



# Consolidated telemedicine implementation guide





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# Foreword



Globally, the COVID-19 pandemic added immense pressure to health systems and their ability to deliver health-care services, revealing gaps and weaknesses even in countries with robust health systems. While digital tools have been emerging over recent decades, the overwhelming public health challenges of the pandemic catalysed their use as an essential mechanism for not only strengthening pandemic response but also for ensuring the continuity of health-care services. In particular, the periods of restricted mobility underscored the need for telemedicine – the delivery of health-related services and information using information and communications technologies (ICTs) – as a critical driver for expanding access to services and promoting continuity of care. This role of telemedicine

is further amplified among underserved communities and in populations living in remote areas and in places where access to brick-and-mortar health care is limited or inadequate. Furthermore, the gains from telemedicine apply across a range of health programmes, including sexual and reproductive health, noncommunicable diseases and mental health, where individuals may desire anonymity and follow-up care is critical.

With these opportunities, and with the growing interest in telemedicine and digital health interventions more generally, there remains a need to ensure these technological advances are accompanied by appropriate guidance to maximize the benefits and limit the potential risks. Telemedicine services need to be trusted and usable by individuals and health workers alike, equitable and accessible across populations, and supported with adequate resourcing and legal frameworks for their institutionalization. Building on established guidelines, emerging best practices and lessons learned, this consolidated implementation guide seeks to facilitate the meaningful and sustainable use of telemedicine and provide a pathway for integrating telemedicine as part and parcel of routine health service delivery.

The World Health Organization (WHO) has long recognized the pivotal role of telemedicine, as first presented in the 2010 report by the WHO Global Observatory for eHealth titled *Telemedicine: opportunities and developments in Member States: report on the second global survey on eHealth* and then re-emphasized in the 2012 publication by WHO and the International Telecommunication Union (ITU) titled *National eHealth strategy toolkit*. In 2015, WHO launched a global survey to explore developments in digital health for achieving universal health coverage (UHC), which included assessing the penetration of telemedicine in Member States. In 2019, a new publication, *WHO guideline: recommendations on digital interventions for health system strengthening*, reviewed the evidence base and formulated recommendations on the use of telemedicine, both among individuals and health workers, to bolster coverage and quality of services. This was complemented by the 2020 release of WHO's *Digital implementation investment guide (DIIG): integrating digital interventions into health programmes* and the 2021 launch of WHO's *Global strategy on digital health 2020–2025* to promote the appropriate and sustainable adoption of digital health technologies within the context of national strategies. Over the course of the pandemic, various forms of guidance and tools emerged in response to the immediate requests for the scale-up of telemedicine services. Across this time span, our knowledge and learnings have expanded significantly, pushing us to optimize the implementation of telemedicine services, as consolidated and documented within this guide.

Harnessing the power of digital technologies is paramount for achieving the Sustainable Development Goals by 2030. Telemedicine in particular holds an important function in the package of digital health interventions for accelerating UHC. In line with the digital health resolution from the Seventy-First World Health Assembly in 2018, WHO remains committed to guiding this digital transformation towards the ultimate goal of health and well-being for all.

**Dr Soumya Swaminathan**  
Chief Scientist  
WHO

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# Abbreviations

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<b>C-DAC</b>	Centre for Development of Advanced Computing
<b>CERTES</b>	Centre d'Expertise et de Recherche en Télémédecine et E-santé
<b>COVID-19</b>	coronavirus disease 2019
<b>DIIG</b>	Digital Intervention Implementation Guide
<b>EMR</b>	electronic medical record
<b>HIPAA</b>	Health Insurance Portability and Accountability Act of 1996
<b>HWC</b>	Health & Wellness Centre (India)
<b>ICT</b>	information and communications technology
<b>ID</b>	identification
<b>IDB</b>	Inter-American Development Bank
<b>IPPA</b>	Indonesia Planned Parenthood Association
<b>IT</b>	information technology
<b>M&amp;E</b>	monitoring and evaluation
<b>NCD</b>	noncommunicable disease
<b>OPD</b>	outpatient department
<b>PAHO</b>	Pan American Health Organization
<b>RAFT</b>	Réseau en Afrique Francophone pour la Télémédecine
<b>RE-AIM</b>	Reach–Effectiveness–Adoption–Implementation–Maintenance
<b>SRHR</b>	sexual and reproductive health and rights
<b>SOP</b>	standard operating procedure
<b>ITU</b>	International Telecommunications Union
<b>WHO</b>	World Health Organization



# Background

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Telemedicine – which involves the use of digital technologies to overcome distance barriers in the delivery of health services – has the potential to improve clinical management as well as extend coverage of services. The demonstrated benefits of telemedicine include reducing unnecessary clinical visits, providing more timely care and expanding access to underserved communities (1). Although telemedicine is a well-established digital health intervention, the barriers in accessing physical services during the coronavirus disease 2019 (COVID-19) pandemic catalysed the use of this intervention globally. Telemedicine also serves as a key mechanism for uptake of self-care interventions and features as a key component of the WHO interim guidance on *Maintaining essential health services: operational guidance for the COVID-19 context* (2,3).

Since the pandemic, countries have demonstrated substantial interest in implementing and scaling up telemedicine services. In some contexts, telemedicine may have been introduced as an immediate response to the COVID-19 pandemic and implemented with limited guidance, infrastructure or underlying regulatory guidelines. While telemedicine offers opportunities to expand access to health services, its implementation must be guided by careful reflection of regulatory and strategic frameworks to mitigate potential risks and harms, and to maximize its sustainability within the health sector. In response to the global increase in the demand for telemedicine (4), this guidance consolidates numerous resources from the World Health Organization (WHO) and provides an overview of key steps and considerations for implementing telemedicine interventions and optimizing its benefits and impact.

## Target audience

The target audience for this resource is policy decision-makers and those responsible for the design and oversight of telemedicine implementations. This document is not intended to be an exhaustive resource; rather, it outlines fundamental processes and evidence-based considerations for ensuring telemedicine interventions add sustained value to the health system and to individuals. Lastly, this is intended to be an evolving document that harnesses learnings emerging from the COVID-19 pandemic while also synthesizing key considerations from WHO resources relevant for telemedicine developed over the past decade. Overall, this consolidated guidance seeks to provide a comprehensive overview of the planning, implementation and maintenance processes to inform a costed investment and support countries across these different stages in their telemedicine journey.



## Definitions and key terms

**Telemedicine** is defined as “the delivery of health-care services where distance is a critical factor, by all health-care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries all in the interests of advancing the health of individuals and their communities” (5). While the evolution of digital technologies has also introduced new terminologies and operational considerations, the underlying principle of telemedicine is the provision of remote health-care services through digital tools.



Telemedicine is a component of **telehealth**, which is a broader application of technologies to distance education and other applications wherein electronic communications and information technologies are used to support health-care services (5,6).

“**Virtual health and care**” is another phrase to denote this area of work that highlights the delivery of health and care services remotely through digital means and technologies (7). Telemedicine can be conducted through several ways, including (5):

- + **Store and forward** – consists of storing and sending information remotely. This is used typically in non-emergency situations. In these instances, health data and images are submitted digitally for analysis at a later time by a health worker, usually a specialist. This has been used for various specialties, such as dermatology, radiology and ophthalmology. It is also described as an asynchronous or deferred mode of digital health care.
- + **Interactive services** – also described as a “real-time” or “synchronous” mode of digital health care. It consists of communication between two or more actors in clinical practice for the purpose of diagnostic and therapeutic assistance in the treatment of clients/patients who would otherwise not have timely access to specialist care.
- + **Remote client/patient monitoring, also known as telemonitoring** – enables health workers to monitor an individual’s condition remotely, using technologies such as connected medical devices and sensors. This is often used for chronic conditions and accompanied by communication channels for coordination of care or alerts to health workers based on clinical parameters/ranges.

Telemedicine may be conducted between clients/patients seeking health services and health workers (also described as client-to-provider or patient-to-health worker), or may be among different health workers (also known as provider-to-provider telemedicine). Furthermore, telemedicine may be delivered via different channels, including video, audio calls, text messages, smartphone applications, and picture archive and communication systems, as well as custom-made telemedicine systems – noting that the fast pace of technology makes it difficult to foresee all the channels of communication that may be used in the future.

Common use cases of telemedicine include:

- + **Teleconsultation** provision of remote clinical services to clients/patients.
- + **Tele-expertise** where a health worker may be seeking a second opinion or guidance from a specialist. This can be further broken down to indicate the clinical specialties such as tele-dermatology, tele-ophthalmology, etc.
- + **Tele-triage** such as fast-tracking emergency decisions by transmission of health parameters and remote consultation.
- + **Guided self help** used widely for the delivery of psychological interventions in mental health. This comprises of self-help information (e.g. provided through a smartphone, website or book) with brief support delivered by a person over the telephone or online.

### WHO recommendations and existing guidance

WHO has recognized the power of telemedicine, issuing a flagship report in 2010 titled *Telemedicine: opportunities and developments in Member States* (8). In the 2019 *Recommendations on digital health interventions for health system strengthening* (1), WHO issued formal recommendations for telemedicine in two scenarios: (a) client to provider; and (b) provider to provider<sup>1</sup> (see [Box 1](#)).



As with all digital health implementations, telemedicine interventions should not exist in isolation and should be underpinned by national digital health strategies that include the building blocks of leadership and governance, strategy and investment, infrastructure, legislation, policy and compliance, workforce, and services and applications (5). Countries developing their telemedicine interventions should be cognizant of these factors and consider them as part of a comprehensive digital health strategy, as well as the broader health sector strategic plans for delivery of services. As such, telemedicine should not be seen as a separate intervention, but rather integrated into the package of health-care services.

<sup>1</sup> As this is a document that consolidates different resources, the term “client” is used interchangeably with “patient” and the term “provider” interchangeably with “health worker”.

## BOX 1. WHO guideline recommendations on telemedicine

### General recommendations

- + **Client-to-provider telemedicine:** WHO recommends the use of client-to-provider telemedicine to complement, rather than replace, the delivery of health services and in settings where patient safety, privacy, traceability, accountability and security can be monitored. In this context, monitoring includes the establishment of standard operating procedures (SOPs) that describe protocols for ensuring patient consent, data protection and storage, and verifying provider licensing and credentials (1).
- + **Provider-to-provider telemedicine:** WHO recommends the use of provider-to-provider telemedicine in settings where patient safety, privacy, traceability, accountability and security can be monitored. In this context, monitoring includes the establishment of SOPs that describe protocols for ensuring patient consent, data protection and storage, and verifying provider licensing and credentials (1).

### Recommendations related to specific health domains and use cases

- + **Good practice statement on telemedicine and self-care interventions:** Client-to-provider telemedicine to support self-care interventions can be offered to complement face-to-face health services (9).
- + **Telemedicine for abortion services:** WHO recommends the option of telemedicine as an alternative to in-person interactions with the health worker to deliver medical abortion services in whole or in part. This recommendation applies to assessment of eligibility for medical abortion, counselling and/or instructions relating to the abortion process, providing instruction for and (active) facilitation of the administration of medicines, and follow-up post-abortion care, all through telemedicine. Hotlines, digital applications, or one-way modes of communication (e.g. reminder text messages) that simply provide information were not included in the review of evidence for this recommendation (10).

This document leverages key elements from existing WHO resources on telemedicine and digital health, most notably those listed below. These resources are complementary and can be reviewed in parallel to obtain greater detail on the specific aspects of interest.

## General background on digital health planning and implementation



National eHealth strategy toolkit (2012)



Digital Implementation Investment Guide (DIIG): Integrating Digital Interventions into Health Programmes



Guidelines on digital health for health system strengthening (2019)



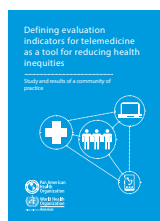
Global strategy on digital health 2020-2025

## Situational analysis of telemedicine programmes



Telemedicine: opportunities and developments in Member States: report on the second global survey on eHealth (2010)

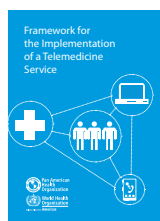
## Assessment and implementation tools for telemedicine



Defining evaluation indicators for telemedicine as a tool for reducing health inequities: study and results of a community of practice (2016)



Implementing telemedicine services during COVID-19: guiding principles and considerations for a stepwise approach (2021)



Framework for the implementation of a telemedicine service (2017)



Leveraging telehealth for efficient delivery of primary health care in the WHO South-East Asia Region (2021)



COVID-19 and telemedicine tool for assessing the maturity level of health institutions to implement telemedicine services (2020)



WHO-ITU global standard for accessibility of telehealth services (2022)

## Programmatic resources:



Maintaining essential health services: operational guidance for the COVID-19 context, interim guidance



Guideline on self-care interventions for health and well-being (2022)

As with all digital health interventions, the implementation of telemedicine interventions requires careful planning and design to ensure that they are in accordance with national digital health strategies and appropriate to local contexts. This document applies the framework from the *Digital implementation investment guide (DIIG)*, which provides a systematic process for planning, costing and implementing digital health interventions within a digital health enterprise (11). This telemedicine guidance leverages the general steps outlined in the DIIG and adapts them to the needs for implementation and monitoring of telemedicine interventions.

# Overview

The steps provided in this guide facilitate a process towards planning, implementing and maintaining a telemedicine programme, with the goal of contributing to a costed implementation plan for telemedicine interventions.

PHASE 01: SITUATIONAL ASSESSMENT	
STEP 01	<b>FORM THE TEAM AND ESTABLISH GOALS</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Identify stakeholders that should be involved in the design, management and implementation of the telemedicine programme</li> </ul>
STEP 02	<b>DEFINE HEALTH PROGRAMME CONTEXT AND TARGETS</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Determine the programmatic and geographic scope of the telemedicine service.</li> </ul>
STEP 03	<b>CONDUCT A LANDSCAPE ANALYSIS</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Conduct a landscape analysis of software applications and channels</li> <li><input type="checkbox"/> Map hardware needs and availability</li> </ul>
STEP 04	<b>ASSESS THE ENABLING ENVIRONMENT</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Assess digital maturity to determine infrastructural and organizational needs</li> <li><input type="checkbox"/> Review availability and competency of health workers</li> <li><input type="checkbox"/> Assess regulatory and policy considerations</li> <li><input type="checkbox"/> Consider implications for cross-jurisdictional flow of information</li> <li><input type="checkbox"/> Explore financing mechanisms</li> </ul>
PHASE 02: PLAN THE IMPLEMENTATION	
STEP 05	<b>DETERMINE HOW THE TELEMEDICINE SYSTEM WILL OPERATE</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Define the functional and nonfunctional requirements</li> <li><input type="checkbox"/> Update workflows reflecting the requirements</li> <li><input type="checkbox"/> Conduct extensive user testing</li> <li><input type="checkbox"/> Plan for change management</li> </ul>
STEP 06	<b>ENFORCE MECHANISMS FOR PATIENT AND HEALTH WORKER SAFETY AND PROTECTION</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Put systems in place for data privacy, access and protection of patient information</li> <li><input type="checkbox"/> Enforce ways to verify licensing/accreditation of health workers</li> <li><input type="checkbox"/> Determine and disclose if audio/video recording will be done</li> </ul>
STEP 07	<b>ESTABLISH STANDARD OPERATING PROCEDURES</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Clarify clinical protocols and identify potential liability considerations</li> <li><input type="checkbox"/> Determine the training package and channels for support</li> <li><input type="checkbox"/> Establish a process for confirming identification</li> <li><input type="checkbox"/> Establish clear consent documentation</li> <li><input type="checkbox"/> Explore whether changes to health worker remuneration are needed</li> <li><input type="checkbox"/> Establish a plan for management of connected medical devices</li> </ul>
STEP 08	<b>INVEST IN CLIENT/PATIENT ENGAGEMENT AND GENDER, EQUITY AND RIGHTS</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Determine mechanisms for outreach</li> <li><input type="checkbox"/> Assess implications on equity, gender and rights</li> <li><input type="checkbox"/> Ensure accessibility for persons with disabilities</li> </ul>
STEP 09	<b>DEVELOP A BUDGET</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Define the budget for overall cost of ownership</li> <li><input type="checkbox"/> Plan how to integrate telemedicine into routine health service delivery and purchasing arrangements</li> </ul>
PHASE 03: MONITORING AND EVALUATION (M&E), AND CONTINUOUS IMPROVEMENTS	
STEP 10	<b>DETERMINE M&amp;E GOALS</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Define indicators for assessing performance and impact</li> </ul>
STEP 11	<b>PLAN FOR CONTINUOUS IMPROVEMENTS AND ADAPTIVE MANAGEMENT</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Embed mechanisms for routine monitoring and continuous improvement</li> <li><input type="checkbox"/> Mitigate potential risks</li> </ul>





# PHASE 01

## SITUATIONAL ASSESSMENT

Form the team and establish goals

STEP 01



Define health programme context and targets

STEP 02



Conduct landscape analyses

STEP 03



Assess the enabling environment

STEP 04





# STEP 01

## FORM THE TEAM AND ESTABLISH GOALS

As with all implementations, the first key step is to establish a team and determine the overall objectives and expected goals of the telemedicine programme. The successful execution of the implementation plan will also require effective project management and coordination across the diversity of stakeholders.

### Identify stakeholders that should be involved in the design, management and implementation of the telemedicine programme



This can include different teams tasked with different responsibilities such as general oversight, technical implementation, etc. Through this planning, consider the perspectives of different stakeholders.



#### GOVERNANCE

These include digital health leads at national and local implementation level, policy-makers, health regulatory bodies, telecommunications regulatory bodies, and relevant bodies for health financing for reimbursement and payment of services, among others.



#### MANAGEMENT

These include health/telemedicine administrators, digital health national coordinators, health programme coordinators, clinical services leads (for example, family planning; safe abortion; maternal, newborn and child health; noncommunicable diseases, etc.), and focal points in health management and information services for incorporating service delivery statistics, among others.



#### OPERATIONS

These include business analysts, software developers, end-user trainers, help desk support/systems maintenance and implementation coordinators, among others. It may be useful to consider the operations category in two subgroups: (i) individuals responsible for the technology, such as the software, hardware, database, and its maintenance, and (ii) implementers, such as trainers and programme coordinators.



#### END-USER REPRESENTATIVES

These include clients/patients and their family members, patient groups, relevant professional bodies, and health workers, among others.



## STEP 02

# DEFINE HEALTH PROGRAMME CONTEXT AND TARGETS

With the teams established, identify potential for the telemedicine intervention in accordance with the national health priorities and needs of end-users, including health workers and clients/patients. This should also include a credible causal explanation for the telemedicine intervention to achieve the desired impact (theory of change) before making a commitment and investment.

## Determine the programmatic and geographic scope



Having a collective understanding of the overall context and scope of the telemedicine service is critical. Below are some questions and considerations to guide the scoping process.

- + Examine current processes and workflows and identify health system challenges and bottlenecks that you seek to address. This would include asking what specific health problems the telemedicine intervention could address, as well as what the prevalence is of a health problem and/or the geographic area of action. Current common health system challenges include geographic inaccessibility, limited distribution of the health workforce, and disruption of service.
- + Determine who the targeted end-users would be – for example, health worker cadre, individuals, or other potential end-users of the system. What are their health needs?
- + How many health facilities, health workers, or clients/patients are targeted for the implementation? In which geographic areas? Is the target population likely to use the telemedicine service?
- + Determine areas for improvement that can be delivered through the telemedicine intervention. Which of the identified needs could a telemedicine service satisfy? Is it possible to provide these health services remotely? Are individuals willing to access these health services using a telemedicine service? What barriers will individuals face in accessing the telemedicine service? How will these potential barriers be addressed? (See [Step 8: Invest in client/patient engagement and gender, equity and rights.](#))
- + How will the telemedicine service fit with the larger context of service delivery needs? For example, will there be integration with ambulance services, biological sample collection at home or primary health centre, delivery of medicines at home through community health workers, referral pathways for continuum of care? Thinking through the overall process for service provision fulfilment would be key to scale-up of telemedicine.
- + Overall, the use of human-centred design approaches and co-design of interventions should be considered for increasing usability, enhancing user experience and facilitating long-term adoption.



## STEP 03

# CONDUCT LANDSCAPE ANALYSIS

As you plan the telemedicine implementation, it is important to conduct a landscape analysis to map the different digital implementations and identify the potential for building on existing investments. Within this mapping effort, it is important to consider both the software applications and communication platforms, as well as the hardware needs that may be leveraged. Conducting the landscape analysis early on can help you understand the relevant digital health implementation, but it may also be useful to come back to this stage once there is greater clarity on the enabling environment and specifications on how the telemedicine system can feasibly operate.

## Conduct a landscape analysis of software applications and channels



Landscape analyses help to document what digital systems are in use, and this can also help to identify gaps and potential to reuse or expand on existing tools that have been applied to meet your needs. There are various resources for conducting a landscape analysis of digital health implementations. One tool is WHO's [Digital Health Atlas \(www.digitalhealthatlas.org\)](http://www.digitalhealthatlas.org), a web-based inventory that curates and maps digital health implementations globally.

The landscape analysis should map the current scope of the telemedicine services with an aim to identify opportunities for expanding the range of health topics covered. For example, antenatal care service could be expanded to include a continuum of care for postpartum health and related care. This would enable the incremental inclusion of telemedicine services offered while using available infrastructure and systems. This landscape analysis can also be revisited as the functional and nonfunctional requirements are developed to ensure alignment with the desired requirements (see *Step 5: Define the functional and nonfunctional requirements of the telemedicine system*).

## Map hardware needs and availability



In addition to mapping the software applications that can be leveraged for the telemedicine intervention, it is also important to assess the type of hardware available and needed. The hardware can include computers, tablets, monitors, audio-conferencing equipment (e.g. headsets), servers and connected medical devices. The mapping of hardware will also need to align with procurement guidelines (if available) and consider the reliability and availability of devices.



## STEP 04

# ASSESS THE ENABLING ENVIRONMENT

The enabling environment includes external influences, such as governance, regulatory, sociocultural, infrastructural and institutional factors. Understanding the enabling environment within which the telemedicine intervention will be implemented is critical for mitigating potential risks.

## Assess digital maturity



These include network and connectivity, integration with electronic medical records, cybersecurity and data protection, access to enabling hardware, and human resources. The Pan American Health Organization (PAHO)/Inter-American Development Bank (IDB) *COVID-19 and telemedicine tool for assessing the maturity level of health institutions to implement telemedicine services* provides a comprehensive checklist of enabling environment considerations organized along the following themes: organizational readiness, processes, digital environment, human resources and regulatory issues (12).

## Review availability and competency of health workers



A common challenge faced in telemedicine programmes is already overburdened health workers who are seeing patients in person being given additional responsibilities for delivery of services via telemedicine. Telemedicine services, once successfully adopted, can significantly increase the health system's reach to patients, but adequate staffing is crucial if the programme is to be a success. In addition, mapping the clinical competency of available health workers is critical to understanding what services can be done over telemedicine and ensuring there is a minimum standard of clinical knowledge and skills to do so. This review of health worker availability and competency should also include an analysis of the level of maturity of knowledge and information and communications technology (ICT) literacy in the health workforce so as to adapt the telemedicine intervention accordingly.

Fig. 1 depicts the domains within the PAHO/IDB tool for assessing the maturity level of health institutions to implement telemedicine services (12).

**FIG. 1.** Description of domains within the COVID-19 and telemedicine tool for assessing the maturity level of health institutions to implement telemedicine services



## Assess regulatory and policy considerations



Regulatory policies and guidelines for telemedicine – as with all interventions – are critical for ensuring quality of care, clarifying accountability, and protecting health workers and patients during provision of services. Regulations can also pave the way for integrating telemedicine into broader health services and facilitate the allocation of resources for it. While telemedicine guidelines and regulations are increasingly being introduced globally, in countries where telemedicine-related regulations do not yet exist, patients and health workers may lack the appropriate protection when care is provided via telemedicine. This section provides some of the considerations to review in light of common components of regulatory frameworks (see [Box 2](#)). The assessment of regulatory policies may also affect the design of the telemedicine programme as there might be changes of priorities or additional factors to consider.

**Box 2.** *Common components for telemedicine guidelines and regulations (13)*

**Although telemedicine guidelines and regulations are still emerging, they should generally contain information on the following:**

- + Authority responsible for regulating telemedicine in the country.
- + When telemedicine is considered to be an appropriate standard of care.
- + Which entities would be involved in the telemedicine services and the types of health workers that can provide telemedicine-based treatment (e.g. doctors, nurses, midwives, community health workers, paramedics, therapists, counsellors, practitioners of alternative medicine).
- + Responsibility and accountability for patient outcomes.
- + Patient consent that includes an explanation of the risks, benefits and limitations of telemedicine.
- + Data privacy and security standards.
- + Technology standards for hardware, software and interoperability.
- + Training requirements and certifications.
- + Quality assurance and quality control measures.
- + Reimbursement of health services delivered via telemedicine.

## Consider implications for cross-jurisdictional flow of information



This is relevant when the telemedicine programme is implemented between two or more countries, or when health workers and their clients/patients are based in different countries or jurisdictions. This may also be an issue in countries with different subnational processes as there may be differences in the registration requirements of the health workforce within regions/provinces/states of the same country.



## Explore financing mechanisms

Integrating telemedicine within service delivery models also includes an assessment of the health financing schemes and payment mechanisms. Some national legal systems may require the physical presence of the patient and health professional at the same time and in the same place, for a medical act to be legally valid. In these instances, telemedicine services may not have the same status as a medical act with a physical presence, which impacts reimbursement, liability, rights and obligations, and may require adaptation of the regulations to enable reimbursement for telemedicine services. Other payment considerations also include whether services delivered via telemedicine would be billed at the same rate as physical consultations or if adjustments will be made.

[Box 3](#) provides examples of national telemedicine guidelines that highlight the range of regulatory considerations to review when designing a telemedicine programme.



### Box 3. Examples of country guidelines for telemedicine

#### Australia



##### HEALTH INSURANCE (SECTION 3C GENERAL MEDICAL SERVICES – GP AND ALLIED HEALTH COVID-19 SERVICES) DETERMINATION 2020 ("TELEHEALTH DETERMINATION")

In response to the COVID-19 pandemic, Australia passed the "Telehealth Determination" legislation to officially recognize telemedicine as a service delivery channel and enable the reimbursement of telemedicine services. The legislation listed the conditions under which telemedicine services would be eligible. Although this legislation is no longer in effect as it was linked to COVID-19 measures, the regulations provide considerations that may be included for long-term routine uses of telemedicine.

<https://www.legislation.gov.au/Details/F2020L00249>

#### Ethiopia



##### TELEHEALTH IMPLEMENTATION GUIDELINE PRACTICAL TIPS

This national implementation guideline provides operational considerations for planning and implementing a telemedicine programme.

<https://icap.columbia.edu/wp-content/uploads/Telehealth-Guide-final2.pdf>

#### Germany



##### ACT TO IMPROVE HEALTHCARE PROVISION THROUGH DIGITALISATION AND INNOVATION (DIGITAL HEALTHCARE ACT – DVG)

This act emphasizes considerations for insurance reimbursement, e-prescription management and equitable access to digitalized health services.

<https://www.bundesgesundheitsministerium.de/digital-healthcare-act.html>

#### India



##### TELEMEDICINE PRACTICE GUIDELINES ENABLING REGISTERED MEDICAL PRACTITIONERS TO PROVIDE HEALTHCARE USING TELEMEDICINE

Among the different regulatory considerations, these practice guidelines provide details on procedures for obtaining consent, ensuring the health worker is a registered medical practitioner, and prescription management via telemedicine.

<https://www.mohfw.gov.in/pdf/Telemedicine.pdf>

#### Singapore



##### NATIONAL TELEMEDICINE GUIDELINES

These guidelines aim to address the relevant components for the delivery of telemedicine services by health-care providers through four domains: clinical standards and outcomes, human resources, organizational, and technology and equipment.

[moh-cir-06\\_2015\\_30jan15\\_telemedicine-guidelines-rev.pdf](https://www.moh.gov.sg/files/Assets/Documents/telemedicine-guidelines-rev.pdf)

#### United States of America



##### AMERICAN MEDICAL ASSOCIATION TELEHEALTH IMPLEMENTATION PLAYBOOK

This document provides a practical guide to implementing telemedicine programmes in light of regulatory policies such as the Health Insurance Portability and Accountability Act of 1996 (HIPAA) and, in particular, highlights considerations for remote monitoring.

<https://www.ama-assn.org/system/files/ama-telehealth-playbook.pdf>

## PHASE 01

### BY THE END OF THIS SECTION, THE FOLLOWING SHOULD BE IN PLACE:

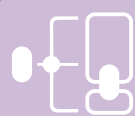
- + Established team with roles and goals articulated
- + Defined target population and programmatic scope
- + Assessment of the enabling environment, including the technical governance, regulatory, sociocultural, infrastructural and institutional considerations, to inform the design of the telemedicine intervention

## PHASE 02

### PLAN THE IMPLEMENTATION

**Determine how the telemedicine system will operate**

STEP 05



**Enforce mechanisms for patient and health worker safety and protection**

STEP 06



**Establish standard operating procedures (SOPs)**

STEP 07



**Invest in client/patient engagement and gender, equity and rights**

STEP 08



**Develop a budget**

STEP 09





## STEP 05

## DETERMINE HOW THE TELEMEDICINE SYSTEM WILL OPERATE

Building on the understanding of the context, targeted scope and assessment of the enabling environment, one of the key steps is conceptualizing and executing how the telemedicine system will operate. This includes co-designing the requirements of the digital system to address the intended goals and taking into account the changes in workflows that the telemedicine service will introduce, as well as ensuring the appropriate training is in place to address both the technological and clinical aspects of the intervention.

Process improvement opportunities should also be mapped for leveraging technology to improve inefficiencies and address identified bottlenecks. Quite often, the direct automation of existing workflows may limit improvements in efficiencies and therefore minimize the acceptance and uptake of the telemedicine intervention. Lastly, telemedicine should not be separated from routine service delivery but presented as additional channel for accessing health services. As such, the management of health service information obtained through telemedicine should be considered for integration into routine health information systems, such as the health management information systems and electronic medical records.

### Define the functional and nonfunctional requirements



Functional requirements detail what the digital system needs to do to support identified health system processes and tasks. The functional requirements for the telemedicine intervention describe what the technology needs to do in order to achieve the intended health objectives (11, p. 128). Nonfunctional requirements are “general attributes and features of the digital system to ensure usability and overcome technical and physical constraints” (11, p. 129). Common telemedicine functional requirements include considerations around the following.

- + Will the telemedicine functionality be conducted as asynchronous or synchronous communication?
- + Will it allow for multiple modes of delivery depending on infrastructure and human resource operating environments?
- + What channels will the telemedicine system use (e.g. text, audio, images, video, remote/self-monitoring through wearables, sensors, applications)?
- + Will the telemedicine system be used between clients/patients and health workers, among health workers, or both?

- + At what point in the service delivery workflows will clients/patients engage with the telemedicine system?
- + Will the telemedicine system use an already developed application? While this presents an efficient approach to introducing the telemedicine service, it should still undergo some user testing to assess how it fits within existing workflows, health system needs and end-user preferences. Developing a new system may give complete control but also presents the challenge of ensuring a usable level of maturity for it to be stable, safe and secure. This also requires resources and expertise and the work involved should not be underestimated. It is also critical that privacy and security is assessed to ensure it is compliant with ethical and legal obligations. For example, some systems may not have the required functionality to be compliant with regulations such as the European Union's General Data Protection Regulation or the United States' Health Insurance Portability and Accountability Act (HIPAA).
- + Will the telemedicine system also include a help desk for end-users – both clients/patients and health workers – to seek support for resolving technological issues? How will the application be supported? Will there be a local technology support team?
- + In the case of remote monitoring, what type of connected medical devices will be used? What are the mechanisms for enabling data transfer and exchange between the connected medical devices and the care team? Will the transmission of data from the connected medical device take place continuously or be based on a determined frequency? How will clinical thresholds be tracked?
- + Will the telemedicine system need to exchange data with or link to other digital systems to ensure continuity of care and accountability? These may include electronic medical records, laboratory information systems, or shared services, such as client/patient, facility and health worker registries (see [Box 4](#)).
- + Will the telemedicine intervention include dashboards and data analysis for the implementation team to monitor key performance indicators for decision-making? This would also need to be linked to the plans for adaptive management to determine areas for reinforcement and coaching (see [Step 10: Determine monitoring and evaluation goals](#)).

#### **Box 4.** *Planning for interoperability and data exchange*

To prevent the telemedicine effort from being a siloed implementation, determine if there are common components and shared services that can be reused or linked across implementations. Examples of common components include unique IDs for clients, health workers and facilities; terminology management services for data exchange; geolocation services; and schedule and decision engines. Shared services consist of canonical master lists, managed through a centralized process or governance mechanism; examples include health worker registries, facility registries, client registries, shared health records and health management information systems. Incorporating these, where available, will facilitate interoperability and reduce fragmentation across different implementations, helping to promote continuity of care among the different end-users of the telemedicine system.

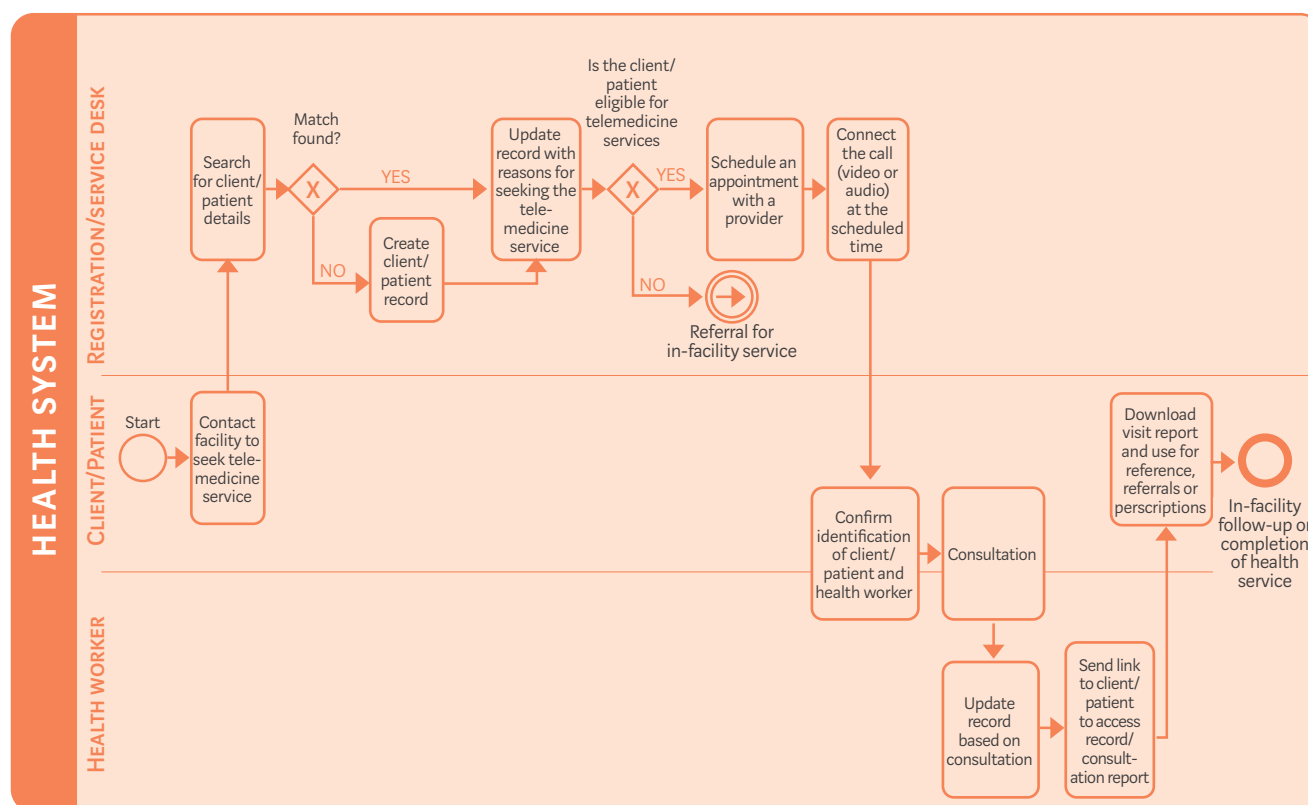
# Update workflows reflecting the requirements



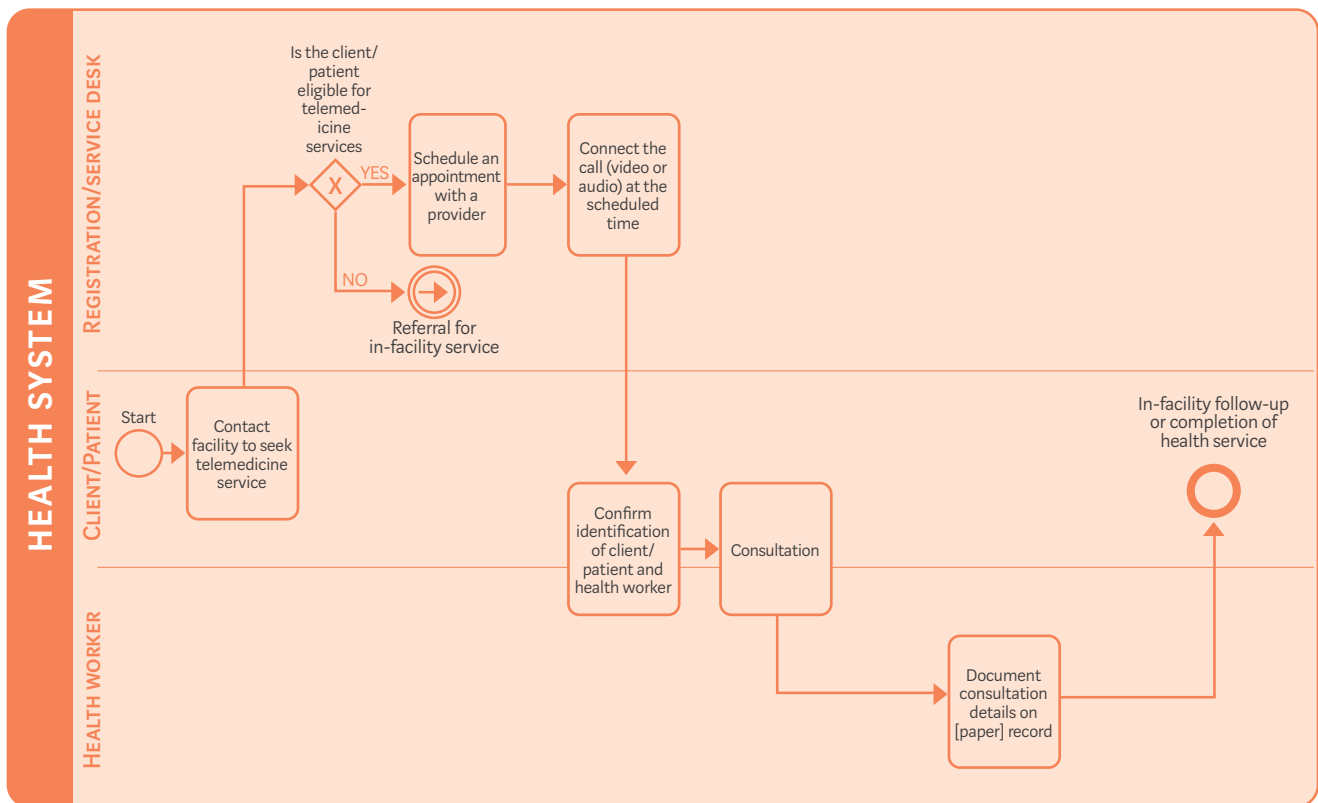
Business process workflows are a common and standardized way to describe how systems should function. [Fig. 2](#) provides an example of how a telemedicine programme integrated with an electronic medical record (EMR) would work. Although this example is based on a linkage with an EMR, it is also important to consider other potential integrations, such as to the health management information system, public health surveillance systems, and laboratory information systems.

Conversely, [Fig. 3](#) provides a more basic example of a telemedicine programme in which there is no direct linkage to an EMR. [Fig. 4](#) provides an illustrative overview for remote patient monitoring. Mapping the workflow of how the telemedicine programme operates and its intended interactions with all users – both clients/patients and health workers – will help ensure understanding of the system’s operations for all stakeholders.

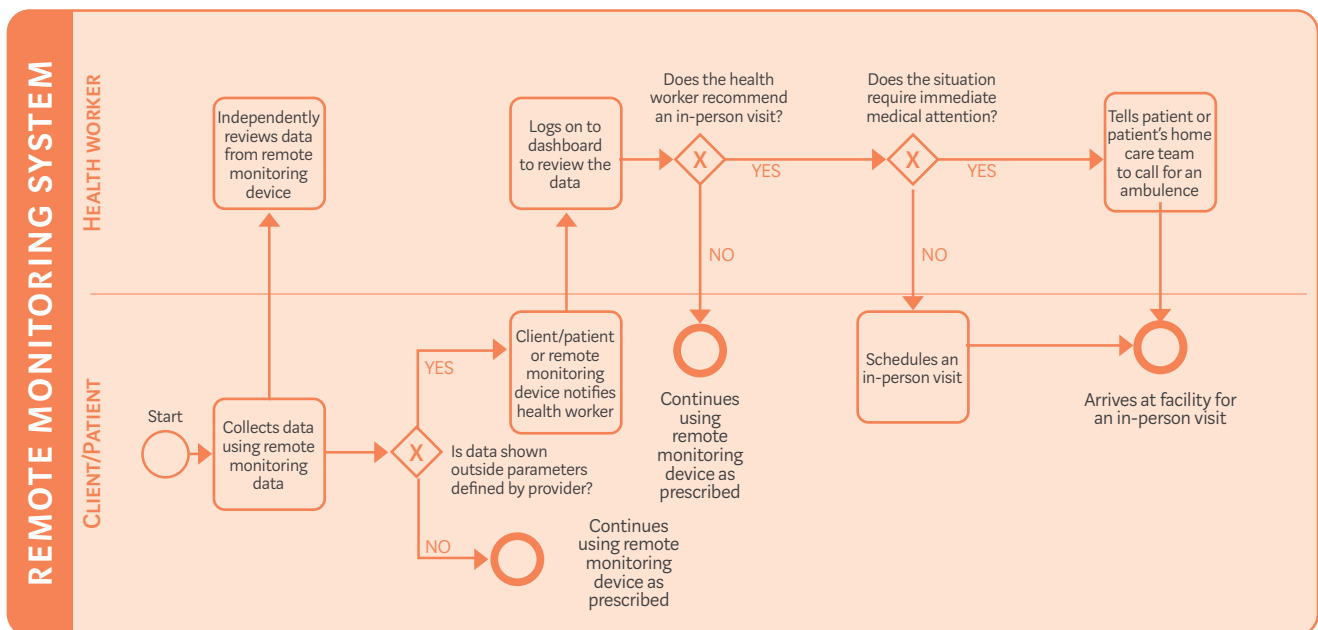
**FIG. 2.** Illustrative telemedicine programme with EMR integration



**FIG. 3.** Illustrative telemedicine programme with no direct linkage to an EMR



**FIG. 4.** Illustrative telemedicine programme for remote monitoring



Furthermore, use of the telemedicine programme will alter the status quo of how services are provided and require careful reflection on how to minimize the potential disruptive effects on the targeted end-users. This should include considerations of the following.

- + How will the daily routines of health workers need to change to include digital technologies? If there are changes to the workflow, how will the standard operating procedures (SOPs) be adjusted and disseminated to health workers?
- + Will the telemedicine service be in addition to the existing responsibilities of health workers, or will there be tasks or activities that will no longer be required of them? If so, what are these tasks and what will be the repercussions of no longer doing them?
- + What are the referral pathways and how will patients access diagnostic tests and medicines, especially in patient-to-health worker telemedicine?

## Conduct extensive user testing



Ensure that use of the technology does not impact negatively on the relationship between client/patient and health worker, particularly when end-users are learning about the technology and how to operate the devices. Throughout this process of defining the telemedicine system's functional requirements, employ human-centred design principles to determine and refine functionalities based on users' needs. This should involve working with users to understand how they currently do their jobs, obtaining user feedback on the system early on and creating regular opportunities for feedback loops to learn from users. Involve health workers, facility staff and other users in the design, user testing and implementation of the programme, and include them in decisions about changes to the programme. In addition, limited digital literacy in itself could be a major contributor to inaccessibility of telemedicine services, and the community health workers can play a role as an alternative to facilitate access to skilled health workers via telemedicine.

## Plan for change management



The process of introducing the telemedicine intervention and change management should begin early in the implementation planning process. Highlighting the sources of resistance or reluctance is key for addressing issues that may affect the acceptability and uptake of the telemedicine service. In addition, understanding these issues can feed into the design process and ensure that the concerns of end-users are reflected in the development and roll-out of the telemedicine intervention.



## STEP 06

# ENFORCE MECHANISMS FOR PATIENT AND HEALTH WORKER SAFETY AND PROTECTION

As the functionalities of the telemedicine system are established and refined, mechanisms for the protection of health workers, patients and their health information will need to be put in place to mitigate risks and maximize the trust that end-users have in the system. These protections include considerations for data privacy and access, and ensuring credibility of the health workers providing services through telemedicine.

## Put systems in place for data privacy, access and protection of patient information



Telemedicine creates some special situations with unique considerations to protect the privacy and security of patients. Data security is needed to address not only risks to patient confidentiality, but also risks to data integrity such as unauthorized alteration of data. Ensure that the concerns of clients/patients and health workers are addressed, and that they and other stakeholders are aware of and able to use these systems. In developing systems for data privacy and protection, the following should be considered.

- + Identify a mechanism to clearly identify which of the users who are linked to the telemedicine service are authorized to have access to the information. If appropriate for the telemedicine service, establish different information levels of access for professionals. The data security and protection plan should clearly establish the responsibility of all involved actors. This plan should also include details on who is responsible for data breaches or leaks, as well as how to handle them.
- + Develop a well-defined data security plan for storing, transferring and processing sensitive health information, and on how to manage access to clinical records for use during the telemedicine service implementation.
- + Identify a location for conducting the telemedicine intervention, such as a closed room, cubicle or other secure environment to minimize overhearing/sharing of health information.
- + Determine if connected medical devices will be used for the remote patient monitoring and the plans for data exchange and security.
- + Determine if personal devices, such as health workers' own phones, will be used as part of the delivery of telemedicine services, and policies for data protection or limitations on what can be recorded or stored on a personal device.



## Enforce ways to verify licensing/accreditation of health workers to ensure trust and accountability



The safety of patients and health workers is very important for continued acceptability of telemedicine and trust in the services provided through this digital platform. There may be risks with unaccredited or unlicensed health workers using a patient-to-health worker telemedicine system. Clarify the legal framework for the implementation of telemedicine, including relating to the licensing and regulation of health workers providing telemedicine services. For example, in India, licensed medical practitioners are obliged to display or make available their registration number prior to initiating the clinical component of the telemedicine service. Telemedicine services should also provide redressal mechanisms to deal with fraud and abusive situations, including blacklisting users and sharing reporting and redressal mechanisms. Similarly, there should also be systems in place to determine how issues of medical liability and auditing of services will be done.

## Determine and disclose if audio/video recording will be done



Since telemedicine interactions may happen over video or audio calls, these calls may be recorded and stored for monitoring and quality assurance purposes, with appropriate patient consent. As this scenario is not found in face-to-face consultations, recording consultations may initially impede patients from sharing health issues openly. The telemedicine service will need to ensure patients are made aware of and consent to a recording of the telemedicine consultation for potential auditing and monitoring purposes. The safe and protected archival of recordings of telemedicine consultations will also require careful reflection on who will have access to the audio/video recordings, and how these will be stored and protected.



## STEP 07

## ESTABLISH STANDARD OPERATING PROCEDURES (SOPS)

Before launching the telemedicine service, clearly defined SOPs are needed to standardize the implementation, mitigate potential risks and promote trust in the service. The development of SOPs is critical both for the health workers providing the telemedicine service, as well as a public-facing guidance to clients/patients (elaborated further in [Section 8. Invest in client/patient engagement and gender, equity and rights](#)).

### Clarify clinical protocols and identify potential liability considerations



Determine what types of cases still warrant face-to-face contact and what can be managed through remote consultations. Consider whether it is possible or desirable for clients/patients and health workers to meet in person before connections are made remotely/digitally, if the situation allows. Of particular concern is that telemedicine interactions between patients and health workers may limit non-verbal feedback, which may impact the ability to build trust and affect the health worker's ability to assess whether the client/patient understands the information provided.

### Determine training packages and channels for support



Identify the topics that the training must cover. These may include familiarity with the digital components; the telemedicine practice guideline; clinical skills, including adaptations for telemedicine services; care practice guidelines for remote patient management; communication skills. As the training package is developed, it may also need to be continuously refined based on the cases and scenarios that end-users are facing. Ensure training and support are available through different channels, including individual training sessions, as well as through help desks and easily accessible tools for end-users to seek information on navigating the technological aspects of the telemedicine system. For clients/patients in particular, communicate the importance of keeping all medical devices and software up to date, as well as operating systems for browsers, smartphones, desktop computers and tablets. Furthermore, tailored training may need to be directed at different stakeholders,<sup>2</sup> including:

<sup>2</sup> Adapted from the Digital Health Applied Leadership Program (<https://ughe.org/the-digital-health-applied-leadership-program-dhalp>).



### STRATEGISTS

policy-makers, health planners, ministry of health permanent secretaries, regulatory bodies



### TACTICIANS

health/telemedicine administrators, health programme managers, national digital health coordinators, digital health coordinators, implementers



### PRACTITIONERS

health workers using the telemedicine programme

## Establish a process for confirming identification



As part of the identification step, the client/patient needs to know that they are interacting with an approved health worker; likewise, the health worker needs to know the identity of the individual to whom they are providing services, particularly if this requires knowing the patient's health history. Ensure that there are mechanisms for documenting and tracing past exchanges and decisions made during consultations.

## Establish clear consent documentation



In most countries, for patient-to-health worker telemedicine, consent is implied as it is the patient who is making an active effort to seek the health services. However, telemedicine services initiated by a health worker requires documented consent, in which a verbal statement or text must be recorded. Where applicable, establish a procedure for informed consent whereby clients/patients authorize the use of the telemedicine service, including consent for how the health information data will be stored. Ensure that the limitations of telemedicine are clearly communicated with patients.

## Explore whether changes to health worker remuneration are needed



Ensure that the distribution of roles and responsibilities between different health workers is clear, including through regulations and job descriptions. This process should begin early on given that changing health worker responsibilities and workflows may take considerable time as changes may need to be made to official government documents. If these changes are not made then the telemedicine implementation may be hampered dramatically as health workers will likely not have the availability or capacity to conduct telemedicine interventions alongside their routine responsibilities. This would also need to be reinforced through training on clinical practice guidelines, including prescribing limitations, indications for referral, quality monitoring and quality audit.

## Establish a plan for management of connected medical devices



If the remote patient monitoring will require the use of medical devices that are not already owned, it will be critical to ensure that there is a process for procurement and distribution. The following are considerations to keep in mind.

- + How will clients/patients obtain the connected medical devices? Will the connected medical devices be provided as a loan? If so, how will these be monitored? If clients/patients purchase the connected medical devices, will they be eligible for reimbursement?
- + How will malfunctions and technical issues with the medical devices be handled? How will maintenance of the medical devices be handled?
- + What plans are in place if patients do not return the loaned medical device?
- + How will devices be calibrated and tested prior to distribution? Will the connected medical devices need to be vetted against regulatory standards?



## STEP 08

# INVEST IN CLIENT/PATIENT ENGAGEMENT AND GENDER, EQUITY AND RIGHTS

Community outreach, awareness and behaviour change communication about telemedicine is critical for uptake, and access to these services may also be mediated by sociocultural, gender and equity factors. As with any other health intervention, significant efforts have to be made to generate client/patient and health worker demand to increase their awareness and acceptability of the telemedicine services, and to ensure this is done in an inclusive manner that does not further exacerbate health inequities.

## Determine mechanisms for outreach



Investment in community outreach, awareness, marketing and behaviour change communication about telemedicine is especially critical as the patient end-users may be unaware of or uncomfortable with a digital channel of health-care delivery. These mechanisms could be through social media, mass media communication and community outreach, and may include the development of materials on how to access the intervention (e.g. pamphlets, health portals, health facilities, etc.) and availability of the telemedicine service. Engage with civil society organizations and local action groups to promote awareness, trust and patient engagement.

## Assess implications on equity, gender and rights



Telemedicine often requires higher network bandwidth for accessibility compared to other digital health interventions; therefore, aspects of the digital divide may come more into play. If the telemedicine service is in part meant to increase health-care access to those who do not have it, careful consideration of the connectivity environment must be taken into account to determine if such services will alleviate or exacerbate the problem. Pay special attention to the needs, preferences and circumstances of particularly disadvantaged or hard-to-reach groups, including people with low literacy or few digital literacy skills, people with limited control over or access to digital devices, people speaking minority languages, migrant populations in new settings, and people with disabilities. This may include ensuring there are multiple ways to access communication channels for the telemedicine intervention, as well as allowing for different access points, such as through community health workers or kiosks. In addition, when considering the procurement of connected medical devices for remote patient monitoring, ensure that inequities in who can access the medical devices are not further exacerbated.

## Ensure accessibility for persons with disabilities

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Persons with disabilities are a diverse group of individuals who experience many barriers and challenges when accessing telemedicine services. For example, people with vision impairment might not be able to read text or use online platforms if these are not compatible with assistive devices such as screen readers, Braille keyboards or screen magnification. People with hearing impairment may be unable to communicate with a health worker if captioning and volume control are not available in videoconferencing. Without voice synthesizers or text-to-speech generators, people with speech difficulties may be unable to communicate their needs and requirements (14).



## STEP 09

## DEVELOP A BUDGET

When developing the budget for telemedicine services, implementation costs should be reviewed across the different phases of implementation – development and set-up, deployment, integration and interoperability, scale-up, and sustained operations (11) – as well as in setting a vision for the financing and payment of services. The steps include:

### Define the budget for overall cost of ownership



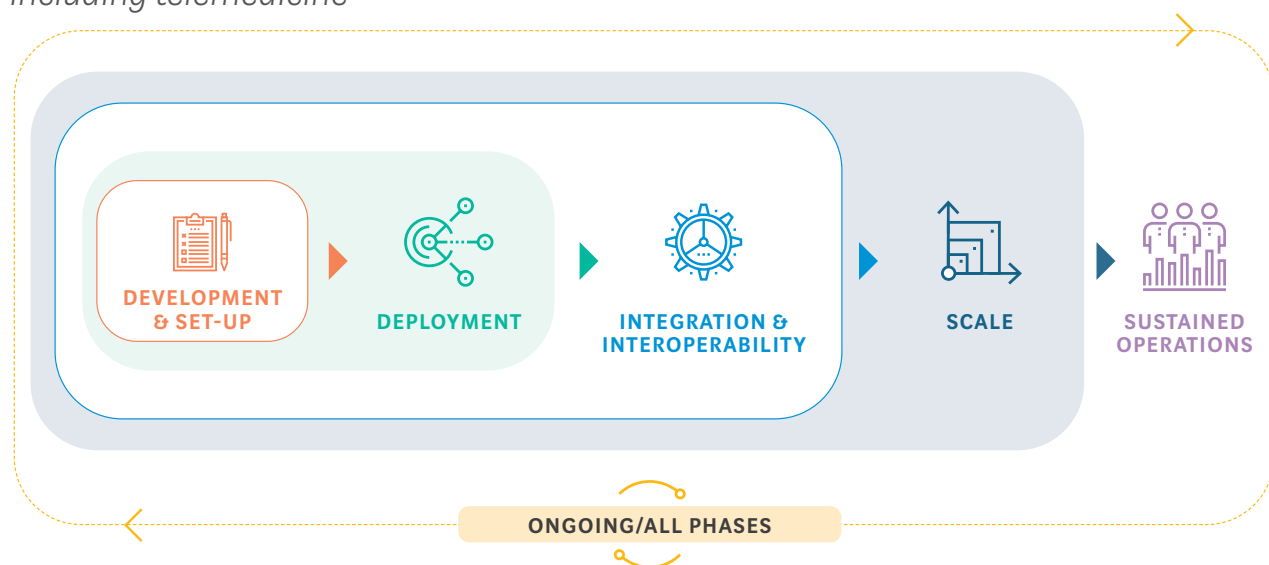
Develop a budget that provides allocations for initial capital expenditures but also costs for the implementation and maintenance phases (see [Fig. 5](#)). There may also be costs that spread across phases, such as those associated with governance meetings and human resources. Also note that there are costs to clients/patients that may not be reflected in the budget but should be considered, particularly if these are expected to be out-of-pocket expenses. Table 1 highlights the illustrative cost categories for patient-to-health worker telemedicine, noting that this is just one example of telemedicine.

### Plan how to integrate telemedicine into routine health service delivery and purchasing arrangements





For the telemedicine service to be institutionalized, there will need to be further exploration into how such services are incorporated into the benefit packages covered by different health financing schemes. This includes an understanding of the conditions of purchasing arrangements including, from whom (e.g. selection from accredited providers), for whom (e.g. target population and effectively covered population), and how these services are being purchased (such as, contracting modalities, reporting obligations, payment methods, rates of remuneration for service provision) (see [Step 4: Explore reimbursement models and payment mechanisms](#)).

**FIG. 5.** Phases of implementation to consider for costing digital health interventions, including telemedicine



**TABLE 1.** Illustrative cost categories for patient-to-health worker telemedicine

Cost category	Description
 <b>ONGOING/ALL PHASES</b>	
<b>Governance</b>	<ul style="list-style-type: none"> <li>» Personnel for partnership-building and coordination meetings to align with stakeholders (such as Technical Working Group members, implementing partners and mobile network operators)</li> <li>» Meeting costs (transportation, personnel time)</li> <li>» Governance body to oversee standards, interoperability and architecture integration.</li> </ul>
<b>Management and staffing</b>	<ul style="list-style-type: none"> <li>» Personnel to oversee overall programme</li> <li>» Clerical staff to answer and triage incoming calls (may not be necessary if clinical staff can also do the call intake)</li> <li>» Clinical staff to provide consultations or refer to a specialist, if needed, which may be particularly expensive if the service needs to be available 24/7</li> <li>» Access to referral specialists in cases requiring expertise not currently provided by available clinical staff (such as dermatology or radiology)</li> <li>» Personnel for routine monitoring of system performance, including tracking of dropped calls and use of the service</li> <li>» Personnel for system set-up and end-user support.</li> </ul>
 <b>DEVELOPMENT AND SET-UP</b>	
<b>Outreach and raising awareness</b>	<ul style="list-style-type: none"> <li>» Development of materials on how to access the intervention (e.g. pamphlets, social media, health portals, health facilities displaying the number to dial)</li> <li>» Dissemination to clients/patients about the intervention (such as messages sent to a phone bank of numbers to communicate availability of the telemedicine service)</li> <li>» Stakeholder meetings/engagement both for health workers and clients/patients as part of development and acceptance feedback.</li> </ul>
<b>Technology adaptation</b>	<ul style="list-style-type: none"> <li>» Software customization for communication and exchanging health content based on the modalities/communication channels to be used, such as videoconferencing, transmission of data/images, voice calls, text messages, software applications</li> <li>» Security features, such as end-user authentication schemes when recording callers' demographic and health information</li> <li>» Cloud-based solutions with encrypted data may be needed for remote monitoring.</li> </ul>





## DEPLOYMENT

### Equipment/ hardware

- » Computer with dedicated software system for audio and/or video connections for health workers to conduct consultations
- » Audio or videoconferencing equipment, which may include headsets and trunk lines (central lines that can direct voice calls, images and videos to multiple lines and across different network operators)
- » Access to authorized or recommended medical devices to capture clinical data needed as appropriate.

### Initial training

- » Development/adaptation of training protocols and SOPs, including call intake, consent and referral processes
- » Initial training to end-users (e.g. health workers and clients/patients) on how to use the telemedicine system.



## INTEGRATION AND INTEROPERABILITY

### Technology adaptation

- » Design of technology architecture to link the telemedicine system with other interventions, such as targeted client/patient communication
- » Software customization to reflect integration.

### Human resources

- » Additional personnel to define interoperability requirements and data exchanges
- » Additional personnel to ensure the ongoing maintenance of the integrated system
- » Additional personnel for increased coordination with partners to follow up on software integrations and governance.



## SCALE

### Training and adaptive management

- » Additional training for health workers conducting the telemedicine
- » Additional training for supervisory personnel on continuous monitoring
- » Additional training for ICT support staff to provide end-user support, troubleshooting, back-up and recovery
- » Periodic review meetings to discuss feedback on system performance and challenges.

### Equipment/ hardware

- » Additional computer with dedicated software system for audio and/or video connections for health workers to conduct the consultation
- » Additional audio or videoconferencing equipment, which may include headsets and trunk lines (central lines that can direct voice calls, images and videos to multiple lines and across different network operators)
- » Access to authorized or recommended medical devices to capture clinical data needed as appropriate.



## SUSTAINED OPERATIONS

### Refresher training and adaptive management

- » Refresher training and continuous support to health workers on how to use the telemedicine system
- » Periodic review meetings to discuss system performance and workflow integration.

### Communication/ data exchanges

- » Airtime and/or transmission of data files, depending on the volume and modality of the communication (modalities/communication channels may include videoconferencing, transmission of data or images, web-based platforms, voice calls and interactive voice response; the caller may incur these costs unless there are provisions for the service to be toll-free, enabling costs to be absorbed by the organization/facility providing the remote consultation)
- » Support line for client/patient experiences and feedback.

### Technology maintenance

- » Software maintenance and licence fees
- » Hardware maintenance, including insurance and repair/replacement of hardware.

## PHASE 02

### BY THE END OF THIS SECTION, THE FOLLOWING SHOULD BE IN PLACE:

- + Description of functional and nonfunctional requirements responsive to the end-users' and programmatic needs
- + Mapped workflows, including integration points with the health information system
- + Defined mechanisms for assuring data privacy, access and protection of patient information
- + Training plan and SOPs, including protocol for health workers and guidance for clients/patients on use of the telemedicine service
- + Budget and financing plans for developing, sustaining and integrating the telemedicine service within the broader health system

## PHASE 03

### MONITORING AND EVALUATION, AND CONTINUOUS IMPROVEMENTS

**Determine monitoring and  
evaluation goals**

**STEP 10**



**Plan for continuous improvements  
and adaptive management**

**STEP 11**





## STEP 10

## DETERMINE M&E GOALS

Monitoring and evaluation (M&E) is fundamental to ensuring that the telemedicine programme is achieving its intended effects (15). Building in a culture of data use for continuous improvements allows for adaptations to be made in response to how the telemedicine programme is being used. For telemedicine in particular, aspects need to be assessed from both the health workers' and clients' perspectives in regard to their interactions with the system and resulting effects.

### Define indicators for assessing performance and impact



The Reach–Effectiveness–Adoption–Implementation–Maintenance (RE-AIM) framework outlined by Glasgow et al. (2019) provides a useful way to organize the different aspects of telemedicine that must be assessed (16). Table 2 adapts the different domains of the RE-AIM framework and draws on illustrative indicators compiled from WHO, as well as national and subnational resources. [Box 5](#) also offers additional resources that may be consulted for designing the M&E plan.

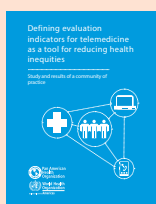
**TABLE 2.** *Illustrative M&E indicators for telemedicine based on adapted RE-AIM framework*

Domain	Definition	Illustrative subdomains	Illustrative indicators
Reach	The number of people who are willing to participate in a given telemedicine programme.	<ul style="list-style-type: none"><li>» Coverage</li><li>» Equity</li><li>» Accessibility</li></ul>	<p>Coverage:</p> <ul style="list-style-type: none"><li>» Percentage of all health services/encounters performed using telemedicine (17,18).</li><li>» Percentage of target population/caregivers enrolled in telemedicine programme (17).</li><li>» Number/percentage of patients being monitored by telemedicine (17).</li></ul> <p>Equity/accessibility:</p> <ul style="list-style-type: none"><li>» Number of people with disabilities, physical/economic limitations, etc., that have had access to care through telemedicine (18).</li></ul>

Domain	Definition	Illustrative subdomains	Illustrative indicators
Effectiveness	The impact of a telemedicine programme on important outcomes, including potential negative effects, quality of life, and economic outcomes. Heterogeneity of effects and reasons for success or lack of success.	<ul style="list-style-type: none"> <li>» Timeliness of care</li> <li>» Quality of care</li> <li>» Financial implications for clients/patients</li> </ul>	<p>Timeliness of care:</p> <ul style="list-style-type: none"> <li>» Time required to obtain health service via telemedicine versus non-telemedicine (17).</li> <li>» Decrease in wait times for clients/patients (18,19).</li> <li>» The amount of time to check in for a visit (19).</li> </ul> <p>Quality of care:</p> <ul style="list-style-type: none"> <li>» Medication adherence/care plan compliance among patients (18,19).</li> <li>» Percentage change in admission and readmission rates (16).</li> </ul> <p>Financial implications – clients/patients:</p> <ul style="list-style-type: none"> <li>» Private or out-of-pocket transport costs to access service (18-20).</li> <li>» Non-transport costs to clients/caregivers, such as time off work/school, cost of childcare (18-20).</li> <li>» Travel distance to service or health worker's office and distance saved from not travelling (18,20,21).</li> </ul>
Adoption	The absolute number, proportion and representativeness of: (a) settings; and (b) intervention agents (people who deliver the telemedicine programme) who are willing to initiate a telemedicine programme.	<ul style="list-style-type: none"> <li>» Adoption by geographic area</li> <li>» Adoption by type of health worker</li> <li>» Utilization of telemedicine services</li> <li>» Health worker satisfaction</li> <li>» Client/patient satisfaction</li> <li>» Acceptance and trust</li> </ul>	<p>Adoption by geographic area or facility:</p> <ul style="list-style-type: none"> <li>» Percentage of units (municipalities, populations, hospitals, clinics) that offer telemedicine services out of the units originally proposed (18).</li> <li>» Proportion of hospitals/health facilities taking part in telemedicine out of the national total (18).</li> </ul> <p>Adoption by health worker:</p> <ul style="list-style-type: none"> <li>» Percentage of health workers that demonstrate adequate ability in telemedicine service delivery (17).</li> <li>» Number of telemedicine appointments requested with health workers of different specialties (18).</li> </ul> <p>Health worker satisfaction and acceptance:</p> <ul style="list-style-type: none"> <li>» Percentage of health workers that indicated overall satisfaction levels of satisfied or above (17).</li> <li>» Percentage of total practitioners referring clients/patients for telemedicine services (17).</li> </ul> <p>Client/patient satisfaction and acceptance:</p> <ul style="list-style-type: none"> <li>» Percentage of clients/patients who refuse to use telemedicine service (17).</li> <li>» Clients'/patients' ability to interpret diagnosis and treatment instructions through the telemedical modality(17).</li> </ul>

Domain	Definition	Illustrative subdomains	Illustrative indicators
<b>Implementation</b>	At the setting level, this refers to the intervention agents' fidelity to the various elements of a telemedicine programme's protocol, including consistency of delivery as intended and the time required.	<ul style="list-style-type: none"> <li>» Usability</li> <li>» Stability</li> <li>» Fidelity of implementation</li> <li>» Adaptations required</li> </ul>	<p><b>Usability:</b></p> <ul style="list-style-type: none"> <li>» Percentage of completed telemedicine encounters affected by a technical issue (17).</li> <li>» Percentage of incomplete telemedicine encounters affected by a technical issue (17).</li> </ul> <p><b>Fidelity of implementation:</b></p> <ul style="list-style-type: none"> <li>» Percentage of requested telemedicine appointments that were successfully scheduled (17).</li> <li>» Percentage of scheduled telemedicine appointments completed (17).</li> </ul> <p><b>Stability:</b></p> <ul style="list-style-type: none"> <li>» Number of hours or days the programme does not provide services due to a technological or operating issue (18).</li> <li>» Time taken to resolve technical problems per unit (18).</li> </ul> <p><b>Adaptations required:</b></p> <ul style="list-style-type: none"> <li>» Number and types of changes to the system to accommodate the programme (e.g. purchasing devices, investing in technology support services and creating telemedicine platforms) (21).</li> </ul>
<b>Maintenance</b>	The extent to which: (a) the programme is sustained after the initial intervention; or (b) a telemedicine programme or policy becomes institutionalized or part of routine organizational practices and policies. This includes proportion and representativeness of settings that continue the intervention and reasons for maintenance, discontinuation or adaptation.	<ul style="list-style-type: none"> <li>» Sustainability</li> <li>» Institutional changes</li> <li>» Costs to health system</li> </ul>	<p><b>Sustainability:</b></p> <ul style="list-style-type: none"> <li>» Percentage of clinical services delivered via telemedicine (21).</li> </ul> <p><b>Institutional changes:</b></p> <ul style="list-style-type: none"> <li>» Percentage of patient encounters for which no subsequent in-person encounter was necessary (17).</li> <li>» Change in access to specialty health workers (19).</li> </ul> <p><b>Costs to health system:</b></p> <ul style="list-style-type: none"> <li>» Percentage of telemedicine services reimbursed (17).</li> </ul>

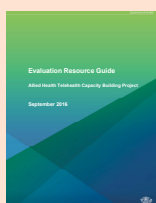
## Box 5. Resources for designing M&E frameworks for telemedicine



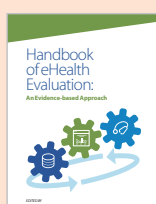
Defining evaluation indicators for telemedicine as a tool for reducing health inequities: study and results of a community of practice. Washington (DC): Pan American Health Organization/World Health Organization Regional Office for the Americas; 2016 (<https://iris.paho.org/handle/10665.2/28562>).



Creating a framework to support measure development for telehealth. Washington (DC): National Quality Forum; 2017 ([https://www.qualityforum.org/publications/2017/08/creating\\_a\\_framework\\_to\\_support\\_measure\\_development\\_for\\_telehealth.aspx](https://www.qualityforum.org/publications/2017/08/creating_a_framework_to_support_measure_development_for_telehealth.aspx)).



Evaluation resource guide: allied health telehealth capacity building project. Brisbane: State of Queensland; 2016 ([https://www.health.qld.gov.au/\\_\\_data/assets/pdf\\_file/0024/451077/telehealth-evalguide.pdf](https://www.health.qld.gov.au/__data/assets/pdf_file/0024/451077/telehealth-evalguide.pdf)).



Lau F, Kuziemy C, editors. Handbook of ehealth evaluation: an evidence-based approach. Victoria: University of Victoria; 2016 (<https://www.ncbi.nlm.nih.gov/books/NBK481590/>).



Program developer toolkit, 2021 edition. Sacramento: California Telehealth Resource Center; 2021 ([https://www.caltrc.org/wp-content/uploads/2021/08/CTRC\\_ProgramDevToolkit\\_2021Layout\\_ChgMgmt210830.pdf](https://www.caltrc.org/wp-content/uploads/2021/08/CTRC_ProgramDevToolkit_2021Layout_ChgMgmt210830.pdf)).



## STEP 11

## PLAN FOR CONTINUOUS IMPROVEMENTS AND ADAPTIVE MANAGEMENT

Continuous feedback loops and change management are critical, especially with the introduction of new systems and processes. Monitoring is not only important for following up on the performance of the telemedicine programme, but also to detect challenges in order to implement improvements to the system.

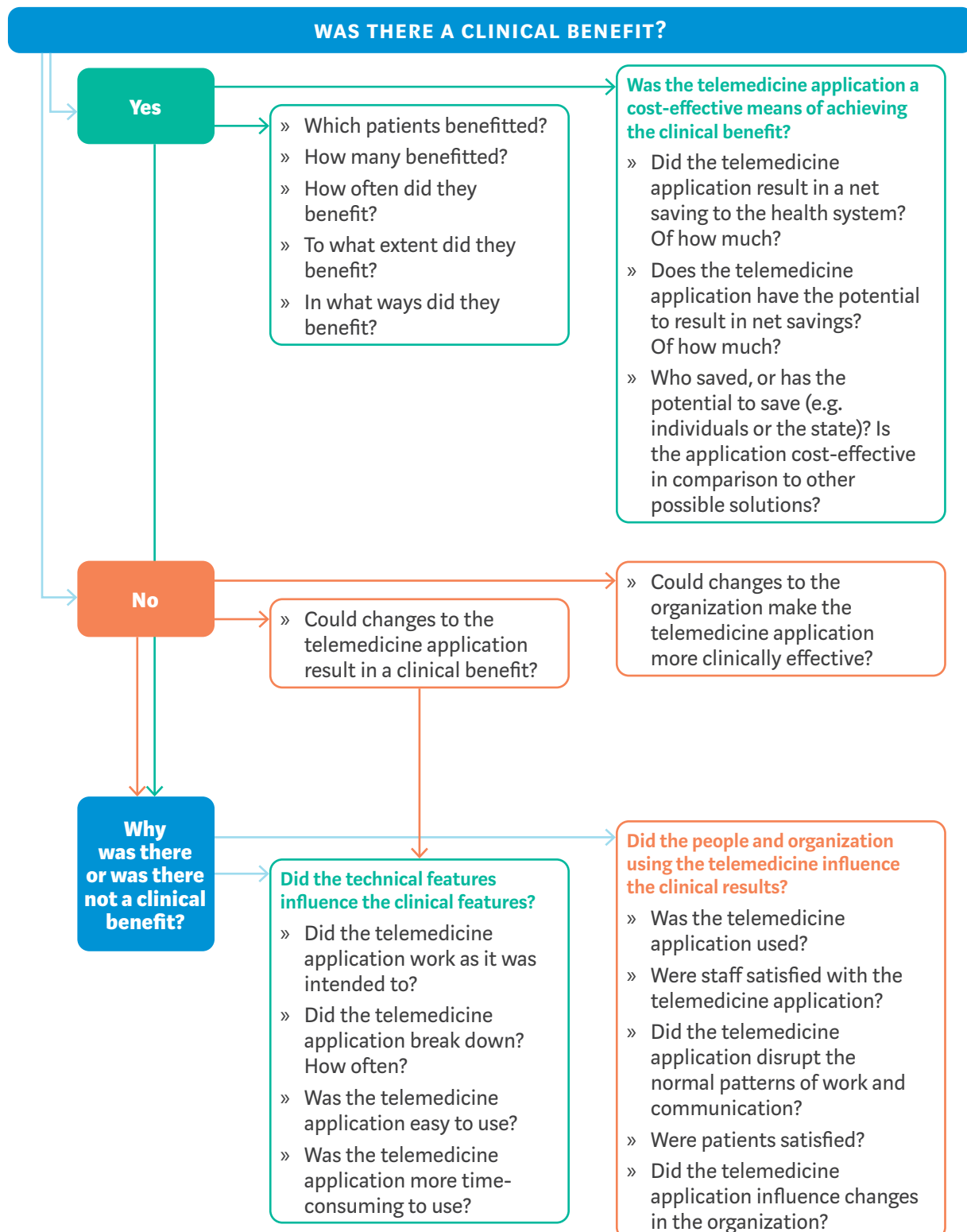
### Embed mechanisms for routine monitoring and continuous improvement



Routine monitoring of performance indicators – such as patterns of uptake and client engagement – will aid in maximizing the impact of the telemedicine service. In particular, reviewing divergent patterns of high and low use of the telemedicine system can help identify ways to optimize the system or detect impediments to use of the system. Ensure that the needs for routine monitoring are incorporated into the overall M&E plans, which should also include dedicated individuals or teams equipped to review the data and apply these towards programmatic decision-making. In addition, discussions with end-users on their experiences can help determine the changes and support needed, or if other health system strategies need to be introduced. This gathering of end-user feedback can inform change management practices and should also be accompanied by resources to enact requested changes. [Fig. 6](#) outlines questions telemedicine programme leads can use to guide adaptive management efforts.



**FIG. 6.** Questions to consider when assessing the implementation of telemedicine programmes



Source: Lau and Kuziemy (2016) (22).



## Mitigate potential risks (23)

As with all interventions, there will be challenges in the implementation and factors that may impede their sustainability. While it is difficult to anticipate all the risks and issues that implementations will encounter, there are some common pitfalls to monitor and potential mitigation strategies that can be put in place. Table 3 provides an illustrative list of considerations – adapted from other resources – to include as part of risk planning and overall monitoring effort. Note that this is not an exhaustive list, and additional considerations for challenges are reflected in the case studies.

**TABLE 3.** *Potential risks/challenges and mitigation strategies<sup>3</sup>*

Domain	Potential risks/challenges	Mitigation strategies
Leadership and governance	Lack of governance mechanisms for oversight and implementation	» Establish a team and governance structure to determine strategic direction necessary for long-term sustainability, including payment for services.
Strategy and investment	Insufficient resources for maintenance of the telemedicine service, including for software updates and cybersecurity coverage	» Communicate funding needs and plan for overall long-term costs.
	Unclear payment processes and reimbursement mechanisms for telemedicine services	» Plan for integration of telemedicine into the health system and inclusion into service delivery packages. » Establish policies for reimbursement of services, including recognition of telemedicine as reimbursable service.
Legislation, policy and compliance	Lack of telemedicine regulations to provide oversight and recognition for telemedicine services to be reimbursed or recognized as an official health service	» Establish regulatory guidelines for telemedicine; this can include through review and adaptation of existing guidelines.
	Legal liability in cross-jurisdiction telemedicine	» Engage stakeholders across the different jurisdictions to clarify regulatory guidelines, including management of legal liability, data exchange, and payment for services.
	Data protection and privacy	» Establish SOPs that delineate access to and storage of patient data, including recordings from audio/video consultations and data from connected medical devices used in remote patient monitoring.
Infrastructure	Inaccessibility by clients/patients due to technology, network and data connectivity, technology quality, failure to meet clinical expectations)	» Develop different modalities for accessing the telemedicine service, including through community-based health workers and different types of devices, audio/video.

<sup>3</sup> Adapted from: Empowered Kids Ontario [Virtual Care Resource Guide](#).(23)

Workforce	Resistance from health workforce and low morale due to unfamiliar workflow and technologies	» Engage health workforce in the design and introduction of the telemedicine service.
	Low levels of engagement or uptake by health workforce	» Allocate resources for training and continuous support and coaching, including through help desks and other channels for technical support. » Conduct trial runs of new workflows to allow for familiarity.
	Lack of physical contact may impact quality of care and raise concerns about medical liability	» Develop policies on what services should be done in person and what can be delivered via telemedicine. » Consult health programme leads and health workers for guidance on what services can be adapted for telemedicine. » Provide training on adapting clinical interventions for telemedicine.
Services and applications	Risk of privacy or security breach due to inadequate or non-compliant privacy and security safeguards	» Ensure terms and conditions of applications address privacy and data-hosting considerations. » Conduct background checks on vendor supporting the software application (as appropriate).
Standards and interoperability	Limited continuity of care and scale of implementation due to fragmentation of digital health landscape	» Use of data exchange standards for use within electronic medical records. » Leveraging available shared services, such as health worker registry, facility registry, unique identifiers.

## PHASE 03

### BY THE END OF THIS SECTION, THE FOLLOWING SHOULD BE IN PLACE:

- + M&E plan, with defined indicators and data sources
- + Mechanisms for continuous monitoring and improvements
- + Risk management and mitigation plan

# ANNEX

## CASE STUDIES

*Disclaimer:* The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by WHO in preference to others of a similar nature that are not mentioned.



# eSanjeevani – India's national telemedicine service

## What was the intervention?

In 2018, well before the onset of the COVID-19 pandemic, the Government of India's Ministry of Health and Family Welfare conceptualized the national roll-out of telemedicine, known as eSanjeevani. eSanjeevani is a cloud-based flagship telemedicine technology of the Centre for Development of Advanced Computing (C-DAC) in Mohali, India. It was customized as eSanjeevaniHWC for implementation in all the 155 000 Health & Wellness Centres (HWCs) of the Ayushman Bharat Scheme – the world's largest government-owned health insurance initiative.

eSanjeevaniHWC was primarily envisaged with the following objectives:

- + To address the shortage of doctors/specialists at ground level.
- + To reduce burden on district hospital and tertiary care facilities due to limited services at primary health-care level.
- + To initiate creation of electronic health records at primary- and secondary-level health facilities and thereby enabling care continuum.

In response to the first set of COVID-19 lockdown measures in which all outpatient departments (OPDs) were closed, the Ministry of Health and Family Welfare directed the eSanjeevani team at C-DAC Mohali to adapt the system for a national patient-to-health worker telemedicine platform. Although few paid private telemedicine services were available in the country, these were relevant only to those who could afford them. This raised the need for a system whereby all citizens could obtain health services remotely from the confines of their homes and in a way that is accessible, easy to use and free for all citizens.

The key guiding principles for developing the patient-to-doctor national telemedicine platform – eSanjeevaniOPD – were the following:

- + The processes must mimic a hospital-based OPD.
- + The user interface must be simple and intuitive.
- + The system must ensure the security of citizens' health information.
- + End-to-end services from development, deployment and operationalization to capacity-building and maintenance must be provided by one technical team.

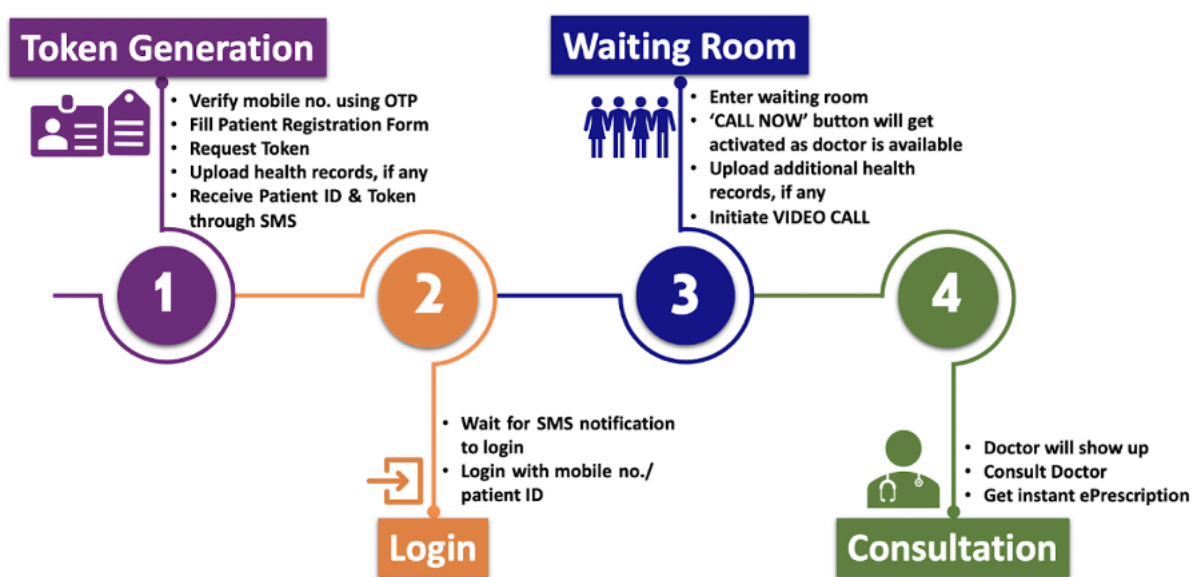
To boost the adoption of patient-to-health worker telemedicine services, the Board of Governors in supersession of the Medical Council of India (replaced by National Medical Commission now) together with National Institution for Transforming India (NITI), released the telemedicine practice guidelines on 25 March 2020 (24).

## How does the intervention work?

There are two ways in which the eSanjeevani programme operates: (i) eSanjeevaniHWC for health worker-to-health worker teleconsultation and (ii) eSanjeevaniOPD for patient-to-health worker teleconsultation.

1. eSanjeevaniHWC is implemented as a health worker-to-health worker modality in the spoke-and-hub model at HWCs located in rural or semi-urban areas. Most of these HWCs do not have medical practitioners<sup>4</sup> and are staffed by nurses, such as community health officers and auxiliary nurse midwives. The patients in villages walk up to their HWCs and in cases when the community health worker feels that the patient needs to consult a general practitioner or a specialist, an electronic medical record is created on the eSanjeevani platform and connects the health worker to a medical practitioner in the designated hub. The medical practitioner then examines the patient remotely and, if necessary, writes an ePrescription. The medicines are dispensed to the patient by the community health worker.
2. eSanjeevaniOPD is a client/patient-to-health worker approach made available through a web application as well as mobile applications (Android and iOS) (25). It functions as a stay-home OPD for patients, who fill a registration form to register and are issued a secure token via a verified mobile phone number. They then log into the application using the token ID and enter a virtual waiting room until they are connected to the medical practitioner who examines them and writes a prescription for them, if necessary (see [Fig. 7](#)).

FIG. 7. Workflow of eSanjeevaniOPD



OTP: one-time password

As of July 2022, the National Telemedicine Service had served over 50.5 million patients. Of these, eSanjeevaniHWC had served over 42.3 million across 98 571 HCWs as spokes served by over 11 000 hubs; eSanjeevaniOPD had served 8.2 million patients.

<sup>4</sup> The term "medical practitioner" refers to both general practitioners (non-specialist doctors) and specialist doctors.

## What were the challenges faced and how were they resolved?

Since it was the first kind of intervention to facilitate telemedicine on a national scale, challenges to the programme were expected at every phase. Some of the challenges included:

- + Data centres did not have the capacity to accommodate on-demand scaling needs of the application catering to pan-India usage in such a short span of time. Hence, the national telemedicine platform had to be designed as a hyperscale cloud-based system and presented a steep learning curve for the development team.
- + SOPs had to be drafted as there were no existing resources to reference. To address this, the team drafted SOPs in consultation with the Ministry of Health and Family Welfare for eSanjeevani. These were reviewed after short periods and then revised based on the requirements and lessons learned from the implementation.
- + A vast majority of health workers had never used information technology/digital interventions, nor were they familiar with examining patients remotely. Rigorous training sessions were organized for the medical practitioners to familiarize themselves with eSanjeevani. These included remote orientation sessions to train practitioners, after which their profiles were created in eSanjeevani and enrolled into the roster for each online OPD. Multiple trials with test cases were conducted for each practitioner and this strategy helped them become more comfortable in using eSanjeevani.
- + In the initial stages, patients from rural areas could not comprehend telemedicine and it took some time for them to develop trust in the telemedicine modality. To address this, aggressive campaigns on social media platforms were carried out by state health authorities to increase awareness about telemedicine in villages and isolated communities, as well as posting banners and posters in HWCs. In addition, a user guide and instructional video on how to use the system were developed for end-users. These user guide resources for medical practitioners and patients are available at: <https://esanjeevaniopd.in/Flowstep>.
- + Since this was a new modality of delivering health services, it was difficult to foresee its demand and at times spikes had to be managed. The use of the system was monitored closely to inform estimates and forecast demand in advance to meet expected spikes.

## What were the lessons learned and way forward?

Internet penetration in India is around 48%; however, in certain regions it was above 55% and in certain other regions it was less than 25%. As expected, telemedicine utilization was greater in the regions with higher penetration. However, telemedicine utilization was higher than anticipated (despite low Internet penetration) in regions where locations of health-care facilities were scattered or where the terrain was difficult. This demonstrates that demand for telemedicine boosts adoption of telemedicine even in regions where Internet penetration is low.

Strong local technical support was also an important factor in uptake. eSanjeevani was developed locally by the Health Informatics Group in C-DAC and has over 60 experienced engineers providing constant back-end technical and operational support to ensure high throughput as well as uptime. eSanjeevani is operational with over 99.5% uptime.

The ability to leverage the investments from eSanjeevani has been another key learning and facilitated efficiencies in expanding eSanjeevani for other use cases. For example, national organizations such as the Employees' State Insurance Corporation – a statutory social security body under the ownership of the Ministry of Labour and Employment – has also onboarded eSanjeevani to extend the access of health services to the workforce. eSanjeevani has also been integrated with the Government's Ayushman Bharat Digital Mission, which is aimed at developing the backbone necessary to support the integrated digital health infrastructure of the country. This integration facilitates users of eSanjeevani to create their individual Ayushman Bharat Health Account – the equivalent of a health unique identifier – and use it to link and manage their existing health records such as prescriptions and laboratory reports. Users would also be able to share their health records with medical practitioners on eSanjeevani to facilitate better clinical decision-making and continuity of care.

eSanjeevani is being augmented further and will be released as eSanjeevani2.0 with additional functions and features, including artificial intelligence-based interventions and multilingual interface to enhance the convenience and efficacy of the service. The platform's capacity is also being scaled up to support over 1 million consultations on a daily basis and ensure accessibility to all patients using the WHO-ITU global standard (14).



# Cabo Verde's national telemedicine programme

## What was the intervention?

Cabo Verde, as an archipelago country, has always sought alternatives to reduce health inequalities and isolation of different populations caused by its geography. Since 2012, the Ministry of Health of Cabo Verde has been implementing a national telemedicine programme with the aim of linking all the islands on a joint platform, provide more timely care and diagnoses, and reduce referrals to central hospitals for specialty care. The telemedicine service was guided by the following objectives.

- + Provide specialized teleconsultations across different facilities and cadres of health workers.
- + Facilitate distance training to health workers.
- + Promote the use of information and communications technology (ICT) for health.
- + Reduce health inequities across the country.

## How does the intervention work?

The telemedicine programme operates through hubs established on the nine inhabited islands. These hubs include a videoconferencing system, allowing multipoint connections. The peripheral sites/spokes are equipped with heart and lung auscultation and electrocardiograms, along with a high-resolution camera (see [Fig. 8](#)). General practitioners and other non-specialized health workers conduct teleconsultations with specialized medical practitioners, such as neurologists, cardiologists, surgeons, endocrinologists, urologists and dermatologists.

## What were the main challenges and how were they addressed?

- + The intervention faced resistance to change from health workers, primarily due to lack of knowledge about telemedicine and concerns using the technology. To address this, the programme placed an emphasis on raising awareness among health workers and providing continuous support to them to overcome needs related to ICT literacy and adapting clinical services to the telemedicine context. In addition, identifying the local leaders or representatives of professional organizations facilitating discussions to obtain their feedback was critical.

**FIG. 8.** Example of a telemedicine station at the peripheral site



- + The Internet technology provider for the telemedicine system, Núcleo Operacional Para a Sociedade de Informação, experienced a cyberattack, which affected the telemedicine operations and the health records linked with it. However, the impact of the cyberattack was mitigated as the telemedicine system records are backed up on a weekly basis. In order to minimize the disruptions, the telemedicine service briefly switched to providing consultations over alternative platforms, such as Zoom, WhatsApp and Viber, which were less secure but enabled the health needs to be met during this interim period. The telemedicine system is now being integrated with the health information system to ensure patient health records are managed under the same data security protocols.

### **What were the lessons learned and way forward?**

Political will is critical for the success of the implementation and is a key driver towards ensuring financial sustainability. In addition to the support required at higher levels, there also needs to be continuous training and engagement with end-users, such as health workers. The national coordination team will continue to emphasize the support to health workers in acclimating to the use of these technologies.

This modality of telemedicine requires extensive investment in hardware and medical equipment, in addition to the technology and software for connectivity. The maintenance of the hardware and equipment may be underestimated and needs to be carefully considered when developing the budget. The financing needs for further scale-up will reflect these potentially overlooked costs for equipment maintenance.



# Telemedicine for continued access to sexual and reproductive health services

## What was the intervention?

When the Government of West Java, Indonesia, directed clinics to close in response to a rising number of coronavirus disease 2019 (COVID-19) cases, people still needed a way to access health-care services. Indonesia Planned Parenthood Association (IPPA) had previously used WhatsApp successfully to provide psychosocial counselling services to people living with HIV. During the pandemic, IPPA expanded its use of WhatsApp to offer clients/patients counselling services, such as on adolescent health, sexually transmitted infections and safe abortion. IPPA also used WhatsApp to communicate with clients/patients in need of supplies, such as contraceptives or antiretrovirals, which IPPA sent to clients/patients via courier or in person through community health workers.

## How does the intervention work?

Clients/patients obtain the contact information for clinics from IPPA's website; social media; and information, education and communication activities, such as through community health workers. After receiving a message from a prospective client/patient via WhatsApp, clinic staff send the client a form that asks for their name, address and other contact information. Upon receiving the completed form, clinic staff share those details with the health workers, who then speak to the patient and deliver services communicating via WhatsApp. Clinic staff take a screenshot of the conversations between the clients/patients and health workers once their exchange finishes in order to document the consultation and save the record to the patient's files. Screenshots are also saved to an external hard drive or disk stored at the clinics. Clients/patients can also connect with clinics through clinic partners in the field, such as an outreach worker, to mitigate barriers to receiving services. When the partner in the field meets someone in need of IPPA's services, it communicates that to IPPA. Afterwards, a health worker from IPPA goes out to the field partner's site or the patient's home to deliver the services. Each patient who has received an IPPA service is asked to share their level of satisfaction with the services they received. Some clinics ask such questions via WhatsApp, while other clinics asks clients/patients to fill out a Google form.

## What were the main challenges and how were they addressed?

IPPA confronted four main challenges with their broader telemedicine programme.

- + Picking the appropriate channel/application for delivering the telemedicine service.
- + Managing the security and confidentiality of their conversations via WhatsApp.
- + Developing an SOP that outlines how medical/clinic staff should use telemedicine.
- + Ensuring all health workers have the same definition, and therefore expectations, of telemedicine.

IPPA initially considered numerous options besides WhatsApp for connecting with clients/patients during the pandemic, including other forms of social media, development of their own telemedicine platform, and start-ups that allow clients/patients to connect with doctors online. However, the decision was made to use WhatsApp due to its widespread popularity. In addition, WhatsApp offers

a combination of video, audio and text options. In the initial stages of the telemedicine programme, medical staff used their private/individual WhatsApp accounts to provide services. However, IPPA has since directed clinics to stop using individual or private WhatsApp accounts and explained that such accounts are not safe or confidential for clients/patients. IPPA is now in the process of developing a fixed SOP and has trained staff on issues such as online or phone counselling, as well as what telemedicine is and how to use it. Provision of abortion counselling services via WhatsApp has its own unique security challenges due to the legal restrictions in-country. Currently, IPPA requires clients/patients in need of abortion services to meet the health worker in person.

### **What were the lessons learned and way forward?**

As IPPA attempts to scale up its telemedicine programme to include additional sexual and reproductive health services beyond counselling, it will focus on developing SOPs early on so it can provide consistent training for staff. In addition, IPPA will enhance mechanisms to ensure the safety and security of clients/patients and health workers.



# Telemedicine for mental health

## What was the intervention?

The ongoing pandemic and the implemented lockdown measures have triggered fear and anxiety, and have adversely affected the mental health and well-being of the public in Qatar. Stress from the pandemic has also exacerbated symptoms among people living with mental health conditions. In response, a helpline was launched to provide support for people experiencing mental health problems resulting from the current COVID-19 pandemic. The helpline was established through collaboration between the Ministry of Public Health, the Primary Health Care Corporation, and the Mental Health Service at Hamad Medical Corporation. This collaboration of stakeholders and partners was essential and key to the success of this intervention.

## How does the intervention work?

The helpline is staffed by a team of mental health professionals who can assess and provide support to callers. (See [Fig. 9](#) for a screenshot of the helpline website.) Callers are categorized into four main categories: children and parents; adults; older people; and front-line health workers. The tele-psychiatry line works on three levels of interventions.

- + First level: Triage to assess people's needs based on the problem itself and the patient's demographics.
- + Second level: Psychological support provision with the available resources.
- + Third level: Psychiatric support where the caller is referred to a specialized psychiatrist for further management and treatment.

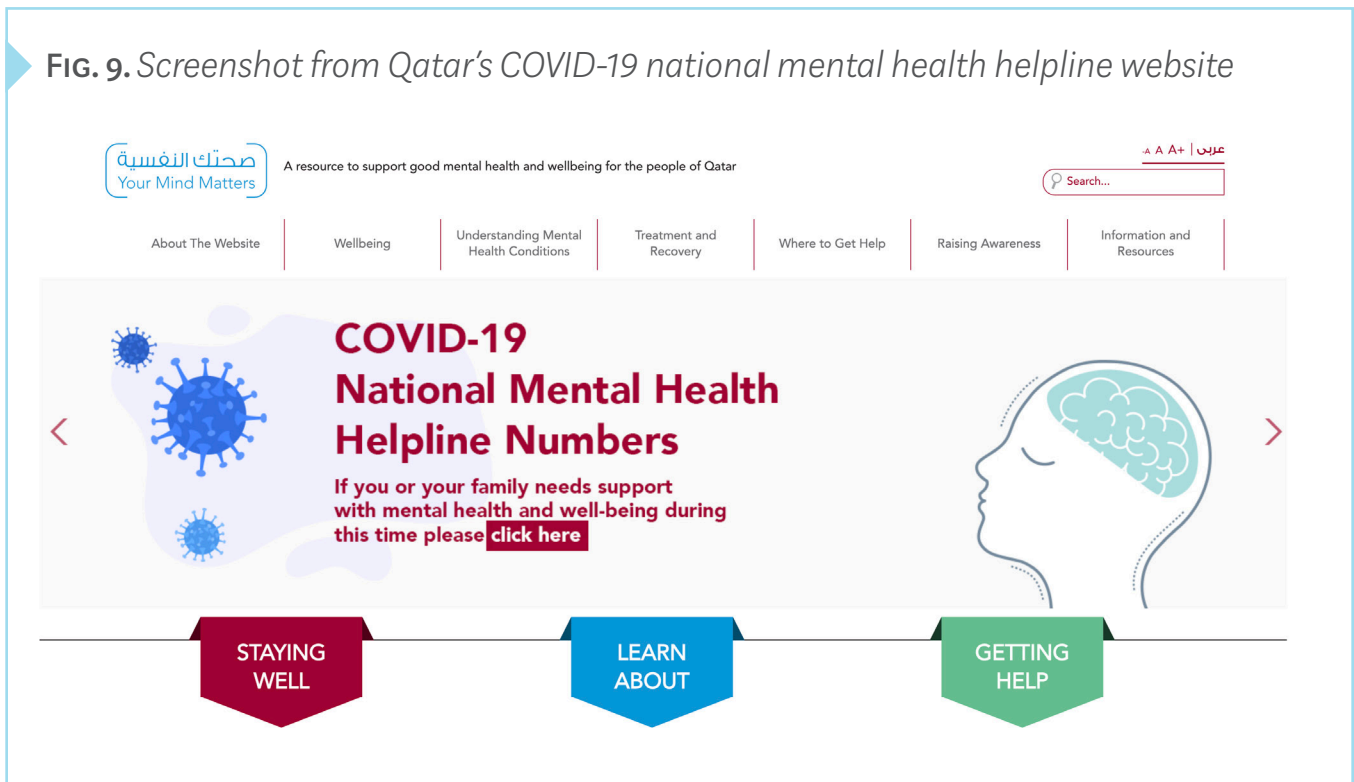
## What were the main challenges and how were they addressed

With the increasing demand for mental health services, Qatar had to face a lack in workforce and trained personnel to operate and respond to the mental health hotline. To address this, Qatar developed and implemented a COVID-19 psychosocial well-being training package for staff working across the health system, using technology to facilitate the delivery of the training.

## What were the lessons learned and way forward?

This initiative has helped in reducing stigma and normalizing conversations around mental health and well-being. The hotline provides a safe, non-judgemental platform that validates the need to talk and is available to all those in need. Qatar plans to ensure that tele-psychiatry and the national mental health helpline become permanent features of mental health services provision.

**FIG. 9.** Screenshot from Qatar's COVID-19 national mental health helpline website



**Additional approaches in mental health:** The WHO World Mental Health Report (26) includes a section on the use of digital technologies in mental health (*page 124*). This includes the use of guided self-help, such as WHO's Step-by-Step intervention, an evidence-based intervention for depression, where users access self-help information online with 15 minutes of weekly support by telephone or message from a non-specialist helper.



# Ultrasonography with remote consultation and supervision

## What was the intervention?

The usefulness of ultrasonography to improve diagnosis and patient management in rural settings has been proven, especially for obstetrical and abdominal pathologies. As portable ultrasonography becomes more affordable and connectivity of isolated hospitals improves, more frequent use of this technology may help to improve the quality and range of health services in rural areas.

This intervention aims to provide remote access to digitally connected medical professionals through use of ultrasonography in small hospitals linked to remote expert supervision. The objectives of the implementation of the Réseau en Afrique Francophone pour la Télémédecine (RAFT) network in Mali were:

- + To enable access to remote expertise by using an Internet-based tool for requesting and receiving advice from reference hospitals.
- + To provide diagnostic tools such as ultrasonography, electrocardiogram and digital cameras to strengthen diagnostic capabilities in peripheral sites, with the remote supervision or second opinion of experts.
- + To reduce isolation of health workers in rural areas.
- + To expand access to adapted, distance learning continuing medical education.

## How does the intervention work?

Generalist physicians as well as non-physicians such as nurses and midwives receive basic training in the proper usage of ultrasound imaging. This training requires approximately two to three weeks of practice with a trained radiologist. After the basic training, which includes acquiring skills to generate and interpret ultrasonographic images, the trainee is also taught how to decide when it is necessary to seek expert advice for the analysis of an image or a video sequence. If an expert review seems necessary, images must be exported and compressed, then uploaded onto a secure server where the specialists can access them for review. Access to these remote virtual communities of medical experts is limited to users and professionals who have previously been identified by the RAFT coordinators and whose training level and expertise have been verified. Non-expert users were typically able to improve their diagnostic ability for a set of conditions within two to three months of remotely supervised practice.

"Bogou" is a secure teleconsultation system which enables virtual communities of experts to collaborate remotely to address patient-specific issues such as obtaining diagnostic support, seeking a second medical opinion, and receiving guidance on evaluating and planning medical referrals. As availability of electrical power remains uncertain in small health-care facilities in the country, heat- and dust-resistant battery-operated ultrasound devices were used by generalist physicians as well as non-physicians such as nurses and midwives.



Due to bandwidth limitations, most of the remote supervision occurs asynchronously, as images may not be accessible in real time. However, new compression techniques have been tested and enable the synchronous transmission of images through bandwidths of around 40 kbps, which can be used to guide the operator remotely to confirm diagnoses.

To secure the communication and storage of telemedicine requests, which often contain sensitive information, a public key encryption scheme has been developed, guaranteeing that only those who have the keys can access the information. Progressively, the use of this tool has led to more structured information capture and, in some usage scenarios, is similar to a collaborative electronic health record, enabling long-term follow-up by the various care professionals involved in the care of patients.

### **What were the main challenges and how were they addressed?**

The two main challenges were: (a) scarcity of qualified human resources that understand both the health care and IT domains at all levels, and (b) sustainability of services.

In terms of resources, there is limited governance and leadership capacity and limited capacity for implementation and maintenance or monitoring. This challenge was addressed by important capacity-building efforts and the creation of the eHealth and Centre d'Expertise et de Recherche en Télémédecine et E-santé (CERTES). Initially developed in collaboration with the RAFT network, the Malian Medical Information and Communication Network established CERTES to provide operational support for telemedicine activities and health information systems deployment.

To ensure the sustainability of digital health services, there is more to be considered than just providing the tools and adequate competencies. The creation of a personalized ecosystem with adequate implementation approaches is essential (combination of top-down involvement and political will of the government and universities, with bottom-up mobilization of primary health-care professionals and care facilities, as well as various retribution models). The community mobilization bottom-up approach ensures the motivation and engagement of care professionals. The top-down political will approach facilitates the long-term sustainability of the system. A combination of these approaches is required to ensure buy-in from different stakeholders and to facilitate scale-up, resulting in sustainable implementation.

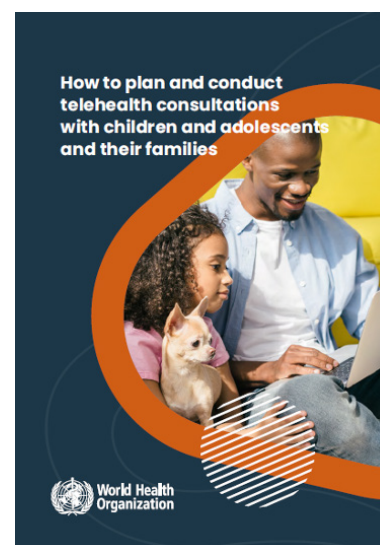
### **What were the lessons learned and way forward?**

- + The availability of remote access to expertise not only enables better training for health workers and care for patients, but also reduces the geographic isolation of facilities and enables new forms of task-sharing – that is, the provision of specialized care by other professionals.
- + In addition to training, organizational capacity-building is crucial to the sustainability of telemedicine implementations. Training is required for both the use of ICT and for the service provision itself, reducing the need for technical support, and developing organizational IT literacy. Training sustains the user group and generates a robust organizational capacity that can survive relatively high attrition rates prevalent in organizations, particularly in rural or remote areas.
- + An additional benefit of deploying such new diagnostic capabilities in remote hospitals is a significant increase in the perceived usefulness and credibility of such facilities, which then leads to increased utilization.



# Teleconsultation with children and adolescents

For more information on telemedicine consultation use cases for children and adolescents, please refer to the 2021 WHO publication *How to plan and conduct telehealth consultations with children and adolescents and their families* (click on image to access the document).



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