EMPOWERING TELEHEALTH SOLUTIONS IN APEC

December 2021

Study on the Policy Landscape for Telehealth in the APEC Region

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ACRONYMS

AeHIN	Asia eHealth Network
AHIMA	American Health Information Management Association
AI	Artificial Intelligence
AIDS	Acquired immunodeficiency syndrome
APEC	Asia-Pacific Economic Cooperation
Bru-HIMS	Brunei Health Information and Management System
CDC	Centers for Disease Control and Prevention (United States)
CENETEC-Salud	National Center for Technological Excellence in Health (Mexico)
CMS	Centers for Medicare and Medicaid Services (United States)
CRVs	Civil registration and vital service systems
CT	Computed tomography
DHB	District Health Board (New Zealand)
DHIS2	District Health Information System 2
EEG	Electroencephalogram
EHR	Electronic Health Record
eHRSS	Electronic Health Record Sharing System (Hong Kong, China)
FCC	Federal Communications Commission (United States)
GHN	Golden Health Network (China)
GP	General practitioner
HA	Hospital Authority
HHS	Department of Health and Human Services (United States)
HIMSS	Healthcare Information and Management Systems Society
HIPAA	Health Insurance Portability and Accountability Act
HITMAP	Health IT Master Plan (Singapore)
HITO	Health Informatics and Technology Office (Hong Kong, China)
HIV	Human Immunodeficiency Virus
HL7	Health Level Seven International
HWG	Health Working Group
ICT	Information and communications technology
IHiS	Integrated Health Information Systems
IMNC	International MedioNet of China
IoT	Internet of Things
IT	Information Technology
KHNW	Krankenhaus Nordwest (Germany)
KKI	Konsil Kedokteran Indonesia
LHP	Lifetime health plan
LHR	Lifetime health record
MBS	Medical Benefits Schedule (Australia)
MHLW	Ministry of Health, Labor and Welfare (Japan)
MOH	Ministry of Health
MSC	Multimedia Super Corridor
NASA	National Aeronautic Space Administration (United States)
NDOH	National Department of Health (Papua New Guinea)
NHI	National Health Insurance (Chinese Taipei)
NHFPC	National Health and Family Planning Commission of China
NOM	Norma Oficial Mexicana (Mexico's Standards)
NTG	National Telemedicine Guidelines (Singapore)
OMP	Other medical practitioners

ONC	Office of the National Coordinator for Health Information Technology (United States)
OpenHIE	Open Health Information Exchange
PAHO	Pan American Health Organization
PLA	People's Liberation Army (China)
PPE	Personal protective equipment
PNG	Papua New Guinea
SMC	Singapore Medical Council
SOP	Standard operating procedure
UMMC	University Malaya Medical Center
UN	United Nations
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VA	Department of Veterans Affairs (United States)
VHA	Veterans Health Administration (United States)
WHO	World Health Organization

Note: The terms "national", "nation" used in the text are for purposes of this report and do not imply the "political status" of any APEC member economy.

EXECUTIVE SUMMARY

INTRODUCTION

The past decade has seen significant transitions in global demographics, as aging populations, a higher prevalence of chronic illness demanding more personalized care, and the resulting increase in healthcare costs require an exploration of new approaches to healthcare service delivery. These same transitions have resulted in a global push towards embracing digital health solutions to provide innovative ways of delivering services in an equitable and efficient manner. This also involves enhancing processes, increasing efficiencies, creating opportunities for collaboration between the private and public sectors, and ultimately improving health outcomes. Telehealth is a key component of this health transformation.

The World Health Organization (WHO) defines telehealth as "the delivery of health care services, where distance is a critical factor, by health care professionals using Information and Communication Technologies (ICT) for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities."[1] The WHO also notes that telehealth can improve patient access to quality, cost-effective, health services wherever they may be and can be particularly valuable for those in remote areas, vulnerable groups, and aging populations.[2]

A pan-Canadian study conducted in 2011 reveals that telehealth has also demonstrated significant benefits to both patients and clinicians by improving equitable access to specialist services for Canadians living in rural and remote communities; reducing travel for patients and clinicians; and reducing wait times for specialty care including dermatology and ophthalmology.[3] Similarly, a study conducted in Australia[4] reveals that telehealth approaches addressed both quality and equity considerations. Not only did patients benefit from lower costs which addressed equity issues, telehealth approaches also reduced inconveniences, improving access to specialist healthcare services while ensuring improvements in the quality of clinical services. Additionally, health professionals benefitted from access to continuing education and professional development as well as experiential learning, stronger networking, and better collaboration.

Telehealth is a critical part of strengthening health systems, improving the quality of and access to health services and achieving the goals of universal health coverage in the Asia-Pacific region. Against this landscape and as part of the Asia-Pacific Economic Cooperation's broader efforts in promoting digital trade and more specifically the approach to improving health service delivery in the region, the United States launched the Empowering Telehealth Solutions in APEC project in 2020 under the APEC Health Working Group (HWG), with the aim of mapping the existing landscape of policies and regulatory frameworks across APEC economies that enable the adoption and use of telehealth services to address

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[1] World Health Organization Global Health Observatory, Telemedicine: Opportunities and Developments in Member States: Report on the Second Global Survey on eHealth, Geneva: WHO (2009).

[2] World Health Organization Global Health Observatory, "Telehealth: Analysis of Third Global Survey on eHealth, 2016," webpage, https://www.who.int/gho/goe/telehealth/en/.

[3] Praxia Information Intelligence and Gartner, *Telehealth Benefits and Adoption-Connecting People and Providers Across Canada*, Canada Health Infoway (May 2011).

[4] J. Moffat and D. Eley, "The Reported Benefits of Telehealth for Rural Australians, *"Australian Health Review* (August 2010) 34(3):276-81. doi: 10.1071/AH09794.

healthcare needs. The objective of this study is to increase APEC members' understanding of the existing policy and regulatory landscape that support telehealth delivery, while highlighting best practices that can be adopted and replicated throughout the region. The analysis considers both a pre-COVID-19 context as well as policy changes implemented in direct response to healthcare requirements during the pandemic.

METHODOLOGY

The information outlined in this report was gathered by a telehealth expert through desk research of publicly available resources including those from key multilateral and regional organizations, such as the WHO, United Nations, World Bank, and Pan American Health Organization (PAHO); analysis of websites in APEC economies to source information on current health policies and regulations; and via interviews and surveys. A copy of the survey questionnaire is at Annex III. Representatives from four APEC economies responded to the survey – these were from Canada; Chile; New Zealand and Chinese Taipei. In addition, digital health experts from Australia; the Philippines; Singapore, and the United States also offered additional insights.

The telehealth and policy landscape rapidly evolved during the COVID-19 pandemic. Therefore, the analysis contained in this report also covers policy frameworks, processes and information that emerged during the course of the pandemic.

OVERVIEW OF KEY FINDINGS AND RECOMMENDATIONS

APEC economies have a well-defined telehealth blueprint or policy frameworks in place, complemented by specific initiatives aimed at increasing the adoption of telehealth services. The findings reveal a strong participation across all economies from both the public and private sectors in developing suitable policies and implementation mechanisms. The study also reveals how APEC economies utilize a broad range of telehealth models, policies, and regulations However, there are limitations with the enabling environment and legislation as well as lack of investment which has led to the "uneven" adoption of telehealth solutions. Therefore, by surveying the existing policy frameworks this report provides a useful menu of policy levers that can be utilized to guide the implementation of telehealth solutions across the APEC region.

The experience of the COVID-19 pandemic provides a compelling example of how, when pushed into crisis mode, policymakers can adjust existing healthcare policies to fully take advantage of new treatment and delivery options. The pandemic required significant rethinking of patient care delivery models that could be accommodated by more widely adopting new technology modalities, while making modifications to reimbursement policy and organizational operations to improve efficiencies and ease of access. In doing so, the pandemic created a regulatory sandbox-like environment for policymakers to make incremental adjustments and assess impacts in a timely manner. For instance, during the pandemic telehealth solutions became one of the safest and the most easily accessible ways to deliver mental health support and manage chronic and noncommunicable diseases in contexts that already had well developed digital infrastructure. In addition, patients requiring prescriptions were able to gain approval from their providers via telehealth consults and then be supplied with an e-prescription.

In most contexts, policy changes that broadened telehealth delivery were made under the aegis of public health emergency directives. As a result, some policy changes have not been fully integrated into existing

health service delivery frameworks. However, as evidenced by rising consumer demand for such services, telehealth should be seen as synonymous with existing healthcare delivery systems, not separate or apart. The experience of the pandemic should motivate policymakers to officially integrate telehealth into healthcare delivery by making temporary measures that facilitate care permanent so that patients and providers have continued access to telehealth. Annex 1 of the report outlines specific details on economies' policy frameworks including initiatives implemented in the COVID-19 context.

In uncovering the rich and varying policy approaches to telehealth across all APEC economies, this report offers a suite of practical policy considerations that all economies could carefully consider when committing to delivering good quality, equitable, reliable and efficient healthcare services, in a post-COVID world. From reimbursement policy to digital infrastructure investments, this report seeks to spark conversations within and among public sector stakeholders in APEC economies about how best to make policy decisions that support the continued and expanded use of telehealth services. These policy considerations are not unique to telehealth services but reflect issues that support and are relevant to ICT connectivity and digital reform. Appropriate policy considerations include the following:

- Develop integrated and interoperable information sharing platforms;
- Align health data standards for greater interoperability;
- Expand telecom infrastructure;
- Address and harmonize licensing and professional practice regulations;
- Expand payment and reimbursement;
- Coordinate across whole-of-government;
- Enhance data stewardship;
- Encourage innovation; and
- Leverage public-private partnerships.

Most importantly, this report offers considerations for the APEC HWG; considerations, that if undertaken, would support a comprehensive, coordinated approach to promoting telehealth innovations across the region. It also provides ready-to-use telehealth resources and best practices for APEC economies.

INTRODUCTION

Innovation often occurs at the moments of greatest need. As a global community, 2020 tested the limits of our healthcare systems and spurred necessary innovation across all aspects of healthcare. To meet current challenges, healthcare workers, innovators, and the public sector worked together to deploy innovative health solutions with supportive policies. Telehealth, though available as a digital health tool for decades, answered a uniquely critical need during the pandemic to safely deliver healthcare to patients outside of typical settings, including home based settings

Figure 1 Telehealth at a Glance

During the first quarter of 2020, telehealth visits grew by **50%** in the U.S. compared to the same quarter in 2019.
Source: Centers for Disease Control and Prevention (CDC), 2020

Global telemedicine industry growth is expected to accelerate from 15% per year to 19.3% per year and its value is projected to be **$175.5 billion**, by mid-decade.
Source: World Bank Digital Development Blog, July 7, 2020

"It's clear that the pandemic has dramatically accelerated digital health's adoption with such speed and volume that it's difficult to see healthcare turning back from tech tools. That's easiest to see in telehealth, which has allowed patients to see their doctors when in-person visits were — and may still remain, — inadvisable." - Lisa Suennen
Source: STAT News, September 9, 2020

Telehealth enables healthcare to extend beyond traditional spheres, connecting medical providers with previously hard-to-reach demographic groups and remote communities. Telehealth reduces disruptions to the continuity of patients' care and provides more equitable healthcare service delivery. Telehealth services increased exponentially following the emergence of COVID-19, producing myriad benefits that should continue after the pandemic, including increased convenience, reduced costs, increased accessibility, and in some cases, improved quality of care.

Until recently, telehealth faced considerable obstacles from policymakers, payors, users, and professional organizations concerned about patient safety. These obstacles included limited high-speed broadband, liability concerns, privacy and safety, whether health workers at remote sites had the appropriate medical credentials, and inadequate reimbursement. Although many of these restrictions had been addressed in some economies before the COVID-19 crisis, as the pandemic sheds light on the benefits of safe, remote testing, monitoring and treatment, removing these obstacles is of even greater importance today.[5] Enabling policy frameworks that guide the effective roll-out of telehealth solutions include aspects such as data privacy policies, patient privacy and confidentiality considerations, coverage and reimbursement issues, intellectual property and licensing concerns, broadband infrastructure, and cross-border conformance. These are foundational to successful telehealth implementation. Notably, private industry activity and innovation have also accelerated during this time, but more progress needs

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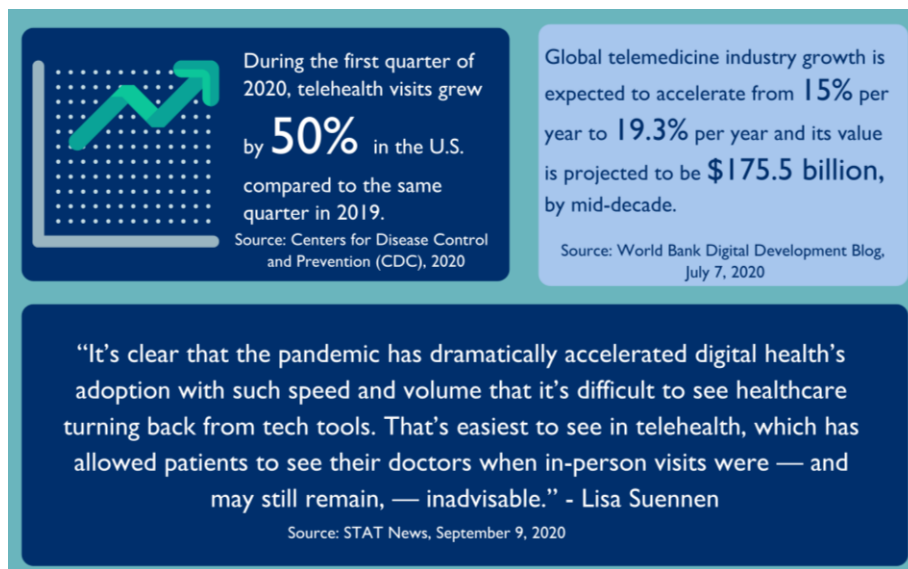
[5] M. Mrazek and R, Shulka, "After Coronavirus, Telemedicine is Here to Stay," Digital Development (blog), World Bank, July 2020, https://blogs.worldbank.org/digital-development/after-coronavirus-telemedicine-here-stay.

to be made to integrate best telehealth practices into regulatory, reimbursement and standards policies across the region.

In 2020, APEC members endorsed the APEC project Empowering Telehealth Solutions in APEC to explore telehealth, map the landscape of policies across APEC economies that enable greater use of telehealth services, and provide an overview of best policy practices for member economy consideration. The information in this report provides a sound understanding of the policy landscape in economies before the COVID-19 outbreak, as well as policy changes made in response to the pandemic to increase use of telehealth solutions in the current pandemic environment. The goal of this project is to enable greater use of telehealth solutions as part of the overall efforts to improve healthcare delivery across APEC and to achieve the goals of the APEC HWG's Strategic Plan (2021–2025) which seeks to encourage research, support digital health innovation, and promote translation of that research into practice in a way that improves both health outcomes and health systems, while addressing the current and future needs of all APEC member economies. In addition, this work is aligned with efforts progressed under other APEC fora to promote innovation and digitalization, and to deliver against long term commitments articulated under APEC's Putrajaya Vision 2040.

As part of this undertaking, information on the policy landscape for telehealth in APEC was gathered via a desk review, survey, and interviews of key stakeholders and relevant agencies. This report provides an overview of telehealth policy frameworks and features examples of telehealth innovations from private industry, including practices that emerged in response to healthcare needs during COVID-19. It also includes a brief overview of the barriers to telehealth adoption and deployment. Learning from the research undertaken for this report, a discussion of policy considerations and recommendations is provided to encourage the adoption of better enabling policies for increasing the deployment of telehealth solutions for improved healthcare delivery in the Asia Pacific region. These recommendations draw upon several examples of best practices currently being implemented by APEC economies. Lastly, the report provides a series of recommendations for consideration by APEC economies to support expanded use of telehealth in the region.

WHAT IS TELEHEALTH?

UNDERSTANDING TELEHEALTH

To ground this report and future discussions in common terminology for use in the broader context of digital solutions to support effective service delivery, it is important that key, often interchangeably, used terms like telehealth, telemedicine, digital health, and eHealth are clearly defined at the outset. Given the need for consistent, cross-economy definitions, this study uses definitions for key terms from WHO's third global survey on eHealth (2016), the WHO Global Strategy on Digital Health, and a foundational American Telemedicine Association's white paper:

- **Telehealth**: The delivery of healthcare services, where patients and providers are separated by distance. Telehealth uses ICT to exchange information for the diagnosis and treatment of diseases and injuries, research and evaluation, and continuing education for health professionals.[6]
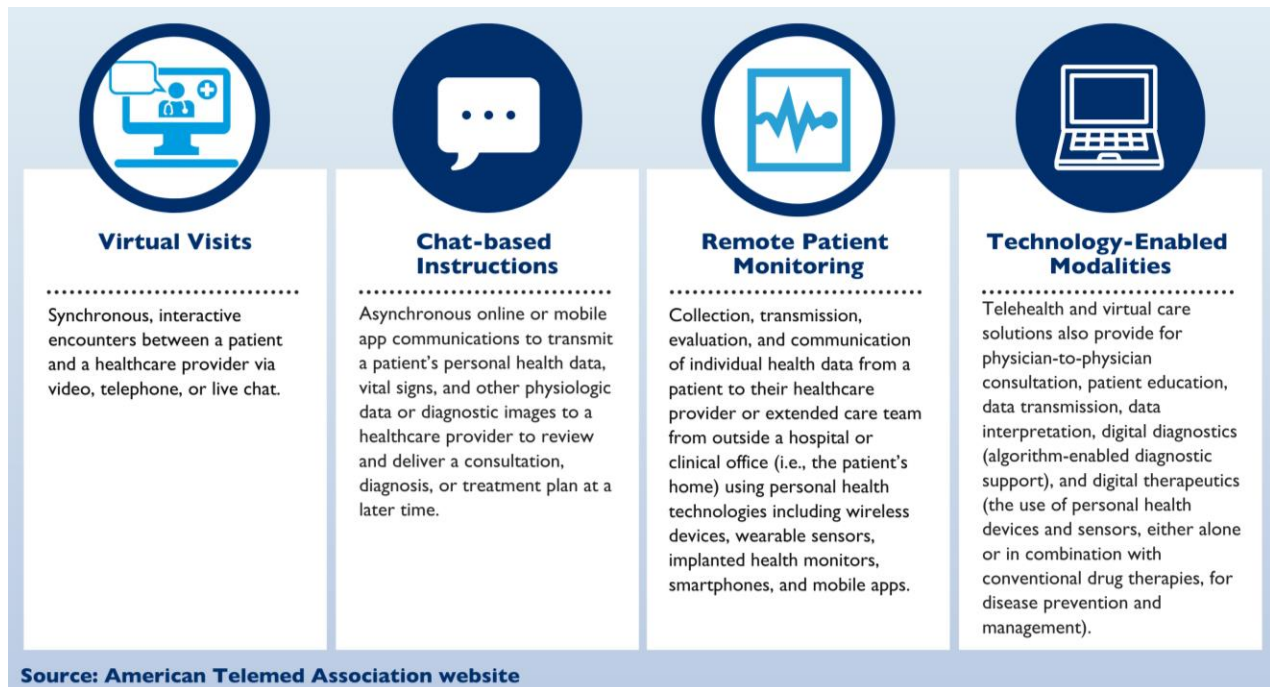
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[6] World Health Organization Global Health Observatory, "Analysis of Third Global Survey on eHealth."

- **Telemedicine**: The use of electronic communications and information technologies to provide clinical services when participants are at different locations. Telemedicine is closely associated with the term telehealth. However, telehealth encompasses a broader application of technologies such as distance education, consumer outreach, and other applications wherein electronic communications and information technologies are used to support healthcare services. [7]

- **eHealth:** The cost-effective and secure use of information and communications technologies in support of health and health-related fields, including healthcare services; health surveillance; health literature; and health education, knowledge, and research.[8]

- **Digital health**: The field of knowledge and practice associated with the development and use of digital technologies to improve health. Digital health expands beyond the concept of eHealth to also include digital consumers, with a wider range of smart-devices and connected equipment. It also encompasses other uses of digital technologies for health such as the Internet of Things, big data, robotics, and Artificial Intelligence (AI).[9]

This report focuses on telehealth as defined above. Telehealth can be delivered both synchronously and asynchronously, an important distinction to bear in mind. Specifically, according to the American Telemedicine Association, the most common approaches in telehealth include:

Figure 2 Types of Telehealth Approaches

Virtual Visits	**Chat-based Instructions**	**Remote Patient Monitoring**	**Technology-Enabled Modalities**
Synchronous, interactive encounters between a patient and a healthcare provider via video, telephone, or live chat.	Asynchronous online or mobile app communications to transmit a patient's personal health data, vital signs, and other physiologic data or diagnostic images to a healthcare provider to review and deliver a consultation, diagnosis, or treatment plan at a later time.	Collection, transmission, evaluation, and communication of individual health data from a patient to their healthcare provider or extended care team from outside a hospital or clinical office (i.e., the patient's home) using personal health technologies including wireless devices, wearable sensors, implanted health monitors, smartphones, and mobile apps.	Telehealth and virtual care solutions also provide for physician-to-physician consultation, patient education, data transmission, data interpretation, digital diagnostics (algorithm-enabled diagnostic support), and digital therapeutics (the use of personal health devices and sensors, either alone or in combination with conventional drug therapies, for disease prevention and management).

Source: American Telemed Association website

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[7] American Telemedicine Association, *Telemedicine, Telehealth and Health Information Technology,* white paper, May 2006, https://www.who.int/goe/policies/countries/usa_support_tele.pdf?ua=1.
[8] World Health Organization, Draft Global Strategy on Digital Health 2020–2025, p.20. https://www.who.int/docs/default-source/documents/gs4dhdaa2a9f352b0445bafbc79ca799dce4d.pdf.
[9] World Health Organization, Draft Global Strategy on Digital Health 2020-2025, p.20.

Telehealth comprises a diverse ecosystem which includes a variety of stakeholders. It is important for policymakers to consider the breadth and depth of this ecosystem and its stakeholders as they seek to create policies that increase access for patients to telehealth services. Delivery of telehealth services involves many stakeholders, including (but not limited to) clinicians, patients, digital infrastructure utilities (e.g., internet providers), insurance organizations, technology partners, developers, and information technology (IT) equipment manufacturers. Findings of the survey pointed to the complex nature of the overall telehealth ecosystem and provide important lessons for how to engage across all stakeholders, coordinate efforts, and develop appropriate public-private partnerships for optimal outcomes.

Promising examples of cooperation, collaboration, and innovation are highlighted in this study such as the following:

- **Brunei Darussalam:** An important public-private partnership has been established between the Brunei Darussalam Ministry of Health and DXC Technology to deliver the "one patient, one record" Brunei Health Information and Management System (Bru-HIMS). This serves 420,000 Bruneians, with advanced telehealth capabilities.

- **Canada:** The federal government of Canada funds a pan-Canadian electronic health record (EHR) system with telehealth at its core, through the nonprofit agency Canada Health Infoway.

- **Chile:** The Chilean Digital Hospital serves over 1 million citizens and is funded as a domestic center of excellence. It uses asynchronous telemedicine approaches focused on medical specialties such as dermatology, nephrology, diabetology, and geriatrics. It deploys synchronic telemedicine to deliver health services in isolated rural regions of Chile.

- **Indonesia:** The Ministry of Health works with the Indonesian Medical Council, a unique body responsible for promulgating telehealth policy and regulation, as well as dealing with licensing, liability and provider related issues.

- **The Philippines:** The Asia eHealth Network is based in Manila, Philippines and works with the Philippines government to operate as a regional multi-stakeholder collaborative, with an interoperability lab, engaged in a broad array of digital health and telehealth initiatives and training in the Asia-Pacific region.

- **Peru:** Private telehealth innovation such as Auna, a network of private hospitals and medical centers across Peru delivers critical telehealth oncology services. Some of these services were expanded during the COVID-19 pandemic.

- **Singapore:** The Singapore Ministry of Health uses a unique on-line regulatory sandbox approach to encourage telemedicine providers to develop innovative care models within well-defined patient safety and welfare parameters.

INNOVATIONS IN TELEHEALTH

While telehealth solutions have been available for more than 50 years, globally, recent technological innovations enable more diverse, tailored, and broadly applicable solutions for addressing healthcare issues across a wide variety of treatments. For example, today's technology of sophisticated chatbots, AI-enabled diagnostic tools, and interoperable electronic health records promise to fuel more detailed

and thorough telehealth interactions in the future. This study found that the private sector (both established firms and start-ups) has continuously introduced innovative new telehealth tools (both before and during the pandemic) to address vital society and public health needs. However, the adoption, acceptance, and ultimate success of these technologies is dependent upon policymakers' understanding the technologies, addressing policy bottlenecks, supporting the enabling environment, and listening to private sector perspectives regarding challenges and opportunities.

The table below highlights a selection of innovative telehealth technologies at the forefront of telehealth in the Asia-Pacific region:

Table 1 Private Industry Telehealth Advancements

DXC Technology (Brunei Darussalam): The company has created a "one patient, one record" Brunei Health Information and Management System in partnership with the Ministry of Health Brunei that serves over 420,000 citizens and has built-in telehealth capabilities.[10]
JD Health (People's Republic of China): JD Health, a subsidiary of JD.com (e-commerce), launched a "family doctor" telehealth/telemedicine service. JD Health launched its free online consultation platform to deal with COVID-19 in late January of 2020 and quickly expanded the scope of its free consultation services to cover all medical departments and diseases.[11] It has an average daily consultation volume of more than 120,000 people.[12]
Halodoc, Alodokter, and GrabHealth (Indonesia): Indonesia has a burgeoning health IT ecosystem, with companies such as Halodoc, Alodokter, and GrabHealth (a joint venture between Singapore-based Grab and China's Good Doctor), providing private medical consultations through chat or video calls, as well as prescription medicine purchase and delivery through partnerships with pharmacies and ride-hailing apps. App customers can pay out-of-pocket, with private insurance from partner companies, or through the startup's own insurance programs.[13]
Doc+ (Russian Federation): Doc+ combines telemedicine with digitally enabled house calls. The visits are currently available in Moscow and Saint Petersburg. Patients can use the Doc+ capabilities via chat or by audio or visual means. For both in-person and remote care, a digital record of the patient's visit is stored and accessible to the patient online.[14]
Teladoc Health (United States): Teladoc Health provides care including telehealth across numerous clinical specialties to address primary care, acute, chronic, and complex health needs. It

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[10] J. Henderson, "Inside Brunei's Cutting-Edge Health System Built by DXC," Channel Asia (July 19, 2019), https://www.channelasia.tech/article/663103/inside-brunei-cutting-edge-e-health-system-built-by-dxc/.
[11] D. Koh, "China's JD Health Launches Family Doctor Telehealth Service," *MobiHealthNews*, HIMSS Media (August 19, 2020), https://www.mobihealthnews.com/news/asia-pacific/china-s-jd-health-launches-family-doctor-telehealth-service.
[12] H. Zhang, "JD Health Provides Free Consultation Targeting 60 Million Chinese Living Overseas," *JD.com Corporate Blog*, JD.com (March 17, 2020), https://jdcorporateblog.com/jd-health-provides-free-online-consultation-targeting-60-million-chinese-overseas/.
[13] U. Florene, "Indonesia's Might Go 'Online First' When Seeking Medical Help from Now On," *KrAsia* (May 3, 2020), https://kr-asia.com/indonesians-might-go-online-first-when-seeking-medical-help-from-now-on.
[14] J. Comstock, "Russian Digital Health Call, Telemedicine Company Doc+ Gets $5 Million," *MobiHealth News*, HIMSS Media (June 6, 2017), https://www.mobihealthnews.com/content/russian-digital-house-call-telemedicine-company-doc-gets-5m.

covers areas such as virtual basic care, mental health, specialty medical services, and integrated care.[15] Teladoc Health Medical Group clinicians serve millions of patients across the globe over Teladoc Health Platforms.[16] Programs such Teladoc Healths Livongo Diabetes and Hypertension Programs with smart home monitoring and live telehealth coaches are having a notable impact on health, such as a greater likelihood of staying in the "safe zone" (being 21 percent less likely, on average, to have days with hypoglycemic readings after joining) and healthcare costs that are 28 percent lower than those with similar conditions not participating in the program.[17]

<u>Jio Health and Earable (Viet Nam)</u>: Jio Health provides online booking of clinical services, manages personal health profiles. and shares patient medical data with healthcare providers. Jio also offers specialty medical services, an online pharmacy, family healthcare plans, maternity care packages, and corporate checkups.[18] Earable is a U.S. company with its engineering and development base in Ho Chi Minh City. It provides services in Viet Nam, including an in-ear device with biosensors and Machine Learning algorithms used to collect health data.[19]

In addition to innovative advancements made by private industry, there are equally innovative efforts being undertaken to use open-source tools to create and maintain economy-level health information systems and individual components and services, such as telehealth. This has been particularly relevant during the pandemic, when economies are seeking cost-effective digital health solutions with a proven track record, as well as training and education services for new digital health and informatics tasks. Some benefits of open-source tools are lower implementation and maintenance costs, active training, user communities, and continuity. These products and modules are being deployed in larger economy efforts such as domestic-wide electronic health information systems, civil registration and vital statistic tracking, HIV-AIDS management, and natural disaster response. These tools are relevant to APEC economies because they are being increasingly deployed on every continent across the globe for general healthcare, COVID-19, and other functions. Table 2 provides examples of such open-source health tools.

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[15] Teladoc, "What We Do," webpage, https://teladochealth.com/what-we-do/.
[16] Teladoc, "Teladoc Medical Group," webpage, https://teladochealth.com/medical-group/.
[17] Livongo, "Harris Health System Doubles Down on Diabetes and Hypertension Programs," Livongo (posted online). https://nebgh.org/wp-content/uploads/2020/09/Livongo.pdf.
[18] J. Russell, "Jio Health Combines On-Line and Off-Line Healthcare in Southeast Asia, Staring with Vietnam," Tech Crunch (April 1, 2019), https://techcrunch.com/2019/04/01/jio-health-southeast-asia/.
[19] T. Van, "Passion – The Mother of Invention, Says Vietnamese Scientist," Viet Nam News (June 1, 2020), https://vietnamnews.vn/society/717520/passion-the-mother-of-invention-says-vietnamese-scientist.html.

Table 2 Open-Source Health Information Tools

DHIS2: The District Health Information System 2 (DHIS2) COVID-19 Digital Surveillance Package tracks suspected and confirmed cases and has been used to control the pandemic. DHIS2 is an open-source, web-based health management information system platform, used in 73 countries.[20] COVID-19 success stories can be found at: https://www.dhis2.org/covid-success-stories.

OpenMRS: OpenMRS is a frontline electronic health record (EHR) system in over 40 economies and plays a vital role in addressing HIV control and care improvement. OpenMRS has been adapted during the pandemic for COVID-19 screening, treatment, and surveillance.[21]

Open Health Information Exchange (OpenHIE): OpenHIE is a global community of practice and peer exchange focused on enabling large-scale health information interoperability, and providing and collating information related to healthcare data standards and exchange. OpenHIE has a COVID-19 response task force.[22]

TELEHEALTH POLICY CONSIDERATIONS AND RECOMMENDATIONS

As mentioned in the section above, innovation will continue to expand with new healthcare delivery solutions and models being developed every day. Of critical importance to the ultimate deployment and adoption at scale of these technologies are the underlying policy and regulatory systems implemented by governments that set the guidelines for how telehealth services can and should be delivered. Also of importance is the dedication of appropriate resources for education, as well as the allocation of funding for the deployment of necessary infrastructure, to incentivize the use of these new, ground-breaking solutions.

The review of publications, the survey and the stakeholder consultations that provided the baseline information underpinning study findings, brought to light a multitude of policy decisions that are critical to appropriately enable telehealth solutions as part of the overall healthcare system in any economy. Careful consideration of these policies and coordination amongst the diverse set of stakeholders who guide the implementation of these policies are critical to ensuring a robust, well-functioning, enabling environment for telehealth. The report identifies and recommends policy practices that have proven to be most conducive to increasing access to and guiding the effective adoption of telehealth solutions. The analysis also includes several case studies from across APEC region of relevant policies in action.

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[20] DHIS2, "About DHIS2," webpage, https://dhis2.org/about/.
[21] OpenMRS, "About OpenMRS," webpage, https://openmrs.org/about/.
[22] OpenHIE, "OpenHIE: Our Community," webpage, https://ohie.org/community/.

Table 3 Telehealth Enabling Policy Considerations and Recommendations

TELEHEALTH POLICY CONSIDERATION	POLICY RECOMMENDATION	SPOTLIGHT ON POLICY IN ACTION (see Annex I for details)
Recognize Telehealth as Healthcare	In all future healthcare regulatory conversations and decisions, recognize telehealth as integral to healthcare policy and reform.	➢ Thailand's Notification of the Medical Council on Guideline in respect of Telemedicine and Online Clinics No. 54/2563 ("Telemedicine Guideline") and effective as of October 20, 2020
Create Integrated, Interoperable Information Sharing Platforms	To the extent possible, create interoperable health information systems that allow for transmission of health information between providers and patients.	➢ Brunei Health Information and Management System (Bru-HIMS) ➢ Chinese Taipei's MediCloud and PharmaCloud ➢ Hong Kong, China's efforts to incorporate robotics, big data analytics, AI, and augmented reality into the Hospital Authority's (HA) services
Align Standards & Achieve Interoperability	Adopt and/or align with internationally accepted health data standards and interoperability principles.	➢ New Zealand's longitudinal electronic health record and integrated digital hospitals initiatives ➢ The United States Office of the National Coordinator for Health Information Technology (ONC) 10-year vision to achieve an interoperable health IT infrastructure ➢ Asia eHealth Information Network (AeHIN)
Expand Telecom Infrastructure	Expand citizen access to connected networks through increased investment, construction, and deployment and upgrades of modern broadband infrastructure.	➢ Papua New Guinea's Highlands fiber network
Address Payment & Reimbursement Policy Challenges	Review payment and reimbursement policies for telehealth and consider: - removing provisions in law that require a prior in-person relationship between practitioner and patient; - removing geographic and originating site barriers; - allowing practitioners to determine appropriate standards of care for patients; - billing parity for telehealth services.	➢ Canada's expansion of billing codes for virtual care delivery in context of COVID-19 ➢ Australia's December 9, 2020 health alert on new telehealth COVID-19 policy and COVID-19 Medicare Benefits Schedule fact sheets ➢ United States COVID-19 Recovery Legislation modifications to Medicare, Medicaid and Children's Health Insurance Program

TELEHEALTH POLICY CONSIDERATION	POLICY RECOMMENDATION	SPOTLIGHT ON POLICY IN ACTION (see Annex I for details)
Coordinate Across Whole of Government	Coordinate policy decision making process across whole of government to be inclusive of all stakeholders including health equities, digital infrastructure equities, digital policy equities, labor, and others for comprehensive policy outcomes.	➢ Chinese Taipei's use of health card database and customs information for providers to send alerts about COVID-19 based on patient travel history ➢ Russia's telehealth policy and digital economy working in concert ➢ Viet Nam's Ministry of Information and Communications and the Ministry of Health working jointly to develop technology platforms and databases for healthcare and to complete a legal framework and develop technical standards
Leverage Public-Private Partnerships	Where appropriate, look to leverage and/or create public-private partnerships to stimulate adoption of new technologies.	➢ Chile's Digital Hospital ➢ Mexico's Salauno ➢ United States—Health IT Policy Committee[23]
Update Licensing, Liability, and Provider Professional Practices-Policies	Update guidance for health care provider regulatory authorities on permitted modalities of care and cross-border licensure requirements: - Flexibility in delivering remote care across state/provincial borders; - Allowing initial visits between patients and providers to be conducted remotely so long as the provider can meet the standard of care for the presenting patient and condition.	➢ Indonesian Medical Council *(Konsil Kedokteran Indonesia)* (KKI) KKI Regulation No. 74 of 2020 on Clinical Authorities and Medical Treatment Through Telemedicine ➢ Japan's temporary easing of restrictions on remote medical care, allowing doctors to conduct first-time visits online or by telephone and expanding the number of illnesses eligible for remote treatment ➢ The United States Center for Medicaid and Medicare Services (CMS) published a 42-page fact sheet COVID-19 Blanket Waivers for Healthcare Providers ➢ China's National Health and Family Planning Commission of China (NHFPC) framework regulation of telemedicine (2014) and July 2018 Guidance for the Administration of Remote Medical Services for Trial Implementation

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[23] The Health IT Policy Committee leads United States efforts to have private-sector input to Health IT policymaking decisions. Note broad range of private sector stakeholders advising HHS. The committee webpage is available at: Health IT Policy Committee | HealthIT.gov.

TELEHEALTH POLICY CONSIDERATION	POLICY RECOMMENDATION	SPOTLIGHT ON POLICY IN ACTION (see Annex I for details)
Expand Patient Access and Health Equity	Leverage all forms of virtual services to deliver care to patients including both synchronous and asynchronous modalities. Consider expanding existing health programs through incorporation of telehealth services. Design initiatives ensuring all individuals and communities, including the most disadvantaged, have access to and use of information and communication technologies (ICTs) and telehealth.	➢ Chile's Digital Hospital ➢ Philippines & USAID ReachHealth Program ➢ New Zealand's COVID-19 Telehealth Strategic Framework (principles of digital inclusion)
Develop Workforce, Educate Public, and Build Capacity	Provide training and education to medical providers and patients on telehealth tools and capabilities.	➢ Peru's Directorate General of Telehealth, Reference and Emergencies continuing education programs for healthcare workers
Encourage Innovation	Employ regulatory sandboxes to encourage creation of new care delivery models, leveraging private sector technology expertise.	➢ Singapore Ministry of Health's regulatory sandbox ➢ Korea's efforts to explore integration of AI, Internet of Things (IoT) tools and other advanced technology into its electronic medical records and telemedicine
Enhance Data Stewardship	Institute healthcare and privacy frameworks that balance personal privacy with the need be able to securely transmit health data for healthcare purposes.	➢ The United States Health Insurance Portability and Accountability Act (HIPAA) ➢ Malaysian MyHEALTH Portal
Facilitate Cross-Border Service Delivery	Consider leveraging global consensus tools and frameworks to ease cross-border service delivery facilitation.	➢ WHO Regional Office for the Western Pacific publication: Implementing Telemedicine During COVID-19: Guiding Principles and Considerations for a Step-Wise Approach ➢ PAHO and Inter-American Development Bank publication: COVID-19 and Telemedicine Tool, Version 3.0 ➢ American Health Information Management Association (AHIMA) publication: International Telehealth Toolkit

MOVING APEC ECONOMIES TOWARDS GREATER USE OF DIGITAL HEALTH

In addition to policy related best practices that economies could consider replicating in their own jurisdictions to enhance and promote access to and adoption of telehealth services, the findings of this report also highlight potential areas for additional work the APEC members could consider. These recommendations could help the efforts of all members to increase telehealth adoption throughout the region and achieve the HWG's broader objectives of improving access to healthcare services in the region. Most importantly, adopting these recommendations would support APEC Leaders' directions to foster an enabling environment that is supported by digital economy and innovation which would not only accelerate digital transformation to support health service delivery, but also address efficiency and equity considerations.

Firstly, under the HWG, economies could engage regional and global creators of innovative, globally accepted telehealth toolkits for use throughout the APEC region. Several international organizations such as WHO Western Pacific, PAHO, the Inter-American Development Bank, and AHIMA International are able to provide guidance on telehealth that could be leveraged by APEC members to develop appropriate strategies to guide the successful implementation of telehealth solutions. These could be shared through targeted APEC-wide capacity building workshops.

Secondly, findings from this study highlight that telehealth implementation and policy are impacted by a broad array of stakeholders and are aligned with other cross-cutting themes progressing under other APEC fora. Fostering APEC cross-fora collaboration to develop a coherent, coordinated telehealth strategy across different sectors, while leveraging work undertaken in the past, could prove useful to broadening access to telehealth services. This could involve collaborative policy discussions between HWG, the Life Sciences Innovation Forum, the Digital Economy Steering Group, the Human Resources Development Working Group, the Emergency Preparedness Working Group, the Sub-Committee on Standards and Conformance, and the Transportation Working Group where natural synergies exist - to facilitate the development of appropriate standards or regulations involving telehealth and related tools. For example, the establishment of the Digital Health Sub-Working Group spearheaded by Chinese Taipei offers an established platform for APEC economies to coordinate and promote efforts within the region on digital health more broadly, with telehealth being a substantive component of the workstream.

Further to the above, this study is strongly aligned with HWG's broader policy directions and the forum's Strategic Plan and reflects APEC's approach to support improved service delivery as economies transition to post-pandemic recovery. Fora such as HWG and LSIF can deliver valuable insights into future APEC digital health activities. In addition, given the group's mandate, topics such as AI in healthcare and digital therapeutics would be areas for further exploration. This would also facilitate the timely sharing of lessons learned on digital and telehealth policy and implementation of best practices, to better prepare APEC economies for a post-pandemic environment as well as help the region manage existing challenges such as rapidly aging populations, higher incidences of chronic illness demanding more personalized care, and increasing healthcare costs.

The analysis undertaken for this study revealed that major digital health interoperability initiatives are underway in numerous APEC economies such as Malaysia, New Zealand, Peru, and the United States. Moreover, key global organizations related to healthcare and standards development are exploring opportunities to partner meaningfully and provide needed training and technical expertise where

appropriate. Given this, APEC members can seek to progress interoperability efforts by further exploring opportunities to foster sustainable and effective healthcare interoperability efforts with standards development organizations (SDOs) and other influential healthcare stakeholders.

Lastly, the HWG could work to improve multi-stakeholder engagement with a focus on improving digital inclusion and health equity in telehealth throughout the APEC region. Digital inclusion and health equity are highlighted in global health and health system sustainability efforts. Research undertaken as part of this study revealed that APEC economies have begun to link telehealth initiatives to digital inclusion or health equity initiatives.

CONCLUSION

The analysis contained in this report provides a snapshot of the policy and regulatory landscape supporting telehealth solutions across the Asia Pacific region. This information is expected to provide a sound basis upon which to further progress the conversation within APEC on adopting innovative ways of delivering health services in the region in an equitable and cost-efficient manner while enhancing efficiencies and developing opportunities for collaboration between the private and public sectors— ultimately achieving the overarching objectives of the HWG and the LSIF. The pandemic has served as a catalyst for economies in the region to develop appropriate policy frameworks and processes, and the analysis contained in Annex 1 clearly indicates how it has accelerated technological, reimbursement, organizational, and patient-centered telehealth changes in several contexts. While telehealth remains an integral part of several APEC economies' medical practices and healthcare policy frameworks offering easy, high quality, and equitable access to communities in the region there are still some regulatory issues and gaps that require further effort by the public sector to ensure the smooth adoption of telehealth services to achieve universal health care.

The recommendations in this report—such as the development of telehealth toolkits, best practice sharing, cross-fora collaboration, will support a comprehensive, coordinated, equitable, interconnected, and sustainable approach to telehealth in the Asia-Pacific context. APEC will also become a global leader in cross-border telehealth learning and innovation at a critical juncture.

ANNEX I: ECONOMY-LEVEL PROFILES ON TELEHEALTH

INTRODUCTION

The following annex provides a snapshot of economy-level contexts involving eHealth and digital health service delivery in APEC economies, best practice examples of economies' implementation of the aforementioned policy considerations and recommendations, as well as relevant telehealth policy frameworks supporting health service delivery in the times of COVID-19, since 2020.

This information guided the analysis and recommendations provided in the main body of the report and was gathered primarily via an in-depth desk assessment of existing, publicly available resources, and supplemented by interviews and information gathered via an APEC survey conducted as part of this study. Representatives from four APEC economies responded to the survey—Canada; Chile; Chinese Taipei; and New Zealand—while digital health experts from the four additional economies of Australia; the Philippines; Singapore; and the United States offered written, structured insights. This was used as primary research material for this study.

As noted in the study's introduction, the telehealth and policy landscape has rapidly evolved, particularly during COVID-19. Therefore, sources such as current news, academic journals, technologies from industry and economies' digital health and telehealth websites were reviewed and monitored for updates during the study's period. Relevant economy policies and regulatory developments were also analyzed in depth to provide the most comprehensive and up-to-date information.

The data contained in this annex are not exhaustive and represents a first step towards guiding a deeper dive into APEC economy-level policy frameworks and existing regulations, as well as the critical drivers, challenges, and opportunities to promote telehealth solutions across the APEC region.

Links to policy documents, relevant sites, and publications are also provided.

AUSTRALIA

Digital Health Environment: The Australian Digital Health Agency (known as Digital Health) is the Australian government's statutory agency responsible for health technology and execution of My Health Record, Australia's digital prescriptions and health referral system, as well as other eHealth programs under the economy's National Digital Health Strategy. Australia's National Digital Health Strategy and the Framework for Action (2018–2022), which support the delivery of digital health, contain seven principles or strategic priorities which are expected to form a sustainable ecosystem for the use of digital health technology. These include:

1. Health information that is available whenever and wherever it is needed (which includes initiatives like My Health Record);
2. Health information that can be exchanged securely;
3. High-quality data with a commonly understood meaning that can be used with confidence;
4. Better availability and access to prescriptions and medicines information;
5. Digitally-enabled models of care that drive improved accessibility, quality, safety, and efficiency;
6. A workforce confidently using digital health technologies to deliver health and care; and
7. A thriving digital health industry delivering world-class innovation.[24]

The strategy adopts a staged approach to improving Australian digital health capabilities. The implementation of the strategy is governed and managed by the federal as well as state and territory governments, in line with identified priority areas where digital health can be progressively extended to support health service delivery reforms in Australia.

Telehealth Implementation and Relevant Policy Frameworks: For over 25 years, telehealth has been the focus of considerable research and discussion in Australia, given the urgent need to serve rural and remote parts of the economy that remain beyond the reach of traditional healthcare services. There have been many pilots and institutional-level uses of telehealth through the years. The federal government, which subsidizes the provision of medical care by medical practitioners under the Australian Medicare System, recently approved telehealth as a mainstream means of delivering (and paying for) physician care.

On April 19, 2017, the Australian government introduced the Better Access Telehealth Initiative for Rural and Remote Areas, a new program designed to improve access to services for mental health treatment for individuals in rural and remote areas. Under these guidelines, the telehealth therapy services are offered via videoconferencing facilities between a patient and their health professional.[25] Service providers who are registered with the Medicare system, including psychologists, social workers, and occupational therapists, can deliver relevant telehealth services. To be eligible, patients are required to have a Mental Health Treatment Plan and be located in a rural and remote area. As of September 2018, eligible patients in rural and remote areas have been able to access all of their sessions offered through the Better Access Telehealth Initiative via videoconferencing facilities.

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[24] Australian Digital Health Agency, "National Digital Health Strategy and Framework for Action," webpage, https://www.digitalhealth.gov.au/about-us/national-digital-health-strategy-and-framework-for-action.
[25] Australian Government Department of Health, "About the Better Access Initiative," webpage, https://www1.health.gov.au/internet/main/publishing.nsf/Content/mental-ba-telehealth.

Medicare rebates are available for up to 10 individual and group mental health therapy service sessions per calendar year to patients with a Mental Health Treatment Plan and referrals. This is designed to increase access, affordability and choice of mental health providers. General practitioners (GPs), specialists, allied health providers, mental health professionals, and nurse practitioners are all eligible to provide telehealth services to patients.

Telehealth Use During COVID-19: Like in other contexts in the APEC region and beyond, the adoption of digital health services in Australia has been dramatically accelerated by the COVID-19 pandemic.[26] As a temporary measure during COVID-19, the Australian government adjusted the Medical Benefits Schedule (MBS) to accommodate telehealth services. On December 9, 2020, the government released a detailed alert on a telehealth COVID-19 policy along with a number of COVID-19 MBS fact sheets. This included a list of healthcare professionals that can provide telehealth services under the MBS scheme (using relevant MBS codes). Australia also included a number of temporary Medicare items and payment changes to help healthcare practitioners deliver telehealth services via phone or videoconference. These measures were extended until June 30, 2021. They include temporary GP and OMP (other medical practitioners) telehealth billing incentives for non-hospital patients who are vulnerable to COVID-19 and relaxing requirements that allow GPs and OMPs to perform telehealth or telephone care when there was an established relationship with the patient.[27]

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[26] D. Koh, "An Overview of Australia's Digital Health Landscape," Healthcare IT (October 14, 2020), https://www.healthcareit.com.au/article/overview-australias-digital-health-landscape.
[27] Australian Department of Health, "COVID-19 Temporary MBS Telehealth Services," MBS Online (September 23, 2020), http://www.mbson-line.gov.au/internet/mbson-line/publishing.nsf/Content/Factsheet-TempBB.

BRUNEI DARUSSALAM

Digital Health Environment: The Brunei Ministry of Health's Office of Healthcare Technology leads the charge for developing approaches to promote digital health services and modernizing healthcare. In 2008, the government of Brunei launched "Vision 2035" as an overarching policy framework to guide the transformation of Brunei into a dynamic and sustainable economy in the Southeast Asian region. Aligned under this broad strategic framework, is the Ministry of Health's own "Vision 2035: Together towards a Healthy Nation," designed as an integrated healthcare approach with community participation and inter-sectorial partnerships.

While there is no current overarching policy framework to guide Brunei's efforts in supporting digital innovations, there are several notable initiatives underway that seek to provide better diagnosis, treatment and care to patients by improving and upgrading existing systems. An example of this is the comprehensive health information system Bru-HIMS - Brunei's Health Information and Management System, led by the Ministry of Health in partnership with DXC Technology. This initiative is an economy-wide, comprehensive health record database intended to enable real-time patient support and more effective data management. The database stores patient information of all citizens and is made available to health practitioners for better medical data access and management. The system enables Brunei's four government hospitals and 60 health centers to automate and better manage patient referrals, heath related data, and treatment plans. Bru-HIMS transactions are fully synchronized across multiple databases to allow for doctors and physicians to coordinate more effectively with pharmacy, laboratory, and radiology units.

Telehealth Implementation and Policy Frameworks: Brunei is noted as one of the first economies in the Southeast Asian region to deploy telehealth to deliver healthcare services. These services are integrated with Bru-HIMS. An example is the Jerudong Park Medical Centre where the Neuroscience Stroke and Rehabilitation Centre has been established in partnership with the North-West Hospital (KHNW) in Frankfurt, Germany. In this center, patients and doctors consult overseas specialists through satellite technology, video conferencing, and data transfer via phones and the internet. Twenty-four hour teleneurology services are offered. All neurological laboratories have been set up on site, covering procedures such as telecytology, teleelectrophysiology, electroencephalograms (EEGs), and ultrasound.[28]

Telehealth Use During COVID-19: Through a series of proactive health measures and strong leadership from both Bruneian Sultan Hassanal Bolkiah and Brunei's Health Ministry, the economy has been able to manage its response to COVID-19 effectively. Brunei has taken a comprehensive whole-of-government approach to managing the impacts of the pandemic by crafting a four-stage de-escalation plan. In addition, the government facilitated enhanced digital connectivity and leveraged its Bru-HIMS health application for tracking and contact tracing and other outbreak and emergency functions.

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[28] HIMSS Asia Pacific, "Brunei's SMART City Story," posted online (June 2016), https://www.himssasiapac.org/sites/default/files/HIMSSAP_ExclusiveArticles_BruneisSMARTCityStory.pdf.

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https://www.gov.bn/SitePages/Digital%20Government%20Strategic%20Plans%20and%20Legislation.aspx

https://www.himssasiapac.org/sites/default/files/HIMSSAP_ExclusiveArticles_BruneisSMARTCityStory.pdf

Telehealth During COVID-19:

https://www.bahdigital.com/stories/e-health-in-brunei

CANADA

Digital Health Environment: Much of Canada's digital health efforts are executed through Canada Health Infoway (Infoway), established in 2001 and funded by the federal government of Canada. Infoway is a not-for-profit organization that works to improve the health of Canadians through increased development, uptake, and use of digital health solutions.[29] A pan-Canadian electronic medical record, on-line patient health portals, and First Nations community-based digital health services, are some of the initiatives provided under the aegis of Infoway.[30] Some of the key achievements under this program are: the availability of electronic health record data for 93.8 percent of all Canadians; core digital health systems established for immunizations, patient and provider registries, drug, lab and diagnostic systems and clinical reports; and cost-effective service provision through digital access to specialized care (with savings measured in terms of more than $420 million in savings and a reduction of more than 280 million kilometers of travel).[31]

Improvements to existing programs are conducted by Infoway via "Healthy Dialogues" and customer surveys.[32] Infoway also provides a wide range of multi-media information on digital health and innovation, including podcasts on breakthroughs and innovative practices.[33]

Telehealth Implementation and Policy Frameworks: While there is no overarching federal government-level policy framework, telehealth has been an integral part of the Canadian healthcare system for over a decade, with a range of programs implemented by provinces and territories. Since Infoway's establishment in 2001 to 2019, almost US$ 77 million has been invested in telehealth and US$ 45 million in tele-homecare programs. Videoconferencing is the most commonly used and relied on platform for achieving provider-to-patient care in rural and remote areas, and specialists employ tools like digital stethoscopes and cameras to conduct patient examinations with assistance from local clinicians. Telehealth can improve access to care for people with mobility issues or people unable to get time off work.[34] Prior to COVID-19, Canada conducted a broad analysis on the benefits of telehealth care, including the examination of the reduction of carbon dioxide emissions resulting from telehealth services in place of in-person care.[35]

Telehealth Use During COVID-19: A survey conducted by Infoway found that up to two-thirds of patient visits (approximately 7 in 10 people) involving primary care providers are undertaken on a virtual platform since the start of the pandemic. To guide the change to virtual care, Infoway is working with Health Canada and the provinces and territories, to rapidly develop and expand virtual

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[29] Canada Health Infoway, "About Canada Health Infoway," webpage, https://www.infoway-inforoute.ca/en/about-us.
[30] Canada Health Infoway, "Solutions: Indigenous Peoples," webpage, https://www.infoway-inforoute.ca/en/solutions/indigenous-peoples.
[31] Canada Health Infoway, "Progress in Canada," webpage, https://www.infoway-inforoute.ca/en/what-we-do/progress-in-canada.
[32] Canada Health Infoway, "Healthy Dialogue Report Highlights," webpage, https://access2022.ca/section/a-healthy-dialogue.
[33] Canada Health Infoway, "Digital Health InfoCast," webpage, https://www.infoway-inforoute.ca/en/what-we-do/podcast-digital-health-infocast.
[34] Canada Health Infoway, "Telehealth," webpage, https://www.infoway-inforoute.ca/en/solutions/digital-health-foundation/telehealth.
[35] Canada Health Infoway, "Analysis of the Current and Potential Benefits of Virtual Care in Canada," PowerPoint presentation (March), https://www.infoway-inforoute.ca/en/component/edocman/resources/reports/benefits-evaluation/3819-analysis-of-the-current-and-potential-benefits-of-virtual-care-in-canada?Itemid=10.

care solutions across the economy.[36] The Canadian government introduced a variety of new and expanded telehealth measures during the COVID-19 pandemic. These include expanded billing codes and technology use, a patient portal for COVID lab results, and virtual mental health services, including children's assistance resources. Examples of these initiatives include:

- **Expanded billing codes for virtual care delivery in context of COVID-19**: All provinces and territories, excluding the Northwest Territories (where physicians are largely salaried), have employed billing/fee codes to expand the use of virtual care.
- **Use of telephone:** While the adoption of virtual care services was limited prior to the pandemic, all provinces and territories are now employing the use of the telephone to support patient consultations with healthcare providers, and it is by far the most widely used modality within and across jurisdictions.
- **Use of video conferencing and secure messaging**: All provinces and territories are using a variety of regulated and unregulated video conferencing services and messaging services to virtually meet and communicate with patients during COVID-19, including primary care physicians. Prior to COVID-19, virtual care services were largely limited to specialist services and constituted a very small portion of practice.
- **Online patient access to COVID-19 lab results:** Online patient access to COVID-19 test results is in place in several provinces, but with varying levels of access. Some programs use a mix of web portals and in some cases an app. Other jurisdictions are exploring providing patients online access to test results. For jurisdictions that currently do not provide patients' online access to test results, results are communicated to patients via phone.
- **In-home monitoring:** Some jurisdictions have programs in place for in-home patient monitoring; these programs vary in scale and purpose. Initiatives in Saskatchewan and Ontario focus on non-COVID-19 patients and the expansion of acute care services for patients outside of hospitals (e.g. vitals monitoring, surgical discharges). British Columbia's program is focused on remote home monitoring of higher risk COVID-19 patients in self-isolation.
- **Virtual mental health services for COVID-19**: Several provinces and territories have COVID-19 specific online mental health resources available. Kids Help Phone provides bilingual services across Canada and its website has experienced steady growth in the number of visitors since the beginning of March. The online Wellness Together Canada resource also provides access to resources and services across Canada.

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Telehealth Implementation and Policy: https://www.infoway-inforoute.ca/en/solutions/digital-health-foundation/telehealth

Telehealth During COVID-19:

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[36] Canada Health Infoway, "Digital Health Week," webpage. https://www.infoway-inforoute.ca/en/digital-health-week.

https://www.royalcollege.ca/rcsite/documents/about/covid-19-resources-telemedicine-virtual-care-e

https://www.bnnbloomberg.ca/canada-s-telehealth-boom-in-the-early-innings-as-covid-19-stokes-demand-1.1507993

CHILE

Digital Health Environment: The Ministry of Health of Chile (MINSAL) created the Department of Digital Health which supports all functions related to ICT tools and the implementation and management of the Digital Hospital as part of the economy's approach to achieving an integrated system for all citizens. The Department of Digital Health oversees provision of digital health services to effectively deliver patient care starting from prevention to treatment and recovery. The Digital Hospital reaches over 1 million patients including those in isolated rural areas and deploys asynchronous telemedicine in a variety of medical specialty areas like dermatology and geriatrics. Distance diagnosis for mammographic services and diabetic retinopathy are also offered via telemedicine.

Telehealth Implementation and Policy Frameworks:
Telehealth is a critical component of Chile's digital health approach and reflects several useful policy initiatives that support access and the quality of healthcare service delivery. Some of the Department of Digital Health's initiatives have focused on:

- Integrating digital health actions to mirror that of face-to-face benefits;
- Articulating telehealth networks in the overall Integrated Health Services Delivery Network design; and
- Developing strategies for disseminating telehealth benefits to citizens.

Plans for future reforms include a document to initiate digital transformation on health services systems, an upgrade of the economy-wide telehealth program, and a Digital Health Law.

Telehealth Use During COVID-19: The Chilean government has implemented a variety of telehealth-related measures during COVID-19. Key initiatives include: providing additional financial support for telehealth programs at the Digital Hospital; expanding telehealth service offerings in the areas of mental health, urgency care, and general medical support for elderly healthcare and the prison system; and introducing a regulatory document regarding health technologies.

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Digital Health Department or Strategy: https://saluddigital.com/en/avance-de-la-ciencia/el-ministerio-de-salud-de-chile-minsal-anuncia-la-creacion-del-departamento-de-salud-digital/

Telehealth Implementation and Policy: https://www.minsal.cl/wp-content/uploads/2018/03/Programa-Nacional-de-Telesalud.pdf

Telehealth During COVID-19: https://www.hospitaldigital.gob.cl/

PEOPLE'S REPUBLIC OF CHINA

Digital Health Environment: China's National Health and Family Planning Commission (NHFPC) oversees digital health, the "informatization" of healthcare, and telehealth. Both China's online services market and digital health efforts were prevalent well before the advent of the pandemic; telemedicine as part of China's overall healthcare system took hold in the mid-1980s. A study undertaken on early Chinese telemedicine activities indicates[37] that initiatives were mostly based on store-and-forward techniques as the telecommunication infrastructure that was required for real-time work was in its infancy at the time. In recent years however, telemedicine has seen a rapid uptake with the growth of telecommunication networks. The availability of low-cost telemedicine services is needed to support health services delivery of China's rural population.

A number of privately owned companies offer online medical consulting services to patients. Since 2018, China has passed several policies to support "internet and medical health" and, most importantly, incorporated the online medical services into the existing domestic health reimbursement system in late 2019. However, many private insurers have not yet codified online care into reimbursable payments. Looking ahead, the Healthy China 2030 economic and social development blueprint holds promise, with its emphasis on advancing health science and technology innovation, promoting health in all policies and expanding the health sector. However, many private insurers have not yet codified online care into reimbursable payments. Looking ahead, the Healthy China 2030 economic and social development blueprint holds promise, with its emphasis on advancing health science and technology innovation, promoting health in all policies and expanding the health sector. [38]

Telehealth Implementation and Policy Frameworks: In 2014, China's NHC issued a regulation framework for telemedicine. In July 2018, NHC published the specification for telemedicine services management (for trial implementation) which included an emphasis on "healthcare matching platforms" and "direct coordination" between medical institutions. The guidance outlines a series of requirements that medical professionals, patients, and platform providers are required to follow to ensure fair and transparent use of digital healthcare platforms for health service delivery. Under the guidance, medical institutions must clearly explain the medical services and associated fees and obtain each patient's (or guardian's or relative's) written consent to receive the service. Patients must also provide consent when giving their personal information. The guidance also requires the medical institution to enter into a telemedicine cooperation agreement (enforceable by electronic signatures) with the healthcare platform provider. In addition, the Law on the Promotion of Basic Medical and Health Care, which demonstrates the legal framework to address medical information exchange, telemedicine services, and safety systems, was approved by the National People's Congress and became effective June 1, 2020.

Telehealth Use During COVID-19: Enhanced efforts have been made in China to improve

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[37] Z. Wang and H. Gu "A Review of Telemedicine in China," *Journal of Telemedicine and Telecare* (2009) 15(1):23–7, doi: 10.1258/jtt.2008.080508.
[38] World Health Organization, "Healthy China 2030: From Vision to Action," webpage, https://www.who.int/healthpromotion/conferences/9gchp/healthy-china/en/.

connectivity and electronic information sharing among different regions and healthcare service providers to improve health service delivery during COVID-19. The government emphasized online screening and consultation for COVID-19 affected patients within a few weeks. Some public hospitals also offered basic digital services via a WeChat public account (WeChat mini program) or with their own apps.

Online prescriptions were also incorporated in on-line service offerings during COVID-19 if patients had previously received a prescription from a medical practitioner. In China, on-line consultations are governed by existing legislation and controls for: online diagnosis and treatment administration; online hospital administration; and long distance healthcare service administration.[39]

The benefits of online health service delivery have been clearly demonstrated during COVID-19,[40] which, according to officials at the National Clinical Medicine Research Center of Geriatric Diseases in China, guided China's strategy in reducing infections among patients, especially the elderly. With a rapidly aging population, this demonstrates that more concerted efforts are needed to integrate internet technologies and healthcare to cope with increasing demand for healthcare services."[41] Looking to the future, China is leveraging big data to expand online telehealth services including remote follow-ups and healthcare advice and examining offline services for those who have difficulty using digital technologies, such as the elderly, children, and the disabled.[42]

China's telecommunications infrastructure also proved resilient during COVID-19 despite a 22.61 percent increase in daily broadband network traffic. Normal activities and operations in some areas of the healthcare sector have resumed but, large online platforms are still experiencing high volumes of traffic which continue since the pandemic.[43]

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[39] Lay Leng Tan, "Leveraging Digital Health in Times of COVID-19 and Beyond," Healthcare IT News (July 13, 2020), https://www.healthcareitnews.com/news/apac/leveraging-digital-health-times-covid-19-and-beyond.
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[41] National Health Commission of the People's Republic of China, "Internet Playing a Bigger Role in Healthcare."
[42] National Health Commission of the People's Republic of China, "Internet Playing a Bigger Role in Healthcare."
[43] International Telecommunications News, "COVID-19: China's Digital Health Strategies Against the Global Pandemic," ITU News (April 15, 2020), https://news.itu.int/covid-19-chinas-digital-health-strategies-against-the-global-pandemic/.

HONG KONG, CHINA

Digital Health Environment: The Hospital Authority (HA) has been developing digital health capabilities since the early 1990's, starting with the in-house development of a comprehensive electronic medical records system called the Clinical Management System (CMS). By the early 2000's every patient possessed a single lifelong electronic patient record available to all clinicians who cared for them wherever they sought care in the HA. Today most major clinical processes have been digitalized, and clinicians can access the patient record and make clinical orders from the bedside with their digital tablets. Patients can also access a variety of digital health services, including telemedicine, through the "HA Go" patient app.

With these foundational digital health capabilities in place, HA has been nurturing an innovation culture to further integrate digital solutions. The IT Innovation Office was established in 2016, supported by four innovation labs (Data, Mobile, artificial intelligence (AI) and Geek) and has since developed and delivered many innovative solutions.

Digital health is a pillar for the long-term sustainability of HA's services, and the flagship Smart Hospital project is underway to develop and implement a wide range of new digital health capabilities, including:

(a) Smart Care – the fourth generation of Clinical Management System (CMS) is under active development, focusing on the five pillars of "patient-centered", "paperless", "protocol-driven", "closed-loop" and "personalized care". The AI Lab allows exploration of HA's clinical data to develop useful AI models, and the AI delivery centre allows these models to be deployed at scale. Devices and connectivity are being deployed to monitor patient status and to provide alerts and insights to patients' health status. Telehealth capabilities have been built into CMS and HA Go, allowing seamless access to telehealth services.

(b) Smart Support – robots and AI models are being tested and deployed in pharmacy, transportation, logistics and security.

(c) Smart Management – the Hospital Command Centre consolidates data and improves operational intelligence via Command Centre "Hubs" to display key metrics and take actions in areas including bed management, logistics and clinical monitoring.

(d) Smart Staff - Digital Workplace applications are digitalizing workflows to eliminate manual steps, providing tools to enhance collaboration and giving staff easy access to the resources they need.

The Department of Health established the Health Informatics and Technology Office (HITO) in October 2019, with a mandate to undertake:
- Planning and management of information technology projects;
- Health informatics enablement and management;
- Advocacy of government/departmental IT and innovation initiatives;
- Development and oversight of the Clinical Information Management System;
- IT capacity building, security and risk management for the Department; and
- Grade management of IT staff in digital healthcare.

Telehealth Implementation and Policy Frameworks:

Telemedicine is part of the Hospital Authority (HA) informatics efforts and a strategy is in place for more agile integration of IT innovation into HA's services along with robotics, big data analytics, AI, and augmented reality.

In 2016, Hong Kong, China launched the territory-wide Electronic Health Record Sharing System (eHRSS). This enables registered healthcare providers/practitioners in both the public and private sectors, to obtain informed consent and proper authorization from the registered patient to share electronic health records for healthcare purposes. The sharable data include personal identification and demographic data; information on allergies and adverse drug reactions, diagnosis, procedures and medication, appointments; birth and immunization records; laboratory reports; and healthcare referrals. The list is updated regularly. Participation in the eHRSS is voluntary for both practitioners and patients.

A wide range of telehealth services have been developed under HA's telehealth framework. These services include tele-consultation, tele-information, tele-reminders, and disease management. HA Go, the HA's one-stop mobile app, is the key enabler and many of the telehealth services have also been integrated into the CMS, giving clinicians and patients easy and convenient access. New telehealth services are under continual development.

In the private sector, there are advances in telemedicine, including:

- DoctorNow is a telemedicine service provider offering remote healthcare services with video consultations for patients suffering from conditions including cough and fever, sore throat, and diarrhea. For other severe illnesses, a face-to-face consultation would be required.
- Pulse by Prudential is a digital health app offering various healthcare-related services including telemedicine, AI assessment, medicine delivery, and connecting registered users to nearby clinics.
- Quality HealthCare Patient Portal is an integrated online platform for digital ticketing and appointment booking as well as video consultation for telemedicine.

Telehealth Use During COVID-19:

With the advent of the COVID-19 pandemic, digital health implementation gained a significant level of prominence in Hong Kong, China, as in other contexts. Hong Kong, China and its Department of Health have established prompt and effective public health measures, which are supported by a wide range of digital technology. These include case investigation, health declarations and port health measures, quarantine and camp management, territory-wide vaccination logistics and issuing of authenticated electronic vaccination certificates, community PCR testing, contact tracing, venue-based exposure notification and law enforcement.

Effective dissemination of COVID-19 information to the public is crucial to better inform the community of the risk to which they may be exposed, and staying away from possible sources of infection. An interactive map and dashboard were developed with geographic information system (GIS) to facilitate the public more conveniently learning about the latest developments of the epidemic at a glance on their computers and smartphones. Through an interactive and user-friendly map layout, it presents statistics on COVID-19 infection, information on buildings where confirmed cases appeared,

places where confirmed patients have visited, as well as information on the community testing services, the quarantine centers, community vaccination services, etc.

The adoption of telehealth has accelerated during the pandemic as HA has explored innovative models to sustain service in the "new normal". Professional collaboration at the bedside has been made possible by clinical tablets supporting the HA videoconferencing platform. Tele-information services have been widely used. Telemedicine for outpatient appointments has been deployed for suitable patients and telerehab adoption has increased greatly.

During the COVID-19 pandemic, health benefits solutions provider StartUpCare partnered with a Hong Kong, China insurance company Generali to launch an all-in-one digital healthcare platform. This platform offers patients a seamless, end-to-end insurance journey within an app. The app included an assessment of initial symptoms, a tool to find a clinic, and setting an appointment. The app also assisted with payment by offering e-claim services. This digital healthcare platform enables customers to book virtual consultations with network doctors and receive medical consultations about prescribing medicine or being referred to specialists. By streamlining services and creating an option for virtual care using telehealth, this digital health platform proved to be a critical tool in combating the pandemic.

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INDONESIA

Digital Health Environment: The Ministry of Health has responsibility for digital health in Indonesia. Digital health innovation is critical for reaching Indonesia's citizens spread across 17,000 islands, and digital health tools have been in use since 1985. The digital health ecosystem in Indonesia includes the use of mobile, app-based, and video-based digital health platforms. Well-established multi-economy companies such as Phillips Healthcare Solutions and many innovative local companies are active in the sector.[44] The Indonesian Minister of Health has encouraged local governments to deploy digital health in the midst of COVID-19.[45]

The economy's digital health strategy is supported through an eHealth policy which was passed in 2002, Indonesia's electronic civil registration and vital service systems (CRVS), an established health privacy framework, initiatives addressing online strategies for provider training in information and communications technology (ICT), and policies improving the health of women and children.[46]

Telehealth Implementation and Policy Frameworks: Indonesia has a burgeoning health IT ecosystem including an active private sector with companies such as Halodoc, Alodokter, and GrabHealth (a joint venture between Singapore-based Grab and China's Good Doctor) providing private doctor consultations through chat or video calls. There are also partnerships between ride sharing apps and pharmacies to deliver prescription medications. Medigo Indonesia provides facilities such as hospitals and village clinics with outpatient management platforms to facilitate operations, including announcement of clinic line-ups, doctors' availability, patient wait-times, and an appointment scheduling system for both staff and patients.

Efforts are underway to improve the regulation of the telehealth and telemedicine sector. The Indonesian Medical Council plays a central role with developing and implementing telemedicine and telehealth guidelines. As part of the government's Industry Revolution 4.0 agenda, the Ministry of Health is assigned with supporting the growth of telemedicine and encourages increased adoption of telemedicine models among healthcare service providers.[47]

Example of Best Practice in Telehealth:
Licensing, Liability and Provider-related Policies: The Indonesian Medical Council approved Konsil Kedokteran Indonesia KKI Regulation No. 74 of 2020 on Clinical Authorities and Medical Treatment through Telemedicine (more details below).

Telehealth Use During COVID-19: During COVID-19, Indonesian President Joko Widodo and

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[44] P. Preesman, "Transitioning Indonesia to Digital Healthcare," Phillips Future Health Index, (June 8, 2020), https://www.philips.com.sg/a-w/about/news/archive/future-health-index/articles/20200608-transitioning-indonesia-to-digital-healthcare.html.
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[46] World Health Organization South-East Asia Regional Office, "eHealth and Innovation in Women and Children's Health: 2013," Atlas of eHealth Country Profiles (online), https://www.who.int/goe/publications/atlas/2013/idn.pdf?ua=1.
[47] C. Endahayu, R. Mokodompit, and C. Benjamin, "Indonesia: New Medical Council Regulation on Telemedicine Services During COVID-19 Pandemic," *Lexology, ,*(July 28, 2020), https://www.lexology.com/library/detail.aspx?g=cbca0f47-e8c7-42aa-9867-585840b22022.

Minister of Health Terawan Agus Putranto encouraged citizens to seek medical help through online platforms and apps. In an effort to expedite adoption of such tools and keep healthcare services accessible during the pandemic, Indonesia's COVID-19 taskforce included links to 20 telemedicine services on its website and the government issued several new telemedicine regulations.

On April 29, 2020, the Indonesian Medical Council *(Konsil Kedokteran Indonesia* or "KKI") issued KKI Regulation No. 74 of 2020 on Clinical Authorities and Medical Treatment Through Telemedicine During the COVID-19 Pandemic. KKI Regulation 74 allows doctors and dentists with an approved registration letter (*Surat Tanda Registrasi*) and practice permit (*Surat Izin Praktik*), to deliver telemedicine services, which are defined as teleconsultation in the form of writing, voice, and/or video. It also deals with licensure and liability issues.[48]

Future policy challenges include integration of these applications with Indonesia's expanding universal health insurance system. Another key challenge for Indonesia to overcome is the digital divide as current internet penetration rates are only 64 percent[49] and there are user data privacy issues that need to be addressed.[50]

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Telehealth Implementation and Policy

Minister of Health Regulation No. 90 of 2015 concerning the Organization of Health Service Facilities in Remote Areas and Very Remote Areas ("MoH Reg. 90/2015")

Minister of Health Regulation No. 20 of 2019 concerning the Organization of Telemedicine Services between Health Service Facilities ("MoH Reg 20/2019") to specifically regulate the organization of telemedicine

Telehealth During COVID-19:

KKI Regulation No. 74 of 2020 on Clinical Authorities and Medical Treatment:
https://www.lexology.com/library/detail.aspx?g=cbca0f47-e8c7-42aa-9867-585840b22022

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[48] C. Endahayu, R. Mokodompit, and C. Benjamin, "Indonesia: New Medical Council Regulation on Telemedicine Services During COVID-19 Pandemic."

[49] S. Kemp, "Digital 2020: Indonesia," DataReportal, webpage (February 18, 2020), https://datareportal.com/reports/digital-2020-indonesia.

[50] I. Yuriutomo, "Indonesia – Data Protection Overview," OneTrust DataGuidance (online) (December 2020), https://www.dataguidance.com/notes/indonesia-data-protection-overview.

JAPAN

Digital Health Environment: The Ministry of Health, Labour and Welfare (MHLW) has primary responsibility for digital health in Japan. As a result of Japan's rapidly aging population, there is significant need for cutting-edge healthcare technology to better meet the population's healthcare needs. Japan's drive towards digital health stems from its long history in innovation and use of digital technology. At the October 2019 G20 Health Ministers meeting, the Okayama Declaration emphasized promoting the use of data and digital health technologies by developing and implementing policy measures and appropriate regulations to protect personal health data and strengthening the interoperability of digital health information systems as well as equitable access to digital health technology.[51] It is also notable that as part of Japan's growth strategy, the economy undertook a deregulation of the medical industry, fueling digital health.

Telehealth Implementation and Policy Frameworks: Initiatives in telemedicine and online medical consultation first originated in 1997 as the *Medical Examination using Telemedicine* guideline from the MHLW, stating that telemedicine could be used if preceded by an initial in-person medical examination. This guideline was in place for 18 years until 2015, during which expansion of telemedicine became more prominent. Japan issued guidelines to enable the expansion of telemedicine, and the reimbursement schedule of medical fees was revised and published in 2018.[52]

ICT-based telehealth networks and tools are being implemented throughout Japan. These tools have been introduced to reduce the number of hospitals and to maintain an adequate healthcare infrastructure despite geographical distances between urban centers and mountainous and rural regions.

At the cutting-edge of telehealth innovation, Sekisui House, one of Japan's largest residential construction companies, recently developed a smart healthcare house with a monitoring sensor system, and an electronic and computer-controlled integrated system within the home, which includes a monitoring sensor network that enables daily health checks for residents.

Telehealth Use COVID-19: As COVID-19 cases rose, Japan temporarily eased restrictions on remote medical care in April 2020, allowing doctors to conduct first-time visits online or by telephone and expanding the number of illnesses that could be treated remotely. Previously, Japanese doctors were only allowed to treat recurring patients virtually, and for a limited number of diseases. The MHLW has not decided whether to make the changes permanent. Toshio Nakagawa, the president of the Japanese Medical Association, has warned against using experiences with use of telemedicine in an emergency situation to inform how telemedicine should be used long-term.[53]

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[51] G20, "Okayama Declaration of the G20 Health Ministers," (October 19-20, 2019), available online at https://www.mhlw.go.jp/seisakunitsuite/bunya/hokabunya/kokusai/g20/health/img/G20Okayama_HM_EN.pdf.

[52] Japanese Health Policy Now, "Latest Initiatives in Telemedicine and Online Medical Consultation," Notes from roundtable webpage, Health and Global Policy Institute, http://japanhpn.org/en/ict-4-2/.

[53] K. Kaneko and I. Nakagawa, "With Apps and Remote Medicine, Japan Offers Glimpse of Doctor Visits in Post-Corona Era," Reuters News (July 8, 2020), https://www.reuters.com/article/us-health-coronavirus-japan-telehealth/with-apps-and-remote-medicine-japan-offers-glimpse-of-doctor-visits-in-post-corona-era-idUSKBN24A01K.

Companies such as Medley Inc. and MICIN Inc., which offer application services for appointments, video consultations, and payments, have experienced increased demand due to COVID-19. Japan's market for such technology is set to grow by 60 percent in five years to nearly 20 billion yen (US$ 185 million) by March 2024.[54] Nearly 15 percent of all Japanese medical institutions (excluding dentistry) offered remote medical services, including by telephone as of July 2020, compared to only 970 registered to offer online care In July 2018.[55]

Moving forward, an intergovernmental study group will consider which COVID-19 telehealth changes are to be made permanent. The Review of Guidelines for Proper Implementation of Online Medical Care Group, led by the Economic Affairs Division, Health Policy Bureau at MHLW, includes participants from Japan's Ministry of Economy, Trade and Industry, and the Ministry of Internal Affairs and Communications. The group has begun discussions about making online medical care permanent, including the first-time visit.

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Telehealth During COVID-19: https://www.reuters.com/article/us-health-coronavirus-japan-telehealth/with-apps-and-remote-medicine-japan-offers-glimpse-of-doctor-visits-in-post-corona-era-idUSKBN24A01K

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[54] K. Kaneko and I. Nakagawa, "With Apps and Remote Medicine, Japan Offers Glimpse of Doctors Visit in Post Corona Era" Thomson Reuters, (July 8, 2020), https://www.reuters.com/article/us-health-coronavirus-japan-telehealth/with-apps-and-remote-medicine-japan-offers-glimpse-of-doctor-visits-in-post-corona-era-idUSKBN24A01K.
[55] K. Kaneko and I. Nakagawa, "With Apps and Remote Medicine."

REPUBLIC OF KOREA

Digital Health Environment: The Ministry of Health and Welfare has primary responsibility for digital health in the Republic of Korea, with related bodies such as the Bureau of Advanced Technology Policy and the Division of Information Management also playing a role. While the provision of digital healthcare services needs further development, in terms of general healthcare, Korea is a leader in the APEC region, with expertise in medical device manufacturing, remote medical treatment, and medical software driving innovation. Digital health is a key priority for Korea, with particular focus on the integration of smart technology, AI, and the Internet of Things (IoT) into healthcare. These aid telehealth delivery, particularly in home care environments. Korea jumpstarted its digital health efforts decades ago with the introduction of electronic medical billing, physician order entry, and the wide use of electronic medical records.

Telehealth Implementation and Policy Frameworks:

Telehealth was introduced in Korea in 1988, and its Medical Service Act was revised in March 2002 to allow telemedicine among doctors and healthcare workers. Three pilot projects for patient–doctor telemedicine services have been introduced since 2006. Korea's Medical Service Act does not allow a full patient–doctor telemedicine experience but has partly allowed it in the form of pilot projects using ICT, in order to enhance accessibility of medical services and health management for people living in remote areas. The Ministry of Health and Welfare, the Ministry of National Defense, the Ministry of Justice, and the Ministry of Oceans and Fisheries are providing telemedicine services centering on special areas such as military bases, correction facilities, deep-sea fishing vessels and places with lower accessibility to medical services. Also, through regulatory exceptions, demonstration projects for the efficacy of telemedicine using new technologies such as wearable electrocardiograph and rehabilitation robots have been carried out since 2019. Eight pilot projects for home health care have also been implemented since 2019 for patients requiring continuous care due to hypertension, diabetes and use of mechanical ventilation. Discussions on developing telemedicine to complement in-person medical services are underway with the participation of stakeholders including the medical community. The aim is to provide patients with better and safer medical service and improve accessibility for people living in remote areas.

Telehealth Use During COVID-19:

In order to prevent infection of health care workers and patients during the COVID-19 pandemic, the Korean government started providing patient–doctor telemedicine services beginning on Feb. 24, 2020. This was authorized through a Ministry of Health and Welfare notification after the Active Administration Support Committee's decision. To provide clear legal grounds for the move, the Infectious Disease Control and Prevention Act was revised in Dec. 15, 2020. As of the first half of 2021, 11,163 medical institutes have provided about 2.38 million telemedicine services. More than 75% of the 45 upper-grade general hospitals and about 15% of the 66,409 clinic-grade medical institutes in Korea are providing telemedicine services. Telemedicine is also being utilized for home treatment of pediatric COVID-19 patients with mild clinical symptoms and adult patients with children, so that they can safely go through the quarantine with emotional and psychological stability in a familiar environment. A decision on maintaining the changes on a permanent basis, after the COVID-19 alert is relaxed to a lower level, will require additional stakeholder consensus.

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Telehealth During COVID-19:

https://www.liebertpub.com/doi/full/10.1089/tmj.2020.0293

MALAYSIA

Digital Health Environment: The Ministry of Health has responsibility for digital health in Malaysia. The Malaysian government is committed to the principle of universal access to high-quality healthcare, which the Ministry of Health provides through a network of clinics, hospitals, and healthcare programs. Integral to this is the MyHEALTH Portal, a web-based health information service set up by the Ministry of Health in Malaysia.[56]

The Multimedia Super Corridor (MSC) Telehealth Flagship Application is a system that aims to make the Malaysian healthcare system more integrated and designed to provide equitable, accessible, and high-quality healthcare services to all citizens. It is anticipated that this system will, upon completion, provide citizens with an electronic lifetime health record (LHR) and lifetime health plan (LHP) as well as a smart card that will contain a subset of the data in the Lifetime Health Record. The MyHEALTH Portal can be viewed both through proprietary and open-source platforms. Additional security measures are in place through Malaysia's Security Policy for ICT, which ensures that external access via smartphones is only possible if registered with the server.[57]

Telehealth Implementation and Policy Frameworks: In accordance with Malaysia's vision to revamp its healthcare system through IT, in 1997 the Ministry of Health introduced Malaysia's Telemedicine Blueprint: Leading Healthcare into the Information Age, which outlines a comprehensive plan to guide all aspects of telehealth services. This involves implementation strategies, success factors, and workforce issues including change management issues, communication, training and development. The blueprint defines telemedicine as encompassing "any health, health-support or governance service that can be provided via a multimedia network and a range of network-based or network-linked information and multimedia tools and technologies used by people and health professionals to access, manage or deliver healthcare.:[58] The blueprint also includes an approach for articulating the laws and regulations to support telemedicine (e.g., the Telemedicine Act, Digital Signature/Contract Act, Computer Crime Act, Multimedia Intellectual Property Act, and the Electronic Government Act). In 2007, after 20 years of implementation experience, the telemedicine structure in Malaysia was organized into five major components: lifetime health record and services; lifetime health plan; health online; teleconsultation; and continuing professional development.[59]

Telehealth Use During COVID-19: During COVID-19, several tech start-ups such as DoctorOnCall that offer virtual health advisory platforms and other capabilities came into existence, operationalizing Malaysia's telehealth blueprint. Another tool used in the multi-agency effort against the pandemic was the MySejahtera app, which was developed by the Malaysian government to assist in

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[56] Ministry of Health (MOH) Malaysia, "MyHEALTH Portal," webpage, http://www.myhealth.gov.my/en/.

[57] J. Mohan and R Yaacob, "The Malaysia Telehealth Flagship Application: A National Approach to Health Data Protection and Utilization of Consumer Rights," *International Journal of Medical Informatics* 73(3): 217–27 (April 2004), DOI:10.1016/j.ijmedinf.2003.11.023.

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[59] M. Som, A. Norali, and M. Ali, "Telehealth in Malaysia: An Overview," Conference Paper, 2010 IEEE Symposium on Industrial Electronics and Applications (October 2010), https://www.researchgate.net/publication/261028358_Telehealth_in_Malaysia-An_overview.

monitoring the outbreak. Features of the app include COVID-19 health guidelines, information on the nearest health facilities, and a COVID-19 hotspot tracker. MySejahtera is linked to the MyTrace app, developed by Malaysia's Ministry of Science, Technology and Innovation, which enables the identification of those who have been in close proximity to an infected person using Bluetooth technology.

To deal with challenges and uncertainties caused by COVID-19, the University Malaya Medical Center (UMMC) used integrated information systems to undertake the following:

- Track and manage crucial supplies such as personal protective equipment (PPE);
- Manage healthcare workers and trace their movements to minimize risk;
- Optimize patient care and ensure that relevant information is delivered effectively; and
- Maintain surveillance of disease clusters and tracking treatment plans of patients.[60]

Malaysia also introduced temporary standard operating procedures (SOPs) to serve as guidelines for virtual health consultants in response to COVID-19. However, the pandemic exposed regulatory issues and gaps on telehealth and telemedicine, since over 20 years had passed since the *Blueprint* was completed. [61]

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[60] Dean Koh, "COVID-19: Malaysia's Pandemic Approaches and Its Impact on Telehealth," MobiHealthNews. HIMSS Media (June 8, 2020), https://www.healthcareitnews.com/news/asia-pacific/covid-19-malaysia-s-pandemic-approaches-and-its-impact-telehealth.
[61] Dean Koh, "COVID-19: Malaysia's Pandemic Approaches and Its Impact on Telehealth."

MEXICO

Digital Health Environment: The Secretaria de Salud (Ministry of Health) has responsibility for digital health in Mexico. With a total population of around 120 million people, the Mexican government is seeking new technological solutions to address traditional healthcare challenges. The digitization of medical records and implementation of new hospital information systems are some of the approaches Mexico is using to achieve improvements and reforms to health service delivery[62]. Health technology and digital apps are widely available to Mexico's general population through mobile and internet technologies. The 2013 Federal Telecommunications and Broadcasting Law is designed to spur innovation and competition and also to advance digital health activities.[63] However, Mexico faces numerous challenges with regard to the applicable legal framework and the efficient regulation of the use of emerging technologies. Additional challenges have arisen due to the government's general austerity policy for all government activities and bodies. [64]

Telehealth Implementation and Policy Frameworks: The Centro Nacional De Excelencia De Tecnologica En Salud (National Center for Technological Excellence in Health, CENETEC-Salud) and the National Center for Monitoring Telemedicine lead Mexico's efforts in the provision of telehealth. The National Center for Technological Excellence in Health is leading efforts to assess medical technologies, institute guidelines, and promote telemedicine. Indeed, telemedicine is one of its four core activity areas.

In Mexico, telemedicine is not specifically regulated by the laws that govern health-related services (i.e., the General Health Law and its Regulations for Health-Related Services). Health authorities have attempted to regulate the diverse use of technology in health-related matters in an isolated manner by issuing Mexican official standards or Norma Oficial Mexicana (NOMs), Mexican standards (NMXs), and other administrative guidelines, many of which were not developed in accordance with the applicable legal requirements and thus have no binding effect.

The NOMs that regulate health services (and, to some extent, those provided through remote access (i.e., telemedicine)) include:

- NOM-017-SSA2-1994 (epidemiology vigilance);
- NOM-168-SSA1-1998 (clinical files);
- NOM-178-SSA1-1998 (minimum infrastructure and equipment requirements for premises bound for ambulatory patients);
- NOM-197-SSA1-2000 (minimum infrastructure and equipment for hospitals and premises bound for specialized medical services); and
- NOM-024-SSA3-2012 (electronic registry systems for health).

[62] HarmoniMD, "The Digitization of Mexico's Health Care," online post, (October 29, 2018). https://www.harmonimd.com/en/digitization-mexico-healthcare-system/.

[63] F. Hernandez Arroyo, "Mexico Telecommunication and Broadcasting Law to Enter into Effect 13 August 2014," *Global Media and Communications Watch* (blog), Hogan Lovells (August 5, 2014), https://www.hlmediacomms.com/2014/08/05/mexico-new-telecommunications-and-broadcasting-law-to-enter-into-effect-13-august-2014/.

[64] J. Campos Vargas, "Challenges of Providing Telemedicine Services," International Law Office (blog), (October 9, 2019), https://www.internationallawoffice.com/Newsletters/Healthcare-Life-Sciences/Mexico/Sanchez-DeVanny-Eseverri-SC/Challenges-of-providing-telemedicine-services.

However, none of these NOMs explicitly regulate the provision of telemedicine services in Mexico. Instead, they contain references to some of the concepts and services that may be associated with telemedicine and, in a broader sense, telehealth.

Likewise, many of these NOMs have not been amended to reflect technological advances in the healthcare field. Efforts are being made to embed and encourage telehealth through the law, but this has not been achieved economy-wide. However, policy and regulation concerning information and communications technology and a digital strategy have moved telehealth forward.

Telehealth Use During COVID-19: Salauno is one of Mexico's leading centers of specialty care, providing affordable, accessible eye-care and tackling blindness, which is an enormous challenge given the high rates of untreated cataracts and diabetes. It does more than 17,000 surgeries per year. Salauno is an example of telehealth's potential to deliver specialty care well during COVID-19. During COVID-19, Salauno launched a telemedicine service to identify patients who require immediate attention due to emergency or degenerative diseases. Just a few weeks after the digital offerings began, Salauno had already conducted around 1,000 teleconsultations—and that number is expected to continue to grow. To better meet the needs of these clients, Salauno began a large-scale effort in 2016 to integrate digital and mobile solutions for greater outreach. Salauno can now communicate with patients and schedule appointments using WhatsApp and an artificial intelligence-powered chatbot on its website and Facebook. The company's shift to digital and mobile offerings has accelerated because of the coronavirus outbreak. "The COVID-19 crisis allowed a shift from a traditional strategy based on linear growth to a digital model that could grow exponentially, given that it's not restricted by physical infrastructure," according to Saluno CEO Carlos Orellana[65]

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[65] International Finance Corporation, "Mexico Takes Eye Care Digital Amid COVID-19," *Impact at IFC* (webpage), https://www.ifc.org/wps/wcm/connect/news_ext_content/ifc_external_corporate_site/news+and+events/news/impact-stories/mexico-takes-eye-care-digital.

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NEW ZEALAND

Digital Health Environment: The New Zealand Ministry of Health has responsibility for digital health. It has developed Digital Health 2020, a guiding framework supporting digital health initiatives titled that aims to advance digital technologies and align strategic digital investments with service delivery. New Zealand has implemented several domestic initiatives in both digital health and interoperability under this policy framework. Its key components include:

- Longitudinal electronic health record;
- Health and wellness dataset to guide evidence-based decisions;
- Preventative IT capability;
- Integrated digital hospitals; and
- Regional eHealth Foundations that support regional access to health information, delivery of the single electronic health record, and lifting digital capability within hospitals[66]

The longitudinal electronic health record offers a historical, consolidated view of a patient's health information, also securely available to caregivers, medical providers, and other relevant decision-makers. This record can also be accessed in patient portals, which are one-stop locations for seeing data such as prescription, lab, and immunization information, and for booking in-person and video appointments.[67]

Under its Digital Health Strategic Framework, the Ministry of Health also develops and promotes health system interoperability and standards that enable data within the health sector to be recorded and used efficiently, consistently, and securely. [68]

Telehealth Implementation and Policy Frameworks: New Zealand has a rich and unique telehealth program, which is demonstrated by the following examples. Twenty District Health Boards (DHBs) established by the Ministry of Health established throughout New Zealand have developed specific strategies, policies, procedures, and guidelines for the use of telehealth in their region. Healthcare standards and interoperability efforts are also tied into their telehealth initiatives.[69] Other initiatives include a detailed telehealth forum and resource center, which provide guidance and resources for people who want to set up, improve or use a telehealth service. The information includes details on telehealth legislation, regulations, standards, and guidelines.

The Ministry of Health works with agencies and sector bodies to plan, develop, and implement:

- Common interoperability principles;

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[66] Health Informatics New Zealand, "Government Digital Health: Digital Health 2020," webpage, https://www.hinz.org.nz/page/GovernmentOverview.
[67] New Zealand Ministry of Health, "Patient Portals and COVID-19," webpage, https://www.health.govt.nz/our-work/digital-health/other-digital-health-initiatives/patient-portals.
[68] New Zealand Ministry of Health, "Digital Health Strategic Framework, "webpage, https://www.health.govt.nz/our-work/digital-health/digital-health-strategic-framework.
[69] New Zealand Ministry of Health, "District Health Boards," webpage, https://www.health.govt.nz/new-zealand-health-system/key-health-sector-organisations-and-people/district-health-boards?mega=NZ%20health%20system&title=District%20health%20boards.

- Reference architectures and roadmaps;
- Best practice evidence and guidelines; and
- Standards needed to support technical and semantic systems interoperability.

Telehealth Use During COVID-19: As in other contexts, in New Zealand during COVID-19 there was a sudden increase in phone and video telehealth appointments across the economy. It is estimated that District Health Boards completed approximately 3,300 telehealth consultations per week between November 2019 and January 2020, which then increased in April 2020 to 34,500 per week.[70] Many DHBs have maintained a high level of telehealth demand. Equally, patients also needed support and education to leverage the use of telehealth and the benefits it offers. To this end, the Ministry of Health provided US$ 10.5 million of support for "digital enablement", including US$ 7.1 million for DHBs and US$ 3.4 million for GPs, in an effort to address the need for digital healthcare support.[71]

New Zealand's COVID-19 telehealth strategy highlights the principle of "digital inclusion" which is aimed at supporting vulnerable communities that are unable to reap the benefits of digital access to healthcare due to not having the technology, education or the confidence to do so. To address this, the government released a guidance document entitled "Information Sharing Advice for COVID-19." It includes information on using appropriate messaging, telehealth, and virtual technology to help minimize information- and technology-related risks while delivering health services.[72]

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[70] R. MacBeth, "Massive Rise in Telehealth at DHBs Revealed," *eHealthNews.nz Digital Patient* (blog), Health Informatics New Zealand (HINZ) (September 29, 2020), https://www.hinz.org.nz/news/528449/EXCLUSIVE-Massive-rise-in-telehealth-at-DHBs-revealed.htm.
[71] R. MacBeth, "Ministry to Fund Digital Enablement Projects," *eHealthNews.nz Digital Patient* (blog), Health Informatics New Zealand (HINZ) (December 2, 2020), https://www.hinz.org.nz/news/541672/Ministry-to-fund-digital-enablement-projects-.htm.
[72] New Zealand Ministry of Health, "COVID-19: Information Sharing Advice for Healthcare Workers," webpage (March 31, 2020), https://www.health.govt.nz/system/files/documents/pages/covid-19-information-sharing-advice-for-health-care-workers-31mar2020.pdf.

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PAPUA NEW GUINEA

Digital Health Environment: The National Department of Health (NDOH) has responsibility for digital health. Papua New Guinea (PNG) has many geographically remote rural areas that make service delivery a challenge due to limited connectivity. PNG Prime Minister James Marape is leading a digital transformation agenda for PNG that aims to harness the potential of technology to spur broad-based development and trade.

To drive this agenda, in March 2020 Papua New Guinea published its Digital Health Laws and Regulations: 2020. Steps are also being taken to advance an Electronic Transactions Act to provide a legal framework for e-transactions. In addition, the world's first public-private working group on digital foreign direct investment has been created in PNG to encourage technology investment and identify actions to make PNG more attractive to external funders of digital economy activities.[73]

Several initiatives supported by multilateral and bilateral partners are underway to achieve goals of the digital transformation agenda. For example, the World Economic Forum, in collaboration with the United Nations and supported by the government of Australia, is playing a role through the Facilitation 2.0 program that is aimed at bringing together public and private sector stakeholders to lay the foundations for digital development, including e-commerce in PNG.[74] Digital upgrades, including a new undersea Coral Sea Data Cable, will support the digital and health agenda through improving connectivity.

Telehealth Implementation and Policy Frameworks: Access to primary health consultations to address minor illnesses and prescriptions are provided through the City Pharmacy's telehealth services. PNG Dataco, as part of National Transmission Network, has built the Highlands fiber network, which works to enable hospitals to transmit 3D teleradiology images and other functions as efforts to ramp up their diagnostic capabilities.[75]

Telehealth Use During COVID-19: Initially, during the early stages of the pandemic, PNG's geographic characteristics prevented the spread of COVID-19. However, despite the low levels of transmission, healthcare workers still faced challenges when treating patients in remote locations due to severe resource constraints. To address this, virtual training programs for health facilities were conducted by global technology companies such as Becton, Dickinson and Company and by Australian Doctors International. The training programs focused mostly on COVID-19 infection prevention protocols, use of PPE, medical equipment, triage facilities, laboratory and pathology issues and more.[76]

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[75] Papua New Guinea Post-Courier, "Hospital Partners with DataCo for Telemedicine," *Papua New Guinea Post-Courier* (April 23, 2019), https://postcourier.com.pg/hospital-partners-dataco-telemedicine/.

[76] Becton, Dickinson and Company (BD), "Virtual COVID-19 Trainings Help HCPs in Papua New Guinea," *BD Blog* (July 28, 2020), https://news.bd.com/Virtual-COVID-19-trainings-help-HCPs-in-Papua-New-Guinea.

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Telehealth During COVID-19: https://postcourier.com.pg/hospital-partners-dataco-telemedicine/

PERU
Digital Health Environment: The Ministry of Health has responsibility for digital health in Peru, with the Ministries of Statistics and Computer Science also playing a role. Peru is a digital health leader in South America. The Peruvian Government's 2011 Strategy and Plan of Action on eHealth and technical documents on digital health governance, telemedicine, mHealth, electronic health records, standards and interoperability, and digital literacy, drive this work in Peru at both the central government and provincial levels.
Telehealth Implementation and Policy Frameworks: Beginning in 2005, Peru set standards of health information and employed a National Plan for Telehealth, which was jointly developed by the Ministry of Health, the Ministry of Statistics, and the Ministry of Computer Science. Telehealth in Peru is based on three fundamental goals: • Provide better access to health services and quality of care; • Integrate information systems and communication; and • Promote the continuing education of health workers. The Directorate General of Telehealth, Reference, and Emergencies was created in March 2017, under Peru's Ministry of Health, with a mandate to formulate and implement telehealth policy and interoperability in this area.[77] Telemedicine supports the Peruvian Integrated Health Networks, focused on the primary level of care. The government-sponsored National Telehealth Network connects tele-consultant centers located in organizations with both low and higher resolutive capacity. This covers specialized patient care and distance training. These telehealth tools need to be complemented with other fundamental components such as policy development; implementation of eHealth standards; investment in health; and training of human resources for continuous quality improvement of health data.[78] Examples of notable Peruvian telehealth projects include:[79] • <u>Wawared project</u> is a mobile health (mSalud) initiative to increase access to health systems for pregnant women with limited resources. It uses text messages to supply maternal and child information, with the goal of reducing cases of maternal mortality and promoting improved maternal and child health. • Through the <u>Muevete Perú Móvil </u>project, the Ministry of Health is using text messages to promote healthy lifestyles such as physical activity.

[77] Pan American Health Organization, "Walter Curioso Shares Experiences and Advances in Telehealth in Peru," Presentation, 9th Annual Congress on Health Information Sciences, https://www.paho.org/ict4health/index.php?option=com_content&view=article&id=125:walter-curioso-director-general-de-la-oficina-de-estadistica-de-informatica-del-ministerio-de-salud-de-peru-comparte-las-experiencias-y-los-avances-en-telesalud-de-peru&Itemid=204&lang=en.

[78] Pan American Health Organization, "Walter Curioso Shares Experiences and Advances in Telehealth in Peru."

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• The Information System for Recording of Live Birth Certificates online allows for immediate registry of the newborn and mother at the delivery room, including data on the health workers who participated in the delivery. This is as an easy-to-use system that requires only a computer, printer, and internet access.

Telehealth Use During COVID-19: Telehealth cancer services delivered by Auna, a network of private hospitals and medical centers across Peru, is an example of high-quality care provision during the COVID-19 pandemic. During lockdowns, many hospitals in Peru canceled outpatient appointments and delivered services through telehealth (remote medical service). In oncology, Auna used telehealth to monitor adverse effects of chemotherapy, palliative management, evaluation of disease symptoms, emotional support, and ongoing patient care. Applications such as teleconsultation, telepathology, tele-education, tele-tumor board (multidisciplinary case discussions), and professional training were employed. The medical services Auna executed through telehealth included clinical visits, palliative care, nurse visits, pharmacy, and multidisciplinary services. Complications associated with the underlying diseases and the immunosuppressive effects of anti-cancer therapy which exacerbates the risks involving contracting COVID-19 highlighted the importance of providing remote care for patients undergoing cancer therapy.[80]

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https://amp.cmp.org.pe/index.php/AMP/article/view/1004

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[80] C. Sologuren, "COVID-19 and Cancer Control: The Response of a Private Oncology Centre," *UICC Global Cancer Control Blog* (January 25, 2020), Union for International Cancer Control, https://www.uicc.org/blog/covid-19-and-cancer-control-peru-response-private-oncology-centre.

THE PHILIPPINES
Digital Health Environment: The Department of Health has responsibility for digital health in the Philippines, with its Knowledge Management and Information Technology Service also playing a key role. The Philippines is an Asia-Pacific hub of regional digital health and innovation in healthcare interoperability. The Philippines government-led National Objectives for Health prioritize the use of ICT in various service delivery areas, in critical health programs, and in health administration. The Philippines also established the eHealth Strategic Framework and Plan: 2014–2020 to guide these efforts.[81] In addition, Manila is home to the Asia eHealth Information Network (AeHIN), a collaboration of digital health advocates created by WHO in 2011 to help economies in the region with digital health development. AeHIN has partners in 25 economies and has aided in building capacity in the region by supporting digital health policy, governance, architecture, program management, standards, and interoperability.[82]
Telehealth Implementation and Policy Frameworks: The Manila National Telehealth Center at the University of Philippines is a major leader in telehealth, engaging in telehealth projects supported by United Nations Children's Fund (UNICEF), WHO, and the Norwegian Agency for Development Cooperation, as well as private industry bodies such as Johnson & Johnson. The center coordinates with the Philippines Department of Health on digital interventions and develops telehealth solutions, translates ICT research into practice, and advocates for concrete policies to strengthen digital and telehealth. The center also works in the telehealth areas of eRecords, eMedicine, and eLearning.[83] This work involves an electronic medical record that is deployed in over 200 health facilities and the National Telehealth Service Program.
Telehealth Use During COVID-19: The Philippines Department of Health released several official guidelines and guidance during the COVID-19 pandemic. This included the April 2020 Department of Health National Privacy Commission Joint Memorandum Circular No. 2020-001 and Guidelines on the Use of Telemedicine During COVID-19, which provide parameters for telemedicine scope and coverage, guidance for healthcare providers and partners, and a monitoring and evaluation framework to assess impact. These initiatives aimed to: • Alleviate the burden on and minimize risks posed by unnecessary patient traffic in health facilities; • Support implementation of community quarantine by providing access to primary care providers through the use of telemedicine, or medical consultation services being provided through online and/or mobile platforms; and • Ensure efficient, safe and secure use of telemedicine by healthcare providers. Formal agreements between the Philippines Health Department and the National Privacy Commission

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[81] The Philippines Departments of Health and Science and Technology, 2014, "eHealth Strategic Framework and Plan 2014-2020," webpage, http://ehealth.doh.gov.ph/index.php?option=com_content&view=category&layout=blog&id=73

[82] Asia eHealth Information Network (AeHIN), "About AeHIN," webpage, https://www.asiaehealthinformationnetwork.org/.

[83] University of Philippines Manila National Telehealth Center, webpage, https://telehealth.ph/

to ensure data privacy and manage health information are also in place. More information is available at: https://doh.gov.ph/sites/default/files/health-update/mc2020-0016.pdf.

The Philippines has also been leveraging ReachHealth, a 5-year United States Agency for International Development (USAID) initiative to strengthen and improve access to family planning and maternal and child health services. Under ReachHealth, USAID is supporting COVID-19 response in 15 priority local government units and is working closely with the Department of Health, the Department of Interior and Local Governance, UN agencies, the private sector, and civil society organizations. Expanded ReachHealth support includes operationalizing economy-wide COVID-19 policies; aiding facility access to COVID-19 financing; strengthening the capacities of health workers on infection prevention and control and case management; improving contact tracing and supporting risk communication; and community engagement efforts.

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https://www.rti.org/impact/covid-19-philippines

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RUSSIA
Digital Health Environment: The Ministry of Health has responsibility for digital health in Russia. Digital health is a strategic policy priority for Russia given its large geographical expanse and the emphasis placed on developing its digital economy to support broader development goals**.** The strategic priorities are articulated in the Digital Economy Program developed in 2017. In 2016, the Russian government approved an eHealth program which involves: • Electronic medical appointments; • Digitizing medical records by at least 50 percent of healthcare organizations by 2018 and at least 80 percent by 2020; and • Implementation of at least 10 electronic services in the patient's My Health personal electronic cabinet on the Uniform Portal of Public Services, which was available to 30 million people in 2020.[84]
Telehealth Implementation and Policy Frameworks: While digital health legislation was adopted in 2017 providing a legal framework for electronic health information exchange, telehealth interactions such as initial diagnosis, e-prescriptions, and remote monitoring of health conditions could only be carried out after a face-to-face examination by a physician. Various domestic medical institutions are using different telemedicine technologies and telehealth networks have been created around the scientific medical centers and in large hospitals. The Russian Ministry of Health is developing legislation on telemedicine and teleradiology, but no final documents or drafts have been yet presented.[85]
Telehealth Use During COVID-19: Prior to COVID-19, innovative approaches were in place in Russia's digital health sphere and telehealth market, with companies like Doc+ combining telemedicine with digital-enabled house calls. In Moscow and Saint Petersburg, patients are able to use the Doc+ capabilities via chat, audio, or visual means. For both in-person and remote care, a digital record of the patient's visit is stored and accessible to the patient online. Telehealth is expected to double in Russia by 2023 and healthcare needs during COVID-19 are expected to accelerate this growth. The State Duma is also adopting legislation allowing for broad-scale remote diagnosis and treatment, moving beyond the 2017 digital health law. This bill was filed with the State Duma in March 2020. Authorities in Moscow have also launched a telemedicine service for patients with COVID-19 who are treated at home.

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[84] S. Collinson, "How eHealth Could Revolutionize Healthcare: the Netherlands Shares Its Experience," *Skolkova IT,* (April 27, 2016), webpage, https://old.sk.ru/news/b/articles/archive/2016/04/27/how-ehealth-could-revolutionise-russian-healthcare-netherlands-shares-its-experience.aspx.

[85] I. Goryachev, "Russia: Digitalization of Healthcare," article published online by Gorodissky & Partners (June 3, 2020), https://www.gorodissky.com/publications/articles/russia-digitalisation-of-healthcare/.

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SINGAPORE

Digital Health Environment: The Integrated Health Information Systems (IHiS) agency has responsibility for digital health in Singapore. The economy possesses notable technological innovation in the private sector relating to digital health, which includes AI, machine and deep learning—all of which are being incorporated into digital health and tele-mental health services. The IHiS agency has a Health IT Master Plan (HITMAP) that incorporates insight from 850 stakeholders across Singapore's healthcare system. The HITMAP focuses on population mapping and enablement, prevention and continuity of care, provider care and operations excellence, healthcare financial excellence, a policy and public health workbench, and IT foundation and resiliency.[86] Recent HITMAP key priorities include using digital health tools to improve the patient service journey, ensuring system-wide interoperability, leveraging computer and data science, and business integration.[87] Singapore's Economic Development Board (EDB) has also fostered a positive enabling environment for telemedicine start-ups in the economy, like Doctor Anywhere, which serves almost 1 million users in Southeast Asia.

Telehealth Implementation and Policy Frameworks: As Singapore has an aging population and increasing incidence of chronic diseases, telehealth can be of great benefit. Telehealth providers in Singapore primarily provide remote telemedicine and/or on-demand house call services. The Singapore Ministry of Health uses a unique regulatory sandbox approach to encourage telemedicine providers to develop innovative care models but within well-defined patient safety and welfare parameters. The regulatory sandbox is an on-line portal where telemedicine providers give feedback on developing innovative care models. Providers are also asked to share key data on their services as this will allow the Ministry of Health to better understand the evolution of the sector and provide a platform for the co-creation of telemedicine regulations under the Healthcare Services Act.[88]

While there is no overarching legislation governing the telehealth sector, providers must adhere to the following guidelines:

- The National Telemedicine Guidelines (NTG) under the Ministry of Health aim to support the delivery of telemedicine services by healthcare providers, with a focus on the following areas: clinical standards and outcomes; human resources; organizational; and technology and equipment. The principles seek to address patient and provider safety, and provide a holistic approach to executing the delivery of Telemedicine services in Singapore.[89]
- Singapore Medical Council's Ethical Code and Ethical Guidelines and Handbook on Medical

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[86] Integrated Health Information Systems (IHiS), "About IHiS," webpage, https://www.ihis.com.sg/About_IHiS/Pages/HITMAP.aspx.

[87] D. Koh, "Digital Engagement and Transformation of Healthcare in Singapore," Healthcare IT News (September 21, 2020), https://www.healthcareitnews.com/news/apac/digital-engagement-and-transformation-healthcare-singapore.

[88] Ministry of Health Singapore, "Licensing Experimentation and Adaptation Programme: A MOH Regulatory Sandbox," webpage, https://www.moh.gov.sg/home/our-healthcare-system/licensing-experimentation-and-adaptation-programme-(leap)---a-moh-regulatory-sandbox.

[89] Ministry of Health Singapore, "National Telemedicine Guidelines," available online at https://www.moh.gov.sg/resources-statistics/guidelines/national-telemedicine-guidelines.

Ethics[90]
- Telehealth Product Guidelines by the Singapore Health Sciences Authority

The telemedicine sector is expected to be licensed by the end of 2022 in the upcoming Healthcare Services Act.

Telehealth Use During COVID-19: Numerous new Ministry of Health telehealth policies have been introduced during COVID-19, including support for healthcare clusters to develop their telehealth services and allowing medical certificates to be issued for tele-consults.

Established telemedicine players such as Doctor Anywhere have also thrived. Doctor Anywhere was founded in 2015 and, with almost 1 million users in Southeast Asia, provided critical telehealth services during COVID-19. The service has seen a very encouraging retention rate for the program's users.[91]

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[90] Singapore Medical Council (SMC), "SMC Ethical Code and Ethical Guidelines (2016 edition)," Government of Singapore, and SMC "Handbook for Medical Ethics (2016 edition)," Government of Singapore, both available online at https://www.healthprofessionals.gov.sg/smc/guidelines/smc-ethical-code-and-ethical-guidelines-(2002-and-2016-editions)-and-handbook-on-medical-ethics-(2016-edition).

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CHINESE TAIPEI

Digital Health Environment: The Ministry of Health and Welfare has responsibility for digital health in Chinese Taipei. Like most economies in Southeast Asia, increasing demand for long-term health services and the growth of digital health are direct results of a rapidly ageing population in Chinese Taipei. The growth of telemedicine or digital health in Chinese Taipei commenced with the building of an economy-wide information network, which made digital health solutions technically and commercially feasible. The key driver was the need to mitigate the problem of medical resource scarcity in remote areas—using digital health solutions to fill the gap when doctors were not accessible in those areas. Also, increasing long-term care needs have made digital health a much more viable and cost-efficient solution for providing care at a lower cost.[92]

Chinese Taipei's National Health Insurance (NHI) scheme addresses the full spectrum of health services through the promise of universal health coverage. The Ministry of Health and Welfare employs advanced digital health tools such as AI, cloud computing and large healthcare databases in the delivery of healthcare. The MediCloud system enables healthcare providers to query patients' medical records within the NHI system, while the PharmaCloud system provides prescription drug information to physicians and pharmacists. Each person in Chinese Taipei carries an electronic NHI card bearing a unique personal identifier to access care. The card encodes personal information, insurance data, notes from recent medical visits, diagnoses, drug prescriptions, drug allergies, major illnesses, organ donation consent, palliative care directives, and public health records (including immunizations). Although full interoperability of all NHI systems has not yet been achieved, the integrated delivery system model is emphasized; it incorporates both mobile health and telehealth.[93]

Telehealth Implementation and Policy Frameworks: Currently, through digital cloud tools, community-based primary care providers can retrieve test reports including CT scans, MRIs, ultrasounds, gastroscopies, colonoscopies, and X-rays from secondary and tertiary institutions and receive prescription information. The economy also has a well-established telemedicine policy in place with privacy practices including informed consent and identity management as part of this framework.

Telehealth Use During COVID-19: In January 2020, the Central Epidemic Command Center (CPCC) of Chinese Taipei was activated to coordinate cross-ministry efforts in managing COVID-19. Each person has a health card with a unique ID that doctors and hospitals use to access online medical records. Providers use the card to seek reimbursement from the Ministry of Health and it gives the ministry regular, real-time data on physician and hospital visits and use of specific services. During the pandemic, the health card and electronic health records system has been leveraged and repurposed for public health purposes to track and trace COVID-19. The government merged the health card database with information from immigration and customs to send providers alerts about

[92] T. C. Lin, H. J., Chang, and C. C. Huang. "An Analysis of Telemedicine in Taiwan: A Business Model Perspective." *International Journal of Gerontology* 5(4): 189–92 (December 2011), https://www.sciencedirect.com/science/article/pii/S1873959811001104.
[93] T. M. Cheng, "International Health Profiles: Taiwan," The Commonwealth Fund (June 5, 2020), https://www.commonwealthfund.org/international-health-policy-center/countries/taiwan.

patients at higher risk for having COVID-19 based on their travel history.[94] Chinese Taipei's real-time electronic health record (EHR) system has proved very effective. This is notable for both digital and telehealth.

Transparent public communication about the pandemic, changes in policies, and education through social media platforms helped mitigate the risks of COVID-19 exposure and transmission. The approaches of open data, open governance, and civil society-government collaboration have also proven key.

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[94] E. Emmanuel, C. Zhang, and A. Glickman, " Learning from Taiwan about Responding to COVID-19 and Using Electronic Health Records," *STAT+* (online) (June 30, 2020), https://www.statnews.com/2020/06/30/taiwan-lessons-fighting-covid-19-using-electronic-health-records/.

THAILAND
Digital Health Environment: The Ministry of Public Health has responsibility for digital health in Thailand. It has a strong public health tradition and an increasing focus on digitalization and health technology integration. Under the Thailand 4.0 program,[95] which is a sector-specific industrial policy that aims to attract investments for transforming the economy, the government of Thailand focuses on promoting innovation, creativity, research and development, and improved technologies. Between 2018 and 2020, the government launched innovative healthcare applications such as H4U (personal health profile app), Smart Health ID (patient administration cloud service), and the Primary Care Cluster App (telehealth and telemedicine) to improve health service delivery.[96]
Telehealth Implementation and Policy Frameworks: The Medical Council of Thailand issued the Notification of the Medical Council on Guideline in respect of Telemedicine and Online Clinics No. 54/2563 dated July 21, 2020. This policy came into effect on October 20, 2020 and is seen as a landmark policy framework that guides Thailand's telemedicine businesses and promulgates safety and professional standards for healthcare providers and patients.
Telehealth Use During COVID-19: With the advent of COVID-19, telehealth has experienced unprecedented growth due to the necessity of having contactless safety requirements and overcoming long-distance obstacles.[97] Telehealth has been piloted during COVID-19 in Thailand as the "new normal" for healthcare. Service expansion is strengthened by UN efforts to map current and needed digital infrastructure within the economy, efforts to emphasize public-private partnerships, and a move towards increased health and social protections for all. This includes vulnerable groups and migrants and refugees.[98] Telemedicine in particular has been a centerpiece of Thailand's "Pattani Model" of innovation launched in August 2020 to strengthen the COVID-19 response and the economy's health system. In this system, patients with different diseases are classified into three "traffic light" groups—green, yellow, and red—based on the need for direct medical care and risk of COVID-19 infection. Those not needing in-person care receive a remote telemedicine consultation and any needed drugs are delivered to them.[99]
Reference Links: **Department of Health**: https://www.moph.go.th/ **Digital Health Department or Strategy**: https://thaiembdc.org/2018/10/22/national-strategy-thailand-4-0-

[95] Royal Gazette, "National Strategy Thailand 4.0 Launched," Royal Thai Embassy –Washington D.C., webpage (October 10, 2018), https://thaiembdc.org/2018/10/22/national-strategy-thailand-4-0-officially-launched/.

[96] GlobalData, "Thailand's Focus to Promote Use of Technology in Healthcare Will Have Significant Impact, Says GlobalData," *Medical Device* (blog), GlobalData (May 20, 2020), https://www.globaldata.com/thailands-focus-to-promote-use-of-technology-in-healthcare-will-have-significant-impact-says-globaldata/.

[97] G. Sabharwal, "Thailand's COVID-19 Response an Example of Resilience and Solidarity," *UN News* (online) (August 4, 2020), https://news.un.org/en/story/2020/08/1069191. (G. Sabharwal is the UN Resident Coordinator for Thailand.)

[98] G. Sabharwal "Thailand's COVID-19 Response an Example of Resilience and Solidarity."

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Telehealth Implementation and Policy: https://silklegal.com/understanding-telemedicine-in-thailand-and-its-relevant-regulations/

Telehealth During COVID-19: https://news.un.org/en/story/2020/08/1069191

THE UNITED STATES

Digital Health Environment: Digital Health Environment: In the United States, there are various federal laws relevant to telehealth, including Medicare and Medicaid statutes that govern aspects of telehealth coverage and reimbursement with the latter providing more flexibility to states. Telehealth is permissible across the economy, with differing rules at the state level in accordance with Medicaid. The Office of the National Coordinator for Health Information Technology (ONC), an office of the U.S. Department of Health and Human Services (HHS), is the principal federal entity charged with coordination of economywide efforts to implement and use health information technology and to advance the electronic exchange of health information. While ONC is the primary federal entity responsible for promoting coast-to-coast health information exchange, digital health adoption, and interoperability, many components within HHS support telehealth in various functional capacities, including the Office of the Advancement of Telehealth within the Health Resources and Services Administration[100]. The American Recovery and Reinvestment Act and the Health Information Technology for Clinical Health Act (both passed in 2009), and the 2010 Patient Protection and Affordable Care Act, which emphasized care coordination and patient engagement, are all key pieces of approved legislation that provide funding, structure, and standards setting which has propelled the United States digital health agenda at the federal level [101]. In addition, in 2010, the Federal Communications Commission (FCC) drafted the Connecting America: The National Broadband Plan to improve U.S. internet access; it has not yet been implemented[102]. Legislation has been introduced in the U.S. Congress requiring the FCC to create a new National Broadband Plan that would highlight goals and lessons learned from COVID-19[103].

As a federal system, much of telehealth regulation is generated at the state level with varying definitions of telehealth and interpretations of what modalities are permissible. State run professional licensing boards also play an important role in setting standards for the use of telehealth solutions by practitioners, again differing from state to state. Reimbursement policy for telehealth services also varies greatly at both the state and federal levels. State-level funding, innovation, and health information exchange initiatives also significantly shape the digital health landscape[104]. Telehealth Implementation and Policy Frameworks: Telehealth services such as radiology image transfer, and two-way television and video health consultations occurred in the United States as early as the 1950s. During the 1960s and 1970s, telehealth became embedded in rural and Native American communities that had limited access to primary care and medical specialists. HHS, the Agency for Healthcare Research and Quality, the

[100] U.S. Office of the National Coordinator (ONC) for Health Information Technology, "ONC: What We Do," webpage, https://www.healthit.gov/topic/about-onc.
101 American Health Information Management Association, "ARRA and HITECH Frequently Asked Questions," webpage, https://library.ahima.org/PdfView?oid=106780.
102 United States Federal Communications Commission (FCC), "National Broadband Plan," webpage, https://www.fcc.gov/general/national-broadband-plan#:~:text=The%20National%20Broadband%20Plan%2C%20released,care%2C%20homeland%20security%20and%20more.
103 United States Congress, "H.R.870 - National Broadband Plan for the Future Act of 2021," webpage, https://www.congress.gov/bill/117th-congress/house-bill/870?q=%7B%22search%22%3A%5B%22national+broadband+plan%22%5D%7D&s=1&r=1
104 Bill Track 50, "HR 8780: National Broadband Plan for the Future Act of 2021," webpage, https://www.billtrack50.com/billdetail/1304505.

Department of Defense [105], the U.S. Department of Veterans Affairs (VA) [106], and the National Aeronautic Space Administration (NASA) all played early roles, as did university-based medical centers of excellence and leading health insurers such as Kaiser Permanente[107]. Telehealth issues are cross jurisdictional, involving many U.S. agencies with the Centers for Disease Control and Prevention (CDC)[108] and the Centers for Medicare and Medicaid Services (CMS) playing key parts[109].The VA is also in the telehealth spotlight with telehealth hubs, mobile apps and functionality integrated into MyHealtheVet services and advanced electronic medical records [110]. Financial, regulatory, and reimbursement barriers have remained to achieving broader dissemination and use of telehealth technology, although the movement towards value-based care and meaningful, team-based care coordination has paved the way for an increased telehealth emphasis.

Telehealth Implementation and Policy Frameworks: Telehealth services such as radiology image transfer, and two-way television and video health consultations occurred in the United States as early as the 1950s. During the 1960s and 1970s, telehealth became embedded in rural and Native American communities that had limited access to primary care and medical specialists. HHS, the Agency for Healthcare Research and Quality,[111] the Department of Defense[112], the U.S. Department of Veterans Affairs (VA), and the National Aeronautic Space Administration (NASA) all played early roles, as did university-based medical centers of excellence and leading health insurers such as Kaiser Permanente[113]. Telehealth issues are cross jurisdictional, involving many U.S. agencies with the Centers for Disease Control and Prevention (CDC)[114] and the Centers for Medicare and Medicaid Services (CMS) playing key parts[115]. The VA is also in the telehealth spotlight with telehealth hubs, mobile apps and functionality integrated into MyHealtheVet services and advanced electronic medical records[116]. Financial, regulatory, and reimbursement barriers have remained to achieving broader dissemination and use of telehealth technology, although the movement towards value-based care and

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[105] United States Agency for Healthcare Research and Quality (AHRQ), "Health Information Technology," webpage, https://www.ahrq.gov/topics/health-information-technology-hit.html.

106 Military Health System (DOD Tricare), "MHS Genesis Electronic Health Record," webpage, https://health.mil/Military-Health-Topics/Technology/Federal-Electronic-Health-Record-Modernization/MHS-GENESIS.

107 V. Gruessner, "The History of Remote Monitoring, Telemedicine Technology," MHealth Intelligence, (November 9, 2015), https://mhealthintelligence.com/news/the-history-of-remote-monitoring-telemedicine-technology.

108 United States Centers for Disease Control and Prevention, "Introduction to Public Health Informatics," webpage, https://www.cdc.gov/training/publichealth101/informatics.html.

109 United States Centers for Medicare and Medicaid Services, "Health Informatics and Interoperability Group," webpage, https://www.cms.gov/About-CMS/Components/HIO/HIO-Landing.

110United States Department of Veterans Affairs, "MyHealtheVet," webpage, https://www.myhealth.va.gov/mhv-portal-web/home. 122 U.S. Department of Veterans Affairs, "About Veterans Health Administration," webpage, https://www.va.gov/health/aboutVHA.asp.

[111] United States Agency for Healthcare Research and Quality (AHRQ), "Health Information Technology," webpage, https://www.ahrq.gov/topics/health-information-technology-hit.html.

[112] Military Health System (DOD Tricare), "MHS Genesis Electronic Health Record," webpage, https://health.mil/Military-Health-Topics/Technology/Federal-Electronic-Health-Record-Modernization/MHS-GENESIS.

[113] V. Gruessner, "The History of Remote Monitoring, Telemedicine Technology," MHealth Intelligence, (November 9, 2015), https://mhealthintelligence.com/news/the-history-of-remote-monitoring-telemedicine-technology.

[114] United States Centers for Disease Control and Prevention, "Introduction to Public Health Informatics," webpage, https://www.cdc.gov/training/publichealth101/informatics.html.

[115] United States Centers for Medicare and Medicaid Services, "Health Informatics and Interoperability Group," webpage, https://www.cms.gov/About-CMS/Components/HIO/HIO-Landing.

[116] United States Department of Veterans Affairs, "MyHealtheVet," webpage, https://www.myhealth.va.gov/mhv-portal-web/home.

meaningful, team-based care coordination has paved the way for an increased telehealth emphasis.

Telehealth Use During COVID-19: The requirements for social distancing during COVID-19 resulted in a rapid spike in U.S. telehealth service delivery in both the public and private sectors. For example, providers within the Veterans Health Administration (VHA) under the U.S. Department of Veterans Affairs, have conducted 1.1 million tele-mental health visits to more than 350,000 veterans in 2020. VHA is a long-standing hub of digital health innovation and the largest integrated health care system in the United States[117]. Telehealth video appointments through the VHA's VA Video Connect spiked one thousand percent since February 2021; and through VA Video Connect, VHA provided 9 million additional virtual care interactions in 2020 versus 2019[118]. The uptake in telehealth visits is aided by major telehealth reimbursement and temporary licensure changes made by CMS 1135 waivers enacted as part of COVID-19 recovery legislation enacted on March 6, 2020[119]. CMS waivers under Section 1135 of the Social Security Act can be applied when the U.S. president declares a disaster or emergency and the secretary of HHS declares a public health emergency[120].

These telehealth reimbursement and temporary licensure changes made by the CMS 1135 waivers impact Medicare, Medicaid, and the Children's Health Insurance Program. These changes enabled:

• Conducting telehealth with patients located in their homes and outside of designated rural areas;

• Practicing remote care, even across state lines, through telehealth;

• Delivering care to both established and new patients through telehealth;

• Billing for telehealth services (both video and audio-only) as if they were provided in person;

• Allowing physicians to waive or reduce cost sharing for telehealth visits; and

• Broadening of the covered Medicare telehealth services to include emergency department visits, home visits, therapy services, and initial nursing facility and discharge visits. In addition, HHS has published a variety of guidelines on telehealth for providers such as the Health Insurance Portability and Accountability Act (HIPAA) Flexibility During COVID-19 guidance. HIPAA is the primary healthcare privacy and security law in the United States. Comprehensive information on these changes can be found at: https://www.hhs.gov/coronavirus/telehealth/index.html. These telehealth

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[117] U.S. Department of Veterans Affairs, "About Veterans Health Administration," webpage, https://www.va.gov/health/aboutVHA.asp.

[118] H. Landi, "VA Spent $39 Million to Support Telehealth Amid COVID-19," Fierce Healthcare (online) (June 25, 2020), https://www.fiercehealthcare.com/tech/va-has-spent-39m-to-support-telehealth-services-amid-covid-19-pandemic-but-digital-divide.

[119] United States Congress, "Coronavirus Preparedness and Response Supplemental Appropriations Act (Public Law 116–123)," webpage, https://www.congress.gov/bill/116th-congress/house-bill/6074.

[120] United States Center for Medicare and Medicaid Services, "1135 Waivers at a Glance," summary document, available online at https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertEmergPrep/Downloads/1135-Waivers-At-A-Glance.pdf.

transformations were granted by CMS on a temporary and emergency basis during COVID-19.

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VIET NAM
Digital Health Environment: The Ministry of Health and the Ministry of Information and Communications have responsibility for digital health in Viet Nam. The Ministry developed a policy framework titled Industry 4.0, which aims to support the latest technological advancements and help Viet Nam progress its economic development program.[121] Viet Nam is a ripe environment for electronic health information exchange and healthcare interoperability efforts. The use of augmented digital and healthcare solutions has been growing in areas such as AI, blockchain technology, virtual reality/augmented reality, 3D printing, and robotic applications. Viet Nam also has a National AI Strategy to guide these efforts. [122]
Telehealth Implementation and Policy Frameworks: In June 2020, Viet Nam instituted Decision 749 approving the National Digital Transformation Program to 2025.[123] The Ministry of Information and Communications and the Ministry of Health will work jointly to develop technology platforms for healthcare, including telemedicine, to build databases for healthcare, and to complete a legal framework and technical standards with a view to encouraging digital transformation in the healthcare sector.[124] Viet Nam's Ministry of Health's Circular 49 guides Viet Nam's telemedicine priorities which include the following elements: (1) remote medical advisory; (2) remote consultation and visual diagnosis; (3) remote consultation on surgery; and (4) remote training and transfer of medical examination and training techniques.[125]
Telehealth Use During COVID-19: As part of the Remote Examination and Treatment Scheme 2020–2025, which reflected the increased demand on health services, the Vietnamese Ministry of Health launched a remote healthcare consultation and support (telehealth) network. This network which was implemented in June 2020, connects 1,000 medical examination and treatment facilities with nearly 30 central or end-line hospitals of Ha Noi and Ho Chi Minh City. The existing remote healthcare network will be expanded to more than 14,000 health facilities and connected with other economies globally. Telehealth enables provincial and district hospitals to leverage broader medical technologies and knowledge from central-level health care facilities.[126]   The remote medical examination and treatment platform was developed by Viettel Group and is called Telehealth. Its capabilities involve remote medical consultations, remote surgery consultations,

[121] G. Onag, "Industry 4.0 Essential to Vietnam as a Manufacturing Hub," *AI and Machine Learning* (blog), FutureIOT (December 9, 2020), https://futureiot.tech/industry-4-0-essential-to-vietnam-as-a-manufacturing-hub/#:~:text=The%20industrial%20sector%20will%20account,alone%20accounting%20for%20over%2020%25.&text=It%20also%20foresees%20a%207.5,productivity%20in%20the%20industrial%20sector.

[122] Voice of America (VOA) News, "ChatBots and Telemedicine Join Vietnam's COVID-19 Fight," *VOA COVID-19* (blog) (August 10, 2020), https://www.voanews.com/covid-19-pandemic/chatbots-and-telemedicine-join-vietnams-covid-19-fight.

123 Official Gazette, "Program on National Digital Transformation Launched," Vietnam Law and Legal Forum (online) (March 7, 2020), https://vietnamlawmagazine.vn/program-on-national-digital-transformation-approved-27272.html.

124 Viet Nam News Service, "Health Ministry Launches Telehealth Network Connecting 1,000 Facilities," Viet Nam News (September 20, 2020), webpage, https://vietnamnews.vn/society/772783/health-ministry-launches-telehealth-network-connecting-1000-medical-facilities.html.

125 T. Treutler and C. Le, "Vietnam Issues Regulations on Distance Medicine," Lexology, (January 22, 2018), webpage, https://www.lexology.com/library/detail.aspx?g=808f5934-4e61-49f5-a304-0f2eb7110f75.

126 Viet Nam News, "Remote Examination and Treatment Project a Breakthrough for the Health Sector," Viet Nam News (online) (September 16, 2020), https://vietnamnews.vn/society/772385/remote-examination-and-treatment-project-a-breakthrough-for-health-sector.html.

remote training, and remote technology transfers. Using this platform, medical practitioners are able to provide direct consultations for patients in remote hospitals across Viet Nam. Doctors at the Ha Noi Heart Hospital recently successfully used *Telehealth* to carry out the first online heart surgeries at Phu Tho General Hospital.[127]

In addition, several digital health startups are offering health service delivery in Viet Nam. These include:

- Doctor Anywhere: used by physicians to assess patients for signs of COVID-19 via video consultations, which are also conducted in Thailand and Singapore.
- eDoctors: allows users to e-book a doctor or nurse for medical examinations and medical services, view examination results, and ask questions online.
- Jio Health: provides online booking of clinical services, manages personal health profiles, and shares patient medical data with healthcare providers. Jio also offers specialty medical services, an online pharmacy, family healthcare plans, maternity care packages, and corporate checkups.
- Earable: this United States start-up's in-ear device has biosensors that are used to collect health data.

Increased emphasis on AI resulted from COVID-19. AI is considered a core technology for Industry 4.0 that has implications for a post COVID-19 environment. The Vietnamese government is working with the government of Australia, which has donated 4 million AUD to explore new ways of using AI in a post COVID-19 environment.[128]

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ANNEX III: APEC ECONOMY LEVEL SURVEY

APEC ECONOMY LEVEL SURVEY: EMPOWERING TELEHEALTH SOLUTIONS ACROSS APEC

The following questionnaire seeks to collate APEC economy-level information as part of an APEC study conducted to map the landscape of policies across APEC economies that enable greater use of telehealth services to address patient and population health needs. This project aims to achieve a better understanding of the policy landscape across economies before the COVID-19 outbreak, as well as policy changes made in response to the pandemic to increase utilization of Telehealth solutions in the current pandemic environment. The goal of this project is to enable greater use of telehealth solutions as part of the overall efforts to improve healthcare delivery across APEC and to achieve the goals of the APEC Health Working Group's Strategic Plan which seeks to encourage research, support digital health innovation, and promote translation of that research into practice in a way that improves both health outcomes and health systems, while addressing the current and future needs of all APEC member economies. (Health Working Group Strategic Plan 2021–2025).

The results of the survey will be included in the study report, which will be circulated to members for review upon completion.

We thank you for your time and patience in participating in this survey.

Respondent Data

Economy			
Name and Salutation			
Gender	☐ Male	☐ Female	
Ministry/Department/ Agency			
Title			

General: Policy and Regulatory Landscape Governing Solutions

Increasingly, changes to policy frameworks and regulation at the domestic or economy - wide level have enabled the delivery of telehealth solutions to revolutionize the field of health service delivery, both in the APEC region and internationally. COVID-19 has also accelerated telehealth use and related policy developments globally. This section of the questionnaire seeks to gather information on existing policy frameworks in the APEC region, including the types of telehealth service delivery models utilized at the economy level in APEC economies. In addition, to allow access to new and innovative telehealth solutions and to provide high quality Telehealth services to patients and consumers, whilst safeguarding public health, APEC economies in the region have adopted appropriate regulations. The survey aims to collate information on all these aspects.

1.   Does your economy have a policy framework, policy guidelines and/or regulations which govern the delivery of Telehealth solutions as part of your economy's efforts at providing healthcare services to its citizens?

Yes ☐   No ☐

2.   If the answer is Yes, are Telehealth policy frameworks, policy guidelines and/or regulations part of a broader digital health or eHealth strategy in your economy?

Yes ☐   No ☐

3.   Please provide any digital health strategy details in your economy or online information links in the space provided below. _____

4.   If the answer is Yes, please detail to the best of your knowledge when the Telehealth policy was implemented and provide links to any information about the policy in the space provided below.

Year of telehealth policy implementation: _____

Please provide the link/s to the telehealth policy: _____

5.   If the answer is Yes, please select the most appropriate options which describe the reasons for utilizing Telehealth solutions in your economy. You may choose more than one option. Please indicate other areas that are not covered in the list below.

Improving Patient Outcomes☐
Improving Accessibility☐
Providing Access to Specialist Technical Expertise☐
Increasing Patient Engagement and Satisfaction☐
Improving Patient Convenience☐
Improving and Leveraging Limited Resources☐
Decreasing Burden on Health Care Systems☐
Reducing the Cost of Heath Care☐
Improving Specialist Efficiency☐

Other_____

6.   If your economy has policy frameworks guiding Telehealth services please indicate what areas the policies cover from the list provided below. This is not an exhaustive list, so please include additional details in the space provided.

Data Stewardship ☐
Information Sharing and IP ☐
Expanding Infrastructure (broadband/software)
Interoperability ☐
Training and Capacity Building ☐
Payments/Reimbursements and Budgeting ☐
Quality of Care ☐
Licensing and Provider Related Issues ☐
Privacy Policies ☐

Other _____

7. If your economy currently uses Telehealth solutions to deliver health services, please indicate the service delivery categories from the list of health services below. You may wish to select more than one category.

       Primary Care ☐
       Chronic Disease Management ☐
       Mental Health ☐
       E-Prescriptions ☐
       Neonatal Care ☐
       Radiology ☐

Other _____

8. Please indicate if the Telehealth services are delivered by a public health provider and/or via a private health provider or by other means. Please provide details in the space provided below.

       Public Sector Provider ☐   Private Provider ☐   Other ☐

9. If the answer is the Public Sector in your economy, please provide details of the Ministry or Agency in the space provided below.

10. If the answer is Private Sector (including a Consortium) or Other please provide additional details below.

11. If the answer is Private Sector (including a Consortium), please provide any additional details on Telehealth service providers (Telehealth companies or open-source tools) in your economy.

12. If health service delivery is decentralized in your economy, please provide additional details of whether the Telehealth service is delivered at the sub-regional/provincial/local levels.

Good Practice Examples

13. If your economy utilizes Telehealth solutions to improve health service delivery, please provide details of good practice examples in the space provided below. Please provide details of the category of service, the location and any additional information that you consider relevant for the APEC study.

Challenges to Telehealth Services and Reforms

14. Please provide information on barriers or regulatory, legal and/or institutional challenges faced by providers in delivering Telehealth Services. Please select the most appropriate option from the list below.

       Lack of Appropriate Enabling Legislation ☐
       Unfavourable or Prohibitive Regulations Governing Telehealth (such as licensing) ☐
       Limitations with Infrastructure (such as bandwidth issues) ☐
       Interoperability Issues ☐
       Lack of Funding ☐
       Low Uptake by Consumers ☐
       Telehealth Reimbursement Issues ☐
       Liability Issues ☐

Other_____

15. Please provide details on relevant regulatory and institutional changes/reforms pursued by your economy to address these challenges mentioned above. Also, please highlight any unintended consequences (if any) that these reforms may have had on the use of Telehealth services. If the reforms have contributed to benefits, which affect the enabling environment and the ability to deliver Telehealth solutions, please provide the information also in the space provided below.

16. Please provide details on any plans for future reforms (if any) aimed to increase the adoption of Telehealth services in your economy. In your response, please include details of the government agency or institution (economy-wide, regional or local) responsible for progressing this work.

Policy Approaches to Address Health Needs During Covid-19

During the lockdowns and as a result of social distancing measures instituted as part of the response to the pandemic, several APEC economies adopted Telehealth as a way of safely providing healthcare to patients in appropriate situations such as routine healthcare consultations; medication consultations; nutrition counseling; mental health counseling and other primary healthcare services.

17. Please provide details of how your economy supported healthcare needs to patients during lockdowns imposed as a result of the pandemic, and if so what were the nature of these services?

18. Did these include Telehealth services and if so what, were they?

19. If the answer is Yes, please provide any additional details on COVID-19 Telehealth service providers (Telehealth companies or open-source tools) in your economy.

20. What new domestic policy frameworks were introduced related to telehealth specifically during this time, if any?