Asia-Pacific
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Summary Report of APEC Economies' Digital Policy Measures to Combat COVID-19

APEC Health Working Group

March 2022

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Prepared for
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Abbreviations

APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
OECD	Organisation for Economic Co-operation and Development
HWG	Health Working Group
LSIF	Life Sciences Innovation Forum

Abbreviations for APEC economies

AUS	Australia
BD	Brunei Darussalam
CDA	Canada
CHL	Chile
PRC	People's Republic of China
HKC	Hong Kong, China
INA	Indonesia
JPN	Japan
ROK	Republic of Korea
MAS	Malaysia
MEX	Mexico
NZ	New Zealand
PNG	Papua New Guinea
PE	Peru
PH or PHL	The Republic of the Philippines
RUS	Russia
SGP	Singapore
CT	Chinese Taipei
THA	Thailand
US or USA	United States
VN	Viet Nam

Executive Summary

For the purpose of further developing APEC's agenda to promote digital health, Chinese Taipei composed this report, supported by the HWG Co-chairs and the members of the Digital Health Sub-Working Group. This report summarizes the digital policy measures HWG members have taken to combat the COVID-19 pandemic. It is anticipated to lay the necessary groundwork, as well as make it more convenient, for any attempt to further explore the implementation of digital health measures designed to combat COVID-19 and future pandemics.

This report summarizes the policy measures of individual economy mainly in eight categories, namely, "Information Enquiry Platform", "Tracking Measures", "Telemedicine", "Mental Health", "Quarantine Measure", "Stockpile and Allocation of Essential Medical Resources", "Diagnosis" and "Social Distancing". It is discovered that all economies can establish policy measures in information enquiry platforms and tracking measures to tackle and monitor the outbreak of COVID-19. Further, in all COVID-19 digital prevention mechanisms, it seems categories like stockpile and allocation of essential medical resources, diagnosis, and social distancing are the most under-appreciated ones. Lastly and foremost, based on the statistics and qualitative data analysis of the information compiled in this report, digital preparedness is correlated with the level of economic development.

The Purpose

APEC has been paying attention to the importance of digital health. In the 9th APEC High-Level Meeting on Health and the Economy in 2019, the Health Senior Officials reiterated the development of innovative technologies was conducive for improving all aspects of the healthcare sector as well as promoting economic growth in the region. Last year, APEC Putrajaya Vision 2040 noted 'Innovation and Digitalization' as a key element. To empower people and businesses to participate and grow in global economy, APEC will foster an enabling environment that is market-driven and supported by digital economy and innovation. APEC will strengthen digital infrastructure, accelerate digital transformation, narrow the digital divide, as well as cooperate on facilitating the flow of data and strengthening consumer and business trust in digital transactions. And the Aotearoa Plan of Action endorsed by Leaders in November 2021 is designed to turn the Vision into reality. Although the development stage of each economy varies, we have witnessed more investment in the application and R&D of digital health in almost every member economy.

The global COVID-19 pandemic has demonstrated how a health issue can quickly have detrimental impacts on both the citizens and prospects of an economy. COVID-19 has exposed and exacerbated existing challenges faced by our health systems, including barriers to access to healthcare and health services. It has also raised social, economic as well as health inequalities, which have been magnified by the disproportionate impact of the crisis on the poor, women, children, indigenous peoples and so on.

Based on our experiences and research, we have recognized that digital technologies have rapidly developed in preventing the pandemic and promoting people's health in the period. The current crisis should be seen as an opportunity to bridge the digital divide among regions by increasing broadband access, however, in certain economies, it might increase the gap. It is a golden opportunity to create incentives to adopt digital technologies across all key governments, industries, and private sectors, and to promote a stronger digital culture across the population.

The impact of digital technologies is especially distinguishable as we are now confronting the COVID-19 worldwide. Policies like monitoring, stockpiling medical resources, diagnosing and telemedicine rely on technologies enormously. In our viewpoint, this also implies the development of digital health will be more in line with the "people-centric" principle as it impacts the health of every individual and local community. The goal of APEC's digital health agenda is expected to attain "Digital Health Becomes a Lifestyle" as we accumulate experience and grow our capacity through the process of containing the

pandemic. The following actions are needed for attaining our goal:

1. Combating the COVID-19 pandemic with digital tools. The power of digital technologies is witnessed as we combat the pandemic, however, more potentials are waiting to be explore. APEC is positioned to pioneer in this area before it can truly lead globally. .
2. Promoting the application of digital health policies in APEC economies. With a wide-ranging diversity in the region, digital health policies are developed and employed in different economic and societal contexts in member economies. Comparison, experience exchange and capacity building will help identify the merits and shortfalls of each and benefit any improvement of these policies.
3. Exploring opportunities of regulatory cooperation to facilitate digital health practices. Regulations offer the necessary conditions for conducting digital health practices. And considerable scale economy can be generated if cross border regulatory cooperation is in position.
4. Establishing Public Private Partnership (PPP) for attaining the objectives listed above. The expertise, capacity and motivation of the business communities can inject extra momentum into our activities in APEC region.

To this end, the Digital Health Sub-working Group (DHSWG) of the APEC Health Working Group (HWG) composes this report to offer an initial stocktaking of the major policy measures utilized by APEC member economies to address the COVID-19 pandemic. This summary of policy facts will benefit policy makers, practitioners and researchers who are interested in understanding what has been done in the region by individual economy. This report lays a necessary groundwork, as well as makes it more convenient, for any attempt to further explore the implementation and potentials of digital health measures designed to combat COVID-19 and the next pandemic to come.

This report presents the policy measures of individual economy mainly in eight categories, namely, “Information Enquiry Platform”, “Tracking Measures”, “Telemedicine”, “Mental Health”, “Quarantine Measure”, “Stockpile and Allocation of Essential Medical Resources”, “Diagnosis” and “Social Distancing”. They are extracted from our experience during the pandemic. From immigration, quarantine to diagnosis and treatment, we have sorted out the process, collect existing international digital health and epidemic control policies. At the same time, available public sources from the other HWG member economies have offered the main information contained in this report. We appreciate all the comments made by HWG member economies for improvement. However, any deficiency will be the responsibility of the authors.

Though it is a rough picture drawn by the report, we consider it a pioneer in the HWG, which will inspire more relevant efforts and cooperation to emerge. It also represents the enthusiasm of the DHSWG, established in early 2020, for developing the agenda of digital health in APEC. We anticipate further R&D and regional actions to emerge soon after this report is published.

Measures Taken in Individual Economy

Australia

Categories of digital tools for COVID-19 prevention and control	Measures taken
• Information Enquiry Platform and Connection Point	• Coronavirus Australia App • COVID-19 WhatsApp channel • Vaccine Information and Location Service • COVID-19 Vaccine Eligibility Checker • National Coronavirus Helpline[1]
• Tracking (including import management and CBS)	• COVIDSafe App • State and Territory Location Check-in Apps • Australian Immunization Register (AIR)
• Quarantine Measure	X
• Stockpile and allocation of essential medical resources	• COVID Vaccine Administrative System (CVAS)
• Mental Health	• Coronavirus Mental Wellbeing Support Service • National Coronavirus Helpline[2]
• Diagnosis	• COVID-19 Symptom Checker • COVID-19 Vaccine Side Effects Symptom Checker
• Telemedicine[3]	• COVID-19 Temporary MBS Telehealth Services • Electronic prescriptions • My Health Record system
• Social distancing	• Declared hotspots • COVID-19 Restriction Checker
• Cross border solution	• International COVID-19 Vaccination Certificate (ICVC)

The government has developed several information enquiry platforms in response to COVID-19. This has included designing a publicly accessible official app, the Coronavirus Australia App, to share the latest information and advice regarding COVID-19. Through the app people can check their own symptoms and receive notification when urgent information and updates are published. Also, the National Coronavirus Helpline has been opened at the start of the pandemic and has since taken over 2,000,000 calls. It is complemented by the Public Enquires Support Ecosystem (PESE) that helps to ensure coordinated communications and responses to public inquiries about COVID-19 vaccination. Healthdirect Australia has extended the use of its Knowledge Base across the ecosystem to provide a repository of content collated and published for use of call handlers in the PESE. The government has also developed the COVIDSafe app which is a tool for identifying

[1] https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/coronavirus-covid-19-advice-for-the-health-and-disability-sector/providing-health-care-remotely-during-covid-19
[2] https://www.health.gov.au/contacts/national-coronavirus-helpline
[3] https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/coronavirus-covid-19-advice-for-the-health-and-disability-sector/providing-health-care-remotely-during-covid-19

people (contact tracing) exposed to COVID-19 to slow the spread in the community. COVIDSafe supports the current manual process of finding people who have been in close contact with someone with COVID-19 through Bluetooth pairing. Each Australian State and Territory has also launched regional apps to support contact tracing, utilizing location check-in.

The government has been providing extra digital supports to improve the mental health of Australians during the pandemic.[4] This has included additional funding to several existing phone and online mental health services (e.g., Lifeline, Kids Helpline), to boost their capacity to meet increased demand as a result of the pandemic. The government has also established a dedicated Coronavirus Mental Wellbeing Support Service which provides mental health support via telephone, and online channels.

The government has added several temporary Medicare items to help health care practitioners deliver telehealth services via phones or video conferencing. Telehealth services help protect health care professionals, their staff, and patients from being exposed to unnecessary risks of infection. A range of health care providers can now offer telehealth services to patients, including general practitioners, specialists, allied health providers, mental health professionals and nurse practitioners.

In response to an outbreak, the state or territory governments or the central government can declare a hotspot to step up COVID-19 pandemic control. The COVID-19 Restriction Checker collates economy-wide information to help people find out easily what they can and cannot do in their location.

Australia's vaccination program is underpinned by user centered digital and non-digital channels (which themselves are supported by advanced digital solutions). The Australian Immunization Register (AIR) provides a single source of truth for vaccination status. Australia is one of few economies with this capability. Reporting of COVID-19 vaccinations is required by law. The AIR Immunization History Statement (IHS) displays all immunizations that an individual has had that are recorded on AIR. The IHS can be viewed and printed through Medicare Online via myGov or the Medicare Express Plus App. Health information including vaccinations recorded in the AIR, and (increasingly) COVID-19 test results can be viewed through an individual's My Health Record, Australians' personally controlled e-health record. A COVID-19 vaccination digital certificate based on data in the AIR is available to consumers.

[4] https://www.health.gov.au/sites/default/files/documents/2020/03/covid-19-national-health-plan-supporting-the-mental-health-of-australians-through-the-coronavirus-pandemic.pdf

The government's Eligibility Checker (EC) and Vaccine Clinic Finder (VCF) are the predominant channels for people accessing vaccines. The Eligibility Checker allows all people living in Australia to easily find out if they are vaccine eligible. If eligible, they are directed to the Vaccine Clinic Finder, to find a clinic administering COVID-19 vaccines near them and to book an appointment. People who cannot yet access vaccines can register their interest to be notified (by SMS or email) when they can access a vaccine. Further, a COVID-19 Vaccine Side Effects Checker has been built to help those experiencing side-effects to determine their next steps. Delivering these solutions has required extensive engagement and cooperation across multiple governments, medical peak bodies and the private sector. The Commonwealth Booking Platform, based on an existing product by Australian company Health Engine, has been procured by the Government to enable COVID-19 vaccine providers, who do not already have an online booking solution, to quickly get up and running with a digital system to offer appointments. The Australian Digital Health Agency has developed the Clinician Vaccine Integrated Platform (CVIP) to enable healthcare providers, who may not have conformant or integrated software, to upload details of vaccination encounters to the Australian Immunization Registry to support health providers and consumers view of Immunization status.

The government has introduced an International COVID-19 Vaccination Certificate (ICVC) for outbound travelers. The certificate meets the new global standard specified by the International Civil Aviation Organization (ICAO) and endorsed by the World Health Organization. The certificate uses Visible Digital Seal (VDS) technology in the form of a QR code that is secure as a passport chip and can be digitally authenticated in the same way as a passport. The QR code can be read by passport control systems at borders around the world and by COVID-19 travel apps such as the IATA Travel Pass that many airlines are using. The certificate also includes the holder's passport number as well as all the necessary vaccination details specified in the global standard, including the vaccine batch number. COVID-19 vaccination details are extracted from the Australian Immunization Register, an economy-wide register that can only be updated by authorized health professionals.

Brunei Darussalam

Categories of digital tools for COVID-19 prevention and control	Measures taken
• Information Enquiry Platform and Connection Point	• BruHealth
• Tracking (including import management and CBS)	• BruHealth • PremiseScan[5]
• Quarantine Measure	• iMSafe [6]
• Stockpile and allocation of essential medical resources	X
• Mental Health	• COVID-19 Health Advice Line:148
• Diagnosis	• Smart Helmets[7]
• Telemedicine	X
• Social distancing	• BruHealth

The government has developed the "BruHealth" app, an one-stop mobile application for anything related to COVID-19 in Brunei Darussalam, including COVID-19 information and epidemic updates, self-assessment tools, activity trace of the confirmed cases etc. In addition, the "BruHealth" app also assists to reduce social distancing (De-escalation Plan), which uses algorithms to determine people's personal health status with the use of questionnaire related to their health status.

The government has also released another COVID-19 contact tracing app known as PremiseScan, which allows businesses and premises to grant or deny the entry of Brunei residents by scanning their safety codes. The Tracking bracelets named "iMSafe" have been issued by Brunei government for those who were ordered to undergo quarantine, alerting authorities whenever the device is taken off or if the wearers break their COVID-19 quarantine. "iMSafe" wristband enables authorities to remotely monitor and locate people who are placed under quarantine in real-time. Equipped with a Bluetooth chip locator and a customized QR code, the bracelet requires the wearers to turn on their Bluetooth device on an Android mobile phone before it can be activated.

To improve mental health, the government provides the COVID-19 Health Advice Line 148, to provide detailed information of COVID-19. For digital diagnosis, the government is current deploying smart helmets that can screen the temperatures of about 36,000 people at a time. The wearable smart helmet will be used to facilitate fast temperature checks. Equipped with helmet goggles, augmented reality display and infrared thermal imaging, the

[5] https://thescoop.co/2020/05/01/covid-19-live-updates-3/
[6] https://thescoop.co/2020/04/04/covid-19-live-updates-2/
[7] https://thescoop.co/2020/05/28/brunei-uses-smart-helmets-to-detect-fever-among-worshippers/

smart helmet can perform contactless rapid temperature screening for indoor and outdoor venues, vehicles; it is also equipped with face recognition and identity verification functions.

Canada

Categories of digital tools for COVID-19 prevention and control	Measures taken
• Information Enquiry Platform and Connection Point	• COVID-19 daily epidemiology update
• Tracking (including import management and CBS)	• ArriveCAN
• Quarantine Measure	• COVID Alert, ArriveCAN
• Stockpile and allocation of essential medical resources	• Inventory Management System
• Mental Health	• Wellness Together Canada
• Diagnosis	X
• Telemedicine	• Pan-Canadian Virtual Care Priorities in Response to COVID-19
• Social distancing	X
• Cross border solution	• Canadian COVID-19 proof of vaccination credential (PVC), ArriveCAN

The government has created a webpage of "COVID-19 daily epidemiology update" on its official website. The webpage summarizes COVID-19 cases across Canada, with detailed data about the spread of the virus over time and in different regions of the economy. The data provides an overview of hospitalizations and deaths, testing, variants of concern and exposures.[8]

Canada has introduced a new health declaration form to help prevent the spread of COVID-19. All individuals traveling to Canada are now required to complete an ArriveCAN form before entering the economy. The contact details and travel information provided can be used to track overseas visitors and minimize infection rates more effectively. After registering their details with the online ArriveCAN system, travelers are issued with a reference number and barcode which will be required to be presented on arrival.[9]

COVID Alert is Canada's free COVID-19 exposure notification app. It can alert people to possible exposures before they have the symptoms. Using COVID Alert for the duration of the outbreak is one of the public health tools available to help limit the spread.[10]

The Public Health Agency of Canada (PHAC) has initiated planning for a modernized

[8] https://health-infobase.canada.ca/covid-19/epidemiological-summary-covid-19-cases.html

[9] https://www.healthdeclaration-online.com/canada?utm_source=google&utm_medium=cpc&utm_campaign=ca&gclid=Cj0KCQjw3f6HBhDHARIsAD_i3D9wHdQxM-NbU9KAZNQYSHGEgcJC1hoVJiEwZ5QEwtVW9RF0tcztHZUaAlWdEALw_wcB

[10] https://www.canada.ca/en/public-health/services/diseases/coronavirus-disease-covid-19/covid-alert.html#a6

warehouse management system. The National Emergency Strategic Stockpile (NESS) has developed a portal to allow for efficient management of Canada's critical medical supplies. This web-based application is designed to allow the NESS to have visibility of supplies, of which, provinces and territories can draw down should their own resources be exhausted. Overall, this allows the NESS to improve its approach to lifecycle management and accurately inform future needs of supply.[11]

Launched in April 2020 by the Government of Canada, Wellness Together Canada (WTC) is an online mental health and substance use support portal that provides free and credible information and supports available 24/7 to individuals across Canada in both official languages. It is led by a consortium of established leaders in mental health and substance use care that includes Stepped Care Solutions, Homewood Health and Kids Help Phone, and features content from other collaborators. Depending on their needs, individuals can access different levels of support, ranging from information, self-guided programming and assessment tools, to connecting with peer support, social workers, psychologists and other professionals for confidential text sessions or phone calls. [12]

The government recognizes that the safe reopening of economies and communities includes international travel. In response to a need to facilitate the restart international travel while recognizing the evolving epidemiological context, the government, in collaboration with the Canadian provinces and territories, have launched the Canadian COVID-19 proof of vaccination credential (PVC) for international travel. The Canadian PVC is a standardized and interoperable credential, based on the SMART Health Card specifications, a factual statement of the holder's vaccination history that can be used by border officials to determine what public health measures may be applied to that individual. It is also a client-focused and protects privacy.

In response to the COVID-19 pandemic, the government is committed to working in partnership with provincial and territorial governments to put in place a range of digital supports to help Canadians get the information, resources and care they need throughout this unprecedented time. On May 3, 2020, the Prime Minister confirmed this commitment by announcing an investment of $240.5 million to accelerate the use of virtual tools and digital approaches to support Canadians. Part of this funding was dedicated to Wellness Together Canada, described above.[13]

[11] https://www.canada.ca/en/public-health/services/emergency-preparedness-response/national-emergency-strategic-stockpile.html
[12] https://wellnesstogether.ca/en-CA#resources
[13] https://www.canada.ca/en/health-canada/corporate/transparency/health-agreements/bilateral-agreement-pan-canadian-virtual-care-priorities-covid-19.html

Chile

Categories of Digital tools for COVID-19 prevention and control	Measures taken
• Information Enquiry Platform and Connection Point	• Chile Reports
• Tracking (including import management and CBS)	X
• Quarantine Measure	• CoronApp (self-evaluation and access to level of risk)
• Stockpile and allocation of essential medical resources	X
• Mental Health	• Salud Responde
• Diagnosis	X
• Telemedicine	• "Your Health is Our Challenge"
• Social distancing	X

The government shares detailed COVID-19 related information, such as confirmed cases, the percentage of positive PCR, hospitalization etc. in the "Chile Report" on the government's official website. The government has created the CoronApp to prevent Coronavirus infections. There are several functions of the app, which include[14]:

1. Carry out a self-assessment of the user's symptoms to generate a risk classification.
2. Receive notifications from the Ministry of Health.
3. Deliver informative content on the contingency and evolution of the pandemic.
4. Provide an instance to report and / or report high-risk behaviors or events.
5. Indicate where those infected will stay during their quarantine.

To improve people's mental health, the government has established the "Salud Responde," a virtual and telephone platform that operates 24/7, where anyone can go to receive information, guidance, support, and education on COVID-19 issues or any other health-related topic.[15]

Chile has adopted telemedicine technology to reduce waiting lists. The objective of this alliance called "Your Health is Our Challenge", is to help decongest the non-surgical waiting lists in the region, especially for non-COVID pathologies that are lagging. The operations consist of telemedicine sessions that will allow specialists at the German Clinic of Santiago to attend to patients in the specialty of endocrinology, among others.[16]

[14] https://www.minvu.gob.cl/coronapp/
[15] https://saludresponde.minsal.cl/
[16] http://www.latinamerica.tech/2020/06/07/chile-adopted-telemedicine-technology-to-reduce-waiting-lists/

China

Categories of digital tools for COVID-19 prevention and control	Measures taken
• Information Enquiry Platform and Connection Point	• Official Website
• Tracking (including import management and CBS)	• Health QR Code • Epidemic Map
• Quarantine Measure	X
• Stockpile and allocation of essential medical resources	X
• Mental Health	X
• Diagnosis	X
• Telemedicine	• Telemedicine platform
• Social distancing	• Community drones are used to disperse public

The government has established an official website to gather and update information, including service availabilities, hours of operation and travel restrictions for all kinds of points-of interest. To track, health QR codes and digital travel records have been employed by the government as permits for making trips, going to school or work, entering certain public venues, and for other daily errands. The results shown on the codes and records can provide the basis for travel control and differentiate response measures, which have made risk identification and targeted control possible in different areas at different levels.[17] In addition, an "epidemic map" has been created to display the specific names and locations of the communities where cases have been reported and the number of confirmed infections. The map has made it easier for the public to guard against infection.[18]

The government has established the telemedicine platform that includes an online consultation clinic, where experts were available 24 hours a day. Experts can conduct preliminary screenings through remote consultation, which helps avoid the risk of cross infection in the hospitals and take the pressure off designated hospitals. Community residents and health providers have felt that it has created favorable support for early detection, diagnosis, and prevention.[19]

[17] https://covid-19.chinadaily.com.cn/a/202006/08/WS5edd8bd6a3108348172515ec.html
[18] https://covid-19.chinadaily.com.cn/a/202006/08/WS5edd8bd6a3108348172515ec.html
[19] https://ccforum.biomedcentral.com/articles/10.1186/s13054-020-02884-9

Hong Kong, China

Categories of digital tools for COVID-19 prevention and control	Measures taken
• Information Enquiry Platform and Connection Point	• Thematic websites • Interactive Map Dashboard • Social media platforms • WhatsApp Helpline • GovHK Notifications App
• Contact Tracing	• Geospatial Information Portal • Case Investigation and Management Portal
• Tracking (including import management and CBS)	• Electronic Health & Quarantine Information Declaration • LeaveHomeSafe App
• Vaccination	• Vaccination Dashboard • Central Vaccination Database
• Quarantine Measure	• StayHomeSafe App & Bluetooth Low Energy wristbands
• Stockpile and allocation of essential medical resources	• Central Resource Allocation IT Module
• Mental Health	• Thematic webpage • Digital “Wellcation booklet”
• Diagnosis	X
• Telemedicine	• Hospital Authority (HA) Telehealth framework • 1D1P for inpatient telehealth services • HA Go for outpatient telehealth initiatives
• Social distancing	X

In order to help the public grasp the latest and accurate information, the government launched the COVID-19 thematic website and the “Hong Kong Anti-epidemic Information Channel” in February 2020 in addition to the "Interactive Map Dashboard," which provides information including the confirmed cases, the buildings where the infected persons lived/visited, the collection points for sending test samples and the testing statistics, etc.[20]. The public can also gain access to information via the COVID-19 WhatsApp Helpline and the “GovHK Notifications App” which makes it convenient to receive messages or notifications and alerts via different means. The government has also employed diversified digital media including Facebook, Instagram, and YouTube as major communication platforms.

To support contact tracing, the robust application of the Geospatial Information Portal (GIP) enables visualization and analysis of vast amount of data and attributes of COVID-19 cases. This supports the government in making strategic and targeted decisions promptly and precisely, to cut the viral transmission chain and safeguard public health. The enhanced

[20] https://www.ceo.gov.hk/eng/pdf/article20210726.pdf

interactive map dashboard presents boundaries of area under compulsory testing notice, and catchment area for sewage tested positive in addition to details of confirmed cases. The link analysis function of the GIP not only shows the relationship between related confirmed cases, but also supports investigators to collate epidemiological relationship between index case and contacts, such as incubation period and communicable period, with georeferenced common meeting points through the linkages of their exposure or movement to study individual behavior and activities. The visualizing of geographical information of common contacts of confirmed cases of COVID-19 helps evaluate relationship of geolocations that would in turn help predict the spread of COVID-19.

The Case Investigation and Management Portal (CIMP) links up information systems of various relevant departments and agencies such as the HA for centrally and electronically collecting information needed for contact tracing, so as to streamline the procedures for information collection, input and sharing, which was once mainly conducted manually. Geocoding services based on geographic information system technology has been enhanced to improve the accuracy in inputting addresses and whereabouts of the confirmed cases. This helps improve the efficiency and effectiveness in tracing contacts of confirmed cases, conducting testing and arranging quarantine or medical surveillance of such contacts.

The government launched the "LeaveHomeSafe" mobile application in November 2020 to provide members of the public with a convenient digital tool to record their whereabouts, while protecting their personal privacy. Users will receive exposure notifications if they have visited same venues with COVID-19 patients at about the same time. To make it easier for citizens to present their vaccination records upon entering specific places under the ‘Vaccine Bubble’ initiative, the version 2.0 of "LeaveHomeSafe" was launched in June 2021 to add the "electronic vaccination and testing records" function which allows users to store their vaccination records and related QR codes in the mobile app and display it when necessary[1]. On the other hand, all inbound travelers entering Hong Kong are required to submit health declaration and quarantine information declaration, and travelers can submit the form online to facilitate and speed up the inbound health clearance procedure.

To support the territory-wide COVID-19 Vaccination Program, another new thematic website was launched in January 2021 as a one-stop information hub for the Program. The “Vaccination Dashboard” was launched in March 2021 to show the statistics on vaccination and safety monitoring. All vaccination records are seamlessly integrated with the existing Electronic Health Record Sharing System (eHRSS). A one-stop registration process of the eHRSS is introduced with the COVID-19 Vaccination Program and the vaccination record QR codes can be displayed through the eHealth App.

To support compulsory home quarantine measures, the government has deployed the use of the "StayHomeSafe" mobile application together with Bluetooth Low Energy wristbands since the onset of the pandemic. These technologies have been developed by the Logistics and Supply Chain MultiTech R&D Centre, the Hong Kong University of Science and Technology and a local technology start-up to monitor whether the quarantined persons stay in their designated dwelling places.

With the COVID-19 case reporting module at HA, healthcare professionals can conveniently report high-risk cases during the clinical consultation. The data will be accessible in real-time by all public hospitals for isolation bed allocation and coordination across all hospitals for treatment purposes. A central resource allocation IT module is implemented within the treatment facilities to ensure appropriate resource allocation and suitable treatment for different patients, which has eased the demand for isolation beds in public hospitals.

On the mental health front, the government attaches great importance in addressing mental health issues arising from the COVID-19 pandemic. A thematic webpage is included in the mental health promotion and public education initiative “Shall We Talk” website to provide mental health resources in relation to COVID-19.

Lastly, the adoption of telehealth has accelerated during the pandemic as the HA has explored innovative service 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 tele rehab adoption has increased greatly. HA Go, the HA’s one-stop mobile app, is the key enabler and many of the telehealth services have also been integrated into CMS, giving clinicians and patients easy and convenient access. New telehealth services are under continual development.

Indonesia

Categories of digital tools for COVID-19 prevention and control	Measures taken
• Information Enquiry Platform and Connection Point	• SP4N-LAPOR! • Bersatu Lawan COVID-19 (BLC)-Official information platform/APP
• Tracking (including import management and CBS)	• Bersatu Lawan COVID-19 (BLC)-Official information platform/APP • PeduliLindungi • Inarisk
• Quarantine Measure	X
• Stockpile and allocation of essential medical resources	X
• Mental Health	X
• Diagnosis	X
• Telemedicine	• Bersatu Lawan COVID-19 (BLC)-Official information platform/APP
• Social distancing	• 10 Rumah Aman ("10 Safe Houses")

In Indonesia, a platform called "SP4N-LAPOR!" has been established for Indonesian citizens to directly communicate with the government. Citizens can send vital information of COVID-19 and receive questions and ideas on how the Indonesian Government responds to the pandemic.[21]

Bersatu Lawan COVID-19 (BLC) is an application built by the Task Force for the Acceleration of Handling COVID-19 of Indonesian Government to overcome the COVID-19 pandemic. With this application, users can perform self-diagnosis to understand their own condition. Users will then receive recommendations based on the results of the diagnosis. BLC also increases users' alertness with its 'Hazardous Live Monitor' feature so the users can see whether certain areas are virus hotspots. In addition, users can also find out the latest updates about COVID-19 from the most valid data sources. The information users get is an update on positive case numbers, recovery rates, and death rates. Users can also find out the COVID-19 referrals to hospitals and consult a doctor online to prevent possible exposure to COVID-19.[22]

For tracking purposes, the Ministry of Health of Indonesia has joined forces with the Bali Provincial Government and the Bali Provincial Health Office to launch a QR Code for the PeduliLindung application. PeduliLindungi is an application that allows the search for

[21] https://www.id.undp.org/content/indonesia/en/home/presscenter/articles/2020/e-citizen-platform-helps-indonesian-citizens.html

[22] https://play.google.com/store/apps/details?id=com.deepcovid19&hl=zh_TW&gl=US

contact tracking and tracing, with an aim to strengthening efforts to reduce the spread of COVID-19. This application helps increase community participation in reporting locations and travel history during the pandemic.[23, 24] In addition, the "Inarisk" app has released by the National Disaster Mitigation Agency, which counts on users to conduct self-assessments by answering 21 questions to determine everyone's risk level. Besides personal information, users must describe their family situations and living environment.[25]

To maintain social distancing for preventing the outbreaks, 10 Rumah Aman ("10 Safe Houses") has been designed to supplement "PeduliLindungi." This app is launched by the Presidential Staff Office (KSP), which utilizes artificial intelligence to generate maps that show the most recently logged body temperatures of people who are nearby, allowing users to check on anyone who may need help.[26]

[23] https://www.kemkes.go.id/article/view/21070200002/kemenkes-luncurkan-qr-code-untuk-aplikasi-pedulilindungi-perkuat-tracking-dan-contact-tracing-covid-.html

[24] https://www.geospatialworld.net/apps/covid-19/indonesia-launches-pedulilindungi-app-to-take-on-covid-19/

[25] https://kr-asia.com/indonesians-skeptical-of-the-states-covid-19-prevention-apps%EF%82%9F

[26] https://kr-asia.com/indonesians-skeptical-of-the-states-covid-19-prevention-apps

Japan

Categories of digital tools for COVID-19 prevention and control	Measures taken
• Information Enquiry Platform and Connection Point	• COVID-19 Information and Resources
• Tracking (including import management and CBS)	• COCOA
• Quarantine Measure	X
• Stockpile and allocation of essential medical resources	X
• Safety Net	• COVID-19 call center: 0570-550571 • Helpline: 0120-565653
• Diagnosis	X
• Telemedicine	• Program for Remote Health Consultation Services launched by the Ministry of Economy, Trade and Industry and operated by MediPlat and LINE Healthcare • The Ministry of Health, Labour and Welfare launched a list of 1,000 clinics that offer telemedicine
• Social distancing	X

The COVID-19 Information and Resources platform has been established by the government during the outbreak of the pandemic. It organizes information ranging from prevention, hotlines for inquiry, quarantine restrictions, and daily case updates. Factual knowledge is crucial when it comes to combatting the pandemic, and such a platform has helped the government maximize its efforts. Along with promoting social distancing, contact tracing apps can also contribute to curbing the spread of COVID-19. An app named COCOA uses Bluetooth technology to document users' trace and send out alerts when they encounter confirmed cases. Each user will be given a random code, and the system will not reveal the exact place of contact to protect privacy.

Despite the pandemic, necessary medical services should still be offered. In response to such a situation, the government has collaborated with private sectors and developed effective telemedicine solutions. The Ministry of Economy, Trade and Industry has released its Program for Remote Health Consultation Services that enables people to consult with doctors remotely for free. The services are operated by LINE Healthcare and MediPlat Inc., with which patients can receive medical care without having contact with anyone, therefore protecting both healthcare workers and patients themselves. The Ministry of Health, Labor and Welfare has also published a list of nearly 1,000 clinics that provide telehealth services.

Korea

Categories of digital tools for COVID-19 prevention and control	Measures taken
• Information Enquiry Platform and Connection Point	X
• Tracking (including import management and CBS)	• KI-Pass • Self-Check Mobile App
• Quarantine Measure	• Self-Quarantine Safety Protection App
• Stockpile and allocation of essential medical resources	X
• Mental Health	X
• Diagnosis	• AI Diagnostic screening
• Telemedicine	• Data-Based Smart Monitoring System
• Social distancing	X

In the wake of several sporadic mass infections in public facilities, the government has introduced KI-Pass, which contains QR codes to keep a customer or visitor entry log digitally at high-risk facilities and to implement rapid response measures. Users can receive a QR code from their smartphone service provider. Upon entry into a high-risk facility, the user will be asked to register the QR code through scanning. The scanned information is automatically transferred to Korea Social Security Information Service, a public institution.[27]

The immigration and quarantine officers check the addresses of the places where inbound travelers will be staying and their phone numbers on their arrival and have them install the "Self-Check Mobile App" to continuously monitor signs of possible symptoms so that they can be quarantined and treated in a timely manner if necessary.[28]

The government has developed the Self-Quarantine Safety Protection App to effectively support the monitoring of those under self-quarantine. The App has two key functions: self-check and GPS-based location tracking. The self-check menu allows the users to monitor four main physical conditions — fever, cough, sore throat, shortness of breath — twice a day. The information is automatically reported to the assigned case officer. In case the person in quarantine does not submit the data or shows any possible symptoms, the assigned case officer will immediately receive a notice. The GPS-based location tracking also allows the

[27] file:///C:/Users/user/Downloads/All%20about%20Korea's%20Response%20to%20COVID-19.pdf
[28] file:///C:/Users/user/Downloads/All%20about%20Korea's%20Response%20to%20COVID-19.pdf

officer to know if the user leaves their quarantine location. The app also provides the information on the quarantine guidelines and the contact information of the assigned case officer.[29]

The government has adopted the "Data-Based Smart Monitoring System" to minimize medical staff's contact with patients with mild symptoms and to facilitate the monitoring of the condition of the patients in residential treatment centers. Patients with mild symptoms are placed in residential treatment centers across the economy can download an app that helps to monitor the patient's condition on their smartphone and allows them to enter their body temperature and blood pressure. Medical staff can then engage in real-time monitoring of their condition using the dashboard on their computer screen. If a patient's condition deteriorates, an automatic alert appears, allowing the medical staff to take immediate measures. This system minimizes the medical staff's direct contact with the patients and allows for the real-time monitoring of many patients with only a small number of medical staff.[30]

[29] file:///C:/Users/user/Downloads/All%20about%20Korea's%20Response%20to%20COVID-19.pdf
[30] file:///C:/Users/user/Downloads/All%20about%20Korea's%20Response%20to%20COVID-19.pdf

Malaysia

Categories of digital tools for COVID-19 prevention and control	Measures taken
• Information Enquiry Platform and Connection Point	• Press briefly televised live on TV and social platforms
• Tracking (including import management and CBS)	• Contact tracing app • MySejahter a- helps users monitor their health condition and the government mitigate the situation
• Quarantine Measure	X
• Stockpile and allocation of essential medical resources	X
• Safety Net	X
• Diagnosis	X
• Telemedicine	X
• Social distancing	X

In response to the COVID-19 pandemic, the government has reviewed the implemented measures, i.e., Movement Control Order (MCO), based on the economy's pandemic situation. Most states in Malaysia are in Phase One of the movement control under the National Recovery Plan (NRP)[31]. Moreover, MySejahtera is an application developed by the government to assist in monitoring COVID-19 outbreak in the economy by empowering users to assess their health risk against COVID-19. This application also provides the Ministry of Health (MOH) with the necessary information to plan for early and effective countermeasures. It is to assist the government in managing and mitigating the COVID-19 outbreak, help users monitor their health and get treatment throughout the pandemic, as well as locate nearest hospitals and clinics for COVID-19 screening and treatment.[32]

[31] https://www.flandersinvestmentandtrade.com/export/nieuws/coronavirus-%E2%80%93-situation-malaysia

[32] https://mysejahtera.malaysia.gov.my/intro_en/

Mexico

Categories of digital tools for COVID-19 prevention and control	Measures taken
• Information Enquiry Platform and Connection Point	• Gobierno de Mexico-official government portal
• Tracking (including import management and CBS)	• COVID-19MX -an official app that allows users to perform self-diagnosis, track the symptoms of several people, find hospitals and check their capacity, and consult official information. Also includes advice and FAQs.
• Quarantine Measure	X
• Stockpile and allocation of essential medical resources	X
• Mental Health	• Línea de la Vida: 800 911 2000(Phone line)
• Safety Net	• Official Hotline: 5586338589 • Each state in the economy has a line for emergencies and guidance regarding COVID-19
• Diagnosis	• Detection of suspicious cases through the use of technological tools
• Telemedicine	• Telehealth services in the State Secretaries of Health
• Social distancing	X

In Mexico, a daily monitoring of all the variables and parameters that allow identifying the magnitude of the risk has been carried out weekly at the meetings on COVID-19[33]; in such a way that people can identify the level of epidemiological risk they are at and adjust the activities to engage in.

In terms of digital prevention, Santander Mexico and BBVA Mexico have provided the local government with an app for people to perform a covid-19 self-diagnosis, find their nearest hospital and receive official information easily and securely. The app connects to other public services, such as the SMS service launched by Mexico City to fight the pandemic. The app has been developed in two parts: Mobile application (covid-19 CDMX app) and command control. The app allows users to perform a self-diagnosis, track the symptoms of several people, find hospitals, and check their capacity, as well as obtain official information. It also includes advice and FAQs. As for Command control, the Mexico City Government manages the platform centrally with the command control. This brings together all the data generated by the app in real time, providing online control and tracking for a prompt response.[34]

[33] https://www.gob.mx/sre/en

[34] https://www.santander.com/en/press-room/press-releases/2020/05/santander-mexico-and-bbva-mexico-provide-mexico-city-government-with-app-to-fight-covid-19

As a consequence of the actions implemented by the authorities for the containment and mitigation of COVID-19 cases, symptoms and mental health problems began to appear reason why the Ministry of Health in Mexico implemented a telephone attention for the population through the **Línea de Vida (Lifeline) 800 911 2000** a 24/7 service, in order to provide counseling or emotional support. Fourteen Health Institutions have joined this service, also, educational, preventive teaching material and a questionnaire regarding detection of risks for mental health are provided through the official website of Coronavirus in Mexico.[35]

It was on October 2020 that The National Telementoring Program was established, it´s main goal was to feed the human capital of the health professionals belonging to the first and second level of attention, by providing advice and guidance regarding their clinical practice through mental health specialists, as a result the population may be able to receive an appropriate care in order to satisfy their needs.[36]

Telephone lines for emergencies and guidance on COVID-19 were established in each one of the 32 states of the economy, it´s main goal was to provide support and attention to the population in case of having symptoms of respiratory disease.[37]

The government, through its State Health Secretariats has implemented digital health services supported by technological tools, such as mobile applications, chatbots, web platforms, as well as telephone assistance systems for self-diagnosis, detection of suspected cases of COVID-19, as well as coordination and referral of patients between the different medical institutions in the economy.

The government has also worked in order to achieve strength and implementation of telehealth actions through the grant of remote triage, counseling services about cases regarding patients with COVID-19. In addition, it is important to mention that as a strategy for the continuity of care services, the reinforcement of consultation, triage, advice, follow-up, monitoring and remote visit services to non-COVID-19 patients took place. To close this idea, it is important to highlight that distance education actions were also carried out for health professionals and coordination of remote services between institutions; having as a result a total of 5,741,033 telehealth actions during the year 2020[38] and for the first

[35] Information on emotional support services and mental health care by telephone. Source: https://coronavirus.gob.mx/salud-mental/

[36] The National Telementoring Progam. Source: https://www.telementosaludmental.org.mx

[37] Telephone lines for emergencies and guidance on COVID-19. Source: https://coronavirus.gob.mx/contacto/

[38] Information provided by 20 of the 32 State Health Secretariats which entirely belong to the Mexican

semester of 2021 a total of 7,981,482.[39]

government. Source: https://cenetec-difusion.com/observatoriotelesalud/info-prog-tm/

[39] Information provided by 25 of the 32 State Health Secretariats which entirely belong to the Mexican government. Source: https://cenetec-difusion.com/observatoriotelesalud/info-prog-tm/

New Zealand

Categories of digital tools for COVID-19 prevention and control	Measures taken
• Information Enquiry Platform and Connection Point	• Ministry of Health social media, News and media updates
• Tracking (including import management and CBS)	• NZ COVID Tracer app
• Quarantine Measure	X
• Stockpile and allocation of essential medical resources	X
• Safety Net	X
• Diagnosis	X
• Telemedicine	• COVID-19 – GPs are still open for business
• Social distancing	X

Like other economies, Ministry of Health New Zealand provides the latest updates[40], information and advice on COVID-19 in New Zealand including daily cases and testing rates. Moreover, the NZ COVID Tracer app is a private and easy way to keep track of where people have been. It helps contact tracing go faster when a case of COVID-19 is detected and stops the virus from spreading. Generally, the NZ COVID Tracer app scans QR codes and creates a private digital diary of the places the users visit[41]. The app uses Bluetooth tracing to keep an anonymized record of the people they have been in close contact with, registers their contact details so contact tracers can get in touch if they need to, and saves the National Health Index (NHI) number to speed up the process if a test is needed. Finally, it also locates nearest testing center and offers other useful information.

During the pandemic, General Practitioner (GPs) are working differently to try and reduce the spread of COVID-19. This means they are doing non-urgent appointments by text, email, phone or video. However, if patients need to see their GP in person, they can still do that safely. People can still get the medical advice they need. GPs may see patients using telehealth, via phone calls, sending texts or emails or using a video call. People will still get the same level of expert medical advice as they normally would. In some cases, GP will still need to see the patient in person. If people need to go into their practice, GPs will care for them safely and protect them from the risk of COVID-19[42].

[40] https://www.health.govt.nz/our-work/diseases-and-conditions/covid-19-novel-coronavirus/covid-19-news-and-media-updates

[41] https://www.health.govt.nz/our-work/diseases-and-conditions/covid-19-novel-coronavirus/covid-19-resources-and-tools/nz-covid-tracer-app

[42] https://www.healthnavigator.org.nz/health-a-z/c/covid-19-gps-are-still-open-for-business/#:~:text=GPS%20are%20still%20'open%20for,or%20using%20a%20video%20call.

Papua New Guinea

Categories of digital tools for COVID-19 prevention and control	Measures taken
• Information Enquiry Platform and Connection Point	• Official COVID-19 Website - Joint Agency Task Force National Control Center for COVID-19
• Tracking (including import management and CBS)	• The State of Emergency Online Application Portal -The system will monitor and keep track of personal passes and vehicle passes thus improving security of the citizens and service providers.
• Quarantine Measure	X
• Stockpile and allocation of essential medical resources	X
• Safety Net	• Official toll-free inquiry hotline:1800 200
• Diagnosis	X
• Telemedicine	X
• Social distancing	X

The government provides daily updates on cases detected and total infections as well as Frequently Ask Questions (FAQ) on COVID-19 online. PNG has also developed The State of Emergency Online Application Portal (SOE Pass Application Portal), an initiative of the Department of Communication Information Technology, The Police Ministry and Business Council PNG, to implement a digital solution to allocate personal and vehicle passes to essential service providers during the period of lockdown. The primary purpose of the passes is to manage the movement of citizens to avoid the spread of Covid-19. The system will monitor and track personal passes and vehicle passes, thus improving security of the citizens and service providers.[43]

Other than previous tools, PNG Flying Labs has built and run an afterschool education program named “Coding against COVID-19,” focusing on youth’s wellbeing. This program introduces young students to aerial drones, digital tools, and algorithms while raising the awareness of practices to reduce the transmission of COVID-19 and thus remain safe during the pandemic.[44]

[43] https://covid19.info.gov.pg/covid-19-awareness/
[44] https://flyinglabs.org/png/

Peru

Categories of digital tools for COVID-19 prevention and control	Measures taken
• Information Enquiry Platform and Connection Point	• Plataforma Digital Unica del Estado Peruano
• Tracking (including import management and CBS)	• SICOVID, Official COVID-19 software for suspect registration, antigen testing and patient monitoring • DECLARATION OF TRAVELERS • CONTACTCOVID
• Vaccination	• Vaccination • **National Universal Vaccination Register against COVID-19** • **Dashboard of immunizations against COVID-19**
• Quarantine Measure	• ContactCovid, self-evaluation and report contacts.
• Stockpile and allocation of essential medical resources	• Sala Situacional • **Excess mortality dashboard** • **KPI COVID-19 dashboard**
• Safety Net	X
• Diagnosis	X
• Telemedicine	• SISOL • Teleatiendo • 113 Salud
• Social distancing	X

Plataforma Digital Unica del Estado Peruano is a comprehensive platform providing reliable information regarding the pandemic such as prevention measures, common symptoms, patient care, vaccination, etc. The platform also contains daily updates of confirmed cases, sample tested and the number of deaths. Furthermore, the users can also share their location in order to protect others and themselves.

It is crucial to have sufficient personal protection equipment and to monitor the availability of medical resources. Sala Situacional is created to organize the stockpile of ICU beds, ventilation equipment and ensure they are appropriately distributed. Such a platform also allows frontline workers to keep track of the resources and evaluate the readiness of the system. Though faced with the pandemic, necessary medical services for both chronic and emergent patient care should still be offered. To tackle this situation, several solutions have been provided by the government such as SISOL, Teletiendo, and 113 Salud, in collaboration with some innovators. These are the measures and platforms to tackle the pandemic using telemedicine.

SICOVID: It's the system that allows the longitudinal follow-up of the patient infected by SARs-COV-19. The SICOVID allows the registration of the following formats: F00: Triage format, F100.1: Antigen test performance record, F200: Epidemiological investigation form, F300: Clinical follow-up record format (SC), F300.1: Mental Health follow-up record format (SSM), F400: Pre-hospital care format, F500: Hospital care form and F600: Death Certificate.

DECLARATION OF TRAVELERS: The use of this tool is aimed at the prevention and control of COVID-19 in travelers entering and leaving the economy by air, land and river in the context of the health emergency due to the COVID-19 pandemic.

CONTACTCOVID: Allows everyone who enters the border (international traveler) as well as the population living in Peruvian territory, to report daily their health status (Symptoms and warning signs) and that of their contacts (family circle) by a period of 10 days as part of the protocol established by the Ministry of Health.

VACCINATION

Registration of Undocumented for Vaccination against COVID 19: Allows the registration of people who go to a Vaccination Center for their vaccine against COVID 19 and do not have any Personal Identification document, in order to identify them later through the National Registry of Identification and Civil Status or National Superintendency of Migrations for Peruvians and foreigners

Aplication of Vaccinator : It allows the registration of the application of the vaccine; and the management of the incoming and outgoing stocks of vaccines received by the Vaccinators Allows the management of the Vaccination Centers by COVID 19 and allows the registration of the Vaccination Programming by the regional health directorate

Load Register for Vaccination COVID 19: It allows public and private entities to upload to the register the list of people who should be vaccinated according to the prioritized load group for vaccination by COVID 19, such as: Health Personnel, Oncological Patients, Pregnant Women, HIV Patients with HIV, validating the data to be registered with the National Registry of Identification and Civil Status (identification of people), economy-wide death registry (deceased), health information system (Persons vaccinated), and validation of other necessary data according to the prioritized load group.

Vaccination Card and Vaccination Certificate COVID 19: It allows the visualization of

the Vaccination Card and the obtaining of the Vaccination Certificate for COVID 19 issued by the Ministry of Health, it also allows to register the request for Regularization and / or Correction of Personal Data and / Vaccination Data for the Vaccination Certificate for COVID 19 issued by Ministry of Health.

National Universal Vaccination Register against COVID-19. It is a database of all Peruvians, which together with the database of vaccinated people, allows the programming of the date, place and dose of vaccination in order to avoid crowds; In addition, it allows verifying if people were previously vaccinated, avoiding duplications.

Dashboard of immunizations against COVID-19. It is a public information panel that shows the doses of vaccine applied according to the number of doses, age group, manufacturer and district, province and department of the economy. It is available at the following link:
https://www.minsa.gob.pe/reunis/data/vacunas-covid19.asp

KPI COVID-19 dashboard. It is an internal information board aimed at officials of the Ministry of Health to guide decisions on the distribution of human, logistical and financial resources in the different regions of the economy. It is available at the following link: https://dph.minsa.gob.pe/covidkpi2/menu/ (It needs user and password)

Excess mortality dashboard. It is a public information board that shows the excess mortality by epidemiological weeks and by district, province and department of the economy. During the first wave of the pandemic, it was the indicator preferably used for the implementation of control measures and the distribution of resources to contain the pandemic. It is available at the following link: https://www.minsa.gob.pe/reunis/data/exceso_mortalidad.asp

The Philippines

Digital tools for COVID-19 prevention, management, and control	Measures taken by The Philippines
• Information Enquiry Platform and Connection Point	• COVID-19 Tracker • Tanod Kontra COVID
• Tracking (including import management and CBS)	• StaySafe.PH & other local contact tracing applications • FASSSTER
• Quarantine Measure	• StaySafe.PH & other local contact tracing applications
• Stockpile and allocation of essential medical resources	• COVID-19 Supply Management Tracking System • DOH Data Collect Application
• Safety Net	• COVID-19 Hotline • One Hospital Command System • KIRA KontraCOVID PH • Tanod Kontra COVID
• Diagnosis	• COVID-KAYA • COVID-19 Document Repository System (CDRS)
• Telemedicine	• Engagement of 3rd-party Telemedicine Providers • Partnership with LGUs, including public and private health facilities on the implementation and use of telemedicine
• Social Distancing	• StaySafe.PH & other local contact tracing applications
• Vaccination Digital Solutions	• Vaccine Information Management System (VIMS) • COVID-19 Electronic Immunization Registry (CEIR) • Digital Vaccination Certificate (VaxCertPH)

In strengthening health system response and resilience, and easing the transition to new normal from the coronavirus disease 2019 (COVID-19) health situation, the Philippine Government has rationalized, mainstreamed, and maximized the adoption and use of innovative information and communications technologies (ICTs) for health, also known as digital health/eHealth, to bridge the access gap for the delivery of continuous, coordinated, and integrated health services and information even to the remotest areas and most vulnerable populations in the economy. At the helm of the implementation of various digital health/eHealth innovations for COVID-19 response is the National Inter-Agency Task Force for the Management of Emerging Infectious Diseases (IATF-EID) as the overall governance and decision-making body, and as assisted by a Sub-Technical Working Group on ICT Solutions (STWG-ICT) that provides policy, technical, and operational recommendations on matters relating to COVID-19 ICT solutions.

Among these digital health/eHealth innovations for COVID-19 response are:

1. **Digital contact tracing,** which allows early detection of cases from those who may have been exposed to known cases and thus reduce viral transmission. The economy's official contact tracing application is StaySafe.PH. Still, the Philippine Government continues to encourage and collaborate with innovators to develop

applications that support this digital health intervention, and likewise, ensures that interoperability of various contact tracing applications is achieved for seamless and integrated data processing for decision-making.

2. **Telemedicine**, which has enabled patients and individuals to receive health services even while staying at home through increasing access to doctors who can provide COVID-19 and non-COVID-19 primary care consultations. By diverting access to primary care services to telemedicine consultations, health facilities are decongested of non-emergency, non-life threatening, non-COVID-19 face-to-face primary care consultations; thus, allowing these health facilities to focus more on the management of moderate to severe COVID-19 cases, among others.

The Philippine Government through its Department of Health (DOH) launched a National Telemedicine Service Program in March 2020, where the Department vets and engages 3rd party telemedicine service providers, and partners with select local government units (LGUs) that have expressed their intent to collaborate for implementing telemedicine services within their respective localities. To date, the DOH has engaged a total of nine (9) 3rd party telemedicine service providers, and seven (7) LGUs. In support to the concurrent implementation of the Philippine Universal Health Care (UHC) Act, the DOH has mandated to its regional offices, Centers for Health Development (CHDs) to activate and expand the implementation of telemedicine services in all public and private health facilities.

3. **One Hospital Command System,** which enables coordination between health facilities and health care provider networks (HCPNs), and streamline the referral and transfer of COVID-19 cases. Specifically, the OHCS facilitates medical transport and patient pick-up arrangements, provides health system capacity data analytics and risk communications, and optimizes the use of medical care services at the economy-wide level.

4. **COVID-19 Hotline**, a full scale DOH health information and medical consultation service using various communication channels (i.e. phone call, chat, SMS, and email). It operates at a 100% service availability, 24/7 with toll-free capability and at least 90% handled calls.
5. **COVID-19 Information Systems,** which have eased the collection, processing, and submission of COVID-19 and other health-related data from various points of services, and generation of critical health reports by Philippine public health authorities for policy development and program planning.

The following are the major Philippine COVID-19 information systems:

a. ***COVID-KAYA***: for case management
b. ***COVID-19 Document Repository System (CDRS)***: for laboratory results submission
c. ***Feasibility Analysis of Syndromic Surveillance using Spatio-Temporal Epidemiological Modeler (FASSSTER)***: for data analytics and decision-making
d. ***Tanod Kontra COVID***: for symptom reporting and chat services
e. ***COVID-19 Supply Management Tracking System***: for central logistics and warehousing, supply distribution and allocation, and distribution logistics
f. ***COVID-19 Tracker***: for case statistics
g. ***DOH Data Collect***: for health service statistics

6. **COVID-19 Vaccination Digital Solutions**, which enabled accurate, timely, and efficient distribution and administration of COVID-19 vaccines to eligible population groups in the economy.

The following are the major Philippine COVID-19 vaccination digital solutions:

a. ***COVID-19 Vaccine Information Management System (VIMS)***, the official key process automation, data management system, and data repository of the Philippine COVID-19 Vaccination Program that is being used for: immunization registration and administration; supply chain management of the COVID-19 vaccines, including healthcare waste management and reverse logistics; monitoring of vaccine and immunization safety and effectiveness; and measuring real-time and equitable vaccine uptake and coverage over time by geography and eligible population groups.

   The COVID-19 VIMS has the following minimum platforms:
   i. VIMS-Immunization Registry (VIMS-IR) – masterlisting, registration, screening, and verification of eligible population groups;
   ii. VIMS-Vaccination Administration System (VIMS-VAS) – scheduling, communication and grievance management, and vaccine administration, including issuance of the vaccine card;
   iii. COVID-19 Bakuna Center Registry (CBCR) – registration and verification of designated vaccination sites;

iv. COVID-19 Supply Chain Management Tracking System (CSCMTS) – central logistics and warehousing, vaccine distribution and allocation, and distribution logistics;
v. VIMS-Inventory Management (VIMS-IM) – vaccine post-inventory management, healthcare waste management, and reverse logistics;
vi. VigiFlow – recording, processing and sharing reports of adverse events following immunization (AEFI);
vii. VIMS-Data Warehousing – data consolidation, integration, processing, and repository; and
viii. COVID-19 Vaccination Quick Count & Reporting Dashboards – analytics, dashboard and report generation.

At the start of the implementation of the Philippine COVID-19 Vaccination Program in the last quarter of 2020, the DOH developed the COVID-19 Electronic Immunization Registry (CEIR), a COVID-19 vaccination digital solution intended for masterlisting, registration, screening, and verification of eligible population groups, scheduling, and vaccine administration. To date, the solution remains operational, but its adoption and use is only limited to select health facilities and institutions.

b. **Digital Vaccination Certificate (VaxCertPH)**, which is the official key process automation, data management system, and data repository of the Philippine Government relative to the application, processing, issuance, and management of digital vaccination certificates (VaxCertPH).

To streamline the development and implementation of various COVID-19 digital health/eHealth solutions, the Philippine DOH has implemented an assessment and evaluation mechanism of 3rd party proposals on COVID-19 ICT solutions, following established criteria and other qualifying requirements to ensure user protection and safety, guarantee privacy and data protection, and prevent redundancies and duplication of efforts, among others. Likewise, the Philippine Department of Information and Communications Technology (DICT) has also implemented a department vetting and evaluation mechanism for all ICT services, products, and applications for Philippine Government use in addressing the COVID-19 situation. Formalized through DICT Department Circular 009 dated 29 May 2020, this mechanism requires that all donations of ICT services, products and applications for government use in COVID-19 response must undergo departmental vetting and evaluation using a defined framework of ICT best practices and standards on ICT service management; project management; enterprise architecture; cybersecurity; and data privacy.

Donations are initiated by submitting a Letter of Intent indicating the details, terms, and conditions of donation duly supported by a favorable indorsement of the end-user agency.

At the lawmaking level, an eHealth/digital health-related Bill is undergoing legislative approval in the Philippine Congress. The Bill aims to direct and regulate the use, practice, and implementation of eHealth in the economy with its key provisions taking after the policy and strategic challenges and lessons learned during the ongoing COVID-19 pandemic.

Russia

Categories of digital tools for COVID-19 prevention and control	Measures taken
• Information Enquiry Platform and Connection Point	• General COVID-19 information website
• Tracking (including import management and CBS)	• Pass Entry System-QR code that people download on their phones. They need to fill out personal health information if they want to travel. • Automated face recognition system- a system first used to control citizen prescribed to self-isolate after coming back from China
• Quarantine Measure	• Social Monitoring-tracks users via GPS and sends them notifications at random times demanding a selfie to prove they're home
• Stockpile and allocation of essential medical resources	X
• Safety Net	X
• Diagnosis	X
• Telemedicine	• Telemedicine center in Moscow-Doctors treat patients with mild COVID-19 symptoms via video call
• Social distancing	X

Russia has recently adopted the Digital Economy Program, National Data Management System Concept, and the Artificial Intelligence Strategy, which demonstrated Russia's aspiration to be a digital leader. A clear, agile, and comprehensive data policy is key to achieving this goal. The growing focus on digital transformation in Russia is prioritized. In the past decade, Russia had focused on developing broadband internet access and built a strong digital infrastructure characterized by a competitive telecommunications market, high rates of mobile penetration, affordable broadband, and a high level of cybersecurity. This infrastructure has enabled the growth of strong domestic and localized digital platforms and can now be used to launch 5G mobile networks to create a more efficiently distributed network of data centers, develop local companies in the data analytics space, and accelerate the use of emerging technologies such as the Internet of Things (IoT), AI, robotics, and blockchain.

COVID-19 has highlighted the importance of digital health to the critical role of medicines across the patient-care pathway in the future. The main legal trend which can be found in the field of digital healthcare in Russia is the development of the legal environment to support automatic systems used in the healthcare sphere. This support is connected to personal data protection and developments regarding the form and order of obtaining a personal data processing consent from a patient. In order to make personal data processing in digital healthcare more effective and safer, it is necessary to improve legal regulations governing the exchange of information in the healthcare sector, e.g., the Regulations on the Unified State Information System in Health Care approved by the Government of the Russian Federation.[45]

Article 36.2 of the Federal Law № 323-FZ dated November 21, 2011 "On protecting the health of citizens in the Russian Federation" regulates the specifics of medical care provided using telemedicine technologies. The Order of the Ministry of Health of the Russian Federation № 965n dated November 30, 2017 approved the Procedure for organizing and providing medical care using telemedicine technologies.
The specified acts have:
- validated the term "telemedicine technologies";
- established the procedure for remote doctor-to doctor and doctor-to-patient/ doctor-to-patients' legal representatives interaction;
- formulated requirements for remote monitoring of the patient's health;
- determined the conditions for the correction of previously prescribed treatment using telemedicine technologies;
- approved requirements for the identification and authentication of a doctor and a patient, as well as requirements for documenting information on the provision of medical care to a patient using telemedicine technologies, including entering information into a patient's medical records, using an enhanced qualified electronic signature of a medical worker.
By order of the Ministry of Health of Russia № 198n, dated March 19, 2020 "On the temporary procedure for organizing the work of medical organizations in order to implement measures to prevent and reduce the risks of the spread of a novel coronavirus infection COVID-19", federal remote advisory centers were put into operation for consultations and council of doctors on diagnostic issues and treatment of COVID-19, It also has determined the procedure for organizing and providing medical care using telemedicine technologies to citizens treated at home with a confirmed diagnosis of COVID-19 and / or pneumonia, acute respiratory viral infections, influenza.

[45] https://practiceguides.chambers.com/practice-guides/digital-healthcare-2021/russia/trends-and-developments

Singapore

Categories of digital tools for COVID-19 prevention and control	Measures taken
• Information Enquiry Platform and Connection Point	• Built a task force across multiple government agencies to coordinate interventions and messaging during any future pandemics • COVID-19 Situation Report on the Ministry of Health's website[46]
• Tracking (including import management and CBS)	• Economy-wide level WhatsApp group for one-way messaging (Gov.sg WhatsApp) • TraceTogether application/token[47] • Biovitals Sentinel Platform - 24/7 monitoring of confirmed but not acute cases in Community Care Facilities using a sensor, a dashboard and AI technology[48]
• Quarantine Measure	• Stay-Home Notice Tracking Solution through electronic monitoring devices[49]
• Stockpile and allocation of essential medical resources	• MaskGoWhere
• Safety Net	• FluGoWhere (to search through a list of Public Health Preparedness Clinics (PHPCs) providing special subsidies conveniently and easily for those diagnosed with respiratory illnesses.)
• Diagnosis	Pilot programme for virtually supervised COVID-19 Antigen Rapid tests[50]
• Telemedicine	Telemedicine providers provide medical assistance for those under the Home Recovery Programme[51]
• Social distancing	Use of real-time maps showing crowd levels at various locations in Singapore[52]
• Cross border solution	• Digital authentication of COVID-19 vaccination and pre-departure test certificates[53]

[46] https://www.moh.gov.sg
[47] https://www.tracetogether.gov.sg
[48] https://www.edb.gov.sg/en/business-insights/insights/innovation-in-a-crisis-singapore-flexes-biomed-chops-against-covid-19.html
[49] https://safetravel.ica.gov.sg/health/shn
[50] https://www.straitstimes.com/singapore/health/moh-conducting-pilot-for-virtually-supervised-covid-19 - antigen-rapid-tests
[51] https://www.covid.gov.sg/unwell/hrp
[52] https://www.nlb.gov.sg/visitors
https://www.nhb.gov.sg/visit/check-crowd-status-level
https://safedistparks.nparks.gov.sg/
https://www.spaceout.gov.sg/
[53] https://www.notarise.gov.sg/

Beginning in 2003, Singapore has built a task force across multiple government agencies to coordinate interventions and messaging during any future pandemics. This task force was tested in 2009 during the H1N1 pandemic and again in 2016 during the Zika outbreak. It was reassembled in January 2020 for SARS-CoV-2[54].

During the pandemic, the TraceTogether programme was developed to support existing nationwide efforts to combat COVID-19 by enabling community-driven contact tracing. Comprising of the TraceTogether Application and Token, it allows the identification of people who were in close proximity to an infected person more efficiently using Bluetooth handshakes. This enabled Singapore reduce the time taken for contact tracing from 2-3 days to less than a day for most cases.[55]. In tandem with TraceTogether, Singapore has also adopted an economy-wide digital visitor registration system that logs the details and contact information of individuals visiting hotspots, workplaces of permitted enterprises as well as selected public venues to prevent and control the transmission of COVID-19. From 17 May 2021, Check-ins must be performed using the TraceTogether Application or Token through the scanning of a QR code or via a Gateway device. Permitted enterprises are advised to stand ready to adapt entry arrangements at their premises to new methods if they want to be confident in meeting statutory requirements[56].

Telecommunications regulator in Singapore is supporting the business community,. It has worked with infocomm industry leaders to put together a suite of technology solutions for remote working, visitor management, and productivity improvement.

[54] https://www.statnews.com/2020/03/23/singapore-teach-united-states-about-covid-19-response/
[55] https://support.tracetogether.gov.sg/hc/en-sg/articles/360052744514-How-will-these-different-TraceTogether-devices-contribute-to-contact-tracing-efforts-#:~:text=The%20use%20of%20digital%20contact,the%20spread%20of%20the%20virus.
[56] https://www.gobusiness.gov.sg/safemanagement/safeentry/

Chinese Taipei

C**ategories** o**f** digital tools for COVID-19 prevention and control	Measures taken
• Information Enquiry Platform and Connection Point	• Central Epidemic Command Center (CECC) • CDC official APP
• Tracking (including import management and CBS)	• Integrate patients past 14-day travel history with their NHI identification card data • import QR Code • Mobile positioning data (CBS)
• Quarantine Measure	• Digital Fence
• Stockpile and allocation of essential medical resources	• Face Mask pre-ordering system
• Mental Health	• 1925 mental health consultation service • Mood thermometer guidebook
• Diagnosis	X
• Telemedicine	• More than 3,000 domestic medical institutions offer telemedicine for people in isolation as part of the economy's COVID-19 response measures
• Social distancing	• Freeway 1968, indicating real-time highway conditions and crowd warnings • Social Distancing App
• Cross border solution	• Issue digital COVID-19 certificate and join the EU Digital COVID Certificate system

Chinese Taipei has mobilized tailored policies for combating COVID-19. The Central Epidemic Command Center (CECC) has been established to conduct cross-sectoral coordination in government for sharing and reporting daily updated COVID-19 epidemic information through holding a regular press conference every day. It not only allows the public to receive first-hand information, but also establishes a channel for the authorities concerned to quickly respond to media's questions. Chinese Taipei has also employed multiple media channels to timely announce information, such as the official Line and Facebook accounts to strengthen the mutual trust between the public and private sector, as well as consolidate the public-private partnership during the pandemic.

Regarding tracking and quarantine measures, Chinese Taipei has used numerous innovative technologies to assist border control. For example, all travelers are required to scan a QR Code to access the "Quarantine System for Entry" website and before taking off or after landing and should fill out a health declaration online form. All travelers are required to undertake 14-day home quarantine or home isolation measures. Through the "Digital Fencing", the location of people under home isolation and home quarantine can be monitored by detecting electromagnetic signals of their mobile phone to determine if they break quarantine rules.

To properly allocate face masks among citizens, Chinese Taipei has established the face mask management platform according to the MediCloud system through implementing the Real-name system. Everyone can purchase face masks by showing their personal health insurance card to the authorized shops. To increase the access to face masks, citizens can also pre-order face masks online or in convenient stores.

With regard to mental health–relates service amid COVID-19 pandemic, Chinese Taipei has set up 1925 mental health consultation service to provide 24 hours free consultation services to those affected by mental issues. Chinese Taipei also published mood thermometer guidebook for people to be able to briefly measure their mental conditions.

Regarding the development of telemedicine during the pandemic, more than 3,000 medical institutions have offered telemedicine for people in isolation as part of Chinese Taipei's COVID-19 response measures. Chinese Taipei announced on May 11, 2018 the "Measures for Communication Diagnosis and Treatment", which stipulates that five types of patients with special circumstances can receive telemedicine treatment, not limited to remote areas in mountainous and remote islands, laying a legal foundation for telemedicine. On 29th, November 2019, the "Reference Principles for Approved Work of Psychologists Performing Communication Psychological Counseling Services" was promulgated, allowing psychologists to conduct psychological counseling with clients through long-distance communication in institutions that have applied for communication psychological counseling services.

In response to the pandemic, Chinese Taipei expanded the scope of original "Communication Diagnosis and Treatment Measures" in February 2020. The measures can be applied to those that are at home quarantine or who cooperate with home quarantine regulations, allowing doctors in the hospital to conduct diagnosis and treatment through computer, mobile phone or tablet video, and even prescribe medicine for those who are quarantined or isolated at home.

People who are isolated and quarantined at home, if they have no symptoms of respiratory infection or fever (≧38°C), but need to receive medical services immediately, they can call the 1922 pandemic prevention hotline first, and the dedicated line staff will assist in referral to the designated hospital to arrange communication diagnosis service. The designated hospital is not possible to directly accept applications for telemedicine medical examinations from people who are isolated and quarantined at home. If citizens still need to go to the hospital for medical treatment later, citizens must wear a mask to go to the designated hospital for medical treatment (no public transportation is allowed), or the health bureau's

epidemic prevention line will assist in arranging an epidemic prevention taxi to escort the doctor.

Also, On December 8 last year, the revised draft of the "Measures for the Production and Management of Electronic Medical Records in Medical Institutions" was announced. It relaxed the regulations that hospitals can find professional institutions to assist in setting up electronic medical record information systems, which can be uploaded to the cloud and can be exchanged or used across institutions with the aim to assist the development of telemedicine in Chinese Taipei.

In response to the demand for telemedicine owning to the pandemic , Chinese Taipei issued a notice on 10th and 19th Feb. stating that people in home quarantine who need medical treatment will be included in remote diagnosis and treatment, and put out another notice for insured subjects who are under home isolation or quarantine due to the pandemic. It says the cost of video diagnosis and treatment is covered by the total health insurance budget, and the care targets are those who are cooperating with isolation and quarantine and have no fever or any respiratory symptoms referred by the Health Bureau and those with urgent medical needs.

The “Freeway 1968” and “Social Distancing” apps are available for download. “Freeway 1968” provides users with one-click dialing of the 1968 customer service line, and integrates various road conditions information on a single page with geographic information (GIS) technology. Users can check the real-time road conditions of expressways and access CCTV real-time images at any time, so the users can grasp the real-time traffic and crowd conditions instantly.

For the latter, it was jointly developed by the Centers for Disease Control and Prevention of the Ministry of Health and Welfare and the “Artificial Intelligence Laboratory”. It allows users in Chinese Taipei to receive COVID-19 exposure notifications, and reminds users who receive exposure notifications to contact the local health bureau to reduce the risk of infection. The objectives are 1) Protect personal privacy: Social interactions are estimated using mobile phone Bluetooth, and data is stored anonymously on personal mobile devices to ensure personal privacy; 2) Reduce exposure risk by reducing the number of interactions: simulate the number of social interactions as a reference for people's decision-making on travel, commuting, and shopping; 3) Use on a voluntary basis: Apps can be installed or removed at will; 4) Reduce economic shocks: Not only do people reduce the number of interactions, but businesses also operate in a way that reduces social interaction, which can reduce the possibilities of the government issuing measures to force the suspension of

economic activity; 5) Reduce the risk of contagion: People are encouraged to continue their daily lives and reduce unnecessary physical contact; 6) Save lives: A confirmed case can share contact information with those who have been in contact with him on the condition of anonymity. Save other lives with privacy in mind.

As for the digital COVID-19 certificate development, Chinese Taipei has issued the digital COVID-19 certificate referring to EU Digital COVID Certificate (DCC), WHO's Smart Vaccination Certificates (SVC), and the COVID-19 Vaccination Record Card of TCDC since December 28th, 2021.

Chinese Taipei adopted the JSON minimum dataset format and the internationally accepted Fast Healthcare Interoperability Resources (FHIR) format, allowing data to be transmitted and exchanged efficiently and globally. In addition, Chinese Taipei followed the General Data Protection Regulation (GDPR), which only collects and records the information required for the digital COVID-19 certificate to protect the personal information of individuals. Since December 22nd, 2021, EU has recognized the "Digital COVID-19 Certificate" as equivalent to EU Digital COVID Certificate. So far, 60 economies have joined the EU Digital COVID Certificate system, including 27 EU economies and 33 non-EU economies (and territories). The command center pointed out that the data fields, digital signatures, anti-counterfeiting mechanisms, personal data protection, QR Code display and electronic verification of Chinese Taipei's "Digital Certification of Vaccination" or "Digital Certificate of Test Results" are all in accordance with EU standards, especially personal data. The protection of personal data is completely based on the principles of minimum use, self-portability, and forgetfulness of the EU General Data Protection Regulations.

Thailand

C**ategories of** digital tools for COVID-19 prevention and control	Measures taken
• Information Enquiry Platform and Connection Point	• Thailand Covid-19 Digital Group (TCDG)-Social media groups, information sites • Daily COVID-19 News Release Report
• Tracking (including import management and CBS)	• DDC-Car e-an application for monitoring people who may be infected.
• Quarantine Measure	• SydeKick -an app that enables the government to monitor the daily behavior of at-risk groups and assists in determining whether specific individuals are detaining themselves at home in accordance with the self-isolation period.
• Stockpile and allocation of essential medical resources	X
• Safety Net	• DDC Hotline #1422
• Diagnosis	X
• Telemedicine	• Telemedicine in motion
• Social distancing	X

Pawoot Pongvitayapanu has launched the Thailand Covid-19 Digital Group (TCDG) as a Facebook community page for designers and programmers willing to collaborate to combat the outbreak using technology. There are nine subset groups under the TCDG to ensure that work is executed speedily. Many are working on a platform to track infected people or those requested to self-quarantine to allow health authorities easier monitoring. Others are handling chatbots for Covid-19 consultation with the public, technology that can identify the location of drugstores, a tool that can gauge the volume of available masks and alcohol-based gel, as well as communication channels for ways to combat the disease, promoted by influencers[57]. The Department of Disease Control (DDC) can access the data and provide recommendations for at-risk people, including those who develop Covid-19 symptoms. The app can also show travel journeys of the infected persons.

As for telemedicine, Yothi Medical Innovation District (YMID) and the Technology and Innovation-Based Enterprise Development Fund have fostered a channel where tech startups can help patients avoid visiting the hospital, allow them to consult doctors online to help reduce the chance of contracting the coronavirus. The YMID has a collection of 22 health tech startups that separately play a role in screening patients, giving basic medical advice, teleconsulting, conducting diagnoses, providing patient-care systems, and arranging medical logistics. The crisis has forced hospitals and schools to engage more in digital technology.

[57] https://www.bangkokpost.com/tech/1898735/online-ventilator

United States

C**ategories of** digital tools for COVID-19 prevention and control	Measures taken
• Information Enquiry Platform and Connection Point	• CDC Cases, Data & Surveillance webpage
• Tracking (including import management and CBS)	• Statewide contact tracing apps e.g., COVIDWise in Virginia
• Quarantine Measure	X
• Stockpile and allocation of essential medical resources	• COVID-19Surge
• Safety Net	• 1-800-CDC-INFO (1-800-232-4636)
• Diagnosis	X
• Telemedicine	• COVID-19 Telehealth Program
• Social distancing	X
• Cross border solution	• Automated Passport Control (APC)

To effectively control the pandemic, the Centers for Disease Control and Prevention has taken the leading role in this battle. The government has created a specific region for COVID-19, providing information on the prevention, control and its response to the pandemic. In addition, surveillance data as well as medical resources availability can also be accessed through the CDC Cases, Data & Surveillance webpage. This ensures that all people have a basic understanding of the pandemic. If there are still questions regarding COVID-19, people can always call CDC's hotline for consultation.

Though there is not a coordinated strategy for the tracking of COVID-19, public health authorities in a few states have developed their own contact tracing apps that send an alert notification when users are exposed to confirmed cases. For instance, the State of Utah and the State of Virginia have both launched apps using Bluetooth technology to detect exposure, namely UT Exposure Notifications and COVIDWise. COVID-19Surge is a spreadsheet-based tool that allows hospital administrators and public health specialists to estimate hospital resources and compare each hospital's capacity so that the staff can be aware of the impact of COVID-19 to better distribute their human resources and stockpile.

Due to the pandemic, U.S. government also develops a need for telemedicine to keep necessary medical services running. The government has launched the COVID-19 Telehealth Program, providing healthcare providers with funds to help them deliver telehealth services.

Regarding cross border solution, Automated Passport Control (APC) has been launched by U.S. Customs and Border Protection (CBP) that streamlines the entry process for U.S.

citizens, U.S. legal permanent residents, Canadian citizens, eligible Visa Waiver Program participants, and specific U.S. visa holder travelers, by providing an automated process through CBP's Primary Inspection area. Travelers use self-service kiosks to respond to CBP – inspection related questions and submit biographic information. APC is a free service, does not require pre-registration or membership, and maintains the highest levels of protection when it comes to the handling of personal data or information. Travelers using APC experience shorter wait times, less congestion, and faster processing.

Viet Nam

C**ategories of** digital tools for COVID-19 prevention and control	Measures taken
• Information Enquiry Platform and Connection Point	• Ministry of Health and Government Online Portal
• Tracking (including import management and CBS)	• NCOVI • Vietnam health declaration (for foreigners) • An Toan DN • Bluezone
• Quarantine Measure	• GPS Tracker bracelets
• Stockpile and allocation of essential medical resources	X
• Safety Net	X
• Diagnosis	X
• Telemedicine	• Viettel's Telehealth
• Social distancing	X

All information regarding COVID-19 is provided on the Ministry of Health and Government Online Portal and daily confirmed cases are also presented. Multiple platforms and applications established by the government have made valuable contributions towards the tracking of COVID-19. The Ministry of Health and the Ministry of Information and Communications have collaborated and developed applications to assist domestic citizens and passengers entering the economy to declare their health status, contributing to finding potential cases. Another app called An Toan DN also helps businesses and organizations to self-evaluate their safety status based on specific criteria. To alert citizens and assist them to get help from related authorities, an app using Bluetooth Low Energy technology named Bluezone was created. When a new case is confirmed, the data will be entered into the system. Whoever installed Bluezone, has their Bluetooth activated, and has contact with the confirmed case will receive a notification.

The Ministry of Information and Communications encourages health authorities to use GPS Tracker bracelets on those who are under quarantine. The bracelets will issue a warning when people isolated at home leave the house or remove the bracelets. This device will not only be effective in managing quarantine cases but also protect the health authorities' staff from being infected since they won't need to visit the homes themselves. A transformation of medical services is needed especially during this desperate time, and thus the Viettel's Telehealth was released to provide patients with virtual care, ensuring they can still receive necessary treatments. Moreover, a platform called Viettel's Telehealth enables remote medical consultation, remote surgery consultation, remote training, and remote technology transfer, and it has been adopted by many hospitals nationwide.

The Findings

To sum up, this report compiles the status of the implementation among APEC economies regarding the digital health technologies in the prevention and control of the COVID-19 pandemic, resulting in the following major findings. Firstly, all economies have established information enquiry platforms and tracking measures so as to tackle and monitor the outbreak of COVID-19. Secondly, in all COVID-19 digital prevention mechanisms, stockpile and allocation of essential medical resources, diagnosis and social distancing are three of the most under-appreciated measures. Lastly and foremost, based on the statistics and qualitative data analysis of this research, digital preparedness is highly correlated with the level of economic development.

However, limitations do exist in this report. First, this report was constructed primarily through secondary data collection and therefore lacks immediacy in obtaining information on the progress of COVID-19 digital prevention in each economy. Additionally, the purpose of this report is to provide an overview of the APEC region's digital health initiatives or policies, and it is not intended to assess the effectiveness and impact of those measures. The findings should inspire further exploration in the field for more first-hand information that leads to in-depth understanding of what has been done in every economy, as well as the outcomes and impacts of them.