# Taiwan Under the Pandemic A Security Perspective

By Wu Shang-Su

he drastic changes in Taiwan's COVID-19 situation present an unusual national security case study. Despite its proximity to the initial outbreak in China, Taiwan was in a "parallel universe" from the beginning of the pandemic with a total of only 1199 confirmed cases and 12 deaths as of May 10<sup>th</sup> 2021.¹ While many countries have suffered seriously from the pandemic Taiwan did not experience any lockdown throughout 2020, and its economy even grew.² When vaccinations began in March 2021, Taiwan looked likely to escape the pandemic without major disruption; an outbreak in May 2021 however removed the laurel of success and plunged Taiwan into uncertainty.³

Taiwan's counter-COVID-19 leadership hub is the specially established Central Epidemic Command Center (CECC), led by Health Minister Shih-Chung Chen. This ad hoc institute is endowed with various powers during the pandemic and is politically supported by President Tsai Ing-Wen and Primer Su Tseng-Chang. In addition, President Tsai's first term Vice President Chen Chien-Jen, an epidemiologist with knowledge and firsthand experience dealing with the severe acute respiratory syndrome of 2003 (SARS), is part of the counter COVID-19 leadership. Both Taiwan's initial success and the recent outbreak provide indispensable lessons to the leadership.

It is too early to conclusively assess the overall impact of the pandemic on Taiwan's security or identify the dynamics between individual political leaders and specific policies. However, the COVID-19 policies are worthy of early analysis for their contribution, flaws, and potential influence on Taiwan's security. Due to the initially stable situation, Taiwan's civil-military relations have not been altered, and the armed forces provided only modest support, such as decontaminating infected locations and supplementing the labor force for mask manufacturing. The external security outlook remains similarly stable: Beijing's military threats have been intensive as usual, and Washington remains the most important source of external security.

The major counter-pandemic policies relevant to Taiwan's security—especially internal security—include masking, tracking, the national information campaign, testing, and vaccine procurement. These policies reflect Taiwan's capacity, capability, and style of handling security matters. In the face of the existential threat

Dr. Wu Shang-Su is a Research Fellow at the S. Rajaratnam School of International Studies. Before joining the RSIS, he had worked at the National Defense University and the Legislative Yuan in Taiwan.

from the People's Republic of China, Taiwan's external security has been ambiguous for decades. If it is unable to address its internal security challenges the island will be even more vulnerable to the overwhelming military forces on the other side of the Strait. Although the pandemic can by no means be considered equivalent to war, and though pandemic-related decisionmaking is conducted by public health officials, Taiwan's responses to this unplanned crisis provide valuable lessons.

### Masks

Based on its experience of the SARS outbreak of 2003, Taiwan's leadership has been aware of the importance of facial masks in such pandemics, and thus mask production was prioritized immediately after the first appearance of COVID-19.8 The SARS experience established consensus among both people and officials on the importance of masks, and led to the establishment of the National Health Command Center established in 2004 for coordinating all related affairs.9 The flu crisis of 2009 provided another opportunity to practice the mobilization of mask production.10 The materials and precision machinery respectively supplied by local petrochemical and machine tool companies also contributed to the rapid expansion of mask production lines.11 Prior to the pandemic, most facial masks available in Taiwan were imported with 93 percent of them coming from China. With the expectation of supply shortages from external sources, on February 6, 2020, Taipei mobilized mask manufacturers and material suppliers to boost domestic production from two million daily in February to 20 million in June, to meet the internal demand.12

According to Article 55 of the Communicable Disease Control Act, the CECC is endowed with various power during the pandemic emergency, including compulsory mobilization of mask factories to supply their products at a fixed price to the government, along with a similar measure affecting

companies producing melt-blown, non-woven, and other materials for masks.<sup>13</sup> Each mask manufacturer has been assigned a quota according to its individual capacity.<sup>14</sup> The government also similarly purchased materials and adjusted both the prices of the masks and materials in response to increased demand in the international market.<sup>15</sup> Moreover, the government funded production lines for mask factories, and supplied military personnel to supplement the labor force. The companies will eventually assume the cost of production lines.<sup>16</sup>

In parallel with this mobilization, on January 31 Taiwan prohibited individual procurement of masks, and then utilized the national health insurance system, including the network of 6000+ pharmacies, to distribute all the expropriated masks for individual rations throughout the country. Although governmental intervention may reduce the efficiency of the market, the compulsory distribution of the basic mask ration backed up by mobilized factories with increasing production generally prevented or mitigated public panic.<sup>17</sup>

This generally successful process of producing and distributing masks was nevertheless not perfectly smooth and encountered both trials and errors. 18 In the initial stage, the gap between the demand and supply was wide, evident in the long queues of people around pharmacies, resulting in some risk of infections, but increasing production eventually caught up and related measures were activated from May 2020.19 After the initial shortage, poor quality, illegal sales, fake origin, and other problems also occurred amidst the mask production mobilization.<sup>20</sup> Despite these problems, Taipei eventually reached its goal of producing sufficient masks to meet domestic needs and began to donate masks and production lines to other countries for humanitarian and diplomatic purposes, such as the Czech Republic.21 Taiwan's mask autonomy has been noted by Beijing which has seized any opportunity to apply its own mask diplomacy against Taiwan.



"Taipei eventually reached its goal of producing sufficient masks to meet domestic needs and began to donate masks and production lines to other countries. Taipei, Taiwan." (Photo by: Bureau of Foreign Trade, Ministry of Economic Affairs, June 1, 2020)

The mask example is indicative of Taiwan's capability to respond to a crisis or even an armed conflict in the Strait. Successful mask production and distribution are a synthetic achievement composed of official planning, integration, adjustment, cooperation by the industrial and private sectors, and public trust. The island can be expected to achieve a similar level of coordination and resource mobilization to meet the needs of defense for various war scenarios. For example, if Taipei could boost capacity to absorb economic sanctions by Beijing, the latter's leverage would be less effective. With full mobilization of civilian resources, such as vehicles and heavy machinery, Taiwan's defense capability against any Chinese incursion would exceed its purely military means.

Despite the achievement time, scale, and disruption will likely constrain the application of the mask experience to the mobilization of other industries during a crisis or armed conflict. Although the COVID-19 rapidly spread worldwide in the first half of 2020, Taiwan's border control and other countermeasures (as well as luck) prevented massive infection, providing the time for mask mobilization to reach its objective. In case of a crisis or an armed conflict with China, there may not be several months for Taipei to conduct full or even significant mobilization. Furthermore, much more than masks will need to be mobilized in case of war. Whether Taipei could manage the simultaneous mobilization of multiple, diverse supply lines cannot be inferred by the mask mobilization alone. Finally, while the

supply of materials for mask production was generally free from disruption, the situation could be quite different during wartime, as the production, storage, and distribution of strategic resources, as well as power supply, could be disrupted, if not neutralized by the enemy's firepower or by sabotage. The simultaneous mobilization of multiple supply lines in the context of a military conflict is difficult to envision.

## **Tracking**

Ensuring that infected people remain in quarantine and disclosing all close contacts of diagnosed patients are essential to controlling the COVID-19 situation. The Taiwanese government chose to trace cellphones through the triangulation of signal stations instead of the global positioning system (GPS). Despite the relatively low accuracy of locations, Taiwan's tracking system has still been able to maintain electronic fences which prevent traced people from entering specific locations, in addition to automatically sending warning, inquiry, and other messages.<sup>22</sup> Passengers from overseas are required to register their cellphones in the Quarantine System for Entry, and are included in the tracking system.<sup>23</sup> The governmental database of the health insurance system and immigration department are also utilized for tracking purposes.<sup>24</sup> In addition to this technology and approach, local administrative personnel check the status of traced individuals through twice-daily phone calls and deliveries of supplies for basic needs.<sup>25</sup> Despite some misses such as a few pilot clusters, the small numbers of confirmed cases would support the efficiency of the tracking system.26 However, the system's capacity has not been fully tested by the relatively small numbers of COVID-19 tests conducted and confirmed cases. Although all passengers from overseas must present proof of negative COVID-19 test results from less than three days before boarding, tests upon arrival are merely an alternative instead

of a compulsory process.<sup>27</sup> In other words, those infected during travel or holding falsified documentation may be less likely to be detected upon arrival. Finally, mixing those in quarantine with other individuals in the hotel of the Taoyuan airport created another loophole in the tracking system.<sup>28</sup>

The large-scale tracking of people during the COVID-19 pandemic could benefit Taiwan's internal security in two ways. Due to similar appearance, language, and culture, penetration by Chinese agents and special force is always a danger.<sup>29</sup> Although such individuals would often change their cell phones and have other means of communication, the experience of extensive tracking and tracing interactions is still valuable for the government in terms of surveillance. Furthermore, the pandemic largely reduces the numbers of people moving in and out of the island so that the internal security authorities would have a relatively simple situation for building up their awareness.

# **Information Campaign**

Misinformation concerning a pandemic could be more dangerous than the pandemic itself in terms of panic-driven behavior; this challenge is especially relevant for Taiwan due to China's relentless campaign of information warfare. It must be noted that the impact of rumors reflects the relationship between the government and people. The high levels of uncertainty resulting from a pandemic could disturb civil-official relationships and open additional space for misinformation. When official information is different or even contradictory to popular experience, misinformation works even better as official information can be mistakenly interpreted as fake news.<sup>30</sup>

Taipei's COVID-19 information campaign is built on countermeasures and transparency. As the internet has become the main domain of spreading misinformation, Taipei not only passed a special law for punishing such violations but also set up

a fact-checking center, in addition to suspending or removing suspect accounts on social media and other platforms. Specific apps were provided enabling people to conduct immediate checks with the fact-checking center regarding information on social media and other virtual communication platforms. Fake information is often poorly produced and in conflict with reality and is soon boosted. Meanwhile, the Centers for Disease Control (CDC) holds a daily press conference which is further broadcast through most media supplying official information. These efforts indeed contribute to Taiwan's stability under the pandemic and constrain the spread of misinformation.

From May 2021, Taiwan's information campaign started to face real challenges as the pandemic surged. With the rising numbers of infections decisionmakers had to strike a balance between avoiding panic and revealing the full extent of the situation. If concern about stability is too high, trust in the government may be eroded leaving room for misinformation and other kinds of agitation. For instance, one person was arrested for spreading misinformation about a confirmed COVID-19 patient in his hometown, but the information was later officially proven to be accurate.<sup>33</sup> If this trend continues, banning accounts posting and sharing unofficial information plus punishment will be less effective in suppressing misinformation while causing people to doubt official sources. Moreover, given that China or other actors deliver better prepared, more realistic, and consistent misinformation or even true but unofficial information, Taiwan's response capability and management capacity are uncertain. To be fair, the experience from COVID-19 still helps Taipei as a rehearsal for future information warfare, and has proven certain capabilities and capacity in a low- or medium-intensity situation. Such experience could be applied to oppress an adversary's information campaign during a crisis or armed conflict, especially in the initial stage when the overall situation is unclear.

## **Testing**

Taiwan's approach to COVID-19 testing is unique or at least unusual compared to its global counterparts and has been blamed as a major factor resulting in the recent outbreak. The conventional wisdom is that it is essential to detect and diagnose infected people for public awareness. Initially Taipei conducted minimal testing compared to countries such as New Zealand and Singapore. New Zealand with its 5.1 million population—less than a quarter of Taiwan's 23.6 million—has conducted 2,095,421 tests, more than triple that of Taiwan's 610,865 as of May 20th, even after the outbreak. Singapore with a similar 5.7 million-plus population has conducted more than 11 million tests.

False positivity, capacity, and social stability are the three main reasons for Taiwan's restrictive approach to COVID-19 testing. Limited testing capacity was the main reason for restricted testing in the initial stage, though the capacity has gradually increased.<sup>37</sup> Concern over false positive results discouraged many asymptomatic people from getting tested.<sup>38</sup> In the summer of 2020 public opinion began to shift toward mass testing, but the official response was negative sensitive to concern about overwhelming the medical system in addition to the false-positive results.39 The risk of disrupting social stability and fear of discrimination against infected patients further discouraged Taipei from expanding the testing program. 40 Despite this unconventional approach, the lack of clusters of community infection resulted in minimal levels of economic disruption, as evidenced by the unusual economic growth of 2020. As testing on such a limited scale might not sufficiently reflect the real COVID-19 situation, it is unclear whether extensive testing in 2020 would have resulted in a lockdown.41

With infection numbers suddenly rising in May 2021, Taipei's limited COVID-19 testing program must be questioned. The testing minimalist approach impedes the collection of information on

the pandemic and may lead to insufficient understanding for decisionmakers. The surge of infections in the Wanhua District of Taipei City might have been discovered earlier with more extensive COVID-19 testing. <sup>42</sup> Testing capacity is crucial for Taiwan to constrain the current wave. As the CECC states the maximum daily capacity is 13,276 or even as many as 16,000, the current capacity has not been overloaded. <sup>43</sup> However, whether the maximum capacity is feasible, and the overall process is efficient enough to reflect the situation in the face of suddenly rising demands may be still questionable. <sup>44</sup>

Some reasons previously justifying limited testing reflect insufficient preparation in civilian sectors, including the medical sector. It is notable that the official statement on insufficient capacity

was in August 2020, already six months after the COVID-19 breakout. In contrast to its mask production mobilization, Taiwan seems not to have similarly mobilized other resources. Undeniably, mass testing might have resulted in some social disruption, but it could have been managed and the population prepared in advance. Informed by examples in other countries mass testing would certainly be more manageable than the surprising eruption of infections in May 2021. It is too early to tell if Taiwan's medical capacity is sufficient for the crisis, merely by the official instructions on lowering operational loading of the medical institutes.45 However, the supply of negative pressure isolation wards—the critical equipment for treating COVID-19 patients in serious condition—was 1,100 in March 2020 and



"Crowded Ximending after several days of zero local COVID-19 case, Most of the people still wearing masks to prevent. Taipei, Taiwan." (Photo by: Jack Hong at Shutterstock ID: 1801636219, May 8, 2020)

only 1,000 in May 2021, indicating some insufficiency in preparation.<sup>46</sup>

Although we may never discover all the reasons behind the Government's limited approach to COVID-19 testing through public sources, it has proven flawed and a similar constrained policy response to other national security challenges would be dangerous for Taiwan. Ignoring or avoiding the intelligence on threats can lead to improper force-structure in the long-term or missing the initiative in the short-term. A salient example of Taipei neglecting or underestimating national security threats in policymaking is the all-volunteer force (AVF) policy that marginalizes the role of conscription. Despite the obvious threat from China and various other concerns related to the AVF policy, Taiwan still adopted the policy in 2016 resulting in a human resources deficit.<sup>47</sup> As for the short-response, Taiwan's recent military acquisitions have shown a transformation towards more offensive capabilities such as air-to-surface missiles and cruise missiles, whose strategic values would be significantly reduced after being struck by China's standoff firepower. Clearly, therefore, ignoring or underestimating threats would negatively affect warfare.48

#### Vaccines

Despite the modest impact of the COVID-19 pandemic prior to May 2021, Taiwan has not been exempted from the worldwide competition for vaccines, which has become a contentious issue with China. Taipei takes a dual approach to COVID-19 vaccines, through external procurement and indigenous development. Due to the recent availability, external vaccine procurement has exceeded internal procurement from the last half of 2020. Taiwan's original plan was to obtain 30 million doses from the German company BioNTech, a co-developer with Pfizer, through a Taiwanese biopharma company, however, the deal fell through in November 2020 due to lack of governmental

support.<sup>49</sup> Afterwards, Taipei attempted to purchase five million doses from the same supplier, but the arrangement failed again due to complications with the dealership of the vaccine. The Shanghai Fosun Pharmaceutical Company has an agreement with BioNTech for delivering vaccines in the "Greater China" area including Taiwan. 50 Such vaccines are using BioNTech's technology to produce in China; Taiwan refused the China-made vaccines due to concerns on safety, effectiveness, and security.<sup>51</sup> Eventually, Taipei managed to obtain 10 million AstraZeneca doses, followed by five million doses of the Moderna vaccine.52 Taiwan with its once stable situation was initially not keen on acquiring vaccines for itself but for its allies to secure relationships. After the outbreak in May 2021, however, Taipei shifted toward accelerating the introduction of the Moderna vaccine for internal use.53

Vaccine diplomacy also emerged as a complicating issue in cross-Straits relations. During the initial delay in acquiring foreign vaccines, some opposition politicians, including former President Ma Ying-Jeou, suggested Taiwan should procure Chinese vaccines, a move which could serve China's vaccine diplomacy. This voice, however, did not prevail or ultimately affect the policy.54 After the May 2021 outbreak Beijing's Taiwan Affairs Office hoped Taipei would welcome the Chinese vaccine, but thus far this has not occurred.<sup>55</sup> Indeed, Taiwan countered China's vaccine diplomacy by arranging alternative COVID-19 vaccine sources for its Latin American allies, such as Paraguay and Honduras, to discourage them from changing their official recognition.56 This dynamic is still ongoing with uncertain impact ultimately on Taiwan's international status.<sup>57</sup> In short, China's challenge to the West through the pandemic has not had significant impact in Taiwan, and the United States as a major supplier of vaccines maintains its relevance and influence.58

The disruption of the BioNTech deal reminds

us of the inconvenient fact of Taiwan's unsettled relationship with the People's Republic of China. The concept of "greater China" reflects a perception of Taiwan generally being a Chinese territory rather than a sovereign state. In parallel, the majority of Taiwanese political elites and people have accepted the status quo, and the current regime under the official title of "the Republic of China" just fits the perception. Undeniably, various constraints, particularly Beijing's threat of the use of force to counter any Taiwanese move towards independence, have resulted in the status quo, but the status quo is indeed disadvantageous to Taiwan, as proven again by the vaccine deal.

Under the status quo, Taiwan has been excluded from the World Health Organization (WHO) since its loss of a seat in the United Nations in 1971, except for being an observer between 2009 and 2016 with China's permission.<sup>59</sup> Non-member status is seen as a major reason that Taiwan's early inquiry email failed to trigger the WHO's global warning system, instead resulting only in a statement downplaying the transmission of the virus between humans. However, Taiwan's membership would not have helped much to highlight its concern amidst China's information and influence campaign. Indeed, its exclusion from the WHO made Taipei more visible on the COVID-19 pandemic than its international counterparts.60 In this specific case, Taiwan's international isolation may have had a positive aspect, at least until it interfered with vaccine procurement.

The flaw in Taiwan's vaccine procurement effort may also result from a defect in decisionmaking and execution. The failure of the first deal in November 2020 may reflect a lack of coordination or consensus among Taiwan's leadership, while the second failure is harder to explain. Being in an unfavorable international status for decades, Taiwanese officials, including the leadership, should have been aware of the Chinese dealer's commitment to supplying the greater China area, but negligence or

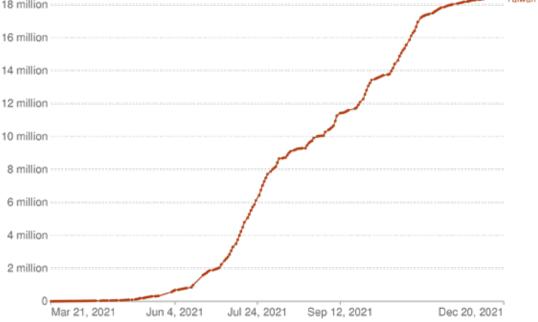
other mistake resulted in the disruption. Although Taipei quickly found alternatives, there was a delay of several months which took a toll on public health and in human lives. When the eruption of infections occurred in May 2021, Taiwan had only about 300,000 doses of AZ vaccine. <sup>61</sup> Despite procurement efforts and internal development, the delay in acquiring vaccines exposed the island's vulnerability.

#### Conclusion

The dramatic changes in Taiwan's response to the COVID-19 pandemic demonstrates some worrisome but valuable lessons for its security. Taipei achieved initial success in countering the pandemic in 2020, but that success leaves significant room for future improvement. The mobilization of mask production was a great combined effort of the government and companies to meet domestic needs. However, that effort has not been replicated in other sectors to increase medical capacity for rapidly rising demands. For example, concern over public panic led to very limited COVID-19 testing. The minimalist approach to COVID-19 testing narrowed Taiwanese decisionmakers' awareness, possibly paving the way to the spiking cases of May 2021. The tracking and tracing system is another positive practice with great potential in counterespionage and other internal security issues. However, the effect of the tracking system on countering the pandemic could be flawed due to a lack of testing requirements for arriving passengers and poor organization at the airport quarantine hotel. Efforts to counter misinformation demonstrates Taipei's awareness of the threat and encourages coordination of available technologies and resources. The information campaign is nevertheless facing a real challenge in an unfavorable situation.

Since both pandemics and armed conflicts challenge certainty and security, Taiwan has a great opportunity to learn from its experiences countering





Source: Official data collated by Our World in Data

Number of people who received at least one dose of COVID-19 vaccine in Taiwan. Total number of people who received at least one vaccine dose. (Source: Our World In Data (https://commons.wikimedia.org/wiki/File:Taiwan-COVID19-data-explorer.svg, 2021)

COVID-19, especially the negative lessons. Its initial success may eclipse the need for improvement, but the recent outbreak demonstrates the fragility of that once bright image. It raises doubt on Taipei's response to an adverse development in a crisis or an armed conflict. As a small state with a narrow margin for error, Taiwan should remain mindful to deal very carefully with its survival challenges, whether from COVID-19 or from Beijing. PRISM

#### Notes

<sup>1</sup> Taiwan Centers for Disease Control, May 17, 2021, available at <a href="https://www.cdc.gov.tw/En">https://www.cdc.gov.tw/En</a>>.

<sup>2</sup>Hilton Yip, "Taiwan's COVID-19 Success Is Worryingly Smug," *Foreign Policy*, April 5, 2021, available at < https://foreignpolicy.com/2021/04/05/taiwan-covid-19-success-china-military-threat/>; Held Davidson, "Lockdowns and panic-buying in Taiwan as Covid cases rise," *the Guardian*, May 16, 2021, available at < https://www.theguardian.com/world/2021/may/16/lockdowns-and-panic-buying-in-taiwan-as-covid-cases-rise>.

<sup>3</sup> "Taiwan to start COVID-19 vaccination with AstraZeneca vaccine on March 22," Taiwan Centers for Disease Control, March 19, 2021, available at < https://www.cdc.gov.tw/En/Bulletin/Detail/D8qwURN9F8430bMmOxGPJA?typeId=158 >; Ralph Jennings, "Taiwan, Once an Icon for COVID Control, Grapples Now with First Serious Outbreak," *VOA News*, May 19, 2021, available at < https://www.voanews.com/covid-19-pandemic/taiwan-once-icon-covid-control-grapples-now-first-serious-outbreak >.

4"Communicable Disease Control Act," Laws & Regulations Database of the Republic of China, June 19, 2019, available at <a href="https://law.moj.gov.tw/ENG/">https://law.moj.gov.tw/ENG/</a> LawClass/LawAll.aspx?pcode=L0050001>; "About CECC Commander," Taiwan Centers for Disease Control, April 9, 2020, available at <a href="https://www.cdc.gov.tw/">https://www.cdc.gov.tw/</a> En/Category/Page/PoZHA3Df6iKJ40Bo8MqOTQ>; Tsai Ing-Wen, "President of Taiwan: How My Country Prevented a Major Outbreak of COVID-19," Time, April 16, 2020, available at <a href="https://time.com/collec-pril 16">https://time.com/collec-pril 16</a>, available at <a href="https://time.com/collec-pril 16">https://time. tion/finding-hope-coronavirus-pandemic/5820596/ taiwan-coronavirus-lessons/>; "Government making all-out effort to stop COVID-19 transmissions," Executive Yuan, May 13, 2021, available at <a href="https://english.ev.gov">https://english.ev.gov</a>. tw/Page/61BF20C3E89B856/906627d8-83c1-4a75-8524a21151bd3a4b>.

<sup>5</sup>Nick Aspinwall, "Changing of the Guard as William Lai Replaces Taiwan's Epidemiologist Vice President," *the Diplomat*, June 19, 2020, available at < https://thediplomat.com/2020/06/changing-of-the-guard-as-william-lai-replaces-taiwans-epidemiologist-vice-president/>.

<sup>6</sup>Stacy Chen, "Taiwan sets example for world on how to fight coronavirus," *ABC News*, March 13, 2020, available at <a href="https://abcnews.go.com/">https://abcnews.go.com/</a>
Health/taiwan-sets-world-fight-coronavirus/story?id=69552462>; "CORONAVIRUS/Taoyuan hospital completes mass evacuation of patients," *Focus Taiwan*, January 21, 2021, available at <a href="https://focustaiwan.tw/">https://focustaiwan.tw/</a> society/202101210020>.

<sup>7</sup> Military Balance 2021 (London: International Institute for Strategic Studies, 2021), pp. 221, 229; Hilton Yip, "Taiwan's COVID-19 Success Is Worryingly Smug."

<sup>8</sup> "How has Taiwan kept its coronavirus infection rate so low?" *DW*, April 9, 2020, available at <a href="https://www.dw.com/en/taiwan-coronavirus/a-52724523">https://www.dw.com/en/taiwan-coronavirus/a-52724523</a>.

<sup>9</sup> Jennifer Summers, Hao Yuan Cheng, Hsien-Ho Lin, Lucy Telfar Barnard, Amanda Kvalsvig, Nick Wilson, Michael G. Baker, "Potential lessons from the Taiwan and New Zealand health responses to the COVID-19 pandemic," *the Lancet*, October 21, 2020, available at < https://www.thelancet.com/journals/lanwpc/article/PIIS2666-6065(20)30044-4/fulltext>; "NHCC," Taiwan Centers for Disease Control, January 31, 2018, available at < https://www.cdc.gov.tw/En/Category/MPage/gL7-bARtHyNdrDq882pJ9Q>.

<sup>10</sup> "President insists supply of masks sufficient to ward off flu," *Taiwan News*, May 3, 2009, available at <a href="https://www.taiwannews.com.tw/en/news/938030">https://www.taiwannews.com.tw/en/news/938030</a>>.

<sup>11</sup> "CORONAVIRUS – The situation in Taiwan," Flanders Trade, January 12, 2021, available at <a href="https://www.flandersinvestmentandtrade.com/export/nieuws/coronavirus-%E2%80%93-situation-taiwan">https://www.flandersinvestmentandtrade.com/export/nieuws/coronavirus-%E2%80%93-situation-taiwan>

<sup>12</sup> Katherine Wei, "Coronavirus: How Taiwan is cranking up mask production to meet shortfall," *Strait Times*, March 3, 2020, available at <a href="https://www.straitstimes.com/asia/east-asia/coronavirus-how-taiwan-is-cranking-up-mask-production-to-meet-shortfall">https://www.straitstimes.com/asia/east-asia/coronavirus-how-taiwan-is-cranking-up-mask-production-to-meet-shortfall</a>; Shiroma Silva, "Coronavirus: How map hacks and buttocks helped Taiwan fight Covid-19," BBC, June 7, 2020, available at <a href="https://www.bbc.com/news/technology-52883838">https://www.bbc.com/news/technology-52883838</a>>.

<sup>13</sup> "Communicable Disease Control Act"; Yun-Tzu Chen, "Summarization of Surgical Mask Policy," Fight COVID Taiwan, available at <a href="https://fightcovid.edu.tw/specific-topics/mask-summerization">https://fightcovid.edu.tw/specific-topics/mask-summerization</a>; "2 melt-blown lines commence operation in northern Taiwan," *Taiwan Today*, July 2, 2020, available at <a href="https://taiwantoday.tw/news.php?unit=2&post=180520">https://taiwantoday.tw/news.php?unit=2&post=180520</a>.

14"徵收口罩1片6元 3元口罩廠3元物流加超商 (Expropriated Masks One for Six Dollars, Three for Manufacturers and Three for Delivery and Distribution)," *TVBS*, February 1, 2020, available at <a href="https://news.tvbs.com.tw/life/1270221">https://news.tvbs.com.tw/life/1270221</a>.

15 陳書璿 (Chen Su-Chun), "口罩熔噴布徵收價 大 漲三成(The Expropriation Prices of Marks and Melt Blowing Texture Increased 30%)," *United Daily News*, August 28, 2020, available at <a href="https://udn.com/news/story/7238/4815709">https://udn.com/news/story/7238/4815709</a>>.

<sup>16</sup> Katherine Wei, "Coronavirus: Taiwan to make surgical masks available online, as part of its mask rationing system," *Strait Times*, March 10, 2020, available at < https://www.straitstimes.com/asia/east-asia/coronavirus-taiwan-to-make-surgical-masks-available-online-as-part-of-its-mask>.

<sup>17</sup> Che-huei Lin, Ya-Wen Lin, Jong-yi Wang, Ming-hung Lin, "The pharmaceutical practice of mask distribution by pharmacists in Taiwan's community pharmacies under the Mask Real-Name System, in response to the COVID-19 Outbreak," *Cost Effectiveness and Resource Allocation*, Vol. 18, No. 45 (2020), p. 4, available at <a href="https://pubmed.ncbi.nlm.nih.gov/33088224/">https://pubmed.ncbi.nlm.nih.gov/33088224/</a>>.

<sup>18</sup> "Taiwan limits masks to three per person, makes 1.4m available," *the Standard*, January 31, 2020, available at <a href="https://www.thestandard.com.hk/breaking-news/section/3/140992/Taiwan-limits-masks-to-three-perperson,-makes-1.4m-available">https://www.thestandard.com.hk/breaking-news/section/3/140992/Taiwan-limits-masks-to-three-perperson,-makes-1.4m-available</a>; Mimi Hsin Hsuan Sun, "Taiwan introduces new system to prevent mask stockpile," *china Post*, February 3, 2020, available at <a href="https://chinapost.nownews.com/20200203-946896">https://chinapost.nownews.com/20200203-946896</a>;

<sup>19</sup>Katherine Wei, "Coronavirus: Taiwan to make surgical masks available online, as part of its mask rationing system"; Huang Tzu-ti, "Taiwan poised to relax mask distribution and export restrictions," *Taiwan News*, May 15, 2020, available at < https://www.taiwannews.com.tw/en/news/3934624>.

20 李鼎強 (Li Ding-Chiang), "通通都要換! 多人反應緊急更換瑕疵口罩(Change All! Flawed Masks Will be Replaced After Many Reports)," TVBS, April 27, 2020, available at <a href="https://news.tvbs.com.tw/life/1315443">https://news.tvbs.com.tw/life/1315443</a>; 張文川 (Chang Wen-Chun), "軍官監守自盜國家隊1500 片口罩 中校李志交重判10年2月(Officer Illegally Sold 1500 Masks, Colonel Li Chih-Chau Sentenced 10 Years 2 Months)," 自由時報(Liberty Times), March 31, 2021, available at <a href="https://news.ltn.com.tw/news/society/breakingnews/3484730">https://news.ltn.com.tw/news/society/breakingnews/3484730</a>; "Another Taiwanese manufacturer accused of selling counterfeit masks," Focus Taiwan, September 10, 2020, available at <a href="https://focustaiwan.tw/society/202009100012">https://focustaiwan.tw/society/202009100012</a>.

<sup>21</sup> Jay Chen, "Taiwan Donates Over 51 Million Masks to Countries Worldwide," *Business Wire*, July 22, 2020, available at <a href="https://www.businesswire.com/news/home/20200722005405/en/Taiwan-Donates-51-Million-Masks-Countries-Worldwide">https://www.businesswire.com/news/home/20200722005405/en/Taiwan-Donates-51-Million-Masks-Countries-Worldwide</a>; Veronica Ugwu, "Taiwan Donates Facemask Production Equipment to the Czech Republic," *Brno Daily*, September 16, 2020, available at <a href="https://brnodaily.com/2020/09/16/news/politics/taiwan-donates-facemask-production-equipment-to-the-czech-republic/">https://brnodaily.com/2020/09/16/news/politics/taiwan-donates-facemask-production-equipment-to-the-czech-republic/>.

<sup>22</sup>Melyssa Eigen, Flora Wang, Urs Gasser, "Country Spotlight: Taiwan's Digital Quarantine System," the Berkman Klein Center for Internet & Society at Harvard University, July 31, 2020, available at < https://cyber.harvard.edu/story/2020-07/ country-spotlight-taiwans-digital-quarantine-system>.

<sup>23</sup> MOFA announces adjustments to regulations for foreign nationals entering Taiwan beginning March 1, 2021, in line with the continuation of CECC Fall-Winter COVID-19 Prevention Program," Bureau of Consular Affairs, February 25, 2021, available at < https://www.boca.gov.tw/cp-220-6342-02525-2.html>.

<sup>24</sup>Heather Yourex-West, "Taiwan used cellphone tracking, big data to contain spread of COVID-19 — should Canada do the same?" *Global News*, March 6, 2020, available at <a href="https://globalnews.ca/news/6642722/taiwan-cellphone-tracking-data-contain-covid-19/">https://globalnews.ca/news/6642722/taiwan-cellphone-tracking-data-contain-covid-19/</a>.

<sup>25</sup> Yimou Lee, "Coronavirus: Taiwan tracking citizens' phones to make sure they stay indoors," *Independent*, March 20, 2020, available at <a href="https://www.independent.co.uk/news/world/asia/coronavirus-taiwan-update-phone-tracking-lock-down-quarantine-a9413091.html">https://www.independent.co.uk/news/world/asia/coronavirus-taiwan-update-phone-tracking-lock-down-quarantine-a9413091.html</a>; "How has Taiwan kept its coronavirus infection rate so low?"

<sup>26</sup> "NZ pilot suspected to have started Taiwan Covid-19 cluster fired for not following protocols," *TVNZ*, December 24, 2020, available at <a href="https://www.tvnz.co.nz/one-news/world/nz-pilot-suspected-have-started-tai-wan-covid-19-cluster-fired-not-following-protocols">https://www.tvnz.co.nz/one-news/world/nz-pilot-suspected-have-started-tai-wan-covid-19-cluster-fired-not-following-protocols</a>; Vivian Hsiao, "Family member of CAL pilot infected in Taiwan: CECC," *the China Post*, April 27, 2021, available at <a href="https://chinapost.nownews.com/20210427-2407385">https://chinapost.nownews.com/20210427-2407385</a>.

<sup>27</sup> Huang Tzu-ti, "Passengers allowed to pay for COVID-19 test upon arriving in Taiwan," *Taiwan News*, November 20, 2021, available at < https://www.taiwannews.com.tw/en/news/4058129>; "Entry and Quarantine Measures for COVID-19 Prevention FAQs concerning COVID-19 RT-PCR test reports issued within 3 days of boarding," Taiwan Centers for Disease Control, March 24, 2021, available at < https://www.cdc.gov.tw/En/File/Get/FKm7\_HIS-MQdajBXpmIJtg>.

<sup>28</sup> "Taiwan evacuates hotel to sterilise it after rare COVID outbreak," *Reuters*, April 30, 2021, available at < https://www.reuters.com/world/asia-pacific/taiwan-evacuates-hotel-sterilise-it-after-rare-covid-outbreak-2021-04-29/>.

<sup>29</sup> Chung Li-hua and Jonathan Chin, "5,000 Chinese spies in Taiwan: source," *Taipei Times*, March 13, 2017, available at <a href="https://www.taipeitimes.com/News/front/archives/2017/03/13/2003666661">https://www.taipeitimes.com/News/front/archives/2017/03/13/2003666661</a>>.

<sup>30</sup> Glenn Laverack, *Health Promotion in Disease Outbreaks and Health Emergencies* (Boca Raton: CRC Press, 2018), pp. 136-137.

<sup>31</sup> Olivia Yang, "Taiwan's battle against COVID-19disinformation," *Medium*, July 22, 2020, available at <a href="https://medium.com/dfrlab/taiwans-bat-tle-against-covid-19-disinformation-eaf76bf57d14">https://medium.com/dfrlab/taiwans-bat-tle-against-covid-19-disinformation-eaf76bf57d14</a>

<sup>32</sup> I-wei Jennifer Chang, "Taiwan's Model for Combating COVID-19: A Small Island with Big Data," Middle East Institute, November 10, 2020, available at <a href="https://www.mei.edu/publications/taiwans-model-combating-covid-19-small-island-big-data">https://www.mei.edu/publications/taiwans-model-combating-covid-19-small-island-big-data</a>.

33 陳彥廷 (Chen Yan-Ting), "內埔有確診! 男未經證實前網路爆雷被送辦 就診診所休診(A Case in Neipu! Man Prosecuted for Spreading Information on Internet. The Clinic Closed)," the Liberty Times, May 18, 2021, available at <a href="https://news.ltn.com.tw/news/society/breakingnews/3537427?fbclid=IwAR2hqZCKNlqc3taBaPqm-W5Fq8j8SJFCZCrXvuMOFOQvzX7RH3E-ktFMy9bY">https://news.ltn.com.tw/news/society/breakingnews/3537427?fbclid=IwAR2hqZCKNlqc3taBaPqm-W5Fq8j8SJFCZCrXvuMOFOQvzX7RH3E-ktFMy9bY>.

<sup>34</sup> Bethel Chukwudi Okara and Fadi Al-Turjman, "Smart Technologies for COVID-19: The Strategic Approaches in Combating the Virus," in Fadi Al-Turjman (Ed.), Artificial Intelligence and Machine Learning for COVID19 (Cham: Springer, 2021), pp. 1-2, 4-5.

35 "Population," Stats NZ, available at <a href="https://www.stats.govt.nz/topics/population">https://www.stats.govt.nz/topics/population</a>; "Testing for COVID-19," Ministry of Health, May 20, 2021, available at <a href="https://www.health.govt.nz/our-work/diseases-and-conditions/covid-19-novel-coronavirus/covid-19-data-and-statistics/testing-covid-19>; "About Taiwan," Governmental Portable of the Republic of China (Taiwan), available at <a href="https://taiwan.gov.tw/about.php">https://taiwan.gov.tw/about.php>; "Coronavirus disease 2019(COVID-19)"," Taiwan Centers for Disease Control, available at <a href="https://www.cdc.gov.tw/en/Disease/SubIndex/">https://www.cdc.gov.tw/en/Disease/SubIndex/</a>>.

<sup>36</sup> "Singapore Population," Statistics Singapore, April 7, 2021, available at <a href="https://www.singstat.gov.sg/modules/infographics/population">https://www.singstat.gov.sg/modules/infographics/population</a>; "UPDATES ON COVID-19 (CORONAVIRUS DISEASE 2019) LOCAL SITUATION," Ministry of Health Singapore, May 17, 2021, available at < a https://www.moh.gov.sg/covid-19>.

<sup>37</sup> "Adequate testing capacity and precisely locate potentially infected individuals," Ministry of Health and Welfare, March 8, 2021, available at <a href="https://covid19.mohw.gov.tw/en/cp-4788-53906-206.html">https://covid19.mohw.gov.tw/en/cp-4788-53906-206.html</a>>.

<sup>38</sup> Phillip Charlier, "In the midst of viral panic, everybody ignores the problem of false positives, and they call for more tests," *Taiwan English News*, March 19, 2020, available at <a href="https://taiwanenglishnews.com/">https://taiwanenglishnews.com/</a> in-the-midst-of-viral-panic-everybody-ignores-the-problem-of-false-positives-and-they-call-for-more-tests/>.

<sup>39</sup> Phillip Charlier, "Health Minister explains problems of mass COVID screening as KMT Party threatens to undermine Taiwan's anti-epidemic success," *Taiwan English News*, August 22, 2020, available at < https://taiwanenglishnews.com/health-minister-explains-problems-of-mass-covid-screening-as-kmt-party-threatens-to-undermine-taiwans-anti-epidemic-success/; Lee I-chia, "VIRUS OUTBREAK: Mass testing 'could swamp the system'," *Taipei Times*, August 23, 2020, available at < https://taipeitimes.com/News/front/archives/2020/08/23/2003742129>.

<sup>40</sup>Yen-Ching Chen, "Mass Testing for Taiwan?" Fight COVID Taiwan, December 7, 2020, available at < https://fightcovid.edu.tw/specific-topics/mass-testing>.

<sup>41</sup> "Taiwan: Coronavirus Pandemic Country Profile," Our World in Data, April 28, 2021, available at < https://ourworldindata.org/coronavirus/country/ taiwan>; Hsiang-Ling Ho, Fang-Yu Wang, Hao-Ru Lee, Ya-Lan Huang, Chien-Liang Lai, Wen-Chin Jen et al, "Seroprevalence of COVID-19 in Taiwan revealed by testing anti-SARS-CoV-2 serological antibodies on 14,765 hospital patients," *the Lancet*, October 10, 2020, available at < https://www.thelancet.com/journals/lanwpc/article/ PIIS2666-6065(20)30041-9/fulltext >.

<sup>42</sup>Lee I-chia, "COVID-19: CECC reports 180 local infections," *Taipei Times*, May 16, 2021, available at < https://www.taipeitimes.com/News/front/archi ves/2021/05/16/2003757478>; Samson Ellis, Cindy Wang, and Michelle Fay Cortez, "Complacency let Covid-19 break down Taiwan's only line of defence," *Bloomberg*, May 18, 2021, available at < https://www.bloomberg.com/news/articles/2021-05-18/complacency-let-covid-break-down-taiwan-s-only-line-of-defense >.

43 "Adequate testing capacity and precisely locate potentially infected individuals"; 梁元龄 (Liang Yuan-Lin), "萬華也有了!「零接觸採檢站」跟上國際腳步, 擴大普篩有可能? (Also Available in Wanhua! Zero-Contact Test Station Catches Up the International Tread. Possible for Mass Tests?" *Common Health*, May 17, 2021, available at <a href="https://www.commonhealth.com.tw/article/84204">https://www.commonhealth.com.tw/article/84204</a>; "Coronavirus disease 2019(COVID-19)," Taiwan Centers for Disease Control, available at <a href="https://www.cdc.gov.tw/en/Disease/SubIndex/">https://www.cdc.gov.tw/en/Disease/SubIndex/</a>.

44 黄仲丘(Huang Chong-Chiu), "【獨家】一日333 例「非真實疫情」專家:是採檢進度! 不是病毒傳播速度(Scoop! 333 Cases Per Day is not the Real Situation. Expert: the Pace of Tests, not the Infection," *Apple Daily*, May 18, 2021, available at <a href="https://tw.appledaily.com/life/20210518/SJGYAVBMHBEBHA7V4DJF3DVU6E/?fbclid=IwAR2DoOBhODE74OegOyY1TT-3OL3y3LCkWP5G7z5UWpOvnKsKuFXJuv9iwVA">https://tw.appledaily.com/life/20210518/SJGYAVBMHBEBHA7V4DJF3DVU6E/?fbclid=IwAR2DoOBhODE74OegOyY1TT-3OL3y3LCkWP5G7z5UWpOvnKsKuFXJuv9iwVA>.

<sup>45</sup> Chang Ming-hsuan, Chen Chieh-ling and Evelyn Kao, "CORONAVIRUS/Taiwan introduces control measures amid spike in local COVID-19 cases," *Focus Taiwan*, May 17, 2021, available at <a href="https://focustaiwan.tw/society/202105160011">https://focustaiwan.tw/society/202105160011</a>>.

<sup>46</sup>Lin Chia-nan, "Virus Outbreak: Team develops system for negative-pressure wards," *Taipei Times*, March 26, 2020, available at <a href="https://www.taipeitimes.com/">https://www.taipeitimes.com/</a> News/taiwan/archives/2020/03/26/2003733406>; Chiang Hui-chun and Matthew Mazzetta, "Gov't reveals plan to ease hospital strain if COVID situation worsens," *Focus Taiwan*, May 13, 2021, available at <a href="https://focustaiwan.tw/society/202105130010">https://focustaiwan.tw/society/202105130010</a>>.

<sup>47</sup> Paul Huang, "Taiwan's Army Is a Hollow Shell After the End of Conscription," *Foreign Policy*, February 15, 2020, available at <a href="https://foreignpolicy.com/2020/02/15/china-threat-invasion-conscription-tai-wans-military-is-a-hollow-shell/">https://foreignpolicy.com/2020/02/15/china-threat-invasion-conscription-tai-wans-military-is-a-hollow-shell/</a>.

48 Military Balance 2021, pp. 301, 303.

49 "Taiwan signs deal with German manufacturer for COVID-19 vaccine doses," *Taiwan News*, October 12, 2020, available at < https://www.taiwannews.com.tw/en/news/4028446 >; Lee I-chia, "COVID-19: Virus prevention program to go on," *Taipei Times*, February 23, 2021, available at < https://www.taipeitimes.com/News/front/archives/2021/02/23/2003752698 >; 韓婷婷&吳佳蓉 (Han Ting-Ting & Wu Chia-Ron), "東洋代理疫苗破局遭疑內線交易 林全反駁: 無政府保證是主因(TTY Vaccine Deal Failure Due to Inside Trading, Lin-Chun Refuted with Lack of Governmental Support)," *Central News Agency*, November 13, 2020, available at < https://www.cna.com. tw/news/firstnews/202011120217.aspx>.

<sup>50</sup> "China's Fosun pharma firm willing to supply BioNTech Covid-19 vaccine to Taiwan," *the Straits Times*, April 1, 2021, available at < https://www.straitstimes.com/asia/east-asia/chinas-fosun-pharma-firm-willing-to-supply-biontech-covid-19-vaccine-to-taiwan >.

<sup>51</sup>Nick Aspinwall, "BioNTech Says Taiwan Will Receive Vaccines After Concerns China Impeded Deal," *the Diplomat*, February 20, 2021, available at < https://thediplomat.com/2021/02/biontech-says-taiwan-will-receive-vaccines-after-concerns-china-impeded-deal/ >.

<sup>52</sup> "First COVID-19 vaccines arrive in Taiwan," *Reuters*, March 3, 2021, available at < https://www.reuters.com/article/us-health-coronavirus-tai-wan-idUSKCN2AV0N6>; Jake Chung, "Moderna vaccines expected in May," *Taipei Times*, April 16, 2021, available at < https://www.taipeitimes.com/News/front/archives/2021/04/16/2003755787 >; Huang Tzu-ti, "Taiwan's homegrown vaccines effective against COVID variants," *Taiwan News*, April 19, 2021, available at < https://www.taiwannews.com.tw/en/news/4181035 >.

<sup>53</sup> Chiang Chin-yeh and Matthew Mazzetta, "CORONAVIRUS/Taiwan's U.S. envoy trying to get Moderna vaccines by June," *Focus Taiwan*, May 15, 2021, available at < https://focustaiwan.tw/politics/202105150007>.

<sup>54</sup> John Feng, "Beijing May Have Scuppered Taiwan's Vaccine Roll-Out, Hints Health Minister," *Newsweek*, February 17, 2021, available at <a href="https://www.newsweek.com/beijing-may-have-scuppered-taiwans-vaccine-roll-out-hints-health-minister-1569807">https://www.newsweek.com/beijing-may-have-scuppered-taiwans-vaccine-roll-out-hints-health-minister-1569807</a>; Yimou Lee, "Vaccines become latest frontline in China's campaign to win hearts of Taiwanese," *Reuters*, January 21, 2021, available at <a href="https://www.reuters.com/article/us-taiwan-china-vaccine-idUSKBN29Q0A5">https://www.reuters.com/article/us-taiwan-china-vaccine-idUSKBN29Q0A5</a>>.

55"台社会团体促民进党当局开放引进大陆新冠疫苗 国台办回应(Taiwanese Societal Groups Ask the DPP Administration to Open the Introduction of Mainland COVID Vaccine, The Taiwan Affair Offices of the State Council Replies)," Sina News, May 17, 2021, available at < https://news.sina.com.cn/c/2021-05-18/doc-ik-myaawc5872260.shtml>.

<sup>56</sup> "Taiwan to help allies buy Covid-19 vaccines, but not from China," *the Strait Times*, March 24, 2021, available at <a href="https://www.straitstimes.com/asia/east-asia/taiwan-to-help-allies-buy-covid-19-vaccines-but-not-from-china">https://www.straitstimes.com/asia/east-asia/taiwan-to-help-allies-buy-covid-19-vaccines-but-not-from-china</a>

<sup>57</sup> "US condemns political use of COVID-19 vaccines after China-Taiwan tussle," Channel News Asia, May 14, 2021, available at <a href="https://www.channelnewsasia.com/news/world/us-condemns-covid-19-vaccines-diploma-cy-china-taiwan-14804518">https://www.channelnewsasia.com/news/world/us-condemns-covid-19-vaccines-diploma-cy-china-taiwan-14804518</a>>.

. 58 Ben Blanchard, "Taiwan mobilises diplomats to seek out COVID-19 shots," *Reuters*, May 18, 2021, available at < https://www.reuters.com/world/asia-pacific/taiwan-says-it-is-talks-covid-19-vac-cines-us-2021-05-18/?fbclid=IwAR0lJwAuLpViuGChs-gx-HGDbkrjk4S8bYLpyHMRajJ7BvfeU5d1HbpF26t4 >.

<sup>59</sup> Michael Collins, "The WHO and China: Dereliction of Duty," Council on Foreign Relation, February 27, 2020, available at <a href="https://www.cfr.org/blog/who-and-china-dereliction-duty">https://www.cfr.org/blog/who-and-china-dereliction-duty</a>.

<sup>60</sup>Louise Watt, "Taiwan Says It Tried to Warn the World About Coronavirus. Here's What It Really Knew and When," *Times*, May 19, 2020, available at <a href="https://time.com/5826025/taiwan-who-trump-coronavirus-covid19/">https://time.com/5826025/taiwan-who-trump-coronavirus-covid19/</a>.

<sup>61</sup> Yimou Lee and Ben Blanchard, "More COVID-19 vaccines coming to Taiwan as cases spike," *Reuters*, May 18, 2021, available at <a href="https://www.reuters.com/world/asia-pacific/taiwan-scrambles-vaccines-domestic-covid-19-cases-rise-2021-05-17/">https://www.reuters.com/world/asia-pacific/taiwan-scrambles-vaccines-domestic-covid-19-cases-rise-2021-05-17/</a>.