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

Interim guidance

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World Health Organization
Western Pacific Region

1. Introduction

1.1 Background

Worldwide, the need to reduce face-to-face consultations without compromising the quality and access of essential health services has revitalized telemedicine and brought it to the forefront in the era of coronavirus disease 2019 (COVID-19). Discussions on the necessity and feasibility of telemedicine have pervaded across a range of medical specialties and care settings. Health systems have introduced regulatory flexibilities and incentives to encourage adoption and implementation, with coordination from providers and technology companies.

The concept of telemedicine is not new. Across the Western Pacific Region, Member States were already using telemedicine applications before the pandemic. During COVID-19, Member States in different stages of digital health transformation are all more engaged in telemedicine implementation. With learnings from early adopters, this guidance aims to provide Member States with an understanding of the activities necessary to implement telemedicine effectively during COVID-19 and beyond the pandemic.

1.2 Goal and guiding principles

1.2.1 Goal

Based on a review of existing literature and the rapid implementation of telemedicine during the COVID-19 pandemic worldwide, with a focus on the Western Pacific Region, and this document aims to inform decision-making surrounding the implementation of telemedicine in Member States.

1.2.2 Target audience

Government officials at national and subnational levels advising on the design and implementation of telemedicine services as part of the COVID-19 response; public health professionals, implementers and donors concerned with the introduction and scaling up of telemedicine systems during COVID-19.

1.2.3 Guiding principles

Patient centricity

Telemedicine must be aligned with the goal of universal health coverage. This requires taking appropriate steps to ensure the accessibility, quality and sustainability of telemedicine services through effective policy, legislative and regulatory interventions. It should also support the continuity and coordination of care.

Multisectoral and multidisciplinary approach

Collaboration between the public and private sectors is required to ensure successful design and implementation. Expertise and perspectives from health and non-health disciplines (notably information and social sciences) should be involved throughout the process. All organizational stakeholders should formulate plans that set out the telemedicine services and capabilities they will invest in and deploy to move from their current state to a defined future state that is aligned with their digital health strategy.

Strong digital governance

A telemedicine governance framework should be put in place with clear lines of accountability, including a strict project management framework with detailed documentation practices. In addition, tools that are open-source can enable the public to more easily scrutinize security and privacy issues, which may assuage fears and help boost uptake in populations. Data collected by telemedicine applications should be secure, private and confidential, in line with data protection and privacy laws, regulations and frameworks, as well as cybersecurity protocols. All data use should be audited with oversight to

monitor for breaches and abuse. De-identification and encryption should be deployed wherever possible to safeguard identities, contact information and health data.

Equity and inclusivity

The deployment of digital technologies can widen the digital divide, leaving behind those without digital devices or skills, even though they may benefit most. Special consideration should be given with respect to adoption and outcomes of telemedicine for mobile, migrant, rural and vulnerable populations, as well as people with disabilities.

Usability and communication

User interfaces, functionalities and communication strategies should be co-designed with end users and adhere to best practices for usability and accessibility. The design should achieve a clear outcome for end users and the health system. The development, deployment and maintenance should meet industry best practice in security, technical and clinical standards. Communication should be clear, honest, consistent and continuous to calm anxieties and facilitate wider adoption, with authorities always taking care to alert the public of any issues that may affect their data, such as scams that masquerade as official tools.

Contextualization and localization

Each Member State or subnational administration should map out services that would benefit most from implementing telemedicine and assess the readiness of digital solutions, based on local social, legal, regulatory and technological contexts.

2. A stepwise approach for telemedicine implementation

The terms “telemedicine” and “telehealth” have been separately defined over time but are often used interchangeably with considerable overlap in scope. This guidance adopts the definition of telemedicine from the *WHO Guideline: Recommendations on Digital Interventions for Health System Strengthening*[1] as follows: “the provision of healthcare services at a distance with communication conducted between healthcare providers seeking clinical guidance and support from other healthcare providers (provider-to-provider telemedicine); or conducted between remote healthcare users seeking health services and healthcare providers (client-to-provider telemedicine)”. Figure 1 presents an overall framework for a stepwise approach for telemedicine implementation.

2.1 Develop an implementation strategy

2.1.1 Set strategic directions and objectives

- This first step is to identify bottlenecks in the health system during COVID-19 and beyond, rethink how care should be delivered rather than replicated on a virtual platform, and determine if the infrastructure and systems in place can give an easy start and grow into a system that can support a long-term telemedicine strategy.
- Objectives should be specific, measurable, attainable and time-bound. They should be set around the fundamental goals of universal health coverage (health equity, coverage, equitable financing, quality, consumer satisfaction, allocative efficiency, technical efficiency, cost containment, political acceptability and financial sustainability) and translated into indicators and metrics for the monitoring and evaluation of system performance. Social goals, such as increased social acceptance of telemedicine and user experience, should be included if the telemedicine strategy is to stay.

2.1.2 Define scope of services

- Service scoping normally relies on a system-level mapping of health service supply and demand to identify unmet needs. With COVID-19, it is almost certain that health service supply will fall significantly short of demand. Clinical management of COVID-19 cases, provision of services to patients with underlying conditions that make them particularly vulnerable to COVID-19 and COVID-19-related mental health care for health workers need to be given high priority as there continue to be gaps in these health service areas. A comprehensive review of the health service and care workflow must be

conducted to identify all activities that can be done virtually. Priority should also be given to tasks that are applicable to both COVID-19 and essential health services.

- Providers should also be encouraged to explore innovatively yet cautiously the use of client-to-provider telemedicine and accommodate more services such as first encounter online, e-prescription and drug delivery. In the case of COVID-19 clinical management, data–starting from alerting health workers to follow-up with people who may have been flagged in screening and risk assessment apps to post-discharge remote monitoring– should be integrated either systematically or through a standardized process for health workers to follow.
- It must be recognized, however that the level of system interoperability is proportional to the variety of services delivered via telemedicine. Depending on the pre-pandemic telemedicine system in place and the broader digital health landscape in each country, it should be decided upfront whether the implementation of telemedicine is intended as an interim response to COVID-19 or it will be integrated into the broader health system (for common objectives, please refer to Table 1).

2.1.3 Identify and engage stakeholders

- Stakeholder engagement must start during this phase. Government agencies on information and communications technology (ICT) and telemedicine vendors are required to assess the objectives, scope and feasibility with providers and reflect user voices in the system design by consulting practitioners.
- Professional societies and technical committees should be invited to set standards and guidelines. Payers and regulators should be involved to coordinate the introduction of incentives and flexibilities into the regulatory framework. Early engagement with all possible and potential stakeholders can bring more confidence and resources into the planning and implementation.

2.1.4 Conduct multidimensional feasibility analysis

A feasibility assessment must be conducted to understand thoroughly the service scope, to identify challenges that may occur during the implementation and to determine if the programme is worth undertaking. The analysis should take into account technological, economic, social, organizational and medicolegal factors. It should be conducted at both the administrative and organizational level.

- At national and subnational health administration levels, the assessment is more about the feasibility of the implementation strategy and its implication for the life cycle of telemedicine programmes in the jurisdiction. For instance, an interim telemedicine implementation strategy requires fewer resources for continuous system integration compared to a strategy to institutionalize telemedicine. Health administrations can partner with telemedicine service providers to co-develop technological readiness assessments or adapt existing maturity assessment toolkits for use.[2]
- At the organization level, an assessment of the technological maturity can help identify if there are quick wins from repurposing existing applications or moderate customization.

2.2 Create enablers

2.2.1 Establish legal, policy and institutional framework

- An enabling environment needs to be created to promote the active and responsible participation of all stakeholders. Liability exposure is a major concern of health workers in practising telemedicine.[3]
- The environment for virtual care on both physician and patient sides invites distraction and risk of inadequate communication, which is the most common root cause of medical error.[4] Communication can be disrupted by an unstable broadband connection, and the quality of a video call can alter the accuracy of instructed physical examination results.

- Data confidentiality and patient privacy issues were also of concern across all forms of telemedicine practice. Medicolegal risk is more often raised in hypothetical cases than in real case scenarios in the literature (lawsuits filed against physicians practising telemedicine),[5] but the perceived risk of malpractice remains high. Adjustments and arrangements must be made to give telemedicine practice a safety net.

- Technical and ethical guidelines for telemedicine practice, clear frameworks and processes should be set up to deter telemedicine practitioners from, and hold them accountable for, misconduct through disciplinary actions and compensation adjustments. However, the degree of flexibility should not be earned at the price of care quality, continuity and increased medicolegal risk. These are the risks that may accompany client-to-provider telemedicine as its business model often relies more on high patient turnover than consistent care as their general practitioner (GP) counterparts provide.[6]

2.2.2 Introduce supply- and demand-side incentives

Incentives must be provided to ensure the full participation of the community and patient acceptance of telemedicine. Introducing incentives to stimulate supply and demand is essential to maximize the benefit of telemedicine services. Insurance coverage of telemedicine service items similar to in-person care can stimulate demand. Performance-based renumeration can be introduced to incentivize practitioners. Organizational senior management need to take responsibility and exercise oversight of all incentive activities and adverse events. Appropriate protocols must be in place to protect the security and integrity of patient information. Standard procedures and codes of conduct should be introduced at the individual level.

2.2.3 Develop norms, standard and guidelines

Technical committees consisting of health professionals and digital health professionals should be set up to guide the development of norms and standards consistent with the service implemented. They can help avoid misunderstandings of issues encountered in implementation (e.g. patient eligibility, billing code, workflow integration). Standards for prioritized teleservice procedures (e.g. scheduling, pre-visit preparation, provider/patient setting, physical examination, consent for data collection) and conditions for in-person visits (e.g. certain information that could not be collected via a telemedicine platform for diagnosis) will streamline the process of staff training, patient coaching and circumstantial decision-making. They also lend convenience to monitoring and evaluation.

2.3 On-site planning and implementation

The tremendous progress in telecommunications, most notably the rapid adoption of mobile devices and internet technologies, has upgraded communication channels, expanded the depth and breadth of services, and merged and simplified telemedicine implementation. Early asynchronous, store-and-forward provider-to-provider telemedicine (teleradiology) can now be provided on the cloud and scaled up without huge upfront costs in setup and maintenance. Patient education, health monitoring and behaviour change programmes have penetrated specialty care enabled by text messages, phone calls and, more recently, mobile applications and wearables. Client-to-provider telemedicine has been propelled by the emergence of videoconferencing applications. Inpatient telemedicine can further be augmented by big data and artificial intelligence on health in order to reduce the need for a large workforce and turnaround times. The evolving landscape brings more possibilities and complexities, which make cautious planning a necessity.

2.3.1 Commit financial and human resources with some risk tolerance

- Financial and human resources need to be reviewed to ensure the implementation will sustain and serve the health system in the long run. An accurate demand forecast is the first step to inform investment decisions in infrastructure and staffing arrangements. To de-risk telemedicine implementation, investments in organizational changes (e.g. care workflow adaptation, workforce training

on digital skills and adapted care practice, oversight and evaluation) needs to be costed.
- Investment in foundational layers (e.g. broadband connection, care workflow adaptation, workforce training) should be prioritized to pave the way for the implementation of telemedicine to grow into a comprehensive service suite. An assessment of the organizational risk profile is important as it may take a considerable amount of time for telemedicine services to grow to a self-sustaining size and to attain financial sustainability.

2.3.2 Develop implementation specifications

Implementing telemedicine is the process of translating utilization scenarios into features and functionalities to incorporate (key technical concepts can be found in Table 2) into a telemedicine system. The specification of features determines the architecture, level of interoperability, its operational capabilities, expected impact and changes to established care workflows, and the technical potential to be integrated into a health system.

- Provider-to-provider telemedicine, which integrates image and data sharing, electronic medical records, teleconferencing, medical equipment and software to assist lower-level health facilities with case management and carry out remote education, has relatively high upfront infrastructure investment and recurring maintenance costs. It also needs dedicated communication lines to perform services.
- More recently, non-public facing, internet-based videoconferencing tools (e.g. Skype, WhatsApp, Zoom) have been nominally free and easy to use in both forms of telemedicine. The downside is mass market tools can neither be easily interoperable with provider information systems nor give control over patient privacy protection.

2.3.3 Select technology partners

The user privacy and data security protection mechanism, transparency in function specifications and service modules, in alignment with guiding principles, should also be included in vendor selection criteria. Previous project experience working with prevailing health systems, user experience and feedback, interoperability with provider systems, extensibility, ability to train and support for hospital site personnel should be given extra weight. User experience is not mentioned as often but is no less important in ensuring provider and client adoption of telemedicine services.

2.3.4 Diversify scenarios for testing

Field tests do not guarantee that usability are detected issues. Using a rapid iterative approach, diversified test environments and users with varying degrees of digital skills in parallel would expedite the process and chance of spotting functionalities that are non-intuitive or add to the user workload. Careful tests of designs, rapid iterations and documentation of user experience lessons should be encouraged. A backup plan should be put in place in case of technical failures.

2.4 Plan for health system integration

Health system integration is a process that takes planning and an outcome supported by evidence. With COVID-19 forcing telemedicine to scale, setting up an accountable governance system that includes having the capacity to run telemedicine, deliver quality care with evidence, and protect providers and clients from adverse events should be put on the agenda.

2.4.1 Monitor and improve system performance

Operational monitoring of system performance should be conducted to guide adjustments.

- Gaining insights from key system performance metrics and then taking actions to improve telemedicine service performance at lower costs are the main goals to keep in mind. Performance indicators with supporting data from telemedicine vendors should be collected ideally in near-real time. Performance data analysis and executive team reviews should be routinely conducted for accountability. Data gathered can be used to carry out benchmarking, inform decision-making at the senior management level, and detect risks that may derail the implementation.

- Each implementing health facility has its specific resource and capacity constraints that require targeted solutions for improvement in daily operations. Feedback should be obtained from health workers, clients and vendors in diagnosing the problem in context. It should also be reflected in system adjustments in a timely fashion.

2.4.2 Generate evidence that telemedicine implementation achieves its intended benefits

While overcoming technological and regulatory challenges, planning for research and real-world evidence generation are needed to assess telemedicine performance in routine use, stand-alone or complementary to in-person service, and to prove cost and time savings at the population level.

- Existing research evidence on the benefits of telemedicine has been limited and mixed. No definite conclusion can be drawn about its effectiveness in improving patient outcome and well-being, behaviour change (e.g. treatment adherence), disease prevention, cost-effectiveness or patient satisfaction. However, the weak evidence base can partly be ascribed to the heterogeneity in study designs, partly explained by the stand-alone nature of randomized telemedicine interventions and by the considerable economies of scale required in the digital sector, which most studies did not achieve.
- Outcome monitoring and evaluation of telemedicine services is needed to assess whether the implementation has achieved its goals. A comprehensive evaluation framework should be developed to collect input, process, output and outcome data in order to measure its availability, accessibility, quality, utilization, cost, user satisfaction, and tangible and intangible impact on provider and health organizations.

2.4.3 Document learning and share experience

Learnings from planning and implementation should be shared between Member States in a timely fashion, as good governance from sharing and growth go hand in hand.

2.4.4 Strengthen digital skills of end users

The literature suggests that perceived reduction in autonomy and existential threat to their practice have led to physician resistance,[7] as have the lack of incentives, enforcement and reimbursement.[8] Training, technical support and favourable organizational arrangements are critical to sustained service provision. [9,10] Training, coaching and supervision must be provided to telemedicine users and others whose work is influenced in health facilities. Recurring trainings should be organized to familiarize health workers with functionalities, service-specific guidelines and procedures, good practices in virtual engagement with patient and patient coaching, as well as the digital code of conduct to ensure ethical behaviour and care service of equivalent quality. Training manuals and workshops can be developed through collaboration with health workforce networks, agencies, academic institutions and experts. Performance evaluation of telemedicine workers through feedback collection from patients can also be used as an instrument to ensure the behaviour and conduct of health workers are consistent with the intended goals and values.

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Fig 1. A stepwise approach for telemedicine implementation

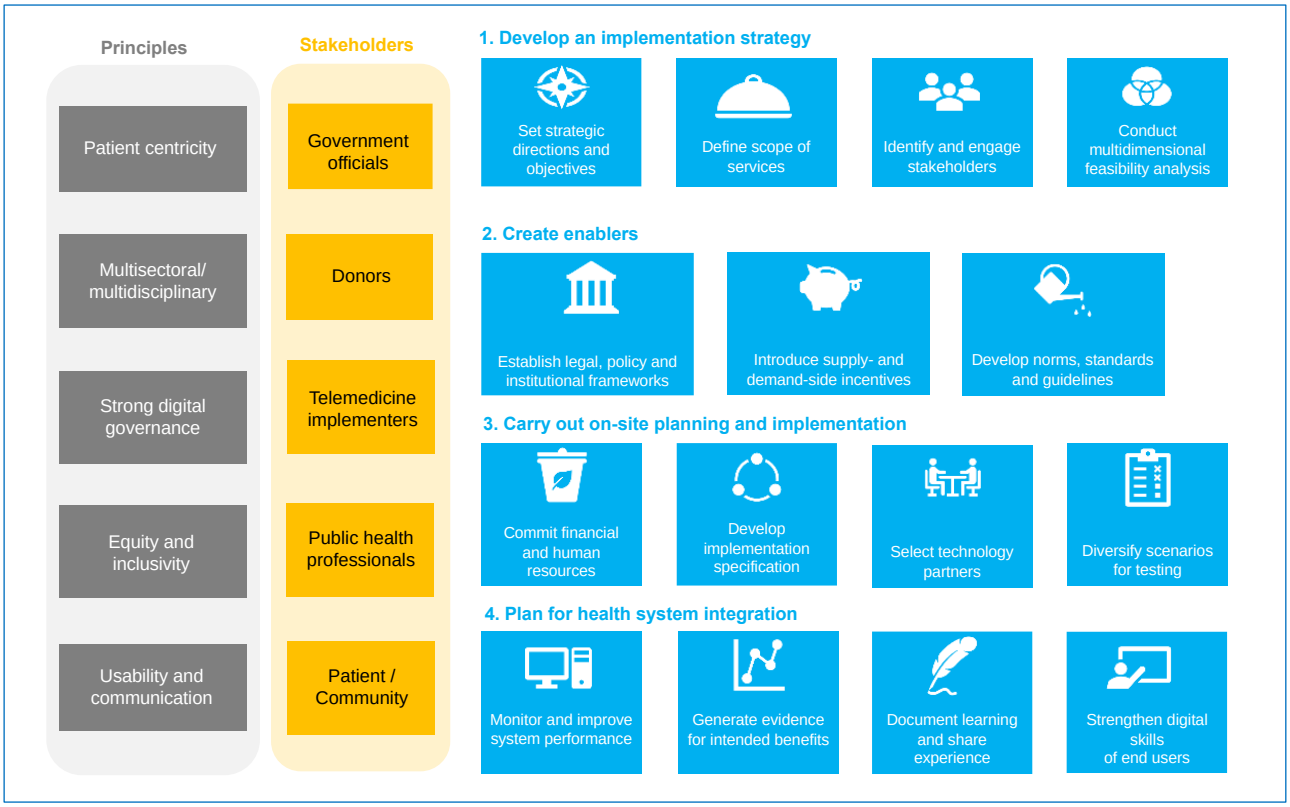

Table 1. Goal-setting and service scoping

Strategy	Goals	Scope of telemedicine services
COVID-19 control and prevention	• Reduce health worker and patient exposure to SARS-CoV-2 in health facilities • Build critical care capacity	Digitize COVID-19 care pathway • Self-screening, self-triage and referral • AI-assisted COVID-19 infection detection • Follow-up and remote monitoring of mild or discharged COVID-19 cases • Emergency triage (tele-ICU) • Provider-to-provider telemedicine for teleradiology, health worker training and case management
Essential health services	• Alternative to in-person primary care and routine outpatient care • Reduce inadequacy in access to medicines • Alternative for low-risk emergency care for non-COVID-19 conditions • Improve access to care for vulnerable populations	Client-to-provider telemedicine care: • Mental and behavioural health • Patient management: routine monitoring of chronic health conditions, follow-up • Medication management and home delivery • Coaching and support for patients on self-management • Home-based care for patients who do not require intensive therapies • Non-emergent care to residents in long-term care facilities

Table 2. Key technical concepts in telemedicine implementation

Utilization scenario	What type of care and workflow is to be delivered via telemedicine in what kind of health facilities, who the users are and how it is supposed to be used. • Along the continuum of primary care and specialty care are scenarios ranging from pre-visit check-in, triage and referral service to in-visit consultation, examinations, medication prescription and delivery, follow-up, and post-discharge remote monitoring and education. The telemedicine intervention scenario could be one or multiple stages along this continuum.
Stations	A collection of software and hardware on provider and patient sides to facilitate the human–computer interface and virtual communication. Each component has its collection of implementation options: • User interface components include a camera, display, microphone, speaker, controls and status indicators. Together they enable the client to supply and the provider to receive data. The interface can be a comprehensive and all-encompassing software and hardware suite or simply a messaging app on a mobile device. • Instruments support the provider in data collection from the client for diagnosis or treatment. These could be devices that collect traditional physiological data or smartphone apps that collect data on sleep and dietary habits, drug administration or even the living environment. A station can have multiple or zero instruments. • A communication protocol enables synchronous or asynchronous data transmission between the provider and the client. Real-time videoconferencing calls are often used in virtual consultations while teleradiology can be supported using store-and-forward technology. • A data storage Data repositories used by different services inside a station at any given moment are dynamic. Client data storage models can vary depending on the scenario. Integration of data is fundamental to support comprehensive services. • Data processing component exists to support decision-making requiring higher-level intelligence extracted from raw data provided by the client. It can be statistical analysis or the use of AI algorithms for clinical decision support, which will require its share of system resources. • Security includes protocols and functions to meet the key need of providers in accessing client data and service delivery.

Appendix

COVID-19 telemedicine implementation in Member States of the Western Pacific Region

Country	Baseline (before COVID-19), key actions output, and outcome (if any)
Australia	**Baseline** • **Legal, policy and institutional frameworks:** There is an established regulatory framework and guidelines for telemedicine service design and implementation. The laws, regulations and regulatory bodies governing medical practitioners who practise via telemedicine are the same as those who do not (Australian Health Practitioner Regulation Agency). • **Scope of service:** A list of telemedicine services were funded by Medicare for residents of eligible aged-care homes and patients of Aboriginal Medical Services across Australia.[1] **Key actions** • **Created enablers:** ▪ Guidelines were developed for COVID-19 telemedicine consultations, electronic medication prescriptions, medication dispensing on e-prescription and patients' use of telemedicine services. ▪ A bulk billing arrangement was made available for vulnerable patients to incentivize their usage of telemedicine services.[2] Decisions on prolonged implementation or suspension will be made with recommendations from the decision-making committee for health emergencies. • **Expanded scope of service:** An expanding list of telemedicine services was made available to all citizens covered by its Medicare Benefits Schedule until the end of September 2020. Videoconferencing and audio-only services are reimbursed separately. **Output** • Both client-to-provider telemedicine (e.g. doxy.me) and non-public facing videoconferencing platforms (e.g. FaceTime, Skype) are in use.[3] **Outcome** • Reportedly led to the emergence of entrepreneurial pop-up telemedicine services, providing consultations to patients anywhere around Australia without a physical presence and unconnected to a patient's regular GP.[4]
China	**Baseline** • **Legal, policy and institutional frameworks:** Telemedicine is not currently governed by specific laws but regulatory frameworks.[5] • **Scope of service:** ○ Each province had its regional provider-to-provider telemedicine centre before the outbreak to assist health facilities in low-resource settings. The overall utilization rate was low due to the lack of incentives and targeted guidelines ○ Client-to-provider telemedicine is a major vertical domain sought after by venture capital. Various health-care service providers and internet health technology groups ventured in the telemedicine space to provide online health consultations and home delivery of medication services. Public hospitals were encouraged to launch equivalent client-to-provider telemedicine services with an edge in patient trust. Before the outbreak, the national health administration had an initial planning document that

	covered telemedicine services, but it was largely unimplemented at the subnational level. **Key actions** ● **Developed digital health strategy in response to COVID-19:** A strategy developed by the National Health Commission provided the policy mandate for health-care organizations and regional and specialty hospital networks to strengthen the ICT infrastructure for telemedicine implementation. ● **Scope of service:** COVID-19 care pathway, primary care and non-emergent outpatient specialty care. ● **Introduced regulatory flexibility:** ○ Accelerated approval process of application for client-to-provider license made by public hospitals at the subnational level; ○ Temporary lift of the ban on first-time visit online; ○ No immediately applicable legislation with regard to health data during COVID-19. Provincial supervision platforms for online health service hold the responsibility to provide oversight for client-to-provider telemedicine. ● **Incentive:** ○ Guidance was issued for subnational health authorities to reimburse public hospital-led client-to-provider outpatient telemedicine services.[6] ○ Provider-to-provider telemedicine for COVID-19 case management was made temporarily free in some provinces; the registration and consultation cost for hospital-initiated client-to-provider outpatient telemedicine was waived during COVID-19. **Output** • **Provider-to-provider telemedicine:** Military hospitals were seen activating provider-to-provider telemedicine for synchronous COVID-19 case management (diagnosis, remote monitoring) even before the Wuhan lockdown, because the health system reform over the past decade had made telemedicine a major eHealth initiative. Established regional telemedicine centres, often housed in top teaching hospitals in the region, provided support to designated hospitals for COVID-19 in the management of severe cases, since designated hospitals were specialized in infectious disease but less competent when it came to case management.[7] Implementations of 5G for quality improvement in case management and other activities in later stages (i.e. tele-ultrasound) were reported in a few hospitals with national reputation.[8] • **Client-to-provider telemedicine offered by commercial platforms:** For-profit platforms offered free COVID-19 consultations online, aside from the business-as-usual on-demand online consultation services (e.g. behavioural health, dermatology, endocrinology, pediatrics, etc) and medicine delivery for common illnesses. Public hospitals expedited applications to obtain a license for client-to-provider outpatient services. Monthly consultations for most stand-alone client-to-provider telemedicine platforms grew tenfold in the first quarter.[9] • **Public hospital-launched outpatient telemedicine:** In February alone, 65 public hospitals nationwide received approval to provide outpatient telemedicine services that can be accessed by clients via smartphone apps, networking apps (i.e. WeChat) and mobile payment apps (i.e. Alipay). Service items include: synchronous and asynchronous online consultations for common illnesses and returning patients, physical examination e-booking, e-hospitalization, e-prescription, refills, and drug delivery; follow-up and drug refills for noncommunicable diseases (NCDs) and cancer patients previously treated in the hospital; and (1,2,3) telephony and online mental counselling services for

	COVID-19. In West China Hospital (a top-level tertiary teaching hospital in Sichuan province in Western China), from 1 February to 23 March 2020, the client-to-provider telemedicine service were used by 31 905 patients for consultation and prescription, with a daily average of 626 patients. NCD and cancer patient management services were provided by 175 physicians to 9660 patient cases with 6953 prescriptions made and 5307 deliveries of medication.[10]
Japan	**Baseline** • **Legal, policy and institutional frameworks:** Legal barriers were slowly lifted after 2015, but the service was not covered by health insurance.[11] • **Scope of service:** Provider-to-provider telemedicine was the main model. **Key actions** ● **Regulatory flexibility:** Deregulation of telemedicine that allows patients to use telemedicine for first-time visits.[12] ● **Scope of service:** Designation of 10 000 hospitals and clinics to offer client-to-provider telemedicine.[13] ● **Incentive:** A reimbursement policy under National Health Insurance was introduced **Output** The Ministry of Economy, Trade and Industry launched a free client-to-provider COVID-19 consultation service in collaboration with commercial telemedicine providers and social media platforms (Mediplat, LINE Healthcare). [14,15] Both platforms have been expanding the number of doctors available online to provide specialty consultations. The daily consultation capacity in both companies was about 5000.[16]
Malaysia	**Baseline** • **Legal, policy and institutional frameworks:** Telemedicine was a highly regulated space with low social acceptance. The Telemedicine Blueprint issued by the Ministry of Health in 1997 did not clearly spell out the procedure for a local medical practitioners to practise telemedicine. Anyone who practises telemedicine in contravention of the 23-year-old law, however, is liable to a fine of not more than RM 500 000, jail for not more than five years or both.[17] **Key actions** • **Identified and engaged stakeholders:** The Ministry of Health and the Medical Practitioners Coalition Association of Malaysia worked with a telemedicine company (DoctorOnCall) to provide all-encompassing telemedicine services.[18] • **Created enablers:** The health administration also involved client-to-provider telemedicine providers to develop telemedicine guidelines. **Output** • DoctorOnCall and the Ministry of Health worked together to provide client-to-provider telemedicine consultations, e-prescriptions and home delivery of medication with family medicine specialists.[19] The platform has since formed a partnership with the e-commerce platform Shopee Malaysia to offer more COVID-19 test options, allowing consumers to purchase COVID-19 real-time reverse transcription polymerase chain reaction tests.[20] ● Commercial client-to-provider telemedicine platforms (e.g. Speedoc, DoctorOnCall, HomeGP) saw increases (40–80%) in daily consulted cases, both on the end-to-end system and WhatsApp-based video consultations. Private hospitals also rolled out client-to-provider telemedicine for specialty care.[21]

Philippines	**Baseline** • Not currently governed by existing laws and regulations. In the absence of a law specifically regulating telemedicine, healt-hcare service providers and groups have been free to offer telemedicine services to the public without the need to secure further regulatory approvals, apart from engaging a duly licensed physician. Nevertheless, there are existing laws that have a significant impact on telemedicine providers, such as the Medical Act of 1959 and the Data Privacy Act of 2012.[22] **Key actions** ● **Legal, policy and institutional frameworks:** ○ **Regulatory flexibility:** The Department of Health and the National Privacy Commission (NPC) have developed a framework for telemedicine services in a bid to improve access to health services during the enhanced community quarantine. Under the framework, consultations and prescriptions can be made by telephone, text message, or other audio and videoconferencing platforms. COVID-19 consultation hotlines were established with services provided by volunteer physicians.[23] ○ **Data security and privacy protection:** The Department of Health collaboration with the NPC is expected to allay concerns on data privacy and confidentiality. The Digital Online Consultation for People's Healthcare (DOCPH) is compliant with the country's Data Privacy Act as regards data protection. ● **Developed guidelines:** The Department of Health has been finalizing guidelines for physicians and patients to use telemedicine for consultation in COVID-19[24] and FDA Circular No. 2020-007, which provides guidelines for the issuance of e-prescriptions[25]. **Output** ● Local government units, hospitals, medical schools, doctors' associations, nongovernmental organizations and other volunteer groups launched hotlines and client-to-provider telemedicine platforms. The Department of Health set up a free COVID-19 emergency hotline[26]. ● The Philippine Medical Association provided free online consultations nationwide via the DOCPH website. The Association also collaborated with The Department of Health to provide referral service[27]. ● The Mariveles Mental Wellness and General Hospital, a national hospital, launched mental health and well-being consultation services through social media platforms[28]. ● A private hospital group ventured into telemedicine, exploring solutions ranging from e-pharmacy, virtual consultations, mobile laboratories and remote patient monitoring to cater to more patients[29].
Republic of Korea	**Baseline** • **Lack of stakeholder support:** The health administration sided with the Korean Medical Association against telemedicine due to quality concerns and diversion of patients to big hospitals. **Key actions** ● **Regulatory flexibility:** The Ministry of Health and Welfare temporarily removed the restriction on telemedicine for the COVID-19 response, allowing doctors to treat mild cases via video consultation[30].

	Output ● The nation's first client-to-provider telemedicine app was launched. The company is looking for doctors and hospitals wanting to use its app for remote treatment[31]. ● In Daegu and Seoul, telemedicine centres have been established to provide free client-to-provider telemedicine services. They rely on self-reported information of vital signs, questionnaires, live video links and other procedures. These centres report handling around 1500 patients a month. ● The Korean Medical Association opposes loosening the framework for telemedicine against the background of the COVID-19 emergency[32].
Singapore	**Baseline**[43] • **Legal, policy and institutional frameworks:** o There is no overarching legislation governing the telemedicine sector. In January 2020, the Ministry of Health announced the telemedicine sector would be licensed in the upcoming Healthcare Services Act by the end of 2022. To better understand the operating environment and challenges of the growing telemedicine industry, MOH had collaborated with prominent telemedicine service providers to launch a regulatory sandbox in 2018 (Licensing Experimentation and Adaptation Programme, or LEAP) that enables new and innovative models and services to be developed and refined in a safe and controlled environment. Telemedicine was the first service area under LEAP[34]. o Personal data in Singapore are protected under the Personal Data Protection Act. • **Established norms, standards and guidelines:** The National Telemedicine Guidelines and the Singapore Medical Council's Ethical Code and Ethical Guidelines and Handbook on Medical Ethics. **Key actions** ● **Regulatory flexibility:** Expansion of the range of pre-approved digital solutions to help small and medium-sized enterprises in the health-care sectors manage the impact of COVID-19[35]. Singapore's Parliament also passed a new law for authorities to license emerging health-care services such as telemedicine to better protect patient safety[36]. ● **Incentive**: The Ministry of Health introduced a time-limited extension of subsidy and coverage for follow-up of patients with chronic conditions through video consultations[37]. ● **User capacity strengthening:** The Ministry Health Regulation Group introduced an online course to guide doctors in designing and delivering telemedicine services. It is also accredited for continuing medical education [38]. ● **Scope of service:** The Singapore Medical Association convened client-to-provider telemedicine providers to establish a unified presentation for the potential use of telemedicine[39]. **Output** Ministry -approved telemedicine apps provided alternatives to in-person visits to GPs (e.g. WhiteCoat, DoctorAnywhere, myDoc, hiDoc, DoctorWorld) for consultation, diagnosis and prescription. WhiteCoat supports access to electronic medical records at the client's end. The service has extended its operating hours (Mon-Sun, 08:00–24:00) and is charged by duration in the case of DoctorAnywhere. They either have GPs in the network or tie-ups with physician and pharmacist groups with chatbots for front-line triage. hiDoc provides specialist consultation service and accommodates home-care services. Telemedicine apps have some sort of triage service beyond

	provider-client interaction, such as health education, symptom checker requiring client input or a health product marketplace. At MyDoc, a telemedicine platform headquartered in Singapore, the number of daily active users rose 60% in February and more than doubled again in March[40]. Hospitals implemented virtual clinical practice for inpatient care (virtual dialysis practice)[41].
Viet Nam	**Baseline** • **Scope of service:** Ministry Health Circular 47/2017 regulating telemedicine (effective in February 2018) allows client-to-provider telemedicine, with providers meeting criteria for IT requirements and licensing. Guidelines for a wide range of activities were also provided by Circular 47/2017 [42]. **Key actions** ● **Stakeholder engagement:** The Ministry of Health and the Ministry of Information and Communications jointly launched a provider-to-provider telemedicine platform in April. The platform provided health consultations, diagnosis and treatment, professional evaluation, and operation consultation and technology transfer at a distance. At its launch at Hanoi Medical University Hospital, the expectation was to have telemedicine deployed in 14 000 health facilities across the country[43]. **Output** Demand for client-to-provider telemedicine serviced such as online consultations, home delivery of medication and ordering of laboratory testing (e.g. Doctor Anywhere, Jio Health, eDoctor) increased multifolds for commercial service providers, allowing service providers to shape user habits[44].

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