RESEARCH ARTICLE

Lessons from Asia: A Review of Five National Responses to the COVID-19 Pandemic

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Abstract

The outbreak of COVID-19 triggered various responses from nations in an effort to control its spread. This review aimed to assess the responses of China, South Korea, Japan, Singapore, and the Philippines, and identify effective strategies to address the pandemic's incidence and mortality rate. Using a descriptive review of existing literature, their responses were evaluated using the World Health Organization (WHO) Strategic Preparedness and Response Plan (SPRP) and the Sendai Framework for Disaster Risk Reduction (SFDRR), which outline long-term objectives of reducing viral transmission, and reducing disaster risks and losses respectively. The countries studied were able to engage and mobilize communities; find, test, and isolate cases; provide clinical care, and maintain essential health services. However, countries differ in implementation, mainly due to their varying Social Determinants of Health (SDH) and disparities in resources. The countries' common goal was to control COVID-19 and return to economic normalcy. This study showed that effective strategies in handling the pandemic contain the following aspects: 1) strategic preparedness by drawing from past experiences, 2) tactical restructuring of the healthcare system, 3) effective resource mobilization and management, and 4) effective use of communication and technology to engage with the public. The SFDRR global targets were clear long-term goals for countries to base their pandemic responses on. This could equip the countries with the right tools and policies for future disasters, including a pandemic. Glaring issues on countries' SDH should also be foremostly addressed. Economic inequality, communication gaps, and issues on governance are primary factors that hinder the effective management of the pandemic for countries. Policy makers and social development workers, including nurses, need to adopt a holistic framework in analyzing situations confronting their work such as disasters.

Introduction

On December 30, 2019, China reported to the World Health Organization (WHO) about unusual cases of pneumonia affecting the region of Wuhan and the wider Hubei province. The WHO (2020) reported that these cases were found out to have been caused by a novel coronavirus. This was later named as the novel severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), commonly known as COVID-19.

Since then, COVID-19 evolved into a pandemic. The WHO declared it a public health emergency of international concern (PHEIC) on January 30, 2020, after documenting an outbreak of 4500 cases, 98% of which are from China. The U.S. Department of Health and Human Services likewise declared COVID-19 a national public health emergency. As of 23 March 2021, at 9:46 AM CET, the WHO reports 123,216,178 confirmed cases of COVID-19 with 2,714,517 deaths.

This review aims to assess the national responses to the pandemic of five Asian countries – China, South Korea, Japan, Singapore, and the Philippines – and draw lessons from it using three different frameworks. Specifically, it would like to identify the main strategies undertaken in addressing the incidence and controlling the mortality rate caused by the pandemic.

The context of COVID-19 will be described using the social determinants of health, namely: economic stability, social and community context, neighborhood and environment, and health care and education. The countries' response to the pandemic will be viewed using the lens of the Sendai Framework for Disaster Risk Reduction (SFDRR). Finally, each country's implementation of COVID-19 management will be assessed based on the WHO's framework.

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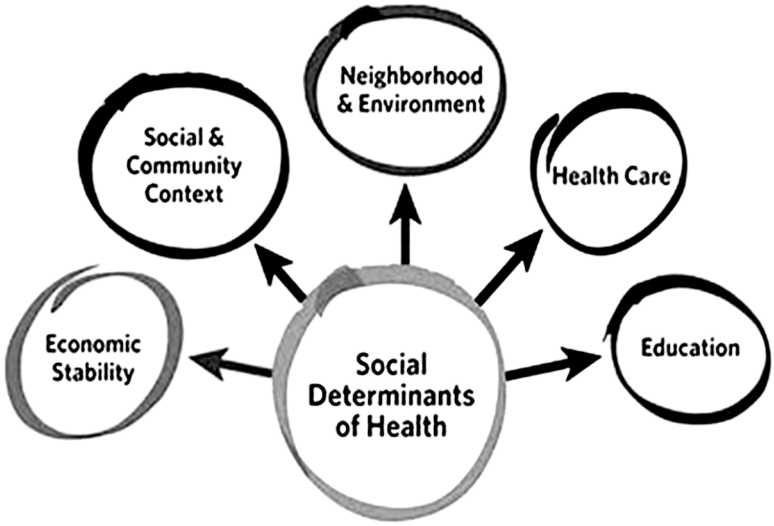
Figure 1. *The Social Determinants of Health and its five key categories*



Note. The illustration is from "The impact of social determinants of health" by UPMC Enterprises. From: https://enterprises.upmc.com/blog/social-determinants-of-health/

The context of COVID-19 and initial strategies by countries

As COVID-19 spread throughout the globe, countries formulated various strategies to control and manage the pandemic. Four Asian countries in this study – China, South Korea, Japan, and Singapore – are countries with developed economies while The Philippines is a developing country. Social, economic, and political conditions vary by country and so does their pandemic response.

These conditions are the social determinants of health (SDH), non-medical factors that affect health outcomes in countries (World Health Organization, n.d.), which are summarized into five key categories as seen in Figure 1.

The five countries in this study possess varying SDH, thus their approaches to handling COVID-19 differ greatly from one another.

The case of China

China, where COVID-19 originated from, has had a history of battling coronaviruses outbreaks like those of SARS and MERS. Albeit contained, China's response to SARS in 2002 was insufficient in terms of reporting to health authorities, quarantine and isolation measures, hygienic measures, and support for healthcare workers (AlTakarli, 2020).

The disease was first documented during the holidays. Ratzan, et al., 2020 claims that, since Wuhan is central China's transportation hub and with the anticipation of the coming Lunar New Year on January 25, 2020 – among the most celebrated events in the country, -- extreme volumes of the movement were expected. The world's second-largest economy failed to contain COVID-19 immediately at the home front. Its late response to the SARS outbreak in 2002 mirrored how they undertook initial measures to COVID-19. Gostin (2020), asserts that it took weeks before Chinese authorities reported the novel coronavirus to the WHO. In fact, authorities made efforts to hide information even if the disease had already been circulating in Wuhan (Yang, 2020).

Lockdowns or quarantines, and travel restrictions figured mainly into China's immediate response to the outbreak. Infection control measures or the *cordon sanitaire* came in late. While the 50 million inhabitants were locked out, 5 million individuals had already traveled from the area where the virus came. The restriction of 50 million people in Hubei province came with the grounding of outbound public transport operations – both land and air, including overseas travel. The sudden *cordon sanitaire* also led to logistical shortages in personal protective equipment (PPE) and pharmaceuticals (Phelan, et al., 2020)

The late response, according to Ratzan, et al. (2020), essentially led to two individuals from Wuhan possibly infecting passengers of two respective cruise ships, with one carrying 6,000 passengers, causing them to be quarantined in international waters.

The Philippine context

The Philippines documented its first case of COVID-19 on January 30, 2020, when a traveler from China arrived in the country. It was only in March that the government declared a

state of public health emergency when the first cases of localized transmission were documented.

The country's late response highlighted the gaps of an already weak health system and its lack of organizational preparedness (Amit, et al., 2021). In fact, only one laboratory was capable of testing for the virus a month before it declared a public health emergency. Hospitals in urban areas became overwhelmed, leading to health workers sounding off distress calls due to being overworked and stretched during a very critical time (Biana & Joaquin, 2020).

Stringent measures like lockdown, community quarantines, and travel restrictions figured mainly to the Philippines' strategy, and have been described as “militarist” and “draconian” (Maru, 2020). A middle-income country, the Philippines had already been suffering economically where the rates of poverty, hunger, and inequality are high. However, these tough measures put an extreme toll on the country's economy sending the country to a recession. Controlling people's movements is central in the country's pandemic measures, which showed the gaps in testing and treating. There are also “massive” lapses in policy communication, with officials going unpunished for violating protocols, while several are arrested for just not wearing masks (Albert, 2020).

South Korea's strategy

South Korea recorded the most cases outside China at the onset of the pandemic (Huzar, 2020). Thus, the country scaled up measures to prevent further community transmission. Key to this was the rapid activation of national response protocols and the establishment of widespread diagnostic capacity across the country. (Oh, et al., 2020)

As South Korea ramped up diagnostic capacity, so did measures of local contact tracing, quarantine, and isolation. Extensive contact tracing was made possible by repurposing low- to middle-level governmental health employees across the country into the Epidemiological Intelligence Service (EIS) (Oh, et al., 2020). Two-week quarantines were immediately implemented for individuals identified as having contact with confirmed or suspected cases, including those who had recent travel to China and in local areas with documented massive outbreaks.

South Korea has used technology to aid in contact tracing by using Global Positioning System (GPS) phone tracking as well as other records such as credit card use, surveillance videos, and others (Kaguyo, et al., 2020). Further, the reconfiguration of South Korea's health service provision complemented the country's efforts to manage the spread of COVID-19 (Oh, et al., 2020). This reconfiguration included the institution of two health systems, one for COVID-19 and the other for non-COVID-related needs to ensure the continuity of health delivery to the citizens.

The country's past experiences with the MERS outbreaks in 2015 and 2018 contributed in strengthening its pandemic response (Huzar, 2020). In addition, the Korean Ministry of Health and Welfare updates its infectious disease plan every 5 years, possibly contributing in handling COVID-19 (You, 2020).

The Japanese model

During the first months of the pandemic, Japan has recorded 11,772 cases with 287 total deaths (As of April 23, 2020). Initially, there was only a minimal number of PCR tests done. Rumors have spread that the country is keeping the numbers low because of the upcoming Olympics.

The Diamond Princess Cruise Ship is said to be the largest outbreak that initially happened outside China. It caught the attention of many epidemiologists because it has an environment with the highest potential of spreading the virus (Dragicevic, 2020). Japan adopted a model which is a cluster-based approach as a result of an epidemiological study on the Diamond Princess cruise ship (Kazuto, 2020). The model is tracking the original infection source. The persons with high transmissibility are then isolated to prevent further Broad testing of the population is then not required and testing is only done to the people suspected to have the virus. This is applicable to incidences where there are only a few infected and when “clusters are detectable at an early stage” (Kazuto, 2020). This was applied in Hokkaido in February and has been proven to be effective since they were able to control the spread.

Kazuto (2020) points out that Japan also adapted the social distancing strategy or the Three Cs as a secondary measure requiring a two-meter distance between individuals. Mask-wearing also has not been difficult to implement in Japan since the Japanese people have the habit of wearing one during the high-pollen season. It has also helped that hugging, kissing and shaking hands are not part of the Japanese greetings. Conversing in crowded public places is also not favorable in the country. On the other hand, the love for karaoke and the frequenting of Japanese-style pubs are what caused the potential spread of the virus.

Singapore's response

Singapore recorded its first case on January 23, 2020. One case, a traveler from China. This was followed by 68 cases also from travelers originating from China. Every year, Singapore receives an estimate of 3.4 million travelers from Wuhan alone. However, the spread of the virus in the country is one of the lowest worldwide. They also have a very low mortality rate (Kuguyo, et al., 2020).

The country has drawn many lessons from the SARS-COV outbreak in 2002. When this occurred, they were able to establish 900 rapid response public health preparedness clinics which served as intermediaries between the community and the hospitals (Kuguyo, et al., 2020). They follow a methodology of screening patients into high-risk and low-risk categories. The ones tagged as high-risk are referred to an infectious disease hospital.

Upon China's announcement on the occurrence of COVID-19, Singapore started distributing masks in households for the residents to wear in case there are asymptomatic SARS-CoV-2-positive individuals. They not only conducted screening measures in ports of entry but also in the communities. They started the implementation of temperature checks in restaurants and shop entrances. It has benefitted the country that they are one of the mass producers of the test kits. They are able to conduct 57, 245 tests per million population while Japan is only able to do 2,313 and South Korea 18,333. (as of June 2, 2020).

Contact tracing was also done extensively in Singapore with the use of a mobile application. The country developed TraceTogether and SafeEntry. These applications can detect if one has been in contact with an infected individual and can also determine the duration of the encounter. The homogeneity of the population in the country although they are of different races, helped Singapore made the adaptability of the pandemic response easier. The country used various media outlets to spread information on COVID-19 in a timely manner (Abdullah & Kim, 2020). They published "The Covid-19 Chronicles" to provide information on COVID-19. This includes recommendations for prevention and where to seek medical help. It was done in a remarkably simple way for the different groups/sectors to easily understand.

As early as January 2020, Singapore has already done simulations on the possibilities of a lockdown. It however did not implement a lockdown initially when they started having cases. It was not until the second wave that Singapore announced a lockdown on April 28, 2020. This delay of lockdown, according to the Singapore public health specialist was done deliberately to minimize the distress and fatigue that will result to a prolonged lockdown.

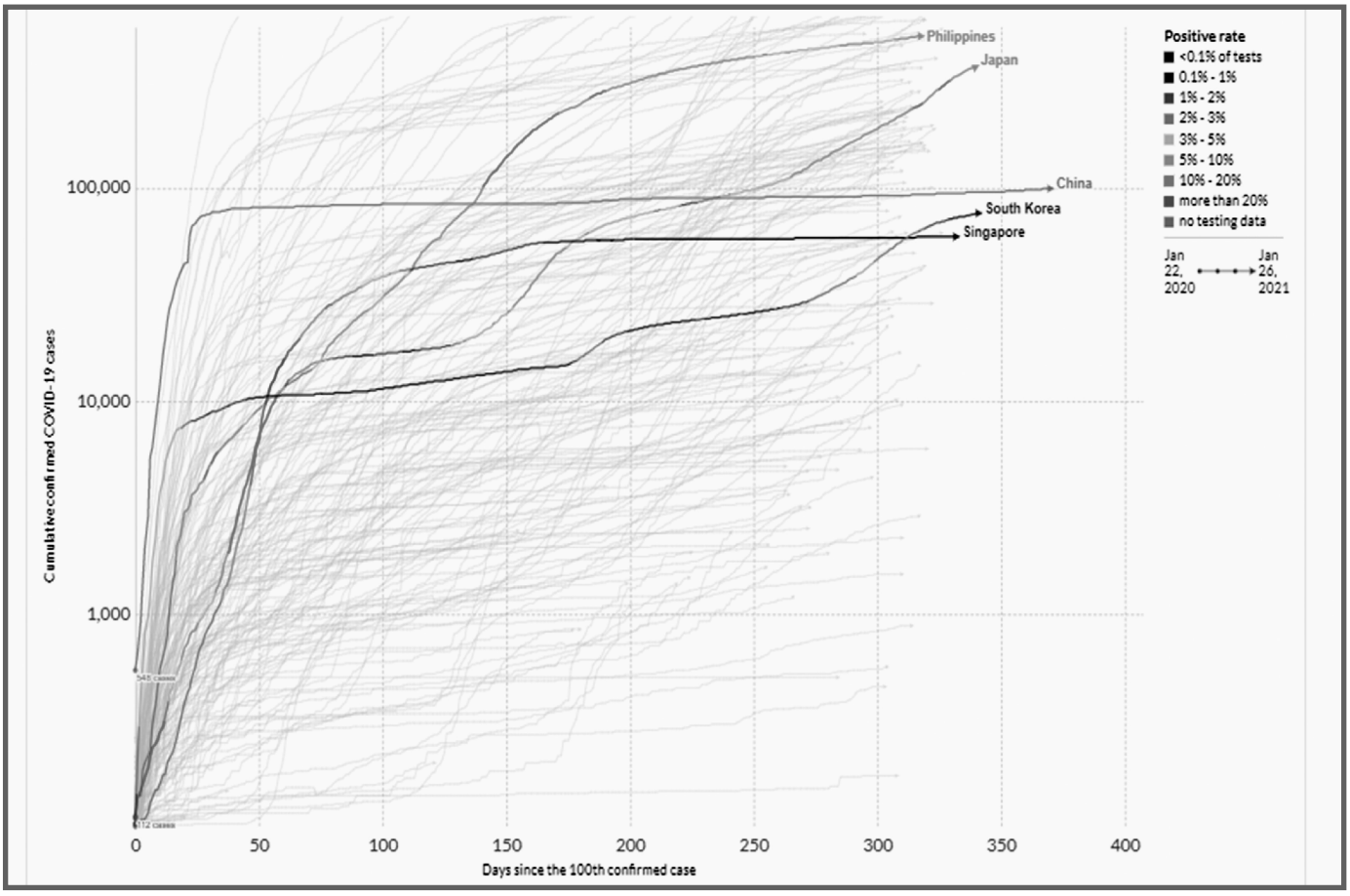
Other measures done were the stoppage of face-to-face classes and online classes were implemented instead. The imposing of sanctions and fines on those who do not follow protocols was also done.

The national responses and the Sendai Framework

The UNDRR (2015) posits that the Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030 outlines seven global targets to reduce disaster risks. These seven targets are: (a) "Substantially reduce global disaster mortality by 2030, aiming to lower the average per 100,000 global mortality rate in the decade 2020–2030 compared to the period 2005– 2015; (b) Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 in the decade 2020–2030 compared to the period 2005–2015;9 (c) Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030; (d) Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030; (e) Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020; (f) Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of the present Framework by 2030; and, (g) Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030. The varying responses to COVID-19 at the national level has global implications to SFDRR's targets which are to reduce: (1) disaster mortality; (2) the number of affected people; (3) disaster economic loss in relation to the global gross domestic product; and, (4) disaster damage to critical infrastructure and disruption of basic services, including health facilities". (United Nations, 2015).

In reducing global disaster mortality and the number of affected people, Singapore managed to report a case fatality of 0.0% among the countries in the study which can be attributed to its readiness in handling a pandemic like past outbreaks and its relatively small area. South Korea's science-based, evidence- and data-driven decision-making in confronting the pandemic led to favorable outcomes such as the lower crude fatality rate and lesser new infections (Oh, et al., 2020). The relatively low number of deaths in Japan can also be attributed to its "cluster-based approach" as discussed above (Kazuto, 2020). The Philippines' lockdown-centric pandemic response has not been sufficient as infections continue to rise, with 459,000 cases as of 20 December 2020 (Albert, 2020). Meanwhile, despite a high case fatality rate, the comprehensive use of digital

Figure 2. *Infection trajectories per country*



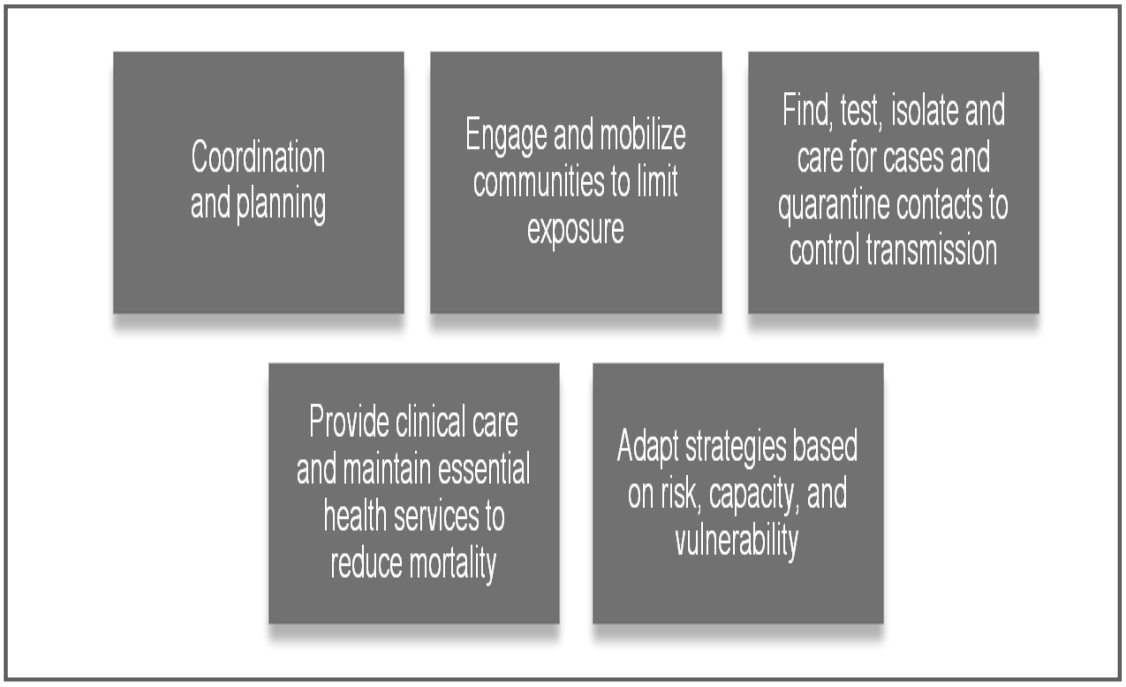
Note. This figure uses data from Johns Hopkins University CSSE COVID-19 Data. Copyright Johns Hopkins University 2020. From "Infection Trajectory: See Which Countries are Flattening Their COVID-19 Curve" by Nick Routley.

technologies for contact tracing, strict regulations and lockdowns, and strong governance resulted in China's flattening of their curve at approximately 30 days after their 100th confirmed case as shown in Figure 2 (Djalante, et al., 2020; Routley, 2020).

The World Bank in June 2020 projected a 5.2% gross domestic product (GDP) loss due to the pandemic, that even countries with advanced economies may even plunge to as high as 7% (World Health Organization, 2020). In fact, all of the five countries showed a decrease in GDP during the first quarter of the pandemic, owing mostly to the loss of consumer power brought about by the pandemic restrictions (Enjoji, 2020). To arrest the economic loss, countries allocated funds as economic stimuli. For instance, Djalante, et al., (2020) affirms that despite the 5.8% decrease in GDP in 2020 Singapore set aside $4.02 billion for the coming year to help businesses and families. South Korea, allocated $13 billion in emergency funds to stimulate economic activity; while Japan passed two packages of loans for businesses totaling $19.6 billion. China, meanwhile, was able to recover its 6.8% GDP decrease during the second quarter of 2020 (Enjoji, 2020), owing to its strategies to control the COVID-19 pandemic (The World Bank, 2020). The Philippines' fiscal response is deemed "timid," with the government's proper management of the health crisis is seen as key to successful economic recovery (Albert, 2020).

Aside from its economic impacts, Huzar (2020) asserts that the COVID-19 pandemic heavily impacted critical infrastructure and basic services, particularly health, education, and social aid. This was seen in how hospitals in The Philippines became overwhelmed with COVID-19 patients leaving no space for other patients. In contrast, South Korea's division of its national health system into COVID and non-COVID arrangements ensured the continuity of healthcare delivery to its citizens. Moreover, people with only mild symptoms of COVID-19 received

Figure 3. *The WHO national strategies as detailed by the SPRP*



Note. Adapted from the World Health Organization's COVID-19 Strategy Updates.

treatment in local government community centers. They were only transferred to a hospital if their symptoms got worse (You, 2020).

The countries in this study were able to formulate varied national responses and mechanisms to control the pandemic aligned with the SFDRR's global targets. Most remarkable are those devised by high-income nations like China, Japan, South Korea, and Singapore. Their position as countries with big economies made it possible for them to develop and sustain measures that can effectively reduce fatalities, prevent further transmission, and ensure that their markets and services remain afloat during the pandemic. Low- to middle-income nations like the Philippines, however, can do better in adopting and implementing similar strategies. The SFDRR's call to build resilience and reduce risk and losses can be realized by drawing lessons from the various national responses.

Assessment on the implementation of WHO's strategic response and preparedness plan (SPRP) to control the pandemic

Two months from the first documented case of COVID-19, the WHO formulated the Strategic Response and Preparedness Plan (SPRP) which set out objectives to tackle the spread and limit the harm caused by the disease (Figure 3). Countries are expected to adopt National Action Plans to control the pandemic using the framework set out by the SPRP (World Health Organization, 2020).

Coordination and planning

Strong national and subnational coordination is key to the successful implementation of COVID-19 preparedness and response strategies (https://www.who.int/en/). South Korea's effectively done this through its multilevel approach, from the rapid activation of protocols led by the national leadership down to the establishment of local public health centers. Their strategy kept the rate of new cases at a minimum compared to other countries (Oh, et al., 2020). The experiences from past outbreaks of SARS and MERS provided countries like Singapore and China tools to rapidly activate coordinated responses to another outbreak such as COVID-19. China activated existing pandemic control mechanisms, such as the National Infectious Disease Information System (NIDIS), and facilitated coordination between its National and Provincial Health Commissions, which covers its entire population (AlTakarli N, 2020). Singapore, on the other hand, drew lessons from its SARS experience and established a Multi-Ministry Taskforce and National Centre for Infectious Diseases which facilitated inter-departmental cooperation and communication when the COVID-19 outbreak struck

(Abdullah & Kim, 2020). Meanwhile, the Philippines is severely criticized for the lacking leadership of in its pandemic response, with its Inter-Agency Task Force focused mainly on controlling people's movements (Albert, 2020). Its response to the pandemic is touted as slow to respond, with strict restrictions deemed late to be truly effective (Searight, 2020).

Engage and mobilize communities to limit exposure

Community engagement and mobilization are required to prevent further infection and transmission. This primarily entails communication. As discussed above, the countries in this study all implemented some form of information dissemination to their populace about COVID-19 and basic health protocols. Some of these forms include the use of mass media and public advisories. Specific approaches include China's use of drones with loudspeakers that publicly remind citizens of mask-wearing, rebuking them if they are caught (Burki, 2020). Similarly, South Korea publicized movements of people who had contracted the virus so that anyone could check to see where it may have spread. Penalization figured prominently in the enforcement of health protocols in the Philippines and Singapore which is seen to improve adherence to the regulations (Kaguyo, et al., 2020).

Find, test, isolate and care for cases and quarantine contacts to control transmission

Essential to stop the spread of COVID-19 is finding, testing, isolating, and caring for cases (World Health Organization, 2020). This requires rapid and active surveillance of the population to see where the cases are and developing suitable and enough facilities for isolation and care of detected cases.

As discussed above, digital technology figured significantly in the contact tracing strategies of the countries in this study. In the case of South Korea, digital data, such as GPS phone tracking, individual transactions were used to identify suspect cases and contacts of positive individuals. China utilized digital technology for large-scale surveillance of its population. Street cameras and mobile applications are used to identify those who show symptoms and the individual's health status. The government also implemented aggressive ways of health checking such as sending officials to individual homes and having ill people be isolated (AlTakarli N, 2020). Japan's "cluster-based approach" as mentioned above proved effective in cracking down on early COVID-19 cases while ensuring testing capacity is not overloaded. The Philippines also imposed the use of mobile applications TraceFast and StaySafePH to complement traditional tracing means. These strategies are complemented with information campaigns that ask people to report their health care conditions and if they may have had contacts with a positive individual.

However, some countries faced bottlenecks in testing and isolation. For the Philippines, this was the initial lack of test kits and capable laboratories. This then developed into a lack of isolation facilities forcing the government to instead ask positive individuals to isolate at home, if possible. In contrast, Japan's aforementioned "cluster-based approach" avoided broad testing by tracking individuals to an original infection source, clustering, and then isolating them (Kazuto, 2020).

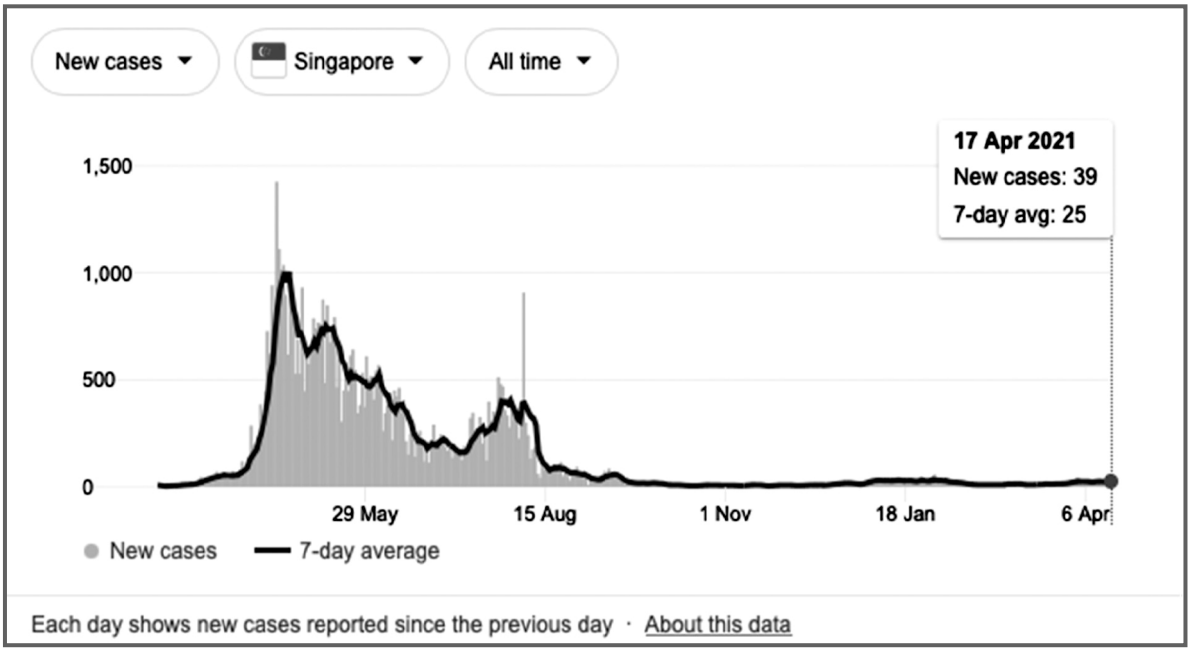
Provide clinical care and maintain essential health services to reduce mortality

COVID-19 put a toll on health systems and healthcare workers globally. This meant the disruption of health care delivery to people around the world. As cases continue to rise, even robust health systems became overwhelmed and compromised. Drawing from its experience with the SARS outbreak, China immediately started building new hospitals in Wuhan and prepared existing ones to receive COVID-19 patients, complemented by the mobilization of more than 40,000 healthcare workers from across the country (AlTakarli N, 2020). South Korea's above-mentioned COVID and non-COVID division of its healthcare system ensured the continuity of health care delivery to its population. Moreover, its health ministry received supplementary funding worth $3.2 billion, allowing them to secure resources and staff which helped the country deal with the pressures the outbreak brought (Huzar, 2020). Japan's universal health care system and its criteria-based admission system ensured the delivery of COVID and non-COVID health services while avoiding en masse trooping of individuals who seek consultation or treatment (Sakamoto, et al., 2020). In stark contrast, the Philippines' already-deficient health care system (Collado, 2019) continues to be overwhelmed with its healthcare workers sounding off distress calls to the government that seems adamant to their plight (Biana & Joaquin, 2020).

Adapt strategies based on risk, capacity, and vulnerability

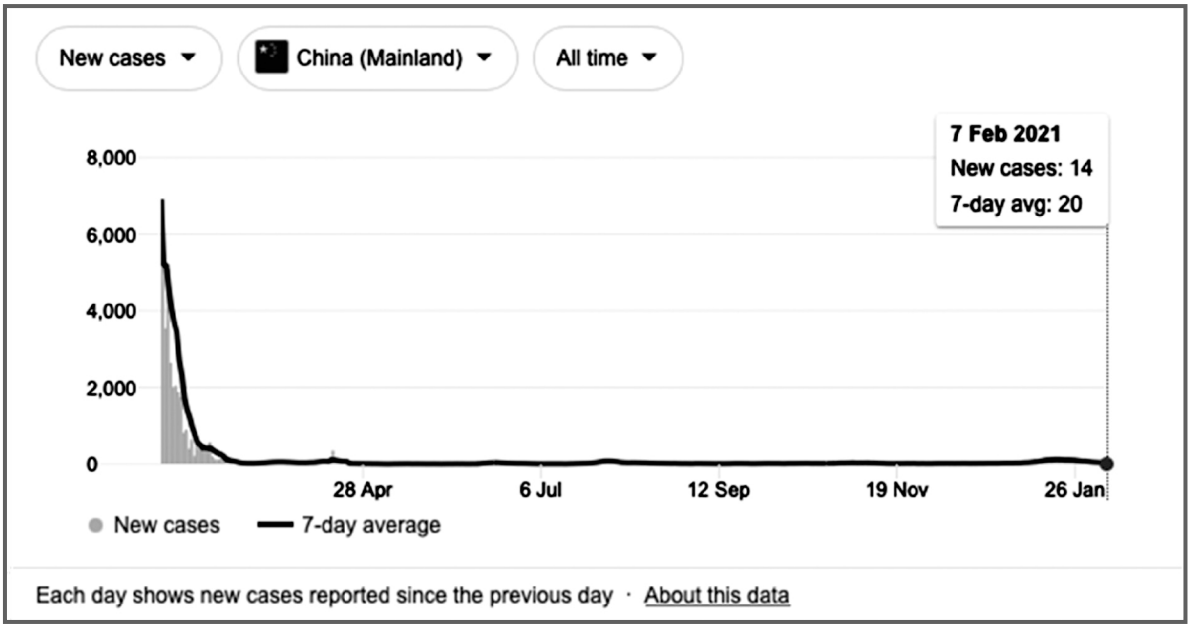
The countries in this study formulated their strategies with the end goal of suppressing transmission and transitioning to a steady state of low-level to no viral transmissions. The objective requires countries to adapt their strategies based

Figure 4. *Singapore's daily cases from April 2019 to January 2020*



Note. The data in this figure was from Johns Hopkins University CSSE COVID-19 Data. Copyright Johns Hopkins University 2020. From Google Search.

Figure 5. *China's daily cases from April 2019 to January 2020*



Note. The data in this figure was from Johns Hopkins University CSSE COVID-19 Data. Copyright Johns Hopkins University 2020. From Google Search.

on each nation's continuously evolving context and nature of COVID-19. Singapore (Figure 4) and China (Figure. 5) seem to have achieved this, with both nations achieving a two-digit seven-day average of new cases as early as March and August 2020, respectively. This made both nations cautiously reopen by lifting lockdown restrictions while keeping public health measures enforced. The Philippines meanwhile, is finding a hard time between adapting its strategies to contain the virus and reopening the economy, as viral transmission remains high despite the long lockdowns enforced since March 2020.

The WHO SPRP provided a clear, whole-of-society framework for countries to base their National Action Plans to control the COVID-19 pandemic. Each country in this study, in one way or another, was able to engage and mobilize communities; find, test, and isolate cases; provide clinical care; and maintain essential health services (World Health Organization, 2020). However, comparing each country's method of carrying out these objectives makes all the difference. This is mainly due to the countries' varying SDH. The four countries' affluent economies provided them big room to adjust and adapt their strategies, with large resources at their disposal.

Conclusion

As the SDH of each country in this study varies considerably, eradicating the spread of the virus and returning to economic normalcy emerged as a common goal for them. While only confined to five Asian countries, the lessons we draw from their experiences are substantial. This study showed that effective strategies in handling the pandemic contain the following aspects: 1) strategic preparedness by drawing from past experiences as did Singapore and China, 2) achieving organizational efficiency and adapting to situations by a tactical restructuring of the healthcare system and government bureaucracy showed by South Korea, 3) effective and wise resource mobilization and management, and 4) effective use of communication and technology to engage with the public. Despite being advantaged economically, lessons and strategies from the four affluent countries in this study can be derived and used by low-to-middle-income countries like the Philippines. The cases of Cuba, Laos, and Vietnam show that focused and effective implementation of the strategies can address the pandemic problem.

Policy makers should be conscious of aligning their pandemic control measures with the SFDRR global targets – which clearly outlines disaster risk reduction objectives in the long run. Following this framework could equip policy makers, social development workers, including nurses, with the right tools and policies for future disasters, be it a global pandemic or not. Further, the glaring issues on each countries' social determinants of health should be foremostly addressed. Economic inequality, communication gaps, and issues on governance are primary factors that hinder the effective implementation of COVID-19 pandemic management for countries.

The effective management of some countries in this study provides hope in these otherwise bleak times.

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