VOLUME 1 · ISSUE 06

BALSILLIE PAPERS

COVID-19 Arising: Lessons in Proactive Response in East Asia

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June 2, 2020

As the COVID-19 pandemic unfolds globally, it is clear that many countries have been ill-prepared to respond to the disease. Yet in China, Hong Kong, Taiwan and South Korea, a combination of disciplined and proactive responses led to early containment of initial outbreaks. Here we explore the unfolding epidemic and responses in the region, identify key elements of the response and consider factors that impeded response elsewhere.

The Emerging Pandemic: A Timeline

On December 31, 2019, health authorities in China reported that they were investigating 27 cases of viral pneumonia in Wuhan, China.[1] It was said that although the virus bore similarities to severe acute respiratory syndrome (SARS), the public health system was considered to be adequately prepared to deal with this problem.[2] On the same day, Taiwan and Hong Kong began screening airline passengers arriving from Wuhan to protect their populations from the unknown infection.[3]

On January 1, the World Health Organization (WHO) established an Incident Management Support Team to address the emerging potential threat. The Hong Kong Special Administrative Region of China moved to a state of heightened awareness the next day.[4] Screening was implemented for travellers arriving from Wuhan on January 3,[5] and similar measures were introduced by Singapore.[6]

On January 4, the WHO issued its first tweet about the outbreak, stating that ongoing investigations were underway[7] and that it was not deemed necessary to take measures restricting travel or trade with China.[8]

On January 11 and 12, the WHO received detailed information from China's National Health Commission on the association of the outbreak with a seafood market in Wuhan.[9] The novel coronavirus was said to have been isolated and identified by January 7, and China shared the genetic sequence for developing diagnostic test kits on January 12.

On January 13, Thailand became the first country outside China to confirm a case of coronavirus — a female traveller from Wuhan.[10]

On January 14, the WHO technical lead noted at a press briefing that there was "limited human-to-human transmission" and that there was a need for preparedness.[11] However, this concern was

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[1] Analysis of various timelines suggests that the disease was noted to be emerging as early as mid-December. See Gerry Shih, Emily Rauhaula and Lena H. Sun, "Early missteps and state secrecy in China probably allowed the coronavirus to spread farther and faster," *The Washington Post*, February 1, 2020.
[2] Mandy Zuo, Lillian Cheng, Alice Yan and Cannix Yau, "Hong Kong takes emergency measures as mystery 'pneumonia' infects dozens in China's Wuhan city," *South China Morning Post*, December 31, 2019.
[3] Cheryl Lin et al., "Policy Decisions and Use of Information Technology to Fight 2019 Novel Coronavirus Disease, Taiwan," *Emerging Infectious Diseases* 27(7), July 2020.
[4] Government of Hong Kong Special Administrative Region, "Government holds inter-departmental meeting on cluster pneumonia cases in Wuhan," Press Release, January 2, 2020.
[5] Samuel Y.S. Wong, Kin On Kwok and Francis K.L. Chan, "What can countries learn from Hong Kong's response to the COVID-19 pandemic?" *Canadian Medical Association Journal* 192(19), May 11, 2020: E511.
[6] Michael Yong, "Timeline: How the COVID-19 outbreak has evolved in Singapore so far," *Channel News Asia*, April 18, 2020.
[7] WHO (Twitter), https://twitter.com/WHO/status/1213523866703814656?s=20.
[8] WHO, "Pneumonia of unknown cause – China," January 5, 2020.
[9] WHO, "Novel coronavirus (2019-nCoV). Situation report 1-21 January 2020."
[10] WHO, "Novel Coronavirus – Thailand (ex-China)," January 14, 2020.
[11] Stephanie Nebehay, "WHO says new China coronavirus could spread, warns hospitals worldwide," *Reuters*, January 14, 2020.

immediately contradicted by a WHO tweet indicating that Chinese authorities had no clear evidence of human-to-human transmission.[12]

On January 20, China's National Health Commission confirmed human-to-human transmission[13] and South Korea reported its first case of the disease — also a female traveller from Wuhan.[14] Despite the continued spread of coronavirus to other countries, there was still no travel restriction recommended by the WHO.

On January 22, the WHO mission investigating the outbreak in China issued a summary indicating that there was evidence of human-to-human transmission,[15] but the Emergency Committee meeting that followed did not reach consensus on whether the outbreak constituted a public health emergency of international concern.[16] By January 30, there were more than 7,800 cases confirmed in 19 countries, including in nine Western Pacific countries, four South-East Asia countries, two countries in the Americas, three European countries, and one country in the Eastern Mediterranean.

On January 29, the WHO issued guidelines on face masks, emphasizing that there was no evidence of their usefulness for persons who felt healthy unless they were caring for a symptomatic person.[17] Proposed prevention measures included avoiding crowded spaces, maintaining a one-metre distance from people with respiratory symptoms, practising hand hygiene, practising cough etiquette and avoiding touching one's mouth or nose.[18] These measures differed from those already adopted in East Asia, which emphasized universal use of face masks and hand hygiene.[19]

On January 30, the WHO declared the COVID-19 epidemic a public health emergency of international concern.[20]

On February 1, the WHO noted that it was aware of the possibility of transmission by persons who were not ill and that asymptomatic cases had been detected in China throughout February.[21] Nonetheless, on February 29, the WHO reiterated its advice against restricting international travel.[22]

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[12] WHO (Twitter), https://twitter.com/who/status/1217043229427761152?lang=en.
[13] Se Young Lee and Kate Kelland, "China confirms human-to-human transmission of new coronavirus: Xinhua," *Reuters*, January 20, 2020.
[14] Joyce Lee, "South Korea confirms first case of new coronavirus in Chinese visitor," *Reuters*, January 19, 2020.
[15] WHO, "Mission summary: WHO Field Visit to Wuhan, China 20-21 January 2020," January 22, 2020.
[16] WHO, "Statement on the meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus (2019-nCov)," January 23, 2020.
[17] WHO, "Advice on the use of masks in the community, during home care and in health care settings in the context of the novel coronavirus (2019-nCoV) outbreak. Interim guidance. 29 January 2020," January 29, 2020
[18] WHO, "Q&A on coronavirus (COVID-19)," April 17, 2020.
[19] Wong, Kwok and Chan, 513.
[20] WHO, "Statement on the second meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus (2019-nCov)," January 30, 2020.
[21] WHO, "Coronavirus disease 2019 (COVID-19) Situation Report – 35," February 24, 2020.
[22] WHO, "Updated WHO recommendations for international traffic in relation to COVID-19 outbreak," February 29, 2020.

On March 11, the WHO declared COVID-19 to be a global pandemic,[23] and the following day, the WHO COVID-19 Solidarity Response Fund was launched.[24] On March 19, the WHO reported that a "solidarity trial" was being initiated to study disease treatment, also releasing updated guidance on community use of face masks. As per previous guidance, it was stated that face masks were not advised for people who felt healthy, and that face mask use would lead to a false sense of security, thereby inhibiting other recommended prevention measures.[25]

Responses in East Asia

Responses to COVID-19 in the East Asia region were immediate and systematic, drawing on experiences from previous respiratory viral epidemics such as SARS, Middle East respiratory syndrome (MERS) and influenza. Here we trace the responses in China, Taiwan, Hong Kong and South Korea.

China

As the epicentre of the epidemic, China adopted various restrictive measures to contain the emerging epidemic. This followed five distinct phases. The first was the period up to January 10, when there were no specific interventions. The second was the period up to January 22, when there was extensive population movement, including outbound travel. This period included high numbers of hospital admissions, increases in COVID-19 cases among health care workers, and evidence of community spread. The third was the period up to February 1, when transport from the city was blocked and public transport suspended. With hospitals full, many cases were self-quarantined at home. Public venues were closed with the exception of pharmacies and supermarkets. Social gatherings were cancelled, and face masks became mandatory in public spaces. Hand hygiene, disinfection of surfaces, home cleaning and self-monitoring of symptoms were additional recommendations. The fourth was the period up to February 16, which included compulsory stay-at-home measures, with centralized quarantine being provided at designated hospitals and facilities. Presumptive cases and close contacts were also treated. The fifth period began on February 17 and involved door-to-door screening by community health workers. This continued until early March. By this time, new cases had declined to very low levels. During this period, cases were being identified elsewhere in China, but did not lead to marked outbreaks.[26]

By mid-April, after more than 82,341 cases and more than 4,600 deaths, the epidemic in China was largely contained.[27]

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[23] WHO, WHO Timeline – COVID-19.
[24] WHO, "UN Foundation and partners launch first-of-its-kind COVID-19 Solidarity Response Fund," March 13, 2020.
[25] WHO, "Advice on the use of masks in the community, during home care, and in health care settings in the context of COVID-19: interim guidance," March 19, 2020.
[26] An Pan et al., "Association of public health interventions with the epidemiology of the COVID-19 outbreak in Wuhan, China," *Journal of the American Medical Association* 323(19), April 10, 2020: 1915.
[27] China subsequently revised its death rates to more than 4,600. Worldometer, "China," accessed May 27, 2020.

Taiwan

As a small but densely populated island of about 24 million people, Taiwan largely contained its outbreak by mid-May to 440 cases and seven deaths.[28] The early response, which included health checks of travellers from Wuhan as of December 31, was based on "evidence of human-to-human transmission" during December that was seemingly ignored by the WHO.[29] By January 15, reporting of infections and quarantines became mandatory.[30] Exports of face masks were curtailed and production of masks for local use was scaled up. On February 6, a face mask rationing system was introduced.[31]

Social distancing measures in the early period were not extensive, mainly involving sending messages to mobile phones along with advisories encouraging mask wearing, maintaining a physical distance of 1.5 metres, and hand hygiene.[32] Mass gatherings were discouraged. A digital database was established that integrated health information with travel history derived from cellphones. Persons testing positive for COVID-19 were advised to self-isolate and cellphone global positioning system (GPS) data were used to monitor compliance. Temperature checks were implemented at airports, workplaces, public buildings, schools and on public transport.[33]

Containment of COVID-19 in Taiwan was attributed to lessons learned during the SARS epidemic in 2002, repurposing of factories to increase production of face masks, partnerships with businesses to help with temperature monitoring and disinfection, effective communication about prevention and mitigation, including the use of social media, fact-checking to undermine misinformation, and public involvement and cooperation in response.[34, 35]

Hong Kong

Hong Kong, with a population of more than 7.5 million, had its first case on January 22, and by mid-May had contained its outbreak to 1,053 cases and four deaths.[36] Temperature screening of travellers from Wuhan was instituted on December 31 and, soon thereafter, entry from China was barred entirely.[37] Diagnostic tests were administered to travellers from Europe and measures extended to hospital admissions for those who were ill, and quarantine for others.[38] Linkages were made with immigration

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[28] Worldometer, "Taiwan," accessed May 27, 2020.
[29] Stephen J. Roberts, "Taiwan controls COVID-19 with a 'surgical light-touch'," *Medical Brief*, May 6, 2020.
[30] Cheryl Lin et al.
[31] *Focus Taiwan*, CNA English News, "Timeline: COVID-19 in Taiwan," April 18, 2020.
[32] Roberts.
[33] *Focus Taiwan*.
[34] Tsai Ing-wen, "President of Taiwan: How My Country Prevented a Major Outbreak of COVID-19," *Time Magazine*, April 16, 2020.
[35] Chang-Ching Tu, "Lessons from Taiwan's experience with COVID-19," Atlantic Council, April 7, 2020.
[36] Worldometer, "China, Hong Kong SAR," accessed May 27, 2020.
[37] Zuo, Cheng, Yan and Yau.
[38] Wong, Kwok and Chan, 511.

data to assist case identification and an emergency was declared on January 25.[39, 40] On January 26, parks were closed and concerts were cancelled. A day later, schools and universities were closed.[41] Work-from-home orders were implemented for civil servants on January 29 and public venues, including libraries and sports centres, were shuttered.[42, 43] On January 30, cross-border travel by rail and ferry was suspended, while bus and air travel was reduced.[44] A survey found that mask use and hand hygiene had achieved uptake of more than 95 percent soon after the first cases were reported.[45]

On March 25, all non-residents were banned from entry, and returning residents were required to complete electronically monitored quarantines.[46] In late March and early April, additional measures were introduced, including prohibiting gatherings of more than four people in public,[47] and closing bars, nightclubs and other social gathering places.[48]

South Korea

South Korea, with a population of about 52 million, had largely contained its epidemic with a total of 10,991 COVID-19 cases and 260 deaths by May 14.[49] Following reports from China, screening and quarantine measures were introduced on January 3 for travellers from Wuhan,[50] and these measures intensified throughout January.[51]

On February 1, 720,000 face masks were supplied to workplaces and various social welfare facilities.[52] Non-residents who had been in Hubei Province during the previous 14 days were banned from entry.[53] On February 7, test kits were made widely available and self-diagnosis via mobile phone application was promoted.[54] To facilitate increased testing, drive-through testing checkpoints were established in the city.

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[39] *Ibid.*
[40] AFP, "Hong Kong declares Wuhan virus outbreak 'emergency' — the highest warning tier," *Hong Kong Free Press*, January 25, 2020.
[41] Chan Ho-him, "China coronavirus forces Andy Lau to call off Hong Kong concerts, following closures of Disneyland, Ocean Park until further notice," *South China Morning Post*, January 26, 2020.
[42] Wong, Kwok and Chan.
[43] Government of Hong Kong Special Administrative Region, "Temporary closure of LCDS facilities from tomorrow," Press Release, Leisure and Cultural Services Department, January 28, 2020.
[44] Wong, Kwok and Chan.
[45] *Ibid*, 513.
[46] *Ibid.*
[47] *Ibid.*
[48] Government of Hong Kong Special Administrative Region, "Restrictions on bars gazetted," News.gov.hk, April 2, 2020.
[49] Worldometer, South Korea, accessed May 27, 2020.
[50] KCDC, "The first imported case of the novel coronavirus (2019-nCov) in Korea," January 20, 2020.
[51] Victor Cha and Dana Kim, "A Timeline of South Korea's Response to COVID-19," Center for Strategic and International Studies, March 27, 2020.
[52] Government of South Korea, Ministry of Health and Welfare, "IMS meeting to respond to Novel Coronavirus is presided over by the Prime Minister," February 2, 2020.
[53] Cha and Kim.
[54] *Ibid.*

On March 5, face mask supply was expanded, and a GPS application was implemented on March 7 to monitor self-quarantine compliance. Throughout March, screening of incoming travellers was expanded to include most incoming travellers.[55]

The Growing Pandemic

During January and February, it was clear that a potential pandemic was emerging. COVID-19 had spread rapidly to Europe and North America, and the scale of the epidemic in China's Hubei Province included sobering accounts of severe illness and death. By the end of February, new cases had been reported in 24 European countries, as well as in the United States and Canada.[56]

When the WHO declared COVID-19 a global pandemic in March, only Italy and Denmark were beginning to implement stringency measures.[57] It was following this point that restrictive responses intensified across Europe to include school and workplace closures, cancellation of public events, restrictions on gathering sizes, lockdown measures and restrictions on movement and travel.[58] Testing and contact tracing systems were also put in place, alongside public information campaigns.

While it is unclear which specific factors slowed response to COVID-19 in Europe, the period prior to the pandemic declaration by the European Union mainly focused on preparedness and coordination, along with providing financial and material support to the WHO and China.[59] Throughout the month of February in the United States, the threat of the epidemic was uncertain, including disagreements between the presidency and public health officials over prevention of the disease, testing inadequacies, and the banning of incoming flights from China, which was condemned by the WHO.[60, 61]

While it appears that deference in the response leaned toward the guidance of the WHO in Europe, it is surprising that the East Asian experiences were not considered to be salutary. Taiwan had responded decisively to "chatter" about human-to-human transmission on social media in Wuhan in late December,[62] and along with Hong Kong, instituted preventive measures on December 31. These early responses prompted a proactive response in the region and a combination of innovative and stringent approaches, alongside simple behavioural measures, followed.

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[55] *Ibid*.
[56] WHO, "Coronavirus disease 2019 (COVID-19) Situation Report – 40," February 29, 2020.
[57] Elaine He, "The Results of Europe's Lockdown Experiment Are In," *BloombergOpinion*, May 20, 2020.
[58] Thomas Hale et al., "Variation in government responses to COVID-19," BSG-WP-2020/032, Blavatnik School of Government, University of Oxford, April 29, 2020.
[59] European Commission, "The EU's Response to COVID-19," February 24, 2020.
[60] Carolyn Johnson and Laurie McGinley, "What went wrong with the coronavirus tests in the U.S.," *Washington Post*, March 7, 2020.
[61] Stephanie Nebehay, "WHO chief says widespread travel bans not needed to beat China virus," *Reuters*, February 3, 2020.
[62] Bethany Allen-Ebrahimian, "Timeline: The early days of China's coronavirus outbreak and cover-up," *Axios*, March 18, 2020.

When one examines the timeline, the initial response by the WHO during the first two weeks in January cannot be faulted. Standard outbreak response measures were applied. Yet on January 14, this impetus was disrupted by the absence of consensus regarding human-to-human transmission. Such disagreement was extraordinary. New cases had been detected well beyond Wuhan City and Hubei Province, and the similarities with SARS were not readily ignored, including linking the outbreak to a novel coronavirus that was identified on January 7. How this understanding translated to disagreement about human-to-human transmission by the WHO as late as January 14 is not readily understood.

It did not stop there. China announced human-to-human transmission on January 20, and yet this was only acknowledged by the WHO two days later. The WHO response in February included daily updates, yet the organization was reluctant to support measures such as the early banning of flights from affected areas, as this guidance issued on February 29 states: "Travel bans to affected areas or denial of entry to passengers coming from affected areas are usually not effective in preventing the importation of cases but may have a significant economic and social impact." This was followed by the requirement that the WHO be advised of relevant public health rationale and scientific information underpinning any "significant interference with international traffic" by countries that chose to do so, and reiterating that the WHO was working with countries to strengthen public health measures that would "avoid unnecessary restrictions of international traffic."[63]

Although it was clear that the outbreak involved respiratory transmission, and that asymptomatic cases were known, the WHO also recommended against the widespread use of face masks for healthy persons. Unprecedented concerns were also raised about face masks, including that adoption of this measure would involve "unnecessary cost, procurement burden and create a false sense of security that can lead to neglecting other essential measures such as hand hygiene practices."[64] As researchers highlighting the beneficial aspects of widespread face mask use observed in *The Lancet*: "We are unaware of any empirical evidence that wearing masks would mean other approaches to infection control would be overlooked."[65]

It is unclear why the WHO would so vociferously counter measures that were so distinctly prioritized in the East Asia response. Travellers coming from Wuhan were identified in early January through proactive screening and border control measures in Hong Kong, Taiwan and South Korea, and these measures rapidly escalated to include travel bans to minimize risk of new cases being introduced. Similarly, there was a singular focus on ensuring that the public had access to surgical face masks without delay.

In Europe and the United States, shortages of surgical face masks reinforced the communication that they were not a necessary requirement for prevention by the general public and no steps were taken to explore

[63] WHO, "Updated WHO recommendations for international traffic in relation to COVID-19 outbreak," February 29, 2020.
[64] WHO, "Advice on the use of masks in the community, during home care and in health care settings in the context of the novel coronavirus (2019-nCoV) outbreak: Interim Guidance," January 29, 2020.
[65] Kar Keung Cheng, Tai Hing Lam and Chi Chiu Leung, "Wearing face masks in the community during the COVID-19 pandemic: altruism and solidarity," *The Lancet*, April 16, 2020.

alternatives. Such rhetoric certainly sowed seeds of doubt.[66] Yet the importance of a respiratory barrier method was not lost on the global public and a growing interest in the production of homemade cloth masks began to emerge. This was supported by social media messaging and video streaming, with early efforts being prominent in countries such as the Czech Republic, Italy, Poland and Spain.[67] By May, most European countries had recommended the use of cloth face masks as a vital COVID-19 prevention measure.[68]

Conclusion

Clearly, the early response to COVID-19 was characterized by a series of missteps — most notably regarding the scientific and public health leadership role of the WHO — but also throughout Europe and North America, where opportunities to gain traction and resist the rapidly advancing pandemic through, for example, broader travel restrictions and clear guidance on prevention measures, were lost. Although the COVID-19 Solidarity Response Fund was established by the WHO in mid-March to support rapid response to the epidemic, there is very little information regarding how these funds are being disbursed to inform and improve approaches to COVID-19 prevention.

While it is beyond the scope of this paper to explore the conditions that constrained response to COVID-19 in some regions, it is clear that political, economic and public health concerns were not readily harmonized. Furthermore, considerations regarding the balance between individual freedom and state control are also likely to have had a deleterious effect. Nonetheless, it would not have taken much for Western authorities to consider previous responses to SARS, MERS and influenza, and even the Spanish Flu of 1918–1920,[69] as harbingers of what was possibly to follow. Looking toward China's intensified response, and decisive responses in the East Asia region, would surely have provided sufficient insight that implementing immediate prevention and containment measures was a preferable course of action.

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[66] Mandy Oaklander, "Public Health Experts Keep Changing Their Guidance on Whether or Not to Wear Face Masks for Coronavirus," *Time Magazine*, March 4, 2020.
[67] Jan Flemr, "Sewing Masks goes viral in Europe," *The Jakarta Post*, March 22, 2020.
[68] "Which countries have made wearing face masks compulsory?" *Al Jazeera News,* May 26, 2020.
[69] Miles Ott et al., "Lessons Learned from the 1918–1919 Influenza Pandemic in Minneapolis and St. Paul, Minnesota," *Public Health Chronicles* 122(6), November 1, 2007: 803.

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ISSN 2563-674X

doi:10.51644/bap16