PUBLIC HEALTH

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OVERVIEW: DEMOCRACY AND PUBLIC HEALTH IN ASIA

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Since 2020, the COVID-19 pandemic has been a stress test for national and international institutions. In particular, governments have been forced to reckon with how effectively their health, economic, and political systems can withstand a crisis and manage its consequences. In 2020, with public health thrust to the forefront of daily discussion and policymaking, many democracies had to rapidly develop and deploy policies that could both protect the health of the population and uphold individual freedoms. Some democratic societies in the Asia-Pacific region were initially successful in controlling the spread of COVID-19, especially in 2020 and 2021. In these highly digitalized societies, governments relied on data and technology to inform their pandemic-related policies. However, data acquisition, movement restrictions, vaccine requirements, and other policies aimed at controlling the pandemic gradually came into conflict with the democratic values and norms of personal privacy and freedom. While some of these democracies garnered global attention for their successful initial responses to the pandemic, questions about how well they have protected democratic values have remained, as well as questions about the sustainability of those responses over time.

In this third year of the COVID-19 pandemic, there is an opportunity to evaluate how societies can strengthen the resilience of the region's democratic and health systems to this crisis and future ones by adapting, evolving, and innovating. In leading the public health working group for this phase of the Brookings Democracy in Asia project, the Center for Asia-Pacific Resilience and Innovation (CAPRI) considered myriad issues in public health that became evident during the COVID-19 pandemic. Given the many ways in

which technology and data have been used in the pandemic, the working group sought to examine how Asia-Pacific democracies have harnessed the power of technology and innovation to protect public health while still giving priority to personal privacy. Drawing on its network of regional specialists, CAPRI recruited five scholars to offer their insights on the pandemic responses in Australia, India, Japan, South Korea, and Taiwan. The authors' diverse backgrounds resulted in a group of papers with different perspectives. Three papers (on India, South Korea, and Taiwan) focused on technology use and data privacy, and two papers (on Australia and Japan) offered broader case studies on the countries' pandemic responses, including the employment of technology and innovative public policy.

DEMOCRATIC GOVERNANCE DURING THE COVID-19 PANDEMIC

The three papers focusing on data and technology use during the pandemic also addressed their common topic from different perspectives — from the international to the individual levels. On South Korea, political economist June Park reflected on the reality that domestic data governance supersedes international frameworks regulating how personal data are used in research, commercial services, and public health surveillance. Given that data governance is unlikely to become standardized internationally, Park provided an example of how South Korea has defined its own rules for data governance. During the pandemic, South Korea revised its three major data regulations with the help of key stakeholders to strike a balance between

data protection for individual citizens and data utilization in the public and commercial spheres. Through data pseudonymization, a clearer legal framework, increased liability for data controllers, and clarification of what constitutes "personal information," the revised regulations attempt to protect individual privacy while facilitating the use of big data in pandemic research.

On Taiwan, Feng-Jen Jean Tsai, a lawyer and an expert in epidemic prevention and democratic governance at Taipei Medical University, examined data and technology use in the national-level pandemic response. Digital technologies and big data contributed to Taiwan's early success in controlling the spread of COVID-19. Multiple government databases, including those of the National Health Insurance system and the National Immigration Agency, were integrated to enable the government to trace, predict, and control the spread of COVID-19. However, the constitutionality of digital contact tracing and health data use is being debated because of concerns over individual privacy. Although, after the 2003 SARS outbreak, Taiwan developed a sound legal framework for government action in a health crisis, it did not govern how technology and data use should be applied to protect public health in prospective pandemics. Tsai argues that legal preparedness is crucial for governments to act effectively and maintain public trust in future crises.

Moving from the supranational perspective of Park and the national perspective of Tsai, Radhika Radhakrishnan, who specializes in gender justice and digital rights, examined the impact of digital health surveillance at the community and individual levels in India. Using a feminist approach to examine contact tracing and quarantine management apps in India during the pandemic, Radhakrishnan argues that people's data must be viewed as an extension of their bodies in order to protect their personal agency, dignity, and safety. During the pandemic, people's digital information — such as their location data, vaccination status, or recorded exposure to COVID-19 — has shaped their physical realities, such as their freedom of movement or access to public services. Without an established legal framework for data governance, India requires an approach centered on the entities that generate data to

clearly define lawful surveillance and prevent stigmatization of and violence toward marginalized communities.

The two case studies on Australia's and Japan's pandemic responses took a broader approach to the topic of public health and democratic governance. The authors note that both countries enjoy a reasonable level of public trust in the government and compliance with pandemic control policies. However, health economist Stephen Duckett of the Grattan Institute argues that the Australian government has struggled with shortcomings in transparency, accountability, and equity in its pandemic response, despite the level of trust and the successful stemming of deaths in 2020 and 2021. Different priorities and values held by the federal and state governments in Australia led to inadequate policy coordination and poor data collection. As a result of these failures, the governments could not effectively meet the communities' needs; they were unaware of how pandemic policies affected marginalized and vulnerable groups.

Yasushi Katsuma, an expert and government consultant in global health and governance at Waseda University, reviewed Japan's strategy of adopting nonpharmaceutical interventions (NPIs) as part of a "living with COVID" policy. Katsuma examined Japan's NPIs, such as restricting international travel, adopting new technology, limiting mass gatherings, and influencing personal behavior. He also evaluated Japan's successful top-down approach to pandemic control through public health campaigns and the use of technologies to perform contact tracing, educate the public, and adapt to a new reality of living with COVID-19. The government has relied on citizens' willingness to change their own behavior (for example, through avoiding the "Three Cs" of closed spaces, crowded places, and close contact and producing educational videos using the Fugaku supercomputer. Other NPIs have included encouraging the use of software such as COCOA to confirm contact with people who have tested positive for COVID-19 and replacing conventional air conditioners with ones that let in fresh outside air. However, the case study shows how the Japan government has been

careful not to implement excessive or arbitrary NPIs to ensure the protection of individual rights as appropriate in a democracy.

COMMON THEMES IN POLICY RECOMMENDATIONS

A few common themes emerged in the papers' policy recommendations that are crucial for effective democratic governance and resilience in the Asia-Pacific. First, several papers identify ways to enhance public trust, accountability, and transparency. Trust in government is a crucial factor in the success or failure of policy implementation in democracies. Taiwan and Australia's experiences during the pandemic illustrate that constant transparency around the data collected and decisions made is essential for ensuring the public's acceptance of public health policies. Transparency and trust-building also require engagement with the people. As Tsai observed, Taiwan's use of digital platforms in collaboration with civil society helped sustain public compliance with pandemic control measures. Similarly, as Radhakrishnan observed in India, Kerala state's employment of population control measures in coordination with public services, such as the distribution of food in community kitchens, helped increase public compliance.

However, public trust in government cannot be sustained without policy success and public accountability. Duckett identified the Australian government's efforts to keep decision-making power vested in elected officials as a measure that can ensure public accountability. Because trust in the government can ebb and flow, democratic tools need to be deployed to maintain it throughout a crisis, and citizens must feel assured that their rights will be protected. In Japan, where public trust in the government is high, Katsuma identified the ways in which the government encouraged behavior changes through public educational campaigns without enacting strict lockdowns or movement restrictions.

Second, several papers show how the pandemic has affected societies unequally, with lower-income and marginalized groups experiencing worse health outcomes. In Australia, lower-income communities have recorded much higher death tolls from COVID-19 than have wealthier communities. In India, health surveillance measures that have involved mobile phone apps or location tracking have resulted in members of marginalized communities being stigmatized or denied access to public services. The papers' authors note that addressing these challenges of inequality requires the integration of complete information on marginalized communities as well as the engagement of these communities in policy design and implementation.

Based on the Australian experience, Duckett identified a need for better information to be collected and shared publicly on how well public health measures are reaching underserved communities. He also identified a need for increased engagement with leaders who can advocate for their communities and facilitate policy implementation locally. In the Indian context, Radhakrishnan recommends that to protect marginalized communities from violence or stigma, COVID-19 surveillance apps and contact tracing measures should collect only the data necessary to contain disease spread. In societies where the effects of the pandemic and public health measures have been uneven, marginalized groups should be at the forefront of policy analysis as response frameworks are developed.

Finally, some papers reflect on how a crisis forces democracies to rapidly reorient and prioritize their values to create a legal framework for policy responses. The debates on data privacy in India, South Korea, and Taiwan reveal how governments' collection and use of data to protect public health might conflict with values such as personal privacy and freedom of movement. Effective policies in a public health crisis must balance the "freedoms to" speak, gather, and organize with the "freedoms from" disease, want, and poverty. The pandemic has shown that the rights and freedoms of the individual may be at odds with the policy solutions that will save the most lives. The balance struck among these competing values will involve difficult and possibly contentious decisions that may differ from country to country and region to region. The

increasing differences among the systems of data governance in China, the European Union, and the United States — differences that have widened over the course of the pandemic — illustrate the importance of this development.[1]

Engaging major stakeholders, particularly the public, in crafting legal structures that define the government's authority and the restriction or protection of personal liberties is essential. While doing so before an emergency is ideal for reducing the risks and uncertainty associated with invoking emergency powers, the five societies examined have been looking for solutions during the pandemic. For example, although, after SARS, Taiwan established a legal framework for responding to future pandemics, it did not clarify the government's authority to collect personal data, which has caused controversy in the current pandemic. In the aforementioned case of Australia, to ensure public accountability, the state of Victoria transferred decision-making power in public health emergencies from the unelected chief health officer to the elected state premier. In the midst of the pandemic, South Korea amended its data privacy laws in anticipation of the new roles technology and big data would have in its economy. Democracies must invest the time now to improve their legal frameworks to better respond to public health emergencies in the future.

MOVING FORWARD

The COVID-19 pandemic has demonstrated how public health is connected to many other challenges facing democratic governance. Thus, interdisciplinary approaches are needed to improve societal resilience. While the five papers highlight different aspects of fighting the pandemic — from data governance to public campaigns for behavior change — their policy recommendations have common themes. These include the need to (1) maintain public trust through accountability and transparency, (2) consider how to prioritize values such as equity and privacy, and (3) ensure legal preparedness for the future. Innovative policies, new technologies, and adaptive institutions will all be essential in helping societies become more resilient in

the face of increasingly common global challenges — be they pandemics, economic crises, or climate emergencies.

The authors thank the members of CAPRI for their valuable contributions to the five papers and this preface.

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AUSTRALIA'S COVID-19 RESPONSE

STEPHEN DUCKETT

DEFINING THE CHALLENGE

The COVID-19 pandemic dominated public discourse in Australia during 2020 and 2021. Overall, based on available data, Australia initially handled the pandemic well, with relatively fewer cases and deaths in the first two years of the pandemic. Independent analysis suggests that the country's strong public health actions have helped to avert approximately 18,000 deaths.[1] However, as the country relaxed public health measures and opened its borders, cases and deaths increased and cases are now in line with comparable countries, but deaths still relatively low (see table 1).

Australia is a federation (six states and two internal territories) of about 26 million people as of March 31, 2022.[2] Public health is a state responsibility under the Australian Constitution. However, controlling the pandemic has been a shared responsibility, with the Commonwealth (federal) government handling external border control and economic management as well as vaccine procurement and distribution.

Australia closed its borders to China on February 1, 2020, within weeks of recording its first case of COVID-19. Borders were closed to citizens of other countries in the ensuing weeks. All international arrivals (primarily returning Australian citizens) were initially required to self-isolate for 14 days, but following a change in policy, they were required to officially quarantine for this time period. A National Cabinet was formed on March 13, 2020, to facilitate a national response.

As an island nation, Australia limited the spread of the virus into the country primarily by using external border controls. Strong action by state governments also limited the virus' spread within states when outbreaks occurred. Yet, despite Australia's overall success in averting deaths, its response to the pandemic in 2020 and 2021 had crucial weaknesses. Like in many other countries, the economic and health effects of the pandemic were experienced unevenly, with poorer people, particularly women, faring worse. As of April 30 2022, over 140 deaths per 100,000 population had occurred in the poorest socioeconomic quintile, compared to about 40 deaths in the wealthiest quintile; on an age-standardized basis, deaths in poorer areas were 2.6 times those in wealthier ones. [3]

Political infighting — based on the different value positions of the Commonwealth government and states — hindered coordination and effective, equitable policy implementation. Further, insufficient transparency and information dissemination impeded accountability. Although the recommendations in this paper are derived from the Australian experience, they could be useful for most Asian countries seeking to improve processes, data collection, information sharing, and transparency. This paper draws on previous research, which includes additional references on Australia's response to the pandemic.[4]

ASSESSING POLICIES AND PRACTICES: THE DIFFERENT VALUE POSITIONS

The pandemic quickly exposed political strains in the Australian federation. In the first two years of the pandemic, the Commonwealth was being governed by the right-wing Liberal-National Party coalition, which, in principle,

TABLE 1

COVID-19 total cases and deaths, selected countries, as of October 1, 2022

	CASES		DEATHS	
	Number (millions)	Per million population	Number	Per million population
Australia	10.24	395,069	15,221	587
Canada	4.28	112,178	45,430	1,191
New Zealand	1.78	346,910	2,030	396
United Kingdom	23.67	351,850	207,948	3,091
United States	96.4	286,047	1,059,826	3,145
China	0.99	696	5,226	4
South Korea	24.82	478,864	28,489	550
Japan	21.33	171,167	45,023	361
India	44.59	31,682	528,673	376
Indonesia	6.43	23,500	158,122	578

Source: "Coronavirus Pandemic (COVID-19): Explore the global situation," Our World in Data, https://ourworldin-data.org/coronavirus#explore-the-global-situation.

aims to minimize government intervention. It therefore discouraged states from imposing lockdowns and other stringent public health measures such as vaccine mandates and density limits. During 2020 and 2021, approximately 60% of Australia's population lived in states with center-left Labor Party governments (the Australian Capital Territory, Northern Territory, Queensland, Victoria, and Western Australia); the remaining 40% lived in center-right Liberal states (New South Wales, South Australia, and Tasmania).[5] Nevertheless, states of both political persuasions pursued restrictive public health measures, including the closing of borders. In response, Commonwealth ministers actively undermined the measures through launching media campaigns and restricting access to government funding by affected businesses.[6] This weakened the states' social license to impose the measures.

Policies differed among the states as well. For example, the apparent triggers for invoking and revoking restrictions were different in New South Wales than in Victoria. New South Wales was slower to lock down and quicker to relax restrictions. Although all political leaders claimed that they were following expert advice

in their decision-making, the significant policy differences among the states, and between the states and the Commonwealth, suggest that either advisers were interpreting the same evidence differently or their advice was not being followed. Furthermore, the inequitable impact of the pandemic suggests that disaggregated data were either unavailable or ignored.

This is not to say that evidence should never be contested.[7] "Following the evidence" involves making judgements — especially in the early stages of a pandemic when evidence is developing rapidly — about what studies to accept or weigh highly. In addition, decisions about public health measures involve weighing the associated risks and benefits, both of which affect people unevenly; this is particularly the case when the evidence may be unclear.

BEST PRACTICES AND POLICY RECOMMENDATIONS

The analysis of Australia's response to the pandemic reveals failures in both decision-making processes and information collection and dissemination.

Better processes

Decision-making

Better processes might have helped reduce the aforementioned policy differences during the first two years of the pandemic. Public trust in both the Commonwealth and state governments was mostly high during this time. This may have been the result of extensive communication and clear political accountability. In most states, the state premier — flanked by the state's chief health officer — engaged the media every day to report the number of daily cases, hospitalizations, and deaths. They also announced new and potential future changes in public health restrictions. The presence of the chief health officer gave scientific legitimacy to the process and the decisions being made. In mid-2020, governments began to be more transparent about the criteria for revising public health measures and lifting lockdowns. This might also have contributed to increased trust and the acceptance of decisions at the time. However, the actual advice provided by chief health officers and other advisers, including the actual and modelled economic impact of public health restrictions, was not made publicly available — thus creating a democratic deficit.

The public health measures were enacted under emergency powers, and they severely restricted individual freedoms, including the freedoms of movement and association. Without transparency on the advice being offered, the public had to trust that the measures were based on expert advice and the best available evidence. In some states (for example, Victoria and Queensland), emergency powers and public health legislation gave the authority to impose public health restrictions to an unelected official, the chief health officer. In others (for example, New South Wales), lockdown powers remained vested in an elected politician.

The issue of transparency around decision-making came to a head in Victoria in late 2021, when the state government sought to extend its emergency powers.[8] By then, Victoria had endured cumulative movement restrictions for more than 200 days since the start of the pandemic. The differences between New South Wales and Victoria were becoming more apparent, with similar levels of infections leading to different restrictions. The Commonwealth government was also putting public pressure on Victoria's government to reduce public health measures and tolerate a higher level of infections.[9]

Although the vast majority of the state's residents continued to support their government's approach to public health measures, a vocal minority began to protest against ongoing public health measures imposed under "state of emergency" legislation.[10] These residents argued that the measures violated their human rights, and despite being in the minority, their protests spurred changes in Victoria's political dynamics. Special parliamentary approval was necessary to extend state of emergency legislation, but by the end of 2021, Parliament was reluctant to extend the existing arrangements without changes. Victoria's government does not have a majority in the upper house of parliament ('Legislative Council') and was therefore forced to negotiate with a range of "independent" politicians to gain parliamentary approval for new processes on imposing public health restrictions. In essence, the resulting processes set a new standard for transparency and democratic accountability for public health decision-making in Australia. The changes to Victoria's Public Health and Wellbeing Act transferred the decision-making power during public health emergencies from the chief health officer to the premier, ensuring public accountability. But the chief health officer must be consulted and provide written advice to be tabled in Parliament. The reasons for the premier's decisions must also be tabled (Section 165AG).

Undoubtedly, the new allocation of power is imperfect. The issues that advisers (including the chief health officer) and political decision-makers (the premier and minister for health) must take into account could be more specific. For instance, they could be required to consider the equity and economic impacts of decisions. Nevertheless, the new processes help address the lack of transparency and democratic deficit and thereby contribute to building trust in evidence-based, public health decision-making.

While processes have improved in one state (Victoria), little has changed at the national level. The National Cabinet was created in explicit recognition that public health powers rest with the states under Australia's constitution and that, therefore, a coherent national response needed to be negotiated. To take on a leadership role, the prime minister and the Commonwealth government had to set up a forum for those negotiations. The name "National Cabinet" evokes an expectation of solidarity, but the Commonwealth and state governments have pursued different policies during much of the pandemic, with policies in some states being undermined by Commonwealth ministers. The policy responses were highly politicized in 2020 and 2021, as there was little incentive for compromise or consensus building.

Transparent processes could have helped mitigate these problems. Records of the National Cabinet's decisions are not public, so the basis of those decisions and whether consensus was reached are unknown. The process could be improved by adopting the same approach Victoria now uses for the imposition of public health restrictions or a similar one. Both the evidence and reasons for decisions should be made public.

Access to information

Australia's 2020 and 2021 pandemic response included increased population surveillance, which infringed upon privacy in the interest of controlling outbreaks. This was a challenging trade-off, especially in lower-trust environments.[11] In addition to the ill-fated national COVID-Safe app, all states introduced check-in apps, whereby people were required to scan a QR code to record their presence at a venue to facilitate tracing and notification of any potential exposure. In 2021, the apps also recorded vaccination status, and most states regulated whether unvaccinated people could enter certain venues.

Although the apps were created for a public health purpose, several instances were reported where other agencies, including the police, accessed information despite government assurances of privacy when the apps were introduced.[12] A significant leak of

business information in New South Wales also occurred.[13] These breaches highlight the need for better privacy protection.[14]

To this end, some progress has been made. Specific legislation was introduced for the national COVID-Safe app,[15] as well as a raft of parliamentary oversight mechanisms.[16] Western Australia also introduced specific legislation (the Protection of Information (Entry Registration Information Relating to COVID-19 and Other Infectious Diseases) Act 2021) in June 2021 to clarify and tighten controls over disclosure of information following unauthorized police access to app data.[17]

To further improve processes for public health emergencies, it is recommended that before significant measures or restrictions are imposed on populations,

- relevant experts such as the chief health officer should make clear why the restrictions are in the public interest and the basis for that conclusion;

- this information should be made publicly available within 24 hours; and

- the decision to impose significant restrictions should be vested in an elected official, who must also publish the reasons for accepting or rejecting the proffered advice.

Moreover, it is recommended that

- key national pandemic decision-making bodies ensure that the evidence base and reasons for all their decisions are transparent and published within 24 hours of the decision, and

- governments enact legislation to prohibit unauthorized access to public health information.

Better information

Comprehensive information is essential for monitoring and managing pandemic responses and for public accountability. In Australia, the availability of epidemiological information improved during the pandemic, but the performance of state-level infectious disease

information systems varied initially. Inefficient systems hindered, for example, epidemiological monitoring and contact tracing. In addition, although basic information about the number of tests, infections, hospitalizations, and deaths was routinely collected and regularly reported from the start, information to judge process performance, such as wait times for test results and the proportion of contacts traced within a threshold time, was not published until late 2020 and in only some states. Information on the distribution of the pandemic's impact and the response by the location of the person infected or industry of employment of those infected, for instance, was generally not collected or reported publicly.

Similarly, when vaccines became available, although the number of people vaccinated was published and classified by age, information that would expose gaps in vaccination coverage — such as rates by location and by cultural or linguistic group, or rates among First Nations Australians — was either not collected or not released.

The failure to collect information hinders an effective and equitable response to a pandemic. The failure to release information creates a democratic deficit and weakens accountability, raising the spectre that the lack of transparency is also hiding a competency deficit.

The failure to report information about the incidence of COVID-19 in different subgroups of the population is symptomatic of a broader problem in pandemic planning in Australia. The need for a differential, pro-poor response for at-risk groups was ignored in published pandemic plans. Without specific actions to address equity issues, a pandemic could be expected to impact subgroups differently, and it did. People who could not afford to self-isolate — for example, some essential workers or people with multiple jobs — became vectors for transmission. They also had lower vaccination rates because they could not take time off work to be vaccinated.

In addition, governments' failure to engage trusted community leaders to help combat misinformation about vaccinations and garner support for restrictions hindered initial vaccine

uptake and public acceptance, respectively.[18] This failure likely led to family gatherings and religious events being held despite the lockdown rules. The engagement of local leaders trusted by residents might have prevented the bungling of the emergency lockdown of a public housing estate in Melbourne, Victoria.[19]

To improve the quality and dissemination of information in a health emergency, it is recommended that governments

* review their infectious disease information systems to ensure they are fit for purpose; and

* review the information collected at each stage in the pandemic response cycle (testing, tracing, and isolation as well as vaccination) to ensure that data collection allows for the monitoring and management of system performance (specifically access) and enables a high-quality, equitable response.

It is also recommended that

* pandemic plans explicitly consider the social and economic determinants of health and the impacts of pandemics on different groups in society; and

* pandemic plans include specific strategies to engage at-risk communities and trusted voices and to address social and economic factors that might inhibit the adoption of public health measures such as self-isolation or vaccination. This will require complementary, coordinated health and economic policies.

CONCLUSION

Overall, Australia managed the first two years of the pandemic well, resulting in a low death rate. Two main lessons can be identified from Australia's experience and applied in other countries.

First, a public's support of restrictive public health measures partly depends on its trust in government and public health agencies, and this trust is largely generated through clear and transparent public accountability processes. In Australia, transparency was strengthened as the pandemic

dragged on. However, a gross breach of transparency in the Commonwealth government's management of the pandemic came to light in August 2022: former Prime Minister Scott Morrison was secretly appointed minister for health while leaving the overt minister, Greg Hunt, in place.[20] This disrupted Australia's "Westminster" style of parliamentary accountability, as Parliament cannot hold a minister accountable if it does not know the person is a minister. The new government has announced an inquiry into this and four other self-appointments by the former prime minister.

Second, pandemic plans need to account for the uneven impacts on population subgroups, as measured by vaccination rates and deaths. In Australia and other countries, the impacts have been more severe for the most disadvantaged. Perhaps they could have been mitigated if data collection and reporting on these subgroups had started earlier. This might have forced authorities to respond with additional resources and strategies to address the revealed inequities.

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NONPHARMACEUTICAL INTERVENTIONS TO COMBAT EMERGING INFECTIOUS DISEASES:

JAPAN'S APPROACH TO COVID-19

YASUSHI KATSUMA

DEFINING THE CHALLENGE

Particularly in the absence of vaccines and therapeutics, nonpharmaceutical interventions (NPIs) can be crucial to stemming the transmission of emerging infectious diseases. Examples of NPIs include mobility restrictions, technology use, regulations on mass gatherings, suspension of businesses and schools, and the promotion of personal behavioral changes. However, these NPIs often affect personal freedom. If restrictions and regulations are imposed excessively and arbitrarily, democratic governance may be jeopardized. To help inform responses to future public health crises, this paper examines Japan's use of NPIs in response to the COVID-19 pandemic and offers policy recommendations that may be useful for other Asian democracies.

ASSESSING POLICIES AND PRACTICES

General policies in response to COVID-19

Japan has employed two general policies in its response to COVID-19: a "living with COVID" policy (as opposed to a "zero-COVID" policy) and a "herd immunity to COVID by immunization" policy (as opposed to by infection).

"Living with COVID" policy

Since the beginning of the pandemic, the Japanese government has promoted a "living with COVID" policy instead of the "zero-COVID" policy other Asian countries such as China have instituted. For example, Japan has never implemented any lockdowns. Its "living with COVID" policy partly comes from its experience with passengers aboard the cruise ship Diamond Princess.

The Diamond Princess docked at Yokohama Port on February 3, 2020. During the ship's subsequent quarantine period from February 5 to February 23, Japan learned many lessons, which it was able to apply to later measures in response to COVID-19.[1] For example, an examination of contact routes revealed that the virus transmitted through both respiratory droplets and aerosols (inadequate cabin ventilation exposed many passengers to COVID-19). The Diamond Princess case also revealed many asymptomatic cases, particularly among healthy, young people. Given the high possibility of aerosol infection and significant number of asymptomatic cases, Japan came to adopt a "living with COVID" policy.

"Herd Immunity to COVID by Immunization" policy

Some countries adopted a "herd immunity to COVID by infection" policy in addition to a "living with COVID" policy. One reason is that not all

people were being seriously affected by COVID-19. Moreover, the prospects of new vaccines and therapeutics for COVID-19 were unclear at the time. Sweden, in particular, promoted this herd immunity policy, but other countries established similar policies as well.[2] By contrast, Japan and many other countries chose not to adopt this policy and instead sought to control the pandemic through NPIs until vaccines and therapeutics became available. When COVID-19 vaccines became available, Japan promoted a "herd immunity to COVID by immunization" policy while continuing its NPIs.

NPIs can be important in combating infectious diseases, particularly before vaccines and therapeutics become available. Japan's policies for NPIs can be grouped into four areas: international travel, technology, regulations for mass gatherings, and personal behavioral changes.

Restrictions on international travel

Japan's first NPIs included placing top-down restrictions on international mobility and strengthening border controls. The use of border measures to prevent the spread of infectious diseases from abroad was not new to Japan. Most notably, in response to the 2009 pandemic influenza (H1N1), Japan legislated the Act on Special Measures for Pandemic Influenza and New Infectious Diseases Preparedness and Response in 2012.[3] In response to COVID-19, this Act has been revised.

Closing of Japan starting in January 2020

It was challenging for Japan to quickly implement restrictions on inbound travelers from mainland China. Although Japan's first identified case of COVID-19 was someone who arrived from Wuhan on January 6, 2020,[4] it was not until January 31, 2020, that Japan started to restrict inbound travelers from Hubei Province.

In the following month, in February 2020, Japan announced restrictions on inbound foreign travelers from all of mainland China and the Republic of Korea. Then, in by the end of March 2020, the restrictions were expanded to 24 countries[5] .Later, as the Omicron variant spread, Japan restricted the entry of all foreign nationals starting on November 30, 2021. Many Japanese

people were likely reminded of the Sakoku period from 1639 to 1854, when Japan was a completely closed country. From January 2020 to March 2022, Japan was essentially closed to many foreign nationals, with few exceptions.

Opening of Japan starting in March 2022

As immunization coverage increased in Japan, the government began to relax mobility restrictions on international travelers. Starting in March 2022, Japan began to allow foreign nationals arriving for study or business to enter, provided they had proof of receiving two doses and a booster of a COVID-19 vaccine recognized by Japan and a negative polymerase chain reaction (PCR) test result. Starting in July 2022, small groups of tourists from certain countries could obtain travel visas for Japan, provided they were accompanied by a tour guide and, as before, had proof of receiving two vaccine doses, a booster, and a negative PCR test. From September 7, 2022, people from most countries could obtain travel visas to enter Japan with only proof of immunization, with a daily arrival ceiling of up to 50,000 foreign nationals. On October 11, 2022, Japan abolished the daily arrival ceiling, and started to welcome visa-free independent foreign tourists from many countries with a visa waiver program with Japan.

Technology

Japan's COVID-19 response has employed technology in three areas: the development and use of mobile applications, the use of supercomputers to produce evidence in support of NPIs, and the promotion of specially designed air conditioners to improve ventilation. The latter area became particularly important because the government encouraged universities in Japan to resume face-to-face teaching in 2021.

Mobile application software

Japan started to use the Health and Location Monitoring App for Overseas Entrants (MySOS) for inbound travelers at Kansai International Airport from February 2022 and then at other airports from March 2022.[6] Since then, all travelers entering Japan, including Japanese nationals, have been encouraged to download MySOS to their mobile devices. Initially, travelers were asked

to upload their valid vaccination certificate, as well as a certificate of their negative PCR test result, before checking in at their airport of departure. But as of September 7, 2022, travelers are no longer required to take a test within 72 hours of departure; this requirement was a significant burden for many international travelers visiting Japan.

Another mobile application used in Japan is the COVID-19 Contact-Confirming Application (COCOA).[7] This app is not used for contact tracing but rather for contact confirmation. Mobile devices with the COCOA app use Bluetooth to communicate with other nearby devices using the same software. If someone is confirmed to have COVID-19 and reports it using the COCOA app, other COCOA users who were near that person are notified of having had possible contact with someone with COVID-19, without the personal details of the contact being revealed. One of the reasons for not using the COCOA app for contact tracing was to respect the right to privacy. In addition, the use of the COCOA app was never enforced for entry into public buildings, as excessive restrictions might jeopardize democratic governance.

The supercomputer Fugaku

Also notable is Japan's use of Fugaku, the world's fastest supercomputer, to simulate how droplet and aerosol dispersion patterns affect the risk of infection. Fugaku's simulation videos have been published on YouTube to demonstrate the efficacy of face masks and ventilation in reducing the risks of infection and have thus helped increase public awareness.[8]

Air conditioners that ventilate with outside air

Most air conditioners used in Japan do not let in fresh air from the outdoors. However, Fugaku's simulations emphasized the prevalence of aerosol transmission and the importance of ventilation. As a result, experts have recommended opening doors and windows for a few minutes each hour, among other measures.

In January 2021, the Ministry of Education, Culture, Sports, Science and Technology encouraged universities in Japan to resume face-to-face teaching from the start of the academic year in April 2021. While resuming in-person teaching, public health experts urged universities to improve ventilation in classrooms, and universities started to search for a new type of air conditioner that uses outdoor-air ventilation. One electronics company, Daikin, started to draw attention because they have produced these types of air conditioners since 2001.[9] Some other Japanese consumer electronics companies are now producing similar air conditioners because of the increasing attention to ventilation given not only by universities but also by public offices and private companies.

Self-restraint on mass gatherings

The Japanese government has never banned mass gatherings, whether indoor or outdoor, in response to COVID-19. Instead, the government has continued to implore event organizers to exercise self-restraint. Most organizers of mass gatherings that are subsidized by public funding have complied with this request. The most notable exception was the 2020 Tokyo Olympic and Paralympic Games, as Governor Yuriko Koike of the Tokyo Metropolitan Government and the late Prime Minister Shinzō Abe were determined to host them.

Nevertheless, the 2020 Olympic and Paralympic Games were postponed by one year, as announced in a telephone conference between Abe and the president of the International Olympic Committee, Thomas Bach, on March 24, 2020. Yoshiro Mori, then the president of the Tokyo Organising Committee of the Olympic and Paralympic Games, has claimed that in a private meeting before the conference, Abe rejected his recommendation for a two-year delay.[10]

The 2020 Tokyo Olympic Games were held from July 23, 2021, to August 8, 2021, followed by the Tokyo Paralympic Games from August 24 to September 5. During the two events, the following two measures were taken to mitigate the spread of COVID-19: First, a "bubble" system was introduced to separate competing athletes and their support teams from Japan's residents. Second, most events were held without spectators. Ultimately, a few hundred cases of COVID-19 among athletes and related personnel were recorded, while a surge in COVID-19 cases among Tokyo residents

was reported. However, a causal relationship between the cases inside and outside the "bubble" system has not been established.

Promotion of personal behavioral changes

Japan has also asked individuals, schools, and businesses to exercise self-restraint. Much attention has been given to public awareness and health education so that residents adopt behaviors to protect their communities from infection. These NPI education campaigns promote measuring body temperature before leaving home, sanitizing hands before entering buildings, wearing face masks in indoor settings, and physical distancing. The concept of physical distancing has been incorporated in the "Avoid the Three Cs" campaign (explained below). Scientific evidence collected through supercomputer simulations has been used to enhance the credibility of the campaigns.

Nonwoven face masks

Japanese citizens have been encouraged to use nonwoven face masks. Even without an explicit rule, many people have adopted this practice, which might be attributed to belief in scientific evidence or trust in the government. Additionally, wearing face masks in Japan was a common practice even before the pandemic, particularly in winter to limit the spread of seasonal influenza and in spring to mitigate the effects of pollen on those with allergies.

Supercomputer simulations have been used to demonstrate how nonwoven face masks are more effective in blocking aerosols than cotton face masks. The evidence has been widely shown on Japanese television, which may have further convinced people to wear nonwoven face masks.

"Avoid the Three Cs" campaign

The concept of physical distancing has been well accepted in Japan, but the use of the term has increasingly been replaced by "avoid the three Cs": closed spaces, crowded places, and close-contact settings. The government launched this campaign in February 2020 with the following recommendations: avoid closed spaces by

using proper ventilation, avoid crowded places by limiting participation in mass gatherings, and avoid close-contact settings through physical distancing.[11] When any of these factors fail to be avoided, the risk of infection increases. "Avoid the three Cs" has become a flagship campaign for Japan, consolidating the efforts made by various ministries, local governments, businesses, and civil society organizations.

BEST PRACTICES AND POLICY RECOMMENDATIONS

The "Living with COVID" policy and the "Herd Immunity to COVID by Immunization" policy

- Before vaccines become available for emerging infectious diseases, NPIs can help slow the spread of viruses.

- If healthy, young people tend to be asymptomatic or not to show serious symptoms when infected, then policies resembling the "living with COVID" policy may be considered. However, the "herd immunity by infection" policy is risky, as those who are healthy and young may still transmit the virus to those in more vulnerable groups. In addition, post-COVID syndrome, or "long COVID," may become prevalent among infected healthy, young people in the long term.

- After vaccines become available, vulnerable groups should be given priority in immunization programs. This practice is in line with the "herd immunity by immunization" policy.

International travel during a public health emergency of international concern

- The International Health Regulations of the World Health Organization (WHO) discourage international travel restrictions. Banning international travel can cause more harm than good by harming economies and hindering medical supply chains. . However, without travel restrictions such as testing, many asymptomatic travelers could transmit the virus to other countries. Policymakers must

find ways to slow the spread of COVID-19 through innovative travel restrictions while not harming the economy.

• Japan was slow to impose restrictions of inbound travelers from mainland China because of a planned visit by President Xi Jinping to Japan in April 2020. Japan waited until Beijing's announcement that Xi's visit would be postponed. In preparation for future pandemics, governments should hold multilateral discussions to establish standard diplomatic protocols when the WHO declares a public health emergency of international concern.

Technology for public health

• In Japan, the Fugaku supercomputer has been used to inform NPIs. Similar efforts in other countries should be coordinated, and the scientific evidence produced should be shared globally. Data and computer scientists have much to contribute to public health.

• When sharing scientific evidence, it should be translated into languages that the public can understand. Governments must demon-strate to their publics that policy is based on scientific evidence generated through academic processes.

• Consumer electronics companies should be encouraged to conduct research and development on innovative products that can improve public health. Collaboration among the public, private, and academic sectors should be promoted so that private companies can better understand public health needs.

The "Avoid Three Cs" campaign

• The conceptual framework of "avoid three Cs" has become a flagship campaign in Japan. It has helped consolidate efforts by ministries, local government, private enter-prises, and civil society organizations. The widespread delivery of simple and consistent messages can be instrumental in helping to establish healthy behavioral norms.

• NPIs such as the promotion of personal behavioral changes should be adopted widely, as has already been done by the WHO Western Pacific Regional Office.[12]

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DATA PROTECTION VERSUS DATA USE FOR SCIENTIFIC RESEARCH AND PUBLIC HEALTH:

THE CASE OF SOUTH KOREA

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DEFINING THE CHALLENGE

The variance in data governance in public health

The COVID-19 pandemic has made clear that data governance varies widely across countries. In the public health domain, countries have different approaches to data collection and processing and, in particular, data tracking (for example, to monitor individuals' compliance with quarantine mandates). Countries also have different comfort levels when it comes to personal data protection, as evidenced by the range of data regulations and methods used for COVID-19 tracking. South Korea uses GPS data to track public health in real time, in accordance with the country's Infectious Disease Control and Prevention Act (IDCPA). Whereas some European countries used apps based on Google/Apple application programming interfaces, in accordance with the European Union's (EU) General Data Protection Regulation (GDPR).[1] The pandemic has also made it apparent that public health officials' level of prowess in handling advanced or new digital technologies has a significant impact on how countries use digital tools to fight the pandemic.

The variation in data governance stems from not only different data protection regulations set by various jurisdictions, but also from the different ways in which the regulations are interpreted and implemented. This is partly because countries are at different stages of their digital transformation and have different capabilities. The problem with this variation in a pandemic situation is that effectively addressing public health crises with digital tools requires both a coordinated global response and cohesive national and local responses. However, advancing digital cooperation among states will not be easy. While data governance may be regarded as an element of regional or multilateral digital trade agreements, how the governance has manifested across jurisdictions during the pandemic reveals that a legally binding agreement on digital cooperation will be difficult to achieve. To be more specific, there are two major obstacles to digital cooperation: (1) the upgrading of digital infrastructure requires significant amounts of investment and political will, and (2) the legal structures and legislations of a jurisdiction supersede those laid out in a regional or international institutional framework.

A major issue related to the first obstacle is the stark digital divide among countries. This is even the case within the EU, with some population groups still lacking access to the internet, as seen in rural America. A central issue related to the second obstacle is how much the policy goals for data regulation vary across jurisdictions. The EU's GDPR is geared toward

protecting the personal data of citizens. China's recently promulgated Data Security Law and Personal Information Protection Law (PIPL) are structured like the GDPR, but the main purpose of the legalization is to preserve national security.[2] The United States currently does not have a single, or principal, federal law but its trade agreements primarily advocate the free flow of data in the interest of U.S. tech firms. The different approaches of the EU, China, and the U.S. alone — even if the U.S. were to write a federal law on data protection — are bound to hinder digital cooperation and any agreement on an international framework. Also strong-arming countries into a single framework may bring few policy outcomes when expectations are high. How countries themselves have characterized and compared their handling of public health data during the pandemic provides a hint that a 'single undertaking' (meaning that nothing is agreed until everything is agreed) approach at the WTO may not work. Furthermore, there are domestic, or local, perceptions of data collection and processing to consider as well.

This paper first outlines data regulation challenges at the domestic level by highlighting the case of South Korea. The country recently revised its data regulations in response to the pandemic, with an eye toward supporting the efficient and rational use of data for "scientific research." But implementation issues perceived domestically have affected the outcomes of the revision. The paper outlines these issues and compares South Korea's approach with those of several other countries in East Asia. Then, as it is the main focus of this piece, the paper underlines the struggle between protecting personal data and using it to safeguard public health and how feasible it would be to seek an integrated form of governance for the global digital space. In practice, such an effort is unlikely to bear fruit — regardless of how much like-minded countries would try to coordinate — as evidenced by some previous attempts at trade agreements. Data governance is largely jurisdiction-based, and some countries may not even be ready for digital cooperation. Some are trying their best to formulate data governance laws or execute them within their jurisdictions, while others are going ahead without laws that limit the use of personal data.

ASSESSING POLICIES AND PRACTICES

The case of South Korea and its East Asian neighbors

South Korea's 3Ts (testing, tracing, treatment), set under the IDCPA, became widely known and evaluated during the country's early response to the pandemic.[3] Some of the data collected through South Korea's COVID-19 Smart Management System includes GPS and credit card data, as well as CCTV footage in some limited cases, in order to determine the source of an infection case. This collection is authorized under the IDCPA, and the data are protected by unusually high levels of security: only a small number of epidemiological investigators at the Korea Disease Control and Prevention Agency have access to the system; no other government agencies have access to the intranet; the system stands behind a double firewall; and the highest levels of login security and record keeping are used. Yet, despite these security measures, some observers, particularly in the West, would perhaps see the government's data collection as an infringement on personal privacy.

Less widely known or evaluated are South Korea's three recently revised data regulations: the Personal Information Protection Act, the Act on Promotion of Information and Communications Network Utilization and Information Protection, and the Credit Information Use and Protection Act. The revisions aim to support ways to best utilize and protect big data for new industries that employ artificial intelligence; cloud services; Internet of Things (IoT) services; and future mobility services, including electric vehicles outfitted with an Advanced Driver-Assistance System and aerial vehicles that operate as part of an Urban Air Mobility (UAM) system. The draft revisions were an outcome of two "hackathons" (forums for innovative computer programming products and solutions) held by the Presidential Committee on the Fourth Industrial Revolution (February 6, 2018 and April 6, 2018). At the time, the committee included stakeholders from relevant ministries, civil society groups, and

industry businesses, as well as legal experts and academics. The committee proposed revisions to the three laws in May 2018, and the National Assembly passed the suggested revisions on January 9, 2020. The revised laws came into force on August 5, 2020, as the contactless economy under the COVID-19 pandemic began to accelerate. The revisions' main areas of focus include (1) deploying pseudonymized information to facilitate big data use, (2) streamlining redundant or overlapping law provisions and building an efficient governance system for personal information, (3) reinforce the legal liabilities of data controllers across industries, and (4) elucidating the ambiguous concept of "personal information," particularly when it comes to "scientific research" and financial/credit services.

One unique factor at the core of South Korea's legal revisions is the drive to incentivize and utilize pseudonymized data in order to boost industry research and development (R&D) in the biomedical and health sectors. However, early assessments of the laws' implementation are mixed. South Korea is striving for a more efficient digital future, but there are obscurities as to how far the purposes of "scientific research" would extend, and what they would entail regarding the collection and processing of public health data. Theoretically, the revised laws enable the use of pseudonymized personal health information for (1) statistics (commercial use included), (2) studies (industrial research included), and (3) the preservation of records for public use. It is emphasized that provisions on the use of pseudonymized data are in line with those in the EU's GDPR, whereby data can be collected and analyzed for scientific research purposes.[4] In practice, however, South Korea's statutes designate only a handful of data processing entities as controllers of public health data. They are tasked with the autonomous integration of data, or in Korean terms, the "self-integration (*selpeugyeolhab*)" of data, which refers to the combination of a piece of pseudonymized data owned by oneself and another piece of pseudonymized data processed by another data controller. Some stakeholders view the small number of data controllers as a big obstacle for agencies that have data but not authorization for self-integration from the government under the revised

laws. Since April 2022, legal developments are in the works in Korea to enable the autonomous integration of data by private data controllers in the domestic finance industry under the Financial Services Commission.[5]

A primary reason why data integration is limited in practice is that activist groups have been strongly arguing for the protection of citizens' health data. For example, in June 2020, personal data related to COVID-19 infections among gay clubs and bars in Itaewon were leaked.[6] Gossip on social media and word of mouth were the main sources of the leakage, prompting calls for greater protection of privacy rights. Criticism continues to circulate online, and the Personal Information Protection Commission has received an influx of petitions regarding personal data protection over the course of the pandemic. There is an evident clash between the goals of protecting personal public health data and of collecting and processing data for efficient R&D in the public sector — be it for commercial purposes or the common public good (e.g., the development of new remedies or medicines for cancer).

A notable demonstration of data integration limitations can be found in examining implementation of South Korea's Cancer Control Act, effective January 1, 2022. The government has been urging citizens diagnosed with cancer to participate in a big data pilot program through using a platform called K-CURE (Korea-Clinical Data Utilization Network for Research Excellence), launched by the Ministry of Health and Welfare (MOHW) and Statistics Korea. But while the MOHW runs the pilot program, and the National Cancer Center — one of the entities authorized to do autonomous data integration — serves as the delegated data center, it is unclear whether the minister of health and welfare should be requesting the cancer data integration or whether the pilot program itself should be eligible to do self-integration. Moreover, under the current law revisions, other available cancer-related data in the private sector cannot be integrated with the extant data that the National Cancer Center possesses. Over time, however, the government will likely review the venues of autonomous data integration to expand the bio and medical care market.

South Korea's approach to data governance has elements of both the EU and U.S. approaches, but it remains to be seen whether the country can achieve data efficiency in the digital world, while simultaneously protecting personal data to a sufficient extent. Most likely, the government will tilt its efforts more toward the first goal, and in the process, citizens will yield some privacy in support of data efficiency and the common good.

While South Korea is attempting to balance these two goals, its Northeast Asian neighbors China and Japan are taking a different approach. As noted earlier, China is prioritizing national security and mandates, aggressively pushing a digital agenda forward through its Data Security Law, Cybersecurity Law, and PIPL (enacted in 2021). Although Japan generally abides by Western standards and its own data governance law — the Act on the Protection of Private Information, revised in 2015 and 2020 — it has been unable to keep up with digital transformations.[7][8] Comparisons between South Korea and Southeast Asian countries make it seem even more unlikely that the digital gap can be closed; for some states, the enactment of data regulations seems far off in the future. One exception is Singapore, which has been implementing its Personal Data Protection Act for almost a decade.

BEST PRACTICES AND POLICY RECOMMENDATIONS

Protecting data while preserving its use for the public good

As the data-driven economy expands, institutions and forums at the international and regional levels are unlikely to dictate how countries govern data in their own jurisdictions.[9] Given the struggle between allowing the free flow of data and protecting the data of citizens, it may be difficult to amass many countries to join a global framework; they will almost always prioritize their domestic legislative frameworks. Countries may use forums to further their individual agendas and interests, but only as long as their own data governance practices are maintained.

As South Korea contends with how to govern its data domestically and within regional and global contexts, it considers the debates taking place in the EU and the United States. When it comes to the handling of data, there are tensions between the EU (which espouses data protection) and the U.S. (which espouses free data flows). These tensions and emerging issues such as digital taxation and the interoperability of central bank digital currencies (CBDC) will make data the prime issue of confrontation in the digital economy into the next decade.[10] Digital transformation and regulatory issues will be discussed at different forums, resulting in "forum shopping" by countries based on their interests. If the U.S. seeks to join the Digital Economy Partnership Agreement (DEPA), existing member states (currently Chile, New Zealand, and Singapore) and other countries seeking access will ask the U.S. where it stands on data protection at the federal level (outside of its trade agreements).[11]

Both the U.S. and EU models have their difficulties and present challenges to governance at the international and regional levels. Without a single, principal legal mechanism that functions at home, the United States' engagements at these levels may not be taken seriously. There is no U.S. federal law on personal information protection[12] and relevant laws are spread across different fields — as demonstrated in the U.S. Privacy Act of 1974, the Gramm-Leach-Bliley Act (also known as the Financial Services Modernization Act of 1999), the Health Insurance Portability and Accountability Act of 1996, and the Children's Online Privacy Protection Act of 1998. In other words, even if the U.S. seeks to engage in the development of digital frameworks to further its digital economic frontier, without a domestic regulatory law set in stone, other countries will question whether the U.S. intends to stay for the long haul. Credibility issues still linger for the U.S., emanating from its handling of the Trans-Pacific Partnership and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership.

Regarding the EU, while its GDPR impacts the activities of countries worldwide — and, thus, the EU may be becoming the world's strongest regulator in data governance — this does not mean that the EU is becoming a pioneer in tech and the

digital economy. As noted, there is still a significant digital divide within its jurisdictions. Also, the GDPR (Article 6) has some pitfalls; these were revealed when the EU practically disabled functional COVID-19 digital tracking.[13, 14]

Based on the analysis above, the United States and Asian countries should consider the following policy recommendations:

- For the U.S., it is crucial to close the gap in its digital infrastructure before discussing international data protection or cooperation. R&D and capital investment will be required to increase network connectivity equipment installations (5G/6G).

- In the U.S., due to vested interests (specifically those of big tech), a blanket law on data protection may not be feasible in the immediate future. Each U.S. state has a different approach or has yet to implement one. At the policymaking level, preliminary efforts should aim to consolidate the policy direction of various states.

- The U.S. should ultimately move towards legislating a data regulation at the federal level in the longer run. It would be ironic for the U.S. to press its allies to enable the free flow of data and advocate for international cooperation on data governance without its own data protection mechanism. This irony is made especially stark by the fact that U.S. tech companies continue to be slapped with fines from the EU and South Korea for violations of data protection regulations.

- As the digital economy grows in Southeast Asia, particularly in Vietnam, the use of digital banking as a tool to expand financial inclusion will grow. In the coming era of connectivity, the growth of digital health care and biotech will be key in the Asia-Pacific region. If South Korea's pseudonymized data use via data integration proves feasible, the experience could provide countries in the region with useful information. In digital finance, the test case for blockchains will be even more crucial if and when the Asia-Pacific faces the expansion of the Chinese digital yuan as a central bank digital currency (CBDC) for cross-border transactions.

- If they have yet to do so, countries in Asia must carefully assess the impact of digital transformations globally and adopt a regulatory framework to effectively shape their digital future.

The creation of an international or regional framework for data governance is highly unlikely in the near term. Democracies in Asia should be mindful of the future need for increased data governance across countries and consider how to best create frameworks that can be effective, protect privacy, and enable international digital cooperation. This will certainly be a difficult task. For a democracy like South Korea, balancing the use of technology for public health with the need for data privacy will be crucial not only for responding to future pandemics but also for presenting an alternative and improved model of data governance based on lessons learned from the COVID-19 pandemic.[15]

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INDIA'S PANDEMIC EXPERIENCE OF MOBILE PHONE-ENABLED DIGITAL SURVEILLANCE:
A FEMINIST PERSPECTIVE

RADHIKA RADHAKRISHNAN

DEFINING THE CHALLENGE

To help contain the spread of COVID-19, states worldwide have been using data to understand the pandemic, mobilize public health resources, and inform communications. They have also been conducting digital surveillance through optional or mandatory contact tracing, citizen location, and digital identification apps, as well as drones. This paper examines India's experience of state-enabled digital surveillance through mobile phones and the implications for individuals in particular.[1]

Though surveillance has historically been performed during epidemics, its nature determines how people experience it. Data governance policies conceptualize data as a disembodied asset whose worth depends on humans' ability to extract it ("data as the new oil"), but this data-as-resource framework often ignores the social context in which data are generated through individuals' bodies.[2] Today, data are used to determine bodily experiences to such an extent that a fundamental reconceptualization of data is required; when increasingly collected for surveillance, data can no longer be thought of as *about* the body but must be reconceptualized to be *part* of the body. In such a context, surveillance is experienced as control over not just individuals' *data* but also their *bodies*.

As a departure from the conventional data-as-resource framework, this paper proposes a feminist approach that accounts for the interconnections between people's bodies and their data. If data constitute who a person is, then how, by whom, and for what purposes data are used become grave concerns with far-reaching consequences for individuals' material bodies. These consequences are revealed in policy design since there are different policies for protecting bodies and data from intrusion.[3] Drawing on the experiences of marginalized communities whose voices are often left out in data protection discourse, this paper identifies specific embodied harms that arise from violations of data governance policies and then proposes recommendations for preserving not just data privacy but the bodily integrity, autonomy, and dignity of surveilled individuals during a pandemic.

ASSESSING POLICIES AND PRACTICES: DIGITAL SURVEILLANCE DURING THE COVID-19 PANDEMIC

Mobile phone apps

To manage the COVID-19 pandemic, governments worldwide launched an enormous ecosystem of contact tracing and quarantine management apps.[4] However, not all apps have been successful or are publicly trusted.

For instance, Singapore launched a short-distance Bluetooth-based app, TraceTogether, to contain outbreaks; however, only about 20% of Singapore's population used it, falling short of the minimum 60% coverage required to be effective.[5]

The Government of India's primary contact tracing app is Aarogya Setu, one of more than 70 apps launched by the central and state governments.[6] Because a discussion of all these apps is beyond the scope of this paper, this section focuses on Aarogya Setu and two state government apps (Ghar Ghar Nigrani and Quarantine Watch) to highlight some embodied harms of digital surveillance.

Aarogya Setu app (Government of India)

The central government released Aarogya Setu (meaning "bridge for liberation from disease") in April 2020. The contact tracing app was jointly developed with industry stakeholders. With over 100 million downloads on the Android Play Store, the app has been criticized for being a surveillance system because of concerns over proportionality, the legality and necessity of data collection and sharing, and insufficient accountability measures.[7]

Beyond these broader issues, however, there are equally important intrinsic ones to consider. The app categorizes bodies as "low-risk" or "high-risk" based on self-reported health data as well as data from nearby mobile devices with the app installed. Because the app is mandatory to access essential services such as railways, these categories determine a person's access to such services. Companies having access to employees' health data through the app may also use it to determine employees' pay and insurance, which impacts their livelihoods.

Further, the app's risk categorizations may not correspond to the individuals' physical realities. First, not everyone in a person's vicinity may have a smartphone or the app; India still has a wide digital divide.[8] Second, the self-reported data may not be reliable given the asymptomatic nature of COVID-19. Third, people may hesitate to self-report accurately because of the stigma associated with the disease. Fourth, the app is prone to incorrectly marking people as positive and negative.[9]

Yet, despite these issues, the *digital* reality constructed by the app takes precedence over one's *physical* reality; people testing negative have been forcibly and wrongly quarantined because of the app's alerts.[10] Basically, the app is determining whether individuals are diseased or healthy, irrespective of whether its data corresponds to the individuals' physical reality. And this is dangerous because the determination has a direct impact on people's access to essential services.

Ghar Ghar Nigrani app (State Government of Punjab)

Like the responses to syphilis and HIV/AIDS have done, the response to COVID-19 has propelled discourses and practices that have led some in society to blame, stigmatize, and produce violence against "others" who are portrayed as vectors of disease. While this has adversely impacted already stigmatized communities, female front-line health workers have emerged as a new affected group. For instance, in China, female health professionals working on the front lines of COVID-19 containment were ordered to shave their heads, as had been done with sex workers infected with syphilis.[11]

In India, stigmatization has been aided by contact tracing apps. In June 2020, the Punjab state government launched the Ghar Ghar Nigrani (meaning "home-to-home surveillance") app for Accredited Social Health Activist (ASHA) workers in the state to undertake door-to-door COVID-19 surveillance. ASHA workers are women from largely marginalized class and caste locations and have been on the front lines of community health care during the pandemic.

Ranjit Kaur, a union leader in Punjab for the All India ASHA Workers and Facilitators Union, said, "If someone has a cough in the village, and the ASHA enters that in the app, if they get called for enquiry, they blame the ASHA for putting them in that situation. ASHAs are facing violence due to it" (translated from Hindi).[12] Many incidents of violence against ASHA workers during their door-to-door surveillance tasks have been reported.[13] As the arms of state surveillance, ASHA workers face the brunt of public distrust of the state's data collection. Out

of fear that data collected by the app could lead to incarceration or quarantine, people resort to violence to keep their data-as-bodies safe.

Quarantine Watch app (State Government of Karnataka)

In 2020, the Karnataka government released the Quarantine Watch app, requiring all home-quarantined persons to upload geotagged mobile phone selfies every hour to prove their presence at home. If they fail to do so, a first information report is registered against them by law enforcement, which can lead to their arrest.

But this app likely creates significant uneasiness for women. Feminist studies have shown that women experience discomfort in filing cyber violence complaints due to their distrust of the state's ability to view private images on their phones during an investigation.[14] This discomfort likely extends to sending state officials selfies from home. Misuse of this data would not just be a data violation but could easily extend to voyeurism, slut shaming, and predatory actions, which threaten women's bodily integrity.

In the age of digital surveillance, the bodies of individuals within the home are now subjects of the digital state through data collected by home quarantine apps.[15] The physical body is disciplined to stay at home and follow state orders without the physical presence of the observer — in this case, a police officer. This is yet another way in which bodies are tracked, monitored, and controlled through data.

Mobile location tracking

Governments worldwide have used mobile location tracking to aid their COVID-19 responses. For example, to predict citizen exposures to the virus, Israel's government authorized its internal security service to collect location data from telecommunication operators without user consent.[16] The Russian government designed a national system to track people in contact with COVID-19 patients, using location data provided by individuals' mobile phone providers.[17]

In New Delhi, in March 2020, a religious congregation was organized by the Tablighi Jamaat, an Islamic missionary movement, in the Nizamuddin Markaz Mosque. The Indian government claims the event caused India's largest spike in COVID-19 cases, despite this claim being scientifically disproven.[18] The police used mobile phone data to trace people who attended or were near the event.[19] Various state governments also released public lists of people thought to have attended the religious event.[20]

On one of these public lists was Salim (name changed), a Kashmiri Muslim, who had not attended the congregation but received calls every day from local police stations. Salim said, "They are keeping an eye on me. … They can stop me from going anywhere. If they have a database, they can find me" (translated from Hindi).[21] The Indian government already exerts discretionary powers to digitally surveil and suppress its citizens in Kashmir — the suspension of the state's internet services is the longest ever internet suspension in a democracy — and COVID-19 has given the Indian government justification to amplify such surveillance.

For Salim, the state's tracking of his location *data* was experienced as the state's tracking of his *body*. His body was connected to the data to such an extent that he physically severed his connection with his phone (leaving it at home when he went outside) to avoid being controlled through his data. Salim did not just experience violations of data privacy. His fear of being publicly targeted and the impacts on his physical mobility indicate that there are devastating consequences not visible or reflected in disembodied data protection frameworks. To capture the true extent of these harms, the body must be visualized in constructions of data.

BEST PRACTICES AND POLICY RECOMMENDATIONS

Data protection rights in India are in legal limbo: in August 2017, the Supreme Court of India deemed privacy to be a fundamental right, including, crucially, the privacy of personal data. Subsequently, the 2019 Personal Data Protection Bill was introduced in Parliament and referred to a Joint Parliamentary Committee for review, but it was withdrawn in August 2022. In the absence of any formal legal regulation, many of India's digital surveillance tools are self-regulated.

The following policy recommendations are aimed at formally regulating the surveillance infrastructure in India by using a feminist embodied approach. Where applicable, these recommendations incorporate a comparative analysis of successful social participation towards building a framework for digital surveillance:

- The surveillance of diseases should not be conflated with the surveillance of bodies, and management of the COVID-19 pandemic should not be reduced to the management of disembodied data. Data governance policies must therefore be broadened to address the embodied harms identified in this paper to ensure that individuals retain control over not just their data but also their bodies.

- For surveillance to benefit and protect people, safety measures — not data collection — should be at the heart of surveillance practices. Safety measures should include providing safety gear to all individuals, as opposed to criminalizing violations without heeding social contexts.

- All surveillance measures must incorporate meaningful data protection safeguards and be lawful, necessary, proportionate, time-bound, and justified by legitimate public health objectives. For example, Singapore's TraceTogether app can be used only by its health ministry to access data that are used strictly for disease control, and the data cannot be shared with law enforcement agencies to enforce lockdowns and quarantine.[22] By contrast, India's Aarogya Setu app collects GPS location data in addition to the names, ages, health details, and professions of users, with no meaningful guidelines or safeguards for data sharing.[23]

- Digital requirements such as contact tracing apps should not be mandatory for accessing essential services and other rights during a pandemic, as in the case of Italy where their usage remains optional.[24] India is the only democracy that has mandated the downloading of a COVID-19 tracking app, or face jail or fines.[25] Although optional usage can lead to lower service coverage, resulting in ineffective contact

tracing, users must nevertheless be permitted to opt in or out of data sharing and to uninstall the apps at any time.

- Contact tracing apps should not be mandatory for front-line health care workers, especially when there are disparities in mobile phone access and use. If apps are used, workers should be provided with smartphones, digital training, and monetary compensation for time spent on the app.

- Data that may put vulnerable groups at risk and are not strictly necessary to contain a disease's spread, such as images, should not be collected. Intrusive data collection (for example, to determine whether a person is following home quarantine) should also be limited when there are other means of obtaining the same information. Moreover, any personal data collected for tracking purposes should not be made public. In Slovakia, for instance, a law that permitted state authorities to access telecommunications data for contact tracing was declared unconstitutional.[26] In Taiwan, mobile phone sensor data were used to privately send alerts through SMS to people near potential COVID-19 hotspots for self-quarantine and self-monitoring without sharing data publicly or with third parties.[27]

- Feminist care practices must be established for surveillance by focusing on the protection of individuals' bodies and not just on the protection of data.[28] For example, the Tuberculosis Directly Observed Therapy program in India requires that patients approach their local anganwadi (rural child care center) to receive and use medication in the presence of a health care worker.[29] This monitoring constitutes manual surveillance, performed through the health care system by trained workers, ensuring that people's needs are met. Similarly, care protocols already exist for HIV/AIDS surveillance, such as not revealing patient names and offering counselling. By contrast, in India, personal data of people suspected to have COVID-19 have been released by the state on government lists and apps, and people have been criminalized for violations of state orders.[30]

- Because public trust in digital surveillance measures is low in India, sometimes leading to violence against public health workers, long-term investment to build trust in public health and state institutions is needed. This trust cannot be replaced merely by the use of data. For example, international bodies have praised the Indian state of Kerala for combating the COVID-19 pandemic.[31] And underlying many of Kerala's strategies is public trust, which increased willingness to observe home quarantine.[32] One way this was achieved was through community engagement; for instance, with support from local government bodies and self-help groups, community kitchens provided meals to the poor.[33]

Epidemics are similar to other political crises in that during such crises, the state can legitimately intervene in people's social lives.[34] The COVID-19 pandemic has been used to normalize state surveillance globally by justifying it as necessary insurance against future threats.[35]

Public health experts say that some form of disease surveillance is required to control the pandemic. But what form should this surveillance take, and how can it be performed while protecting peoples' rights? This paper establishes that while data can provide important insights, it cannot keep people safe as an end in itself, especially when the people surveilled do not control their data. Though presented as a justified safety measure, data-enabled surveillance can lead to violence and other corporeal threats to individuals.

Visualizing the connection between bodies and data reveals the specific harms that can arise from data violations. While these violations are not new, they are now occurring in opaque, digitally mediated ways that were previously impossible. In all the cases discussed in this paper, surveillance has undermined not just individuals' data privacy but their bodily integrity, autonomy, and dignity. Although the more specific harms will usually differ by case, all harms can be identified by recentering the analysis on bodies. Disregarding this embodiment would do injustice to the experiences of surveilled marginalized communities.

Data governance policies must abandon the data-as-resource framework and adopt an embodied approach so that individuals have agency over not just their data but also their datafied bodies. Such an approach would ensure that human rights are protected within legal frameworks in the digital age, especially during pandemics.

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USING TECHNOLOGY FOR PUBLIC HEALTH PURPOSES:
EXPERIENCE AND LESSONS FROM TAIWAN

FENG-JEN TSAI

DEFINING THE CHALLENGE

The challenge Taiwan faced before and during the COVID-19 pandemic was the balance between technology use and human rights protection. As one of the wealthiest democratic countries in Asia, Taiwan successfully introduced universal health care coverage in March 1995. As of 2021, almost the entire population (99.96%) is insured.[1] This mandatory public insurance covers most medical services through a single-payer insurance model administrated by a central public health care agency. Due to the combination of high accessibility to health services and low sharing costs, public satisfaction with the system reached 91.6% in 2021.[23] By collecting data through patients' electronic cards and health providers' reimbursement claims, the government has gathered comprehensive health data for the whole population. The National Health Insurance (NHI) Administration also integrated cloud technology in 2013, allowing doctors to access patients' medical care records from cloud servers and avoid duplicating treatment.[4] During the COVID-19 pandemic, this comprehensive electronic NHI system served as the main mechanism for implementing the government's public health policies.

The World Health Organization (WHO) declared COVID-19 a public health emergency of international concern on January 30, 2020.[5] As of October 2022, there have been more than 600 million cases and 6.5 million deaths worldwide due to COVID-19.[6] Compared with other countries, Taiwan was much less affected by the pandemic during 2020 and 2021. As of early April 2022, Taiwan had fewer than

10,000 confirmed cases and approximately 800 deaths,[7] with most cases having been imported. In 2020, Taiwan suffered only moderate economic impacts, with its gross domestic product declining by less than 1%, and the GDP gross further increased from 3.36% in 2020 to 6.57% in 2021[8]. Though Taiwan shifted its response approach from a zero-COVID strategy to a "new model" of living with COVID in 2022,[9] Taiwan has effectively mitigated the effects of COVID-19 in early stage of the pandemic through border management, which includes digitally assisted contact tracing and other public health measures. Linking NHI card data with other databases has been an important part of the government's response. Although this approach has been successful, some have voiced concerns over the possible violation of human rights.

The argument that the government's use of technology and data collection might violate human rights is not new in Taiwan. The Taiwanese government maintains a complete National Health Insurance Research Database (NHIRD), which researchers can apply to use for medical research.[10] The NHIRD data can be cross-referenced and merged with data from other government databases. This combination of data can enable complex analyses, making the NHIRD uniquely valuable for health-related research.[11] However, using this type of data for further research has been controversial in Taiwan.

In 2012, several human rights organizations launched a lawsuit to prohibit this usage of NHIRD data.[12] In January 2017, after five years of proceedings, the Supreme Administrative

Court eventually ruled that the practices regarding NHIRD data use were in compliance with the Taiwanese Constitution and relevant statutes.[13] Despite this final ruling, one of the plaintiffs, the Taiwan Association for Human Rights, further appealed to the Constitutional Court. In opposition to the action brought by human rights organizations, representatives from medical and academic fields also launched a petition with the argument that participation in medical research is a civic duty and that the government should maintain the provision of the NHIRD for research purposes.[14]

The main criticism against using the NHIRD for medical research is the lack of patient consent.[15] The mandatory NHI system automatically records insured individuals' information to ensure payment to health providers. Under this arrangement, patients in Taiwan are not asked to provide consent for the collection and (re)use of their data. Moreover, they cannot opt out if they become aware of research using their data and do not wish to participate. The government sees no need for opting in or out of personal data use, on the grounds that the data are sufficiently safeguarded, particularly through anonymization (actually pseudonymization) before transmission to researchers. Although the government insists these measures are enough to safeguard individuals' privacy, human rights organizations continue to argue that the risk of identifying individuals through this data remains and that individuals' autonomy and their right to opt out of inclusion in the dataset must be protected.[16] The final ruling of the Constitutional Court delivered in August 2022 required the NIH Administration to amend the regulation to protect individuals' right to opt out of the dataset.

ASSESSING POLICIES AND PRACTICES

The debate regarding the use of NHIRD data has not yet been settled, but it has inspired much societal discussion about the balance between individual rights and the use of technology for public health purposes. Conferences and national research projects have focused on the issue, as have congressional debates

regarding the related regulations. These discussions have provided the foundation for further debates about balancing the collective good with personal liberty during the COVID-19 pandemic in Taiwan.

As an island that frequently interacts with China, Taiwan was expected to be one of the worst-hit countries by COVID-19 in early 2020. However, Taiwan's experience with the SARS pandemic in 2003 made Taiwan highly conscious of the potential spread of pathogens from China. Therefore, when a Taiwan Centers for Disease Control (TCDC) doctor saw information on a possible SARS-like outbreak in Wuhan, China, in the early morning of December 31, 2019, the TCDC took it seriously and immediately notified the WHO and prepared internally for a potential pandemic.[17]

On January 21, 2020, Taiwan reported its first confirmed imported case of COVID-19, prompting the TCDC to establish the Central Epidemic Command Center (CECC). The CECC was tasked with facilitating interdepartmental coordination across the ministries of the Interior, Education, Transportation and Communications, and others.[18] In a prompt and immediate response to the possible pandemic, the CECC implemented the screening of all airline passengers arriving from Wuhan in the early stages of the COVID-19 outbreak.[19] Screening was then extended to all passengers entering Taiwan from high-risk areas and countries in late January and extended to all passengers in early February, regardless of their location of origin. Then, the entry of non-Taiwanese citizens or nonresidents was restricted in mid-March. In addition to border control, the Taiwanese government linked individuals' NHI card data with their travel histories recorded in the Ministry of the Interior's National Immigration Agency database. Hospitals and clinics were alerted if individuals at risk of having COVID-19 sought health services. This allowed hospitals to more easily identify potential cases in real time, preventing further spread of the virus to the community and providing appropriate health services to identified individuals.[20]

Additionally, implementing and managing contact tracing was achieved through digital assistance. Contact tracing efforts for

COVID-19 in Taiwan included case investigation, contact list generation, health monitoring, and quarantine measures for close contacts.[21] If necessary to identify the origin of a patient's infection, case investigators could access the records of the patient's movements from police and telecommunication companies. Then, people who had been in close contact with confirmed cases could be identified. If local public health officers could not reach the identified close contacts, the TCDC would provide more information from other data sources, such as the household registration system.[22] Close contacts and travelers returning from high-risk countries were required to quarantine at home for 14 days, followed by an additional 7 days of self-monitoring. During the quarantine period, their health status was monitored twice daily through self-reporting via an automatic text message or web app in addition to telephone calls or home visits by public health workers. The CECC also set up a smartphone-based system to track the real-time locations of people in quarantine and alert local authorities if anyone left their designated location or switched off their phone.[23] Those who triggered an alert would be contacted or visited by the authorities within 15 minutes.

Apart from digitally assisted contact tracing and quarantine management, other COVID-19 measures included mandating the use of face masks in public places, delaying the start of the new semester for schools in February 2020,[24] and banning gatherings of over 100 people indoors and 500 people outdoors in March 2020.[25] Through these controls, Taiwan successfully protected its population from the first wave of COVID-19. Even without stringent, broad restrictions on movement or local or national lockdowns, the number of confirmed cases in the community fell to zero in April 26, 2020.[26, 27]

Many of the aforementioned disease control measures involved not only individuals' health data but also their locations and mobile data. Data use during the pandemic involved both passive recordkeeping and active surveillance. The legal preparedness of Taiwan's public health bodies might partially explain its success in introducing the measures without vehement opposition. Laws are central to pandemic

responses in democratic societies. In Taiwan, relying on preexisting public health legislation meant that the government could manage the health crisis without declaring a public health emergency. In other words, Taiwan's public health measures remained subject to judicial review under the ordinary constitutional framework.[28] The stability of the legal framework that enabled Taiwan's COVID-19 response demonstrates how crucial it is to have the public's cooperation and trust.

However, the legal basis for the government's use of technology during the pandemic has not gone unchallenged. In early 2022, the highest supervisory and auditory governmental branch, Control Yuan, conducted an investigation on the government's use of active surveillance to enforce quarantine.[29] The legal basis cited for the government's approach is the Communicable Disease Control Act (CDC Act). The CDC Act was originally enacted in 1944 but was comprehensively amended in 2004, right after the SARS pandemic. Thoughtfully designed in the Parliament, the amended CDC Act provides an overarching legal framework for the government to adopt various measures deemed necessary to prevent and contain the spread of an infectious disease. The CDC Act describes the formulation, structure, and function of a cross-sector center for epidemic command (in other words, the CECC). The law also regulates the authorization of administrative agencies to undertake necessary actions for disease control. Yet the Control Yuan's investigation concluded that the Act does not clearly authorize administrative agencies to obtain individuals' locations or mobile data and therefore risks the "normalization of exceptional status" within the regulatory system. This investigation demonstrates that Taiwan's current laws remain insufficient for future pandemic responses.

Despite the investigation, Taiwan's society appears to understand and accept the tradeoffs between public health monitoring and privacy. One reason may be that technology has also been leveraged to improve the communication of health information and new policies. Early in the pandemic, the TCDC started using an existing digital messaging system (Line) to enable citizens to access real-time information

about COVID-19.[30] Throughout the pandemic, the CECC has conducted daily news briefings that provide updates on epidemiological evidence and the government's new policy approaches. Information from these daily press conferences is updated in a synchronous information system. These communication platforms provide not only a source of accurate and reliable information but also an outlet for the CECC to address social concerns regarding public health measures. For example, concerns about the violation of individual privacy through contact tracing were addressed in CECC press conferences. The CECC was transparent about the technology used and explained how individuals' data are required to be deleted after six months, striking a balance between using technology to improve public health and guarding individual privacy. By prioritizing transparency, the CECC strengthened public confidence and maintained its credibility, further enhancing public cooperation during the pandemic.

Civil society engagement has also helped to strengthen public confidence. For example, when confronted with a shortage of face masks, the government set a mask distribution policy and partnered with civil society actors to develop a digital platform to help citizens obtain masks.[31] Using open data, these civil society actors created maps and applications showing the availability of masks across the island. This technology, which improved the availability of information, served to ease public panic around the mask shortage.

In conclusion, the government has devoted much time to communicating with society about the balance between technology use for public health purposes and the protection of individual privacy and liberty — both during and before the COVID-19 pandemic. Although the debates around using NHIRD data for medical research and conducting surveillance to enforce quarantine have not been settled, open communication will continue to enhance mutual trust between the public sector and the community. In democratic countries, technocratic, evidence-based approaches to improving public health policy with technology must be balanced with significant efforts to protect individuals' privacy and liberty.

BEST PRACTICES AND POLICY RECOMMENDATIONS

Based on Taiwan's experience, the following policy recommendations could be broadly useful for other democracies:

- Transparency in the policymaking process is crucial for sustaining public trust in government and democratic institutions. Trust in government generally refers to the people's confidence in the national government. With such confidence, people are willing to follow implemented policies. Taiwan's experience in addressing the inherent conflict between using technology to promote public health while safeguarding human rights highlights the need for transparency. This experience might provide useful information for other countries in Asia that are considering a universal health coverage system or technology-based policies for public health, such as infectious disease control. However, governments must carefully consider what information should be accessible during a pandemic, as too much exposure to scientific uncertainty could cause the public to panic.

- A clear legal framework is the foundation for a stable policy environment. Although Taiwan's current CDC Act remains insufficient due to the rapid development of technology, it has nevertheless provided a comprehensive legal framework for COVID-19 control measures. The positive outcomes Taiwan has enjoyed reflect the importance of preparing legal frameworks in anticipation of possible crises. Importantly, the prioritization of conflicting values, which generally arise when developing frameworks, should be discussed and considered along with supporting measures in "peace time."

- Governments need to communicate risks to, and educate, both health professionals and the public. Health professionals should be aware of the impact of applying new technology — for both research and policy — on human rights. The public must also be engaged in policy discussions about the balance between technology use for public health and the protection of individual rights

and must have sufficient understanding of the issues. Multilateral communication can enhance understanding among government, academics, and civil society and, in turn, enable collaboration in policymaking and implementation. To foster an environment for meaningful public participation in peace time, policymakers should use technology to provide information before, as well as after, final policy decisions are made.

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