan

Licensing	Open Source, copyrights are with GoPK
Website	https://lmis.gov.pk/
Covid-19 Specific Functions	-Not linked with COVID-19
RMNCAH Functions	-The digital application includes all Essential Medicine Lists, hence includes all the RMNCAH essential medicines

Digital Health Tool	Pakistan LMIS
Description	<p>The Pakistan LMIS is a web-based logistics management information system that was commissioned to USAID and DELIVER PROJECT by the Government of Pakistan and launched in 2011. The Pakistan LMIS was adapted after stakeholder consultations from the public and private sectors from a LIMS system being used in Bangladesh. This LMIS is fully owned by the government of Pakistan.</p> <p>The Pakistan Vaccine LMIS has multiple modules serving specific purposes:</p> <ul style="list-style-type: none"> ● CMS ● Demand and Supply Planning ● Inventory management ● Warehousing management ● Cold chain equipment management (CCEM) ● Forecasting module ● Transactional reports ● Analytics, Dashboards ● Consumption module ● Power BI ● SMS/Emails/Alerts and notification <p>Likewise, the Pakistan Contraceptive LMIS has different modules:</p> <ul style="list-style-type: none"> ● Control Panel ● Warehouses ● HF types ● Bulk edit warehouses ● Unlock data entry ● Locations ● List master/ details ● Manage data sources ● Dashboard comments ● Requisition flow ● Email list ● Batch Manufactures ● Stakeholders ● Products ● Statistics ● Power BI tool ● Alert rules

	<p>At the federal level, the Lifeline Federal LMIS is used for tertiary care hospitals. The Lifeline Federal LMIS has as well multiple modules:</p> <ul style="list-style-type: none"> • CMS • Demand and Supply Planning • Inventory management • Warehousing management • Transactional reports, Analytics • Dashboards • Consumption module • Power BI • SMS/Emails/Alerts and notification <p>More information on the Pakistan LMIS can be found here.</p>
<u>Current Use Case(s)</u>	Logistics Management Information System (LMIS), Track and Trace System, Immunization Stock Forecasting, Cold Chain Monitoring, Cold Chain Equipment Inventory, Contact Tracing, Immunization Delivery Monitoring, Immunization Forecasting, Data Visualization, Core Mobile Services
Scale	National
Implementer(s)	Government of Pakistan
Donor(s)/Funding Source	Government of Pakistan
Licensing	Open Source, copyrights are with GoPK
Website	https://lmis.gov.pk/
Covid-19 Specific Functions	<p>With the support of the USAID Global Health Supply Chain Program-Procurement and Supply Management project, the Government of Pakistan has used its mature logistics management information system (LMIS) to plan for and deliver critical COVID-19 supplies.</p> <p>Much of the work has been coordinated through the Ministry of National Health Services, Regulations and Coordination (MoNHSR&C) and National Disaster Management Authority (NDMA).</p> <p>More detailed information of how the Pakistan LMIS has been used for the COVID-19 response can be found here.</p>
RMNCAH Functions	<p>The medications in the WHO Model List of essential Medicines for Children (WHO Model List of Essential Medicines for Children - 7th list, 2019) are included in the Pakistan LMIS.</p> <p>The Essential Medicine Lists for the different provinces can be accessed below:</p> <ul style="list-style-type: none"> • Sindh • Punjab • Khyber Pakhtunkhwa • Balochistan

Digital Health Tool	Resource Management System (RMS)
Description	The Resource Management System (RMS) currently spans about 4000 covid/ non-covid hospitals throughout the entire country. The system facilitates decision making in terms of establishment of the correct need assessment and capacity enhancement.
<u>Current Use Case(s)</u>	Logistics Management Information System (LMIS)
Scale	National
Implementer(s)	Government of Paksitan
Donor(s)	Government of Pakistan
Licensing	Open Source, copyrights are with GoPK
Website	www.rms.nitb.gov.pk
Covid-19 Specific Functions	The Resource Management System was created during the COVID19 pandemic to regulate the supply of Oxygen, ICU equipment and other commodities replenished in the country. This led to timely procurement of supplies for optimum COVID-19 case management.
RMNCAH Functions	Not directly related to COVID-19

Digital Health Tool	COVIM
Description	COVIM is a COVID-19 vaccine inventory management system.
<u>Current Use Case(s)</u>	Immunization Stock Forecasting, Immunization Forecasting
Scale	National
Implementer(s)	Expanded Programme on Immunization, National Command Operation Center, and National Institute of Health
Donor(s)	Government of Pakistan
Licensing	Open Source, copyrights are with GoPK
Website	https://covim.epimis.pk/
Covid-19 Specific Functions	Stock management (supply and utilization) of COVID-19 vaccines.
RMNCAH Functions	-The vaccination of women, 12 years and over including pregnant women, adolescents and elderly is being recorded through this app.

Digital Health Tool	Sehat Express
Description	Sehat Express is a web-based platform and mobile application

	<p>developed to provide instant video consultations with doctors.</p> <p>Sehat Express has several capabilities:</p> <ul style="list-style-type: none"> • Electronic medical record • Triage • COVID-19 Assessment • Laboratory & Diagnostics • Prescriptions • SMS • Third-party integration with the application “Sehat Kahani” for volunteer doctors training
<u>Current Use Case(s)</u>	Telemedicine
Scale	National
Implementer(s)	National Institute of Health
Donor(s)	Government of Pakistan
Licensing	Open Source, copyrights are with GoPK
Website	https://sehatexpress.nhsrc.gov.pk/
Covid-19 Specific Functions	Through these telemedicine platforms patients can be evaluated for COVID-19 symptoms.
RMNCAH Functions	-The health services provided also include RMNCAH services
Digital Health Tool	Sehat Kahani
Description	<p>Sehat Kahani is a mobile and web based application that offers a holistic digital health solution that enables individuals to access primary and secondary healthcare services online without the hassle of waiting for long hours at a physical healthcare facility.</p> <p>Sehat Kahani has an all female health provider network that provides quality healthcare to those in need, using telemedicine.</p>
<u>Current Use Case(s)</u>	Telemedicine
Scale	Subnational
Implementer(s)	Sehat Kahani, WHO
Donor(s)	Sehat Kahani, WHO
Licensing	Proprietary ,Open Source, copyrights are with Sehat Kahani
Website	https://sehatkahani.com/
Covid-19 Specific Functions	-Although the Sehat Kahani platform was not COVID-19 specific, it became more useful due to the lockdown and closure of facilities.

RMNCAH Functions The all-female network provider allows for women all over the country with a connection to the internet to consult with a doctor in a way that they feel comfortable. More information can be found [here](#).

Digital Health Tool	Yaran-e-Watan
Description	Online support, provider to provider telemedicine initiative for management of COVID-19 related complications. Implemented at the tertiary hospital level only.
<u>Current Use Case(s)</u>	Telemedicine, Online Support/Mentorship for Health Care Workers
Scale	Subnational
Implementer(s)	Public (Government of Pakistan)- Private partnership
Donor(s)	Government of Pakistan, Private Sector
Licensing	Open Source, copyrights are with GoPK
Website	https://203.124.44.46/
Covid-19 Specific Functions	Developed specifically for COVID-19, see above.
RMNCAH Functions	Also supported healthcare workers providing RMNCAH services
Digital Health Tool	COVID-19 Telehealth Portal
Description	Doctors in Pakistan can sign up to volunteer their time for a free consultation with patients. Pakistanis can fill out a COVID-19 screening questionnaire on WhatsApp and then choose to speak to a doctor. Currently implemented at tertiary hospital level only.
<u>Current Use Case(s)</u>	Telemedicine
Scale	Subnational
Implementer(s)	Government of Pakistan (National Command Operation Center)
Donor(s)/Funding Source	Government of Pakistan (National Command Operation Center)
Licensing	Open Source, copyrights are with GoPK
Website	https://telehealth.gov.pk/
Covid-19 Specific Functions	Developed specifically for COVID-19, see above.
RMNCAH Functions	The advice through COVID 19 Telehealth Portal was given to patients of all ages including children, adolescents and pregnant women thus

improving access to care.

Digital Health Tool	Integrated Disease Information Management System
Description	COVID-19 patient recording, contact tracing, tracking the disease's spread, and quarantining. The tool is also used to create awareness on prevention and containment.
<u>Current Use Case(s)</u>	Contact Tracing
Scale	National
Implementer(s)	Government of Pakistan
Donor(s)/Funding Source	Government of Pakistan
Licensing	Open Source, copyrights are with GoPK
Website	- https://dhis2.nih.org.pk/dhis-web-commons/security/login.action
Covid-19 Specific Functions	Developed specifically for COVID-19, see above.
RMNCAH Functions	The data can be disaggregated for children and adolescents by age and sex, as well as for pregnant women.
Digital Health Tool	Integrated Disease Surveillance Response (IDSR)
Description	<p>The Integrated Disease Surveillance System (IDSR) is used for monitoring the following diseases: acute hemorrhagic fever, acute respiratory infection, acute watery diarrhea in children under 5 and in children 5 and above, influenza like illness, measles, diphtheria, and severe acute respiratory infection. This reporting only shows aggregate numbers and the reporting is done weekly.</p> <p>Currently this system does not link to other data systems, such as HMIS, however, there are plans to do so in the future.</p>
<u>Current Use Case(s)</u>	Public Health and Disease Surveillance System
Scale	National
Implementer(s)	Government of Pakistan
Donor(s)/Funding Source	Government of Pakistan with support from partners
Licensing	Open Source, copyrights are with GoPK
Website	- https://dhis2.nih.org.pk/dhis-web-commons/security/login.action

Covid-19 Specific Functions	Routine data collection system which helped in keeping track of trends for Notifiable infectious diseases including COVID-19.
RMNCAH Functions	Some of the data collected reflects disaggregation for age (under and over 5 years old).

Digital Health Tool	eVACC
Description	eVACC is a mobile vaccination registry tool. It allows for dynamic data visualization and representation in terms of graphs, tables, and downloadable reports; GSM tracking of vaccinators; automated SMS for vaccination reminders; data edits and updates, and vaccinators, centers, and users management.
<u>Current Use Case(s)</u>	Immunization Delivery Monitoring, Immunization Forecasting, Data Visualization, Electronic Immunization Records
Scale	Subnational
Implementer(s)	Government of Pakistan
Donor(s)/Funding Source	Government of Pakistan
Licensing	Open Source, copyrights are with GoPK
Website	https://pitb.gov.pk/tracking_evaccs
Covid-19 Specific Functions	Not related to COVID-19
RMNCAH Functions	This registry tool monitors the status of vaccinations being provided for children under 5 years of age

Digital Health Tool	Maternal and Perinatal Death Surveillance and Response (MPDSR) app
Description	Mobile-based application used for recording maternal and perinatal deaths. More information about MPDSR can be found here .
<u>Current Use Case(s)</u>	Civil Registration and Vital Statistics (CRVS)
Scale	Subnational
Implementer(s)	Government of Pakistan, WHO
Donor(s)	Government of Pakistan, WHO
Licensing	Open Source, copyrights are with GoPK
Website	-Under development

Covid-19 Specific Functions	-Not related
RMNCAH Functions	Births and deaths are recorded at Union Council level via reporting by family members. Officers at Union Council then report the birth to the National Database and Registration Authority (NADRA).

Digital Health Tool	Human Resources Management Information System (HRMIS)
Description	The Human Resources Management Information System (HRMIS) is used to track human resources across two provinces (Punjab and Khyber Pakhtunkhwa) including health workers.
<u>Current Use Case(s)</u>	Health Worker Registry
Scale	Subnational
Implementer(s)	Department of Health
Donor(s)/Funding Source	Department of Health
Licensing	Open Source, copyrights are with GoPK
Website	<ul style="list-style-type: none"> • https://hrmis.pshealthpunjab.gov.pk/ • https://www.hrmis.kp.gov.pk/login.php
Covid-19 Specific Functions	- Not related to COVID-19
RMNCAH Functions	-HRMIS includes healthcare workers providing RMNCAH services like LHVs, LHWs.

Digital Health Tool	Zindagi Mehfooz
Description	Zindagi Mehfooz aims to benefit approximately two million children in one of Pakistan's most disadvantaged provinces, Kyber Pakhtunkhwa. The registry uses a combination strategy of reminders and incentives to encourage parents to vaccinate their newborn children against measles, hepatitis, and polio. Every child enrolled in the program is assigned a radiofrequency identification tag (RFID), which enables health workers to track them in the system using near field communication Nokia 6131 phones through IRD's Interactive Alerts application. RFIDs are placed on each child's EPI identification card to track their appointments in order to ensure they are receiving the appropriate vaccinations at the correct time intervals. More information can be found here .
<u>Current Use Case(s)</u>	Electronic Immunization Records (EIR)
Scale	Subnational
Implementer(s)	Government of Pakistan

Donor(s)/Funding Source	Government of Pakistan
Licensing	Open Source, copyrights are with GoPK
Website	https://zm-epi.org/login.htm
Covid-19 Specific Functions	Not related
RMNCAH Functions	Track and trace under-five children for immunizations, Tetanus vaccinations for pregnant mothers

Digital Health Tool	Child Electronic Registration and Vaccination app (CERV)
Description	<p>The child electronic registration and vaccination app (CERV) CERV is a mobile-based tool for Electronic Immunization Registry (EIR) that aids to monitor individual immunization schedules and immunization histories to enhance the performance of the Expanded Program on Immunization (EPI) program in terms of coverage and efficiency. The CERV is fully implemented in 100+ union councils of the Peshawar and Islamabad districts. The Union Council is the lowest administrative layer of Pakistan and Peshawar is a polio high-risk district of Pakistan. The app can be used in all fixed centers, outreach sessions, mobile teams, and health houses to help the government fully immunize all children and eliminate all the VPDs. The vaccinators are entering all data into the application.</p> <p>CERV app maintains the permanent register, daily register, tally sheets, stock register, and the vaccinator attendance and generates tally reports based on coverage, consumption and stocks, defaulter list, dropouts, and fully immunized children listings. The CERV application has advanced features such as child fingerprint scanning for identification, real-time inventory levels of health facilities, cold chain volume visibility, and cold chain working status and it is linked with the central EPI MIS system.</p>
<u>Current Use Case(s)</u>	Electronic Immunization Records
Scale	Subnational
Implementer(s)	Government of Pakistan
Donor(s)/Funding Source	Government of Pakistan and other partners
Licensing	Open Source
Website	https://play.google.com/store/apps/details?id=com.pacotech.cerv
Covid-19 Specific Functions	-Not related to COVID-19
RMNCAH Functions	Track and trace under-five children for immunizations

Digital Health Tool	National Immunization Management System (NIMS)
Description	The National Immunization Management System (NIMS) is the core system to track all vaccinations in Pakistan. All vaccination (core and booster doses) can be tracked through the CNIC or the passport number
<u>Current Use Case(s)</u>	Electronic Immunization Records
Scale	National
Implementer(s)	National Database and Registration Authority (NADRA), NIH, National Command Operation Center (NCOC)
Donor(s)/Funding source	Government of Pakistan
Licensing	Open Source, copyrights are with GoPK
Website	https://nims.nadra.gov.pk/mis/
Covid-19 Specific Functions	-Also used for COVID-19 vaccinations
RMNCAH Functions	Track and trace under-five children for immunizations

Digital Health Tool	Pakistan Health Information System (PHIS)
Description	Integrated health services, logistic, and surveillance dashboard
<u>Current Use Case(s)</u>	Data Visualization
Scale	National
Implementer(s)	Government of Pakistan
Donor(s)	Government of Pakistan
Licensing	Open Source, copyrights are with GoPK
Website	http://nhsrsrc.pk/
Covid-19 Specific Functions	-This integrated dashboard also provides a link to the COVID-19 Dashboard
RMNCAH Functions	PHIS is an integrated dashboard that displays input from multiple sources including the Lady Health Workers' (LHW) network, MNCH program, EPI dashboards as well as the Nutrition MIS.

Digital Health Tool	Microsoft Power BI
Description	Power BI is a collection of software services, apps, and connectors that

	work together to turn your unrelated sources of data into coherent, visually immersive, and interactive insights. Your data may be an Excel spreadsheet, or a collection of cloud-based and on-premises hybrid data warehouses. Power BI lets you easily connect to your data sources, visualize and discover what's important, and share that with anyone or everyone you want.
<u>Current Use Case(s)</u>	Data Visualization
Scale	National
Implementer(s)	Government of Pakistan
Donor(s)/Funding source	Government of Pakistan
Licensing	Proprietary
Website	https://powerbi.microsoft.com/en-us/
Covid-19 Specific Functions	The Power BI team has created a COVID-19 tracking sample that enables governments to publish or customize an interactive report about COVID-19. Using Power BI Desktop, they can analyze and visualize COVID-19 data to keep their communities informed at the city, county, state, and national levels. Then using Power BI Publish to Web, they can share the report publicly to inform citizens.
RMNCAH Functions	-Not related to RMNCAH functions
Digital Health Tool	COVID-19 Health Advisory Platform
Description	Graphical representation pertaining to COVID tests, cases, and deaths
<u>Current Use Case(s)</u>	Data Visualization
Scale	National
Implementer(s)	Government of Pakistan
Donor(s)/Funding source	Government of Pakistan
Licensing	Open Source, copyrights are with GoPK
Website	-www.covid.gov.pk
Covid-19 Specific Functions	Graphical representation pertaining to COVID tests, cases, and deaths
RMNCAH Functions	-The website also provides Guidelines for clinical management of COVID cases during pregnancy as well as management of COVID-19 in children

Digital Health Tool	ArcGIS
Description	<p>ArcGIS offers unique capabilities and flexible licensing for applying location-based analytics to your business practices. Gain greater insights using contextual tools to visualize and analyze your data. Collaborate and share via maps, apps, dashboards and reports.</p> <p>In Pakistan, ArcGIS is used for polio surveillance.</p>
<u>Current Use Case(s)</u>	Geographic Information System Mapping (GIS)
Scale	National
Implementer(s)	Government of Pakistan
Donor(s)/Funding source	Government of Pakistan and support partners
Licensing	Open Source, copyrights are with GoPK
Website	https://www.esri.com/en-us/arcgis/about-arcgis/overview
Covid-19 Specific Functions	ArcGIS has a COVID-19 specific site from which users can have access to maps, datasets, applications, and more for coronavirus disease 2019 (COVID-19). These resources are updated periodically with new information as it becomes available.
RMNCAH Functions	Used for polio surveillance

Digital Health Tool	QGIS
Description	<p>A Geographic Information System a software for viewing data with a spatial reference for real-world viewing, mapping and analysis. The primary segment of the data seen in a GIS is its spatial component – i.e. where is it on earth? Each piece of data will also contain non-spatial data known as attribute data. Attribute data is generally defined as additional information about a spatial feature, for example, a government building. The actual location of the government building is the spatial data. The attribute data includes the building name, the number of floors in the building, the government departments that use the building, when it was built etc. GIS is now commonly used in many aspects of our day-to-day lives. For example, Google Maps on our phones to find an address is a type of GIS.</p> <p>In Pakistan, QGIS is used in the tuberculosis program for analysis.</p>
<u>Current Use Case(s)</u>	Geographic Information System Mapping (GIS)
Scale	National
Implementer(s)	Government of Pakistan

Donor(s)/Funding Source	Government of Pakistan and support partners
Licensing	Open Source, copyrights are with GoPK
Website	https://qgis.org/en/site/
Covid-19 Specific Functions	The widespread use of GIS for COVID-19 response has demonstrated the power of geospatial thinking and the scalability, speed, and insight provided by GIS. More than simply mapping phenomena, GIS uses geography to furnish context for events in a common reference system. Applying spatial analysis tools, GIS brings out the relationships, patterns, and associations that are often hidden by the complexity of data. More information on the possible uses of GIS technology for COVID-19 can be found here .
RMNCAH Functions	Not related

Digital Health Tool	The Lives Saved Tool
Description	<p>The Lives Saved Tool is a mathematical modeling tool which allows users to estimate the impact of coverage change on mortality in low and middle income countries.</p> <p>In Pakistan, The Lives Saved Tool has been used during the COVID-19 pandemic to predict the number of maternal and child deaths with or without the use of non-pharmacological interventions.</p>
<u>Current Use Case(s)</u>	Analytical Modeling Tool
Scale	National
Implementer(s)	Government of Pakistan, WHO, Bill and Melinda Gates Foundation (BMGS)
Donor(s)	Government of Pakistan, WHO, BMGF
Licensing	Copyrights are with Johns Hopkins University and BMGF
Website	https://www.livessavedtool.org/
Covid-19 Specific Functions	During the COVID-19 pandemic, LiST Tool was used to estimate the number of lives that would be lost without the use of mitigation measures. This exercise yielded results that were used to advocate for the continuity of routine RMNCAH services even during emergency situations such as epidemics. As a result, efforts were made to provide essential routine services using PPE and other preventive measures.
RMNCAH Functions	The Lives Saved Tool (LiST) is based on a modeling approach developed over ten years ago to estimate the impact of scaling up community-based interventions on child mortality for the 2003 Lancet Child Survival Series. Over time, LiST evolved to include facility-based interventions that impact newborn mortality. Later, stunting and wasting risk factors were added to

the model for the 2008 Lancet Nutrition Series. With financial support from the Bill & Melinda Gates Foundation, the model was integrated into Spectrum, an analytical health program planning tool. In 2011, interventions that impact stillbirths, birth outcomes and maternal mortality were added to the model, in addition to diarrhea and pneumonia incidence in 2013. More information and RMNCAH functions can be found [here](#).

Digital Health Tool	Open Data Kit (ODK)
Description	Open Data Kit (ODK) is open-source software for collecting, managing, and using data in resource-constrained environments. It allows for offline data collection with mobile devices in remote areas. The submission of the data to a server can be performed, when Internet connectivity is available. It allows communities to aggregate data with full control over the collected data and the servers where this data is stored. In Pakistan, ODK is used in the polio vaccination program for data collection regarding polio vaccines.
<u>Current Use Case(s)</u>	ODK
Scale	National
Implementer(s)	Government of Pakistan
Donor(s)/Funding Source	GAVI, UNICEF, BMGF, WHO
Licensing	Open source
Website	https://getodk.org/
Covid-19 Specific Functions	ODK has been used to fight both endemic and pandemic diseases for more than a decade and it's being used in the COVID-19 response for disease surveillance, rapid diagnostics, and vaccine trials. More information on specific applications can be found here .
RMNCAH Functions	Used for polio vaccinations

Digital Health Tool	RapidPro
Description	RapidPro is an open source software that allows the setting up of a workflow logic to collect any kind of data via SMS. The software has features for managing users' contacts, sending messages in multiple languages and inter-operating with external systems. The RapidPro software can be hosted as a service on a local computer server, or on the cloud. The SMS facility is widely available on all types of phones, hence can reach a wide and diverse audience. RapidPro does not require an active internet connection, making the SMS implementation cost-effective from a business standpoint. RapidPro provides a continuous stream of

	<p>“living” data that offers unique opportunities to react in real time to changes at the level of implementation.</p> <p>In Pakistan, RapidPro is being used for two way communication in the context of the COVID-19 pandemic through the WhatsApp platform.</p>
<u>Current Use Case(s)</u>	RapidPro for Health, Risk Communication and Community Engagement (RCCE)
Scale	National
Implementer(s)	Government of Pakistan
Donor(s)	Government of Pakistan
Licensing	Open source
Website	https://community.rapidpro.io/
Covid-19 Specific Functions	RapidPro is being used for COVID-19 in a variety of countries and contexts, such as Mexico and Zimbabwe .
RMNCAH Functions	Not related

Digital Health Tool	Sehat Tahaffuz Helpline
Description	Sehat Tahaffuz Helpline was originally set up for parents and caregivers to get support and information about polio and other vaccines supported by UNICEF and partners, the helpline is now being used to respond to tens of thousands of calls every day about the coronavirus disease (COVID-19). As part of its emergency response to the COVID-19 outbreak, the government has expanded the center to help people get information on how to stay safe and connect them to a doctor when required.
<u>Current Use Case(s)</u>	RCCE
Scale	National
Implementer(s)	Government of Pakistan
Donor(s)	UNICEF
Licensing	Open source
Website	-Not applicable (Telephone Helpline)
Covid-19 Specific Functions	Being used for COVID-19 communication and advice to the general population. More information can be found here .
RMNCAH Functions	Also used for emergency situations in pregnancy and for children

Digital Health Tool	Keyhole
Description	<p>Keyhole helps marketers measure, improve and report on the impact they're making on social media. Keyhole's social listening, influencer tracking and social media analytics products help marketers improve their social media strategy, and prove their impact to colleagues and clients. Keyhole's easy-to-use dashboard allows you to build and share reports instantly.</p> <p>In Pakistan it is used for collecting and analyzing public sentiment on social media regarding COVID-19, vaccination, and the government's response.</p>
<u>Current Use Case(s)</u>	Social Monitoring
Scale	National
Implementer(s)	Government of Pakistan, UNICEF
Donor(s/Funding source)	Government of Pakistan, UNICEF
Licensing	Open source
Website	https://keyhole.co/
Covid-19 Specific Functions	For collecting and analyzing public sentiment on social media regarding COVID-19
RMNCAH Functions	Not related

Digital Health Tool	Ministry of Health's Facebook Page
Description	<p>A Facebook page and an Instagram profile are public profiles created by businesses, organizations, celebrities and anyone seeking to promote themselves publicly through social media. These pages are publicly visible online and often post status updates, links, events, photos and videos to their fans' news feeds and walls. Facebook and Instagram pages provide a way for MOHs in particular to interact with citizens.</p> <p>In Pakistan it is used to disseminate content organically and through sponsored means.</p>
<u>Current Use Case(s)</u>	Social Media for Risk Communication and Community Engagement (RCCE)
Scale	National
Implementer(s)	Facebook Public Policy team, Yale School of Public Health, UNICEF

Donor(s)	Government of Pakistan, Facebook
Licensing	Open source
Website	https://www.facebook.com/NHSRCOfficial
Covid-19 Specific Functions	Facebook has partnered with their developer community to provide free services to government health organizations and UN health agencies to help them use Messenger to scale their response to the COVID-19 crisis by sharing timely and accurate information, and speed up their responses to concerned citizens.
RMNCAH Functions	-Also provides information regarding RMNCAH services

Digital Health Tool	Twitter
Description	<p>Twitter is a service for friends, family, and coworkers to communicate and stay connected through the exchange of quick, frequent messages. People post Tweets, which may contain photos, videos, links, and text. These messages are posted to your profile, sent to your followers, and are searchable on Twitter search.</p> <p>In Pakistan it is used to disseminate content organically and through sponsored means.</p>
<u>Current Use Case(s)</u>	Social Media for RCCE
Scale	National
Implementer(s)	Government of Pakistan
Donor(s)	-
Licensing	Open source
Website	https://twitter.com/nhsrcofficial
Covid-19 Specific Functions	Twitter has become a key platform for some of the world's top experts to contribute to real-time knowledge-sharing and provide input on policy making. State, county, and city governments have also adopted Twitter as a means of announcing the latest information about case numbers and hospitalizations. The result: Much of the data about the state of the pandemic is published first on social media—and only thereafter through traditional media such as radio, television, and news websites.
RMNCAH Functions	-RMNCAH related information is also disseminated through Twitter

Digital Health Tool	Integrated Management of Neonatal and Childhood Illnesses (IMNCI)
Description	The Integrated Management of Neonatal and Childhood Illnesses (IMNCI) strategy was developed by the WHO to reduce morbidity and

mortality among under-five children across the globe. Among its core components is enhancing case management skills of frontline health workers (FHWs): IMNCI prescribes a series of steps to FHWs to identify and manage major childhood diseases. IMNCI implementation has traditionally relied on paper-based tools and training material, which creates the need for memorization and lengthy training sessions, along with heightening chances of error and prolonging screening time per child. As a result, IMNCI implementation has faced persistent barriers, and impact has been limited. Using Android technology, an eIMNCI application has been developed; an electronic version of WHO’s 2014 IMNCI guidelines. The application allows FHWs to easily navigate the otherwise complex IMNCI protocol on their mobile phones, eliminating the need for memorization and extensive training. As data is entered into the application, the system automatically integrates incoming patient data with disease symptoms to classify the patient in accordance with IMNCI algorithms, and enables the FHW to skip over questions that are irrelevant to the case at hand. Screening time per child is thus considerably reduced. Furthermore, the application incorporates a referral system whereby FHWs can connect more serious cases to a health facility for treatment and follow-up.

<u>Current Use Case(s)</u>	Community Health Worker Learning Management System (CHW LMS), Capacity Building and Training to Support the provision of RMNCAH Services
Scale	National
Implementer(s)	Government of Pakistan, UNICEF
Donor(s)	Government of Pakistan, UNICEF
Licensing	Open source
Website	https://imnci.phcglobal.org/
Covid-19 Specific Functions	-Since the IMNCI application can be accessed online, it is useful in times when access to health facilities is limited, to refer cases to health facilities for treatment and follow up.
RMNCAH Functions	Reducing morbidity and mortality for children under five years of age.

Digital Health Tool	We Care
Description	Ministry of National Health Services Regulation and Coordination (MoNHSRC) has launched “We CARE”, a national campaign for protecting and supporting our frontline health workers in the context of Covid-19. ‘WE CARE’ aims at providing adequate personal protective equipment (PPE) to the health workers, orienting them on using various PPE items as per international standards, and creating an overall psycho-social environment of care and support. ‘WE CARE’ also aims to sensitize the public, including patients and visitors at healthcare facilities, to supports frontline healthcare workers by following preventive behaviors to not only reduce the risk of infection to themselves but also

	reduce the work burden on and health risks for the health providers.
<u>Current Use Case(s)</u>	Community Health Worker Learning Management System (CHW LMS)
Scale	National
Implementer(s)	-Government of Pakistan
Donor(s)	-
Licensing	Open source
Website	https://wecare.nhsrc.gov.pk/
Covid-19 Specific Functions	See above
RMNCAH Functions	-By supporting Community Health Workers, We Care helps improve RMNCAH service delivery.

Digital Health Tool	RMNCAH Upskilling Course
Description	6-module RMNCAH refresher course for Skilled Birth Attendants.
<u>Current Use Case(s)</u>	Capacity Building and Training to Support the provision of RMNCAH Services
Scale	National
Implementer(s)	Government of Pakistan, WHO
Donor(s)	Government of Pakistan, WHO
Licensing	Open source
Website	http://34.86.83.116/login/index.php
Covid-19 Specific Functions	Not related
RMNCAH Functions	See above

Auxiliary tools

Tool	Common Operational Datasets (COD)
Description	CODs are authoritative reference datasets used to support operations and decision-making in the initial response to humanitarian emergencies as well as to enable activities such as micro-planning. 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
Scale	National
Access to CODs	Pakistan's CODs

Tool	Computerized National Identity Card (CNIC)
Description	The Computerized National Identity Card (CNIC) is an identity card issued by Pakistan's National Database and Registration Authority (NADRA). The card is available to any citizen of Pakistan that is 18 years of age or older. The CNIC is a computerized version of the National Identity Card (NIC). It is a blend of state-of-the-art technology and well-defined business rules to guarantee its authenticity and validity.
<u>Current Use Case(s)</u>	National ID
Scale	National
Implementer	Government of Pakistan
Website	https://id.nadra.gov.pk/identity-documents/identity-nic/

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	Pakistan Telecommunications Authority (PTA) and National Data Registration Authority (NADRA)

Tool	TV and Radio
Description	TV advertisement used to raise awareness regarding any health risk or Ministry initiatives. The Ministry's Strategic Communication Cell oversees advertisements pertaining to COVID-19 only. Communication teams of other departments and allied bodies have their own funding and processes.
<u>Current Use Case(s)</u>	Traditional Media, RCCE
Scale	National
Implementer(s)	Press Information Department - Ministry of Information and Broadcasting (MoIB)

Enabling Environment

Infrastructure

- Urban areas of Pakistan have access to stable electricity, whereas rural areas many times lack such reliable access. The main perceived barrier to increasing such access in rural areas is lack of funding for repairs and maintenance of the electrical grid.
- Household subscriptions to fixed broadband internet are almost non-existent while a mobile broadband subscription to the internet is more common (41% of the population). About 25% of the population reportedly use the internet. Male vs female use of the internet is 21% vs 13%. More information can be found [here](#).
- The number of mobile connections in Pakistan increased by 6.9 million (+4.2%) between January 2020 and January 2021. The number of mobile connections in Pakistan in January 2021 was equivalent to 77.7% of the total population.
- There were 46 million social media users in Pakistan in January 2021, which increased by 9 million (+24%) between 2020 and 2021.
- The cost of internet subscriptions along with lack of information communication technology (ICT) skill among the general population are the main barriers. There also exist geographical barriers that make it difficult to build and maintain ICT infrastructure.

Leadership and Governance

- There is a newly launched National Digital Health Framework in Pakistan, a Health Information System Technical Working Group, and a Steering Committee.
- There exists an all-of-government [Digital Pakistan Policy](#).

Legal Framework for Data Protection and Security

- There are no mechanisms in place to ensure the privacy and security of data and information. However, such mechanisms are being developed under the National Digital Health Framework.

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

- There are [some laws](#) to protect individual privacy, governing ownership, and access and sharing of individually identifiable digital health data.

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

- There is a platform being developed for monitoring and evaluation of digital solutions for RMNCAH.

The Way Forward

Pakistan has been implementing 34 digital health tools under a strong leadership of the government. The mapping exercise explores a part of seven key categories of the enabling environments for digital health recommended by the Global Digital Health Index: Leadership and governance, Legislation, Policy, and Compliance, and Infrastructure (Figure 1). For “Leadership and Governance”, the Government of Pakistan is taking a strong leadership in setting up policy and framework for digital health. Digital Pakistan Policy states a key goal is to create a digital ecosystem with infrastructure and institutional frameworks for the rapid delivery of innovative digital services, applications and content with a holistic technology focusing on ICT serving as a broad enabler of every sector for socioeconomic development. The Policy has 10 policy objectives including holistic digital strategy; sectoral digitalization; youth, women and girls empowerment using IT; increase foreign and domestic investment; persons with disabilities; and standardization. The Ministry of IT (MoIT) will play the role of an enabler and facilitator for digitalization, providing necessary guidance and support. MoIT supports the Ministry of National Health Services to accelerate the use of telemedicine especially for distant rural communities, digitalisation of hospital information systems, sharing information on preventive care, development of accreditation systems and standards and protocols. Reflecting this strong initiative, the currently available digital health tools have been addressing all health system challenges layed out in “Classification of Digital Health Interventions v1.0”: information, availability, quality, acceptability, utilisation, efficiency, cost and accountability (Table 2). The level of implementation of the most digital health tools are national level with a few exceptions of being implemented at subnational level. In order to further strengthen the current progress, a national digital health action plan with costing would be needed to guide how the Digital Pakistan Policy should be implemented and monitored and where further investment should go. If the country is thinking to move forward on investing more on edge technologies like Artificial Intelligence (AI), further considerations are necessary on which health system challenges are to be addressed and ethical implications on equity, resources, safe use and privacy and data protection. In terms of “Legislation, Policy, and Compliance”, there appears to be some laws, but, legal framework to ensure safe, effective and efficient essential health service delivery would be needed as well. The key informants who participated in this exercise have pointed out several challenges on “Workforce”: a shortage of trained health workforce with the skills to use digital software/ applications, limited capacity development on digital health and career progression to align with future needs of the health sector. To overcome these challenges, an assessment on future needs of digital health workforce should be done prior to the development of a national digital health action plan so that development of course/ programmes/ e-learning in pre- and in-service training, creation of positions and career path for digital health workforce and accreditation of digital health workforce could be aligned with the country’s needs. These initiatives could address sub-optimal use of digital technologies in data collection, analysis and use for evidence-based decision making including at the community level. For “Standards”, especially for the development of the evidence-based standardized guidelines, WHO’s Digital Health Adaptation Kits could support the country to take existing guidelines and adapt them to work with common applications which are already available.

The health thematic areas including RMNCAH are addressed by digital health tools even though many of them have been implemented to support COVID-19 response (Table 3). The health management information system which has been digitalized till district level include key RMNCAH indicators. The telemedicine application appears to take consideration on easy access for female beneficiaries by utilising female doctor network. There are digital

health tools available for healthcare workers to support their daily activities on their capacity development on RMNCAH, surveillance (maternal and perinatal deaths), and assessment and treatment of childhood illnesses.

The use of Global Digital Goods appears to be limited (DHIS2), however, four Open Source Software (Child Electronic Registration and Vaccination app, QGIS, Open Data Kit, RapidPro) have been used and this could bring some advantage as being free, adaptable, and designed to be interoperable across commonly used systems. In future, it is worth considering deploying more Global Digital Goods and Open Source Software while taking into consideration their pros and cons. There appears to be overlaps of digital tools to cover similar areas (e.g. ArcGIS (Polio) and QGIS (Tuberculosis)) which could be considered to make them interoperable.

Around 25% of the population has been reportedly using the internet (male 21% and female 13%). With the number of mobile connections increasing and reaching 77.7% of the total population, mobile broadband subscription to the internet is more common (41% of the population) compared to household subscription to fixed broadband internet. Challenges include the cost of internet subscriptions along with lack of information communication technology (ICT) skill among the population, and geographical inequality with unstable electricity in rural areas. With a high number of social media users and mobile connections, digital tools which could be deployed with mobile phones with limited bandwidth should be considered to connect with community and health care workers working at community and primary level.

Pakistan is one of the excellent examples in the region how digital health is evolved and to find opportunities for effective adoption, integration, and scale-up of digital solutions in RMNCAH 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.

Figure 1. Key seven categories of the enabling environment



Efficiency	Human Resource Management Information System	Subnational
Cost	eIMNCI	National
Accountability	Sehat Express Sehat Kahani Sehat Tahaffuz Helpline (Polio/ COVID-19) Yaren-e-Watan COVID19 Telehealth portal Zindagi Mehfooz Child Electronic Registration and Vaccination Application National Immunisation Management System RapidPro (COVID-19) Computerized National Identity Card (CNIC) SMS Short Code	National Subnational National Subnational Subnational Subnational National National National National National

Table 2. Thematic areas and use of digital health tools

Thematic areas	Pakistan
RMNCAH	DHIS/DHIS2 Electronic Data Management System (EMR) Lady Health Worker Management Information System (CBIS) LMIS Integrated Disease Information Management System IDSR (disaggregation of COVID19 cases by age/sex) Lives Saved Tool Sehat Kahani (All Female Doctor Network) RMNCAH Upskilling Course MPDSR app eIMNCI
Communicable disease	Electronic Data Management System (EMR) Lady Health Worker Management Information System (CBIS) LMIS Sehat Express (COVID-19) Sehat Tahaffuz Helpline (Polio/ COVID-19) Yaren-e-Watan (COVID-19) COVID19 Telehealth portal (COVID-19) Integrated Disease Information Management System (COVID19) IDSR (COVID-19) Data Science Platform (COVID-19) ArcGIS (Polio) QGIS (Tuberculosis) Lives Saved Tool (COVID-19) RapidPro (COVID-19) Keyhole (COVID-19) We Care (COVID-19)
Immunisation	LMIS COVIDM (COVID19) eVACC Zindagi Mehfooz Child Electronic Registration and Vaccination Application National Immunisation Management System

	ArcGIS (Polio) Open Data Kit (Polio)
Public Health Emergency & humanitarian emergencies	Integrated Disease Information Management System IDSR (COVID19) Common Operational Datasets (COD)
Risk Communication and Community engagement	RapidPro Keyhole Sehat Tahaffuz Helpline (Polio/ COVID-19) SMS Short Code

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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+CO+VID+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 program 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/i/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

<p>Assessing country readiness for COVID-19 vaccines</p>	<p>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</p>	<p>https://documents1.worldbank.org/curated/en/467291615997445437/pdf/Assessing-Country-Readiness-for-COVID-19-Vaccines-First-Insights-from-the-Assessment-Rollout.pdf</p>
<p>DICE Website</p>	<p>The Digital Health Centre of Excellence - or DICE - is a mechanism to deliver agile and coordinated technical assistance to National Governments on sustainable and scalable deployment of carefully chosen mature digital health solutions that address health priorities in the context of the COVID-19 pandemic and post-pandemic health systems needs</p>	<p>https://www.digitalhealthcoe.org/</p>
<p>DICE's YouTube Channel</p>	<p>DICE's YouTube Channel where past webinars can be accessed</p>	<p>https://www.youtube.com/channel/UCi--Kf5uVzYv-unxv7DqR9g/featured</p>
<p>ITU Digital Development Dashboard for Pakistan</p>	<p>An overview of the state of digital development in Pakistan based in ITU's data</p>	<p>https://drive.google.com/file/d/1CVN3rhpRmiOt6I004YteEunBfE8N8t3/view?usp=sharing</p> <p>https://www.itu.int/en/ITU-D/Statistics/Dashboards/Pages/Digital-Development.aspx</p>