Singapore's Response to Covid-19

Abstract This chapter will discuss Singapore's response to the Covid-19 pandemic, focusing in particular on how it has mobilised and adapted its policy capacities to deal with the pandemic. I will also discuss the new capacities that were established this period. In focusing on how policy capacities were drawn upon or created in its Covid-19 response, this chapter will provide readers with an understanding of the various policy capacities that are necessary for responding to pandemics and other healthcare crises, as well as the capacity limitations or deficiencies that may have posed challenges for policymakers.

Keywords Covid-19 · Singapore · Pandemic response · Policy capacity

Like the SARS virus, the Covid-19 coronavirus first entered Singapore through its borders. In this case, it was a 66-year-old Chinese national who had arrived in Singapore from Wuhan on 20 January 2020 and was subsequently tested positive for the virus on 23 January 2020 (Yong 2020a). Singapore would within months experience high rates of infection, with the number of confirmed Covid-19 cases exceeding 55,000 as at time of writing. Such high rates of infection were wholly unexpected, given Singapore's excellent public healthcare system and its reputation as a leading medical hub.

These high infection rates therefore raise an important question that will be of interest to policy scholars and practitioners alike: how did such high levels of infection occur in a high capacity country such as Singapore? This question will drive the discussions that form the rest of this chapter. While I will devote much attention to the policy capacities that have underpinned Singapore's successful response to the Covid-19 pandemic, I will also discuss the capacity deficiencies that may have caused such high infection rates.

After the entry of the first Covid-19 case into Singapore, seven more cases of Covid-19 infections would be identified on 28 January, all of whom were Chinese nationals from Hubei. Consequently, travellers with recent travel histories to Hubei were barred from entering Singapore while the government began evacuating Singaporeans from Wuhan on 31 January 2020. As the days went by, more Covid-19 cases were found, although all of them were imported cases, i.e. individuals who had caught the virus elsewhere and brought it with them into Singapore.

It would not be long before community transmission took place, with the first cluster emerging on 4 February 2020 in Yong Thai Hang Medical Hall, a traditional Chinese medicine shop that caters mostly to tourists from China. The cluster had emerged when several employees of the medical hall were infected with the virus after prolonged interactions with a group of travellers from China (Tan et al. 2020). The emergence of more community transmission, particular cases without links to previous cases or travel history to China, would prompt the Singapore government to raise the DORSCON level to orange on 7 February 2020.

As more Covid-19 cases and clusters emerged throughout February, the Singapore government introduced new measures to control the spread of the virus, both domestically and from foreign travellers. I will discuss these at greater length below. The subsequent months would bring forth several grim milestones in the progress of the pandemic in Singapore. On 21 March, Singapore announced its first fatalities from the virus. These were a 75-year-old Singaporean woman and a 64-year-old Indonesian man, both of whom had underlying health conditions and were warded in the intensive care unit (ICU). More fatalities would be announced in the coming months, although Singapore's Covid-19 death rate would remain relatively low, compared to those of other countries.

It was however in early April that a major turning point took place. First, increasing local transmission of the coronavirus prompted the government to announce a 'circuit breaker'. Beginning on 7 April 2020,

the circuit breaker imposed an elevated set of safe distancing measures, such as the closure of schools and workplaces, except for essential services and critical economic sector, as well as the limiting of food sales to take-away and delivery (i.e. patrons were no longer allowed to dine in) and retail services to the provision of daily living needs (Ministry of Health 2020a). Initially scheduled to last for a month, the circuit breaker was subsequently extended for another month until 1 June 2020.

A second turning point came with the emergence of Covid-19 clusters across several migrant worker dormitories. Infection levels at these dormitories initially numbered in the hundreds daily but subsequently exceeded 1000 cases a day. Many of the workers living in these dormitories were from the construction industry or were involved in essential services sectors such as cleaning services, food and beverage (F&B), healthcare, and public transport, among others. The main cause of these infection clusters are the cramped and unsanitary conditions of the dormitories, much of it arising from poor management by dormitory operators.

Interviews with residents of these dormitories by researchers and VWOs revealed that many dormitories housed 12–20 men in each room, with a toilet and kitchen facilities shared by 150 men; these facilities were also not sufficiently sanitised (Lim and Kok 2020). It was also common practice for two men to 'rotate' on one bed, with the day-shift worker able to sleep on the bed when the night-shift worker is at work, and vice versa (Yea 2020). As I will discuss later in this chapter, these worker dormitory infections represent a significant policy blind-spot that had arisen in shortcomings or deficiencies in analytical capacity.

The Covid-19 pandemic has also given rise to significant socio-economic disruption in Singapore. More than just a healthcare crisis, the economic spill-over effects of the Covid-19 pandemic are expected to cause an economic crisis, not only in Singapore but all over the world. On 14 July 2020, Singapore entered technical recession, with its economy contracting by 41.2% in the second quarter on the back of weak external demand and decreased domestic economic activity due to the circuit breaker (Tang 2020).

The Covid-19 pandemic is expected to cause the worst recession that Singapore has ever experienced. Hence unlike the SARS crisis, Singapore's response to the Covid-19 pandemic necessarily involved a larger gamut of policy tools that targets a broader spectrum of society. These range from economic stimulus packages to strict social distancing rules and new healthcare system procedures. I will now discuss these various policy initiatives in the next section on Singapore's response to the Covid-19 pandemic.

Singapore's Response

Like the SARS crisis, the policy initiatives and measures that were implemented during the Covid-19 pandemic can be categorised as:

Community Measures
Healthcare System Measures
International Measures

On 22 January 2020, a Multi-Ministry Taskforce on Covid-19 was established to lead and direct Singapore's response to the Covid-19 pandemic. Co-chaired by Minister for Health Gan Kim Yong and Minister for National Development Lawrence Wong, the Taskforce includes ministers from the various relevant ministries that are expected to be involved in Singapore's Covid-19 response. These are listed in Table 4.1.

The composition of the Multi-Ministry Taskforce also reflects the diverse areas of Singaporean society which have been impacted by the Covid-19 pandemic. Whether in terms of hospital resources (healthcare), disruptions to schools (education) and food supply chains (trade and industry) or even heightened social tensions amidst the circuit breaker (social and family development), the impacts of Covid-19 on Singapore were large and diverse, prompting a multi-pronged approach involving a range of different ministries and ministers.

Community Measures

Unlike the SARS crisis, Covid-19 was not a nosocomial infection. Rather, a large proportion of Covid-19 infections occurred within the broader community. The community measures implemented during the Covid-19 crisis were therefore much more extensive, as compared to those that were implemented during the SARS crisis. Singapore's community measures for managing the Covid-19 pandemic can therefore be further delineated into three distinct categories:

- Safe distancing measures
- Mandated wearing of face masks
- Financial support

Table 4.1 Multi-Ministry Taskforce on Covid-19 (Ministry of Health 2020b)

Role	Member	Ministry/Agency
Co-Chairs	Mr Gan Kim Yong Minister for Health	Ministry of Health
	Mr Lawrence Wong Minister for National Development	Ministry of National Development
Advisor	Mr Heng Swee Keat Deputy Prime Minister	
Members	Mr S Iswaran Minister for Communications and Information	Ministry of Communications and Information
	Mr Chan Chun Sing Minister for Trade and Industry	Ministry of Trade and Industry
	Mr Masagos Zulkifli Minister for the Environment and Water Resources	Ministry of the Environment and Water Resources
	Mr Ng Chee Meng Minister, Prime Minister's Office Secretary-General of National Trades Union Congress	National Trades Union Congress
	Mr Ong Ye Kung Minister for Education	Ministry of Education
	Mrs Josephine Teo Minister for Manpower	Ministry of Manpower
	Mr Desmond Lee Minister for Social and Family Development	Ministry of Social and Family Development
	Dr Janil Puthucheary Senior Minister of State	Ministry of Transport

Safe Distancing

The Covid-19 virus is mainly spread through air-borne droplets that are released when an infected individual sneezes or coughs in public. An infection can occur when a sufficient amount of these droplets is breathed in by a passer-by or close contact. Aside from airborne droplets, the Covid-19 virus can also be spread through contact with contaminated surfaces. Such surfaces could have been contaminated with the aforementioned airborne droplets land on these surfaces, or when an infected person touches these surfaces after having sneezed or coughed into his or her hand.

Given this nature of Covid-19's transmission mechanism, Singapore's community measures were therefore strongly centred on social distancing,

also known as 'safe distancing' in the city-state. This began on 7 February 2020, with the raising of the DORSCON level from yellow to orange giving rise to the first set of community measures. Specifically, organisers of large-scale public events were advised to defer these events while schools were asked to suspend after-school and external activities. Workplaces were also advised to carry out temperature scanning.

The rapid rise of local Covid-19 cases and clusters would prompt the government to introduce its 'safe distancing' measures on 13 March 2020, which required the deferment or cancellation of all cultural, sports and entertainment events involving 250 participants or more (Ministry of Health 2020c). This requirement would be expanded to include all events and gatherings (Ministry of Health 2020d). The 13 March 2020 directive also required public venues to impose safe distancing measures, such as ensuring that seats are at least one metre apart in restaurants, limiting the number of patrons that can enter entertainment venues, tourist attractions and sports facilities and ensuring that these patrons keep a one metre distance from each other.

On 24 March 2020, the government announced the closure of all bars and entertainment venues, suspension of all religious and worship activities, and the deferment or cancellation of all events and mass gatherings, while other public venues such as malls and public attractions were required to reduce crowd density to no more than one person per 16 square metres of usable space, with museum group tours and mall atrium sales cancelled as well (Ministry of Health 2020e). At the same time, the Multi-Ministry Taskforce also announced stricter measures to limit gatherings outside of work and school to no more than 10 persons.

It was however on 3 April 2020 that Singapore announced its most stringent set of safe distancing rules yet: a 'circuit breaker' that involved the shutting down of all schools and non-essential workplaces. Under the circuit breaker, schools shifted to home-based learning while work was carried out through telecommuting from home. Additionally, the circuit breaker mandated the closure of non-essential retail stores, while restaurants and other food outlets were only allowed to offer takeaway or delivery services. Supermarkets and pharmacies were allowed to resume business, albeit under strict safe distancing guidelines.

Initially planned for a month, the circuit breaker would come to be extended for another month. The circuit breaker was eventually lifted on 1 June 2020 under a phased reopening of Singapore's socio-economic activities.

While Phase 1 allowed for the reopening of schools and workplaces, it was only in Phase 2 that retail stores and food and beverage outlets were allowed to resume operations, albeit under safe distancing measures. Social interactions involving up to 5 people were also allowed. As of writing, Singapore is still operating under Phase 2 conditions. Phase 3 reopening is expected to return Singapore to normal conditions, although this is expected to only take place upon the development of an effective Covid-19 vaccine or treatment.

Face Masks

Aside from social distancing, another key community measure involved the distribution and mandated wearing of face masks in public. In an experiment conducted by the Agency for Science, Technology and Research (A*STAR) and the Singapore General Hospital, scientists found that a properly-worn mask can significantly reduce the spread of droplets from an infected person (Government of Singapore 2020).

While this importance of face masks is evident on hindsight, it was not always the case during the crisis. The WHO only recognised the importance of mandating all individuals to wear a face mask in public in early April 2020, with the consequence being that countries that complied with WHO guidelines and regulations, such as Singapore, faced a similar lag-time in implementing mandatory mask-wearing in public.

Prior to 15 April, the government had maintained its position that individuals should only wear a mask if they are unwell (Zhang 2020). It was only on 3 April 2020 that Prime Minister Lee would announce during a national address that the government would no longer be discouraging people from wearing masks in public; this was on the back of an extensive review of the medical literature by the MOH that was conducted in March (Zhang 2020). This is particularly in light of emerging evidence from the WHO and the U.S. Center for Disease Control and Protection that the virus could be spread by persons who did not display the typical symptoms of Covid-19 infection.

In recognition of the emerging scientific consensus on mask-wearing as well as the WHO's change in stance on mask-wearing, the government updated its mask guidelines to encourage the wearing of masks in public spaces, eventually making it mandatory on 15 April 2020 for individuals to wear a mask whenever they leave their homes or vehicles (Ministry of Health 2020a). Barring several exceptions (such as during strenuous exercise or when travelling in a vehicle with fellow household

members), anyone caught outside without a mask would face an initial fine of SG$300, and a fine of SG$1000 for subsequent offences (Yong 2020b).

Budgets

Aside from efforts to reduce social interaction and close contact among individuals, a third set of community measures involved the disbursement of financial resources to mitigate the economic impacts of the pandemic for individuals, households and businesses. This was effected through the unveiling of four budgets in quick succession, an event that was unprecedented in Singapore's independent history.

The first budget was unveiled on 18 February 2020. Known as the "Unity Budget", this first budget drew on SG$6.4 billion to fund the government's efforts to address the impacts of the Covid-19 pandemic. Covid-19-related measures included a SG$1.6 billion Care and Support Scheme that would fund a one-time pay-out of between SG$100 and SG$300 to Singaporeans aged 21 and above, a SG$1.3 billion Job Support Scheme that would pay for 8% of the wages of local workers, as well as various tax rebates for firms in the aviation, hospitality and MICE (meetings, incentives, conventions and exhibitions) sectors that had been hit hard by the Covid-19 crisis.

The budget also included a whole slew of other measures, top-ups and special transfers aimed at stimulating Singapore's economy in what was increasingly recognised as a difficult year ahead. The Unity Budget would be swiftly followed by the announcement of a SG$55 billion "Resilience Budget" on 26 March 2020. Amounting to 11% of Singapore's GDP, the Resilience Budget further enhanced the Jobs Support Scheme by co-funding 25% of the wages of all local workers (raised from the previous level of 8%), with sectors that have been harder hit by the pandemic receiving higher levels of wage co-funding, such as the food services sector (50% wage support) and the aviation and tourism sectors (75% wage support).

The Care and Support Scheme was also significantly expanded, with cash pay-outs to all adult Singaporeans tripled and the introduction of an additional SG$300 pay-out for all parents. Other measures that were introduced include a SG$1.2 billion Self-Employed Person Income Relief Scheme that paid out a monthly case assistance of SG$1000 to self-employed persons, a Temporary Relief Fund that provided financial assistance to the needy, a freeze on all government fees and charges for

a year, an automatic 3-month deferment of income tax payments for companies and self-employed persons, as well as a range of property tax rebates and write-offs for businesses that have been especially hard hit by the pandemic.

To address the disruptions that were expected to emerge with the circuit breaker, a SG$5.1 billion "Solidarity Budget" was unveiled on 6 April 2020. The budget further expanded the Care and Support Scheme by providing an additional SG$300 cash pay-out to all adult Singaporeans, with the first tranche of Care and Support Scheme pay-outs brought forward to April 2020 while all other payments that were announced in the Resilience Budget were similarly brought forward to June 2020. The Jobs Support Scheme was similarly expanded, with the government now co-funding 75% of workers' wages across all sectors.

Lastly, a SG$33 billion "Fortitude Budget" was introduced on 26 May 2020 to help businesses and workers tide through the Covid-19 crisis and its deleterious impacts on the economy. The Fortitude Budget included enhancements and extensions to the Job Support Scheme, a SG$2 billion SGUnited Jobs and Skills Package to create 40,000 jobs, 25,000 trainee-ships and 30,000 skills training opportunities, as well as a SG$13 billion contingent sum that could be used to respond to any potential uncertainties that may arise from the pandemic, along with other measures (Lim 2020).

Taken together, the four budgets mobilised close to SG$100 billion to address the Covid-19 crisis, with SG$52 billion drawn from past reserves (Chew 2020, Lim 2020). As I will discuss later in this chapter, Singapore's ability to draw on such large amounts of financial resources to address the Covid-19 crisis reflects its extensive material capacity.

Healthcare System Measures

While Singapore's community measures played an important role in limiting community transmission of the Covid-19 virus by minimising social interactions and contact, its healthcare system measures have been equally, if not more, important in testing, detecting and treating Covid-19 cases.

This began on 23 January 2020, when Singapore's first confirmed Covid-19 case, a 66-year-old Chinese man from Wuhan, was admitted into the Singapore General Hospital's (SGH) isolation ward, with contact tracing initiated immediately. SGH, along with other hospitals, would

quickly find their isolation wards and intensive care units (ICUs) filled up as confirmed Covid-19 cases rose rapidly over the subsequent few months. This necessitated the mobilisation of other facilities to house some of the Covid-19 patients.

To this end, the MOH put in place a 'comprehensive medical strategy' that involved a set of 'tiered medical facilities'. Under this strategy, patients who exhibited severe symptoms admitted into the various hospitals' ICUs while those with mild or no symptoms were cared for at Community Care Facilities (CCFs); patients who were recovering were also often transferred to CCFs from the hospitals (Ministry of Health 2020f). The CCFs were established in response to the rising rates of infection that threatened to overwhelm Singapore's healthcare system. These facilities include holiday chalets such as D'Resort in Pasir Ris as well as convention halls that were repurposed to become CCFs, such as Singapore Expo and the Changi Exhibition Centre.

Hence while the NCID and isolation facilities that were established post-SARS reflect the presence of excess capacity, the onset of crisis often requires the optimisation of these resources and capacities in order to preserve healthcare capacity during the crisis. This necessary transition between 'slack' and 'optimisation' in policy capacity will be discussed in the following chapter. The tiered medical facilities that were set up during the Covid-19 outbreak therefore represent a crucial set of healthcare system measures that prevented Singapore's hospitals from becoming overwhelmed by the large number of infections.

Within these tiered medical facilities, healthcare processes and procedures were quickly introduced with the onset of Covid-19. These processes and procedures are broadly similar to those that were introduced during SARS, such as the compulsory use of PPEs by healthcare workers and medical personnel, extensive screening and contact tracing processes at entry points to hospitals and other medical facilities, limitations to the number of visitors to these facilities as well as the deferment of non-essential medical procedures, and perhaps most importantly, the reactivation of a network of Public Healthcare Preparedness Clinics (PHPCs).

Comprising 900 primary care clinics and last activated during the 2009 H1N1 influenza pandemic, the PHPCs were provided with the necessary resources, guidance and PPEs to provide subsidised consultation, treatment, investigations and medications for all Singapore citizens and permanent residents diagnosed with respiratory illnesses (Today Online

2020). This contributed to a greater willingness among the public to seek medical attention for respiratory illnesses, in the process facilitating early detection of Covid-19 infections and reducing community transmission.

Aside from healthcare procedures and facilities, another key set of healthcare system measures include the development and use of Covid-19 test-kits. Firstly, ASTAR and Tan Tock Seng Hospital co-developed the 'Fortitude' swab test kit that would play a crucial role in broader Covid-19 testing across Singapore. While initially used by hospitals, the use of these test kits were subsequently extended to 20 polyclinics and selected general practitioner (GP) clinics, with samples collected processed at the NCID's National Public Health Laboratory as well as private laboratories such as ParkwayHealth Laboratory (Teo 2020a).

This was followed by the development of the world's first serological test by Duke-NUS Medical School, which played a key role in identifying the linkage between two infection clusters (CNA 2020a). Such serological tests that allow researchers to detect antibodies that are developed in an infected person have subsequently been used to assess the extent of community transmission in Singapore. The Duke-NUS Medical School would also subsequently develop a rapid test kit that can detect the presence of Covid-19 antibodies in a person within a few hours (Goh 2020).

A similar emphasis on speed was taken by Singapore-based medical technology firm Biolidics Limited, which developed a test kit that can test for Covid-19 infection in a person within 10 minutes (Kamil 2020). In sum, test kits and testing capabilities represent an important component of Singapore's healthcare response to the Covid-19 pandemic, with rapid test kits contributing to its ability to quickly identify infected persons as well as expedite its contact tracing processes.

While highly effective, these healthcare measures are only focused on detecting and treating Covid-19 cases within Singapore's broader population. It should be noted that even the most efficient or well-developed healthcare system can be overwhelmed by high levels of infection. Given Singapore's position as a global business and tourism hub, large numbers of 'imported' Covid-19 cases could easily enter Singapore and overwhelm its healthcare system.

It was therefore crucial that measures were put in place to limit the importation of Covid-19 cases, in order to preserve healthcare system capacity and functionality. I will now discuss these 'international measures' that were implemented to minimise and limit the potential inflow of Covid-19 cases from overseas.

International Measures

Singapore's first set of international measures were implemented on 2 January 2020, when the MOH began temperature screening for inbound travellers from Wuhan. These temperature screening measures would subsequently be expanded to all incoming travellers from China on 22 January, while anyone with pneumonia and travel history to China within 14 days were required to be isolated. The introduction of these expanded measures coincided with the formation of the Multi-Ministry Task Force. These temperature screening measures can therefore be thought of as an 'automatic' mechanism that is set off with the onset of an emerging epidemic or pandemic in the region, since the Task Force was only established after these measures had already been initiated.

Temperature screening measures would be significantly expanded with the identification of Singapore's first Covid-19 case, with temperature screening implemented at all sea and land checkpoints for all travellers on 23 January 2020. Travel curbs were subsequently introduced on 28 January. Under these travel curbs, visitors with recent travel history to Hubei or with passports issued in Hubei were not allowed to enter or transit in Singapore. These travel curbs were subsequently expanded to on 1 February 2020 to include all visitors of any nationality with recent travel history to Mainland China.

Singapore residents and employment pass-holders returning from China were also required to go on a 14-day stay home notice from 17 February. As Covid-19 infections soared across the world, Singapore announced on 3 March that travellers from Iran, Northern Italy and South Korea would not be allowed to transit or enter Singapore. From 15 March 2020, travellers with recent travel history to ASEAN countries, Japan, Switzerland and the United Kingdom were also issued with a14-day stay home notice when they entered Singapore. During this period, Singaporean residents were also advised to defer all travel abroad, while all short-term employment pass holders were barred from entering or transiting in Singapore on 22 March 2020.

More stay home notices were subsequently issued, with Singapore residents and pass holders returning from the US and UK required to serve a 14-day stay home notice at dedicated facilities. These facilities largely comprised hotels, many of which were tasked to house returning Singapore residents and pass holders who were required to go on stay home notices. This would serve to prevent these returning individuals

from potentially spreading the coronavirus to their family or household members.

The commencement of the circuit breaker on 7 April would lead to a complete halt to all travel and transit into Singapore, with the exception of delivery drivers and certain essential services personnel who were allowed to enter Singapore from Malaysia via the Causeway that connects the two countries by land. These broad travel restrictions would be loosened with the end of the circuit breaker. As of writing, the government has allowed travellers from certain countries to transit in its airport, while plans are also afoot to allow cross-border travel between Singapore and Malaysia.

Policy Capacity in Singapore's Covid-19 Responses

Singapore's response to the Covid-19 pandemic has involved policy capacity in two key ways. First, it drew upon existing capacities that were established post-SARS. Second, new capacities were created to address the rapidly-worsening Covid-19 pandemic. While some of these capacities were developed through the adaptation or modification of existing capacities, others were entirely new.

In the rest of this chapter, I will discuss the policy capacities that were mobilised and created in Singapore's response to the Covid-19 pandemic. I will also discuss the capacity deficiencies and shortcomings that may have prevented policymakers from preventing the emergence of large infection clusters in Singapore's migrant worker dormitories.

Operational Capacity

At the heart of Singapore's operational capacity is its excellent healthcare system. Ranked among the top in the world but taking up relatively low levels of state expenditures, Singapore's healthcare system has been described as "high quality, low cost" (Haseltine 2013). Of particular importance is the availability of hospital beds and resources for treating infected patients. In the early phases of both the SARS and Covid-19 outbreaks, designated hospitals were tasked with receiving and treating infected patients, with the Tan Tock Seng Hospital designated as the 'SARS hospital' while the National Centre for Infectious Diseases (NCID) played a similar role for Covid-19 (Tan 2003).

Completed in May 2019, the NCID is a 330-bed purpose-built medical facility that is "designed to manage an outbreak on the scale

of SARS" (Kurohi 2019). The NCID building includes isolation units, in-house laboratories and research units, high-efficiency particular air filters, as well as technological features such as real-time locational contact tracing through electronic tags that are issued to all staff, patients and visitors (Co 2019). Prior to the Covid-19 outbreak, the NCID was mainly involved in detecting and treating major food poisoning cases, and conducting research on infectious diseases (Kurohi 2019).

As I will discuss in the next chapter, the NCID can be thought of as a form of excess capacity that could be tapped on during the outbreak of an infectious disease, but which would otherwise be left to focus on research activities rather than active clinical work. However, even such excess capacity would not be enough, with the rapid increase in Covid-19 cases requiring the government to tap into other hospital and medical facilities for the isolation and treatment of infected patients.

In a bid to preserve hospital capacity, the Ministry of Health announced on 23 March 2020 that Covid-19 patients who are clinically well but continue to test positive for the virus would be transferred to private hospitals such as Concord International Hospital, Mount Elizabeth Hospital and a community isolation facility that was set up at a holiday resort facility in Eastern Singapore (Chong 2020a; CNA 2020b). The Singapore Expo, an exhibition and convention centre in Eastern Singapore, was subsequently converted into a second community isolation facility for Covid-19 patients who are recovering or exhibit mild symptoms (Tee 2020).

A rapid rise in infection rates among Singapore's migrant workers also prompted the government to rehouse many of its healthy migrant workers in other facilities, such as schools, military camps, university student accommodations, and vacant public housing projects, so as to prevent further spread of the virus among migrant workers (Phua and Ang 2020). As I will discuss below, many of these migrant workers were living in highly cramped and often-unsanitary conditions.

As I discuss below, the availability of physical infrastructure is crucial to ensuring operational capacity. While its healthcare infrastructure such as hospitals and clinics has allowed Singapore to house and treat infected persons, the availability of other physical infrastructure that can easily be converted into patient-care and isolation facilities, such as hotels, military barracks, and convention centres, have also contributed immensely to its ability to maintain operational capacity in the face of rising infection rates. Such infrastructure can therefore be thought of as a form of excess

capacity, that though not purpose-built for dealing with a pandemic, can nonetheless be mobilised during such a crisis.

Aside from hospital and medical facilities, a second source of operational capacity lies in Singapore's ability to conduct extensive contact tracing. In response to questions about the sources of Singapore's success in managing Covid-19, Prime Minister Lee noted that: "As the cases started to come in, we were able to identify them, because we said treatment and testing for COVID-19 will be free. We were able also to contact trace and find the contacts of the people who had come in and isolate the contacts, so that we slow down the spread within the population" (Lee 2020).

Initially drawn from the Ministry of Health and subsequently incorporating personnel from the Singapore Police Force and the Army, contact tracing teams are tasked with identifying the close contacts of infected persons and ensuring that these close contacts are isolated and quarantined to prevent further spread. The contract tracing process begins in the hospital, where a warded patient is asked to construct an 'activity map' that details the activities that he or she has carried out and people that he or she has met over the past two weeks; this is followed by an investigative process whereby contact tracing teams call up all the people that the patient has interacted with, in order to determine whether a person is a close contact and hence at risk of an infection (Khalik 2020). Close contacts who are clinically well are then quarantined for 14 days, while close contacts with coronavirus symptoms are hospitalised.

This ability to conduct extensive contact tracing hinges upon two key capacities. First, it requires personnel who are sufficiently trained to carry out contact tracing. Should infection rates outpace the abilities of contract tracers from the Ministry of Health, relevant personnel from other parts of the public service, such as investigative officers from the police force and military can also be activated. Second, contact tracing requires the presence of established procedures detailing the contract tracing process, such that existing and new contact tracers can quickly take on their roles. In the case of Singapore, these procedures were established in the aftermath of the SARS crisis and encoded in the institutional fabrics of both the Ministry of Health and the NCID.

Another operational capacity that is tangentially related to Singapore's healthcare system and contact tracing efforts is its technological infrastructure. A key example of this is the invention of the Infrared Fever Screening System by the Defence Science and Technology Agency

(DSTA) during the SARS outbreak (Tan et al. 2004). An infrared-based system that allows for fever screening of large groups of people, the Infrared Fever Screening System was deployed at major public buildings and facilities such as the airport during both the SARS outbreak and the Covid-19 pandemic. The DSTA also developed a low-cost diagnostic kit that can detect the presence of the Covid-19 novel coronavirus in individuals in a significantly shorter amount of time (Tan 2020).

More recently, a contact tracing application, the 'TraceTogether app", was developed by the Government Technology Agency (GovTech) and Ministry of Health to assist in its contact tracing efforts. The app identifies people who have been within two metres of coronavirus patients for at least 30 minutes through the use of Bluetooth wireless technology and allows contact tracers to quickly identify other users who have been in close contact with infected persons, rather than relying on individuals' memories (Baharudin 2020a; Government Digital Services 2020). A wearable device was also designed for distribution to individuals who may not have access to smart phones, and hence are not able to use the TraceTogether app (Baharudin 2020b).

It should however be noted that the TraceTogether app was popular with citizens, having been downloaded by only a quarter of the resident population (Chong 2020b). Such reluctance to download the app stemmed in part from limitations in the app that had caused excessive draining of smartphone batteries and in part from privacy concerns (Chong 2020b). GovTech has also adapted the social messaging app Whatsapp to provide citizens with daily updates on Covid-19 cases by developing an artificial intelligence (AI) translation tool and created an app-based reporting tool for monitoring individuals under quarantine (Basu 2020).

Aside from digital technologies, the private technological firm Razer and the DSTA have both been engaged to design produce essential PPEs such as face masks and face shields (CNA 2020c; Koh 2020). These have served to shore up Singapore's supply of masks and PPEs. Like physical infrastructure, the presence of a technological ecosystem comprising technological firms and government technology agencies therefore represents an important facet of Singapore's operational capacities. While these firms and agencies are in ordinary times focused on commercially-viable technologies, they can be mobilised during a pandemic to develop new technologies that can in turn be applied to the government's pandemic response efforts.

Material Capacity

Singapore's ability to develop and mobilise these operational capacities, whether these are healthcare system capabilities or physical and technological infrastructure, fundamentally depended on the availability of material capacity. Three forms of material capacity are especially relevant here. These are financial resources, facilities and technological hardware.

As I have discussed earlier in this chapter, Singapore had over the course of its response to the Covid-19 pandemic introduced four budgets, totalling close to SG $100 billion, with SG $52 billion drawn from its past reserves (Chew 2020). The various features and components of the four budgets have been discussed above, and there is no need to repeat these. It suffices to say, however, that the four budgets aimed to introduce a strong fiscal stimulus to counteract the negative economic impacts of the Covid-19 pandemic as well as to provide for the additional operational capacities that were mobilised during the crisis.

Underpinning this significant financial outlay is Singapore's large national reserves. According to the Ministry of Finance, Singapore's reserves refer to the total assets minus liabilities of the government and its various entities, with total assets comprising physical assets such as land and building and financial assets such as cash, securities and bonds (Ministry of Finance Singapore 2018). Singapore's reserves are managed and invested for returns by its sovereign wealth fund GIC Limited, government-owned investment company Temasek Holdings, and Singapore's central bank, the Monetary Authority of Singapore (MAS).

While the size of Singapore's total reserves are kept secret due to its strategic nature, although estimates by analysts have placed it well above SG $500 billion (Ng and Jaipragas 2019). Current reserves represent the amount of reserve that is accumulated within a term of government, while past reserves consist of the total amount of reserves that have been saved up over past terms of government. While current reserves are used to fund the government's policies and initiatives, the government can also draw from its past reserves during periods of crises, although draw-downs of past reserves require the approval of the elected President.

Singapore's large reserves are therefore an important form of material capacity which allows for the funding of key policy initiatives, particularly during crises. Its past reserves have also been mobilised during the 2009 Global Financial Crisis and during the Covid-19 pandemic, as discussed

above. Aside from financial resources, Singapore has also drawn on other forms of material capacity to address the Covid-19 pandemic.

The first of these is its 'national stockpile', which includes more than three months' worth of carbohydrates (such as rice and noodles) and more than two months' worth of proteins and vegetables (Lam 2020). This national stockpile of essential products was initially established to pre-empt disruptions in food supply from Malaysia. In light of heightened demand for masks during the Covid-19 pandemic, the Singapore has also built up a national stockpile of masks and medical supplies (Meah 2020).

Underpinning these stockpiles is the government's ongoing efforts to diversify its supply chains, especially in anticipation of potential disruptions, whether these be due to a pandemic or strategic conflict. This approach is fundamentally driven by Singapore's 'siege mentality' approach to security and diplomacy, as discussed in Chapter 1 (Leifer 2000). In any case, Singapore's national stockpile of food and medical supplies can be seen as an important form of material capacity that can be mobilised during a crisis.

The last form of material capacity that has been particularly relevant in Singapore's Covid-19 response efforts is its urban infrastructure. As I have discussed above, the emergence of large infection clusters in Singapore's migrant worker dormitories had prompted the government to relocated some healthy migrant workers to schools and military barracks that had been repurposed to become temporary worker housing facilities. This served to lower the density of migrant worker dormitories, reducing risks of infection for their residents.

At the same time, exhibition centres such as Singapore Expo and the Changi Exhibition Centre as well as holiday resorts such as D'Resort were also repurposed to become Community Care Facilities (CCFs) to house Covid-19 patients who were clinically well, i.e. exhibiting mild or no symptoms from the virus. Hotels were also mobilised to house returning residents who had to be placed on Stay Home Notice. In sum, urban infrastructure such as hotels, exhibition centres, schools and barracks were rapidly mobilised and repurposed to house Covid-19 patients and individuals on Stay Home Notice.

Whether in the form of financial resources, the national stockpile or urban infrastructure, material capacity represents an important set of resources that can be mobilised during a crisis. Material capacity is particularly crucial for maintaining operational capacity. For instance, financial resources are needed for maintaining existing healthcare system capacity

or funding new healthcare initiatives. Similarly, the mobilisation of urban infrastructure to house Covid-19 patents can help conserve healthcare system capacity. Given the role of these material capacities in funding and driving Singapore's Covid-19 response, it is likely that the government will continue to maintain its high levels of material capacity.

However, and as I will discuss in the next chapter, such efforts to maintain a high level of material capacity runs counter to the resource optimisation and efficiency-focus that characterises the dominant NPM approach to public administration. Rather, maintaining high levels of material capacity involves setting aside excess capacity, whether these are financial resources, food or buildings, in preparation for a potential crisis. More importantly, the maintenance of excess capacity can ensure greater systemic robustness during a crisis. Another set of capacities that can contribute to policy robustness is analytical capacity. I will now discuss these.

Analytical Capacity

While the capacities that I have discussed so far have proven crucial in driving Singapore's policy responses during the Covid-19 pandemic, the capacities that it has built up before and in anticipation of the pandemic are equally important. At the heart of such efforts is analytical capacity.

Analytical capacity, particularly in terms of the ability to pre-empt and prepare for a future pandemic draws, significantly on specific and highly technical activities such as strategic foresight and horizon scanning, all of which involve extensive collection and processing of data in order to separate the 'signal' from the 'noise', in the parlance of futurists and foresight specialists. At the heart of such analytical capacities is the government's Centre for Strategic Futures (CSF), a strategic foresight and horizon scanning unit situated within the Prime Minister's Office.

A key aspect of the CSF's role includes "building capacities, mindsets, expertise and tools for strategic anticipation and risk management" (Centre for Strategic Futures 2020). The CSF is therefore tasked with building the tools and capacities for addressing future crises, with pandemics often included as a major high-risk event in the CSF's annual reports (Centre for Strategic Futures 2017).

Aside from pre-empting future pandemics, Singapore's efforts to contain the Covid-19 virus depended heavily on its ability to collect and process large amounts of information, particularly in its contact tracing

and quarantine management processes. The role of contact tracing teams as well as the manpower resources that were directed towards contact tracing, both from the MOH and from the military and police force, have been discussed at great length above.

Aside from manpower resources, another important source of analytical capacity are the technological tools that been developed to enhance the Singapore's contact tracing and surveillance abilities. This includes the abovementioned TraceTogether app and the SafeEntry app, a "national digital check-in system" that allows workplaces, malls, restaurants, supermarkets and other public venues to keep track of the individuals who enter their premises, by requiring individuals to 'check-in' to a premise by scanning a QR code (GovTech 2020).

These technological tools can be thought of as an additional means through which the Singaporean government has been able to collect and rapidly process individual locational data, often through automated processes. Such technologically-enabled surveillance tools therefore represent another important form of analytical capacity that has been used, not only in Singapore but in other Asian countries such as South Korea, to keep track of infection rates as well as enforce compliance with quarantine orders.

While these analytical capacities have contributed immensely to Singapore's ability to detect, contain and monitor Covid-19 infections, shortcomings or deficiencies in analytical capacity have also in part driven Singapore's high infection rates, particularly within its migrant worker dormitories.

The emergence of the migrant worker dormitory clusters can be seen as a 'black elephant' event, i.e. an unexpected shock that has arisen from an already-known systemic problem that policymakers and society are unwilling to address (Ho 2008; Centre for Strategic Futures 2017). The cramped and unsanitary conditions of migrant worker dormitories are not new to the public. Much of these had previously been documented published by the media and non-profit organisations such as Transient Workers Count Too (CNA 2018; Transient Workers Count Too 2020).

Yet despite the availability of such information, policymakers were not able to translate this knowledge into 'actionable intelligence' for preventing COVID-19 infections. This inability to translate such information on migrant worker dormitory conditions into healthcare policy implications reflects shortcomings or deficiencies in analytical capacity (Woo 2020). There are several possible reasons for this. First, observers

have noted how the government had placed an overly-strong focus on Singaporean citizens and residents in its initial testing and control measures (Nortajuddin 2020). Early and extensive testing of migrant workers residing in these dormitories could have prevented, or at least reduced, these infection clusters.

Second, non-profit and civil society groups who possessed information on the living conditions of these migrant workers were not able to obtain the attention of policymakers. Certainly, much of this can be attributed to the "weak and emasculated" state of Singapore's civil society, exacerbated by a "political acquiescence of the middle class" that had led to state domination of public and societal discourse (Chong 2011). Furthermore, the ability of civil society groups to gain the attention of the government is also unequally distributed across sectors, with areas such as environmental sustainability and women's rights commanding greater policy salience than migrant worker rights (Chua 2000; Chong 2011; Ortmann 2015; Soon and Koh 2017).

Insufficient channels of communication between policymakers and civil society therefore prevented the transmission of important information on migrant worker dormitories onto the policy agenda. Without such information, or the ability to identify the healthcare implications of migrant workers' living conditions, policymakers were effectively blindsided by the large numbers of Covid-19 infections that emerged from migrant worker dormitories.

As I will discuss at the end of this chapter and in the next, certain forms of analytical capacities need to be strengthened, particularly the ability to identify causal linkages across different policy issues and domains, as well as the ability to leverage on the data and information that reside within civil society and to transform this knowledge into actionable intelligence. This latter point—better communication between civil society and the state—also relates to another set of policy capacity, specifically political capacity. I will discuss these next.

Political Capacity

There are two aspects of political capacity that are relevant to the case of Singapore. The first comprises political trust and legitimacy, while the second involves political communications. The two forms of political capacity are interlinked. While the public's willingness to comply with the government's regulations and directives depend on the presence of political trust, effective political communications can serve to build up this trust. Both communications and trust are therefore crucial for

ensuring public compliance with policies and regulations, in the process contributing to the successful attainment of policy objectives.

Much has been written about political trust and legitimacy in Singapore. As an archetypal East Asian 'developmental state' that operates on the basis of performance legitimacy, political trust in Singapore is dependent on the government's ability to attain high levels of economic growth and socio-political stability (Huff 1995; Perry et al. 1997; Liow 2011; Woo 2018). Singapore's success in managing past crises and pandemics, such as the SARS crisis and the 2007 Global Financial Crisis, would have likely contributed to the government's performance legitimacy.

Some of this can also be attributed to the Singaporean state's 'semi-authoritarian' approach to governance and its low tolerance for dissent (George 2007; Rodan 2008; Tan 2012, 2016), although the People's Action Party's (PAP) ability to consistently win all General Elections since Singapore's independence allude to a relatively high level of political trust from the general population. Certainly, the recent 2020 General Elections suggest some level of decline in this trust and the government's performance legitimacy, with the PAP experiencing an 8% decline in vote-share and the lost off a GRC to the opposition Workers' Party.

While some observers had attributed this decline in vote-share to citizens' unhappiness with the government's handling of the Covid-19 pandemic (BBC 2020; Li 2020), others have pointed to public unhappiness over the government's decision to hold an election during the pandemic in the first place (Koh 2020). The PAP's own assessment was that voters in their 40s and 50s had voted against it due to the economic hardships that had arisen from the pandemic, while its online campaign was not able to connect well with younger voters (Lai 2020). This was despite expectations, based on historical precedence, that the PAP would do well during the elections due to a 'flight to safety' mentality among voters (Li 2020).

However, one should also not read too much into the elections results. The PAP's ability to secure a 61.2% vote-share suggests broad general support from the population, while continued public compliance with safe distancing rules and measures point to a certain level of trust in the government's ability to manage the Covid-19 pandemic.

Aside from issues of trust and legitimacy, political communications have also played a key role in ensuring public compliance. Singapore's efforts to communicate its policies to the general public, particularly during the early phases of the Covid-19 pandemic, has received much

favourable attention. Much of this has been attributed to the government's clear and concise policy directions and advice that were delivered through traditional and social media on a near-daily basis (Hsu and Tan 2020; Sagar 2020).

This emphasis on trust and transparency in political communications was also evident during the SARS crisis, with the government granting World Health Organisation (WHO) officials full access to its information and all data and information presented in a daily conference chaired by the Director of Medical Services and attended by key public officials and WHO observers (Centre for Strategic Futures 2017, p. 14). This practice of daily information sharing has been extended to the Covid-19 crisis, with the Multi-Ministry Taskforce on Covid-19 sharing updates and information with the public through frequent press conferences.

Yet despite these efforts, insufficient communications between the government and dormitory operators as well as employers of construction workers may have led to the commingling of workers from different dormitories at worksites and in social settings. This was revealed in a ministerial statement by Manpower Minister Josephine Teo on 4 May 2020, with infected workers from different dormitories found to be linked through common worksites (Teo 2020b). While the first dormitory cluster was identified on 30 March 2020, the practice of allowing workers from different dormitories to work on common worksites continued well into early May.

Dormitory workers and construction sector employers were therefore not sufficiently cognizant of the infection risks that can emerge when workers from different dormitories go to work at common worksites and return to their individual dormitories at the end of the workday. This suggests some limitations in Singapore's political communications, particularly in terms of the government's ability to effectively communicate its policy stance and regulations to dormitory operators and construction sector employers.

Conclusion

As this chapter has shown, Singapore's ability to respond quickly to the Covid-19 pandemic and minimise Covid-19-related fatalities is fundamentally driven by the presence of key policy capacities that allowed it to identify and isolate potential Covid-19 cases, maintain healthcare system capacity and functionality despite high infection rates, provide the necessary financial and material resources to support its Covid-19 response,

and ensure public compliance with its policy initiatives and regulations, among others.

At the same time, its high rate of infection, much of it driven by large infection clusters within its migrant worker dormitories, are also attributable to deficiencies in certain analytical capacities, with the result being insufficient understanding of the infection risks that resided within these cramped and densely-populated migrant worker dormitories. This suggests a need to strengthen those aspects of analytical capacity that can enhance policymakers' understanding of migrant worker dormitory conditions as well as those that can help policymakers develop a keener understanding of the causal linkages that may exist between different policy issues and domains—in this case, linkages between manpower policy and healthcare policy.

Policy capacity is therefore a useful frame of analysis that can help policymakers and researchers to identify the strengths and limitations that may exist within their policy systems. As Singapore's experience with Covid-19 has shown, a deep pool of excess policy capacity is necessary for rapid response to crises, even if this runs counter to NPM expectations of resource optimisation and efficiency. Conversely, the framing of policy limitations in terms of capacity deficiencies can help policymakers identify the specific capacities that may need to be built up, in order that future crisis response efforts are improved and enhanced. I will discuss these at greater length in the next chapter.

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