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Minimum public health interventions for post COVID-19 lockdown: Lives and Livelihoods

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Introduction

Public officials around the world have been challenged with managing both lives and livelihoods in shifting their cities/ countries out of tight lockdowns imposed due to COVID-19. Heated debates in government offices between economic and health officials are common and unsurprising as economic officials often lack a deep understanding of public health and health officials are unused to consider explicitly costs and especially economic externalities in their decision making.

This background brief is intended for public officials primarily from economic and finance ministries/ departments to provide a deeper appreciation of the state of the science in public health interventions and their economic implications.

We discuss the **minimum health standards for post lockdown COVID-19** in our view and provide a case study of the Singapore experience in relaxing lockdown restrictions.

Context

Many countries have had to 'lock down' and are in varying stages of unlocking or relaxing containment measures. There is however uncertainty over what are the minimum measures that should be retained, what measures can be relaxed and in what sequence. In essence, the timing needs to be right almost Goldilocks-like, not too hot and not too cold. The premature release of social distancing rules may exacerbate the situation, leading to further economic losses. Likewise, the needless extension of these measures put a greater toll on businesses and their employees with bankruptcy, retrenchments, and unemployment, and less fiscal space to cope with the pandemic.

The Economic Carnage

There should be no doubt that this is the worst economic crisis in a century. The International Monetary Fund (IMF) projects negative growth of 3% and describes the Great Lockdown as "the worst recession since the Great Depression, and far worse than the Global Financial Crisis" (Global growth shrank 'only' 0.1% in 2009).

Asia has seen a 35% decline in arrivals in Q1/ 2020 with icons such as Singapore Airlines and Cathay Pacific Airlines requiring effective government bailouts. The luxury resort group, The Banyan Tree, retrenched 30% of its workforce in Singapore, its global headquarters, whilst super app Grab cut staff globally by 5% and sports media company ONE Championship laid out 20%.

Domestic services and traded tourist services are most affected across sectors (see Table 1) and millions of jobs are at risk. Only businesses providing food, medicine and healthcare, utilities, telecommunication, banking and logistical services have managed to remain open throughout and can face the future with some optimism. Other sectors such as the arts, entertainment, recreation, hotel industries and retailers face large **unemployment** numbers and **permanent business closures**.

TABLE 1:
Cumulative impacts on outputs by the COVID-19 global pandemic; by (%) deviations from baseline

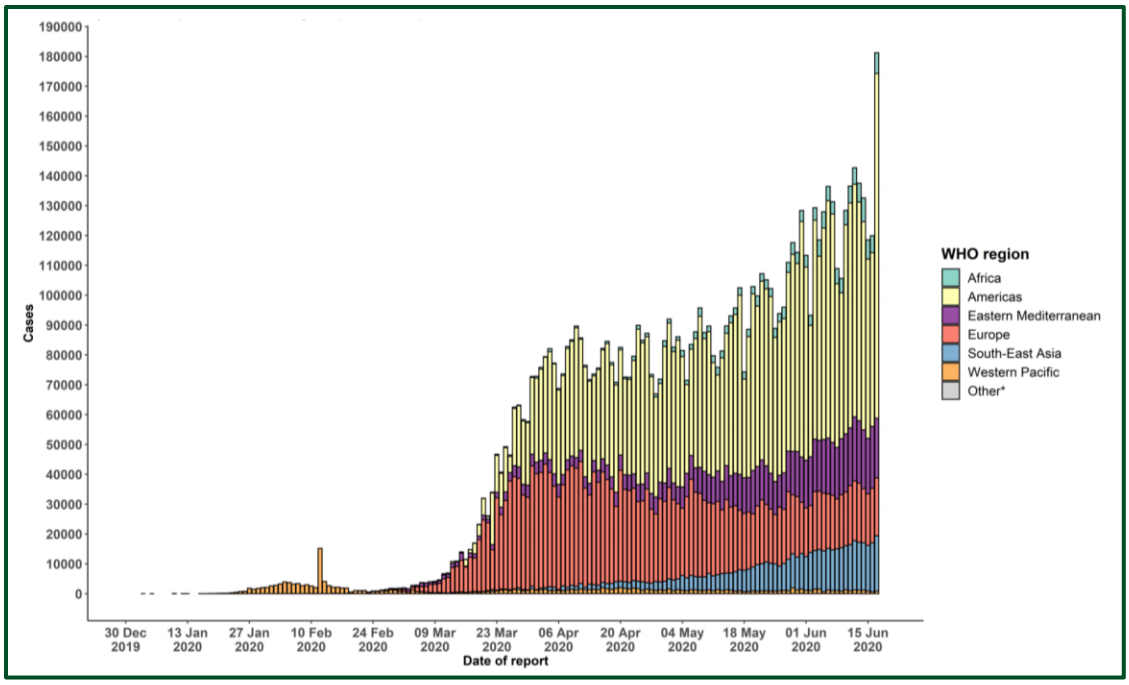
	Agriculture	Natural Resources	Manufacturing	Services	Domestic Services	Traded tourist services	Total
China	-3.12	-1.08	-3.61	-3.67	-4.85	-4.64	-3.54
Singapore	-2.61	-3.47	-4.32	-4.01	-7.18	-6.28	-4.11
U.S.	-3.60	-0.21	-2.45	-3.80	-9.99	-11.27	-3.38
Developing countries	-2.90	-1.42	-3.47	-3.87	-7.98	-8.63	-3.51
Globally	-3.04	-1.29	-3.13	-3.95	-8.77	-9.26	-3.56

Taken from Maliszewska et al. (2020); *Source:* Envisage simulations

Balancing policy goals- Lives AND Livelihoods

That said, public health measures, while economically horrifically painful, are necessary and the challenge is to balance the risks of further COVID-19 surges with economic and societal restoration. A key need is understanding risk- "Only a Sith believes in absolutes" as Obi Wan Kenobi, the famous Star Wars character says. There are no public health interventions that reduce the risk of COVID-19 transmission to zero and public officials need to understand this, define acceptable levels of risk despite the uncertainty and move economic re-opening ahead with caution.

As of the time of writing, there have been worldwide almost 8.5 million cases of COVID-19 with nearly half a million deaths. As the chart from the World Health Organization 18th June 2020 report shows, the world is far from beating COVID-19. In fact, as Beijing demonstrates, we are far more likely to experience a near-term future of starts and stops, with regularly occurring cases which threaten to mushroom into national epidemics and pandemics if not stopped early and decisively.



Public Policy Objectives

There are really 4 objectives to achieve in these difficult situations:

1. Test, trace and isolate cases as soon as possible to avoid secondary cases and widespread community transmission

2. Prevent hospital and health system resources from being overwhelmed

3. Enable economic re-opening cautiously so that livelihoods can be maintained

4. Prepare citizens and businesses for the profound changes a COVID world necessitates

Balancing across these 4 will be dynamic, requiring multi-disciplinary decision-making and access to real-time information as we will discuss later in this brief.

Importance of public health interventions

Currently, there are over 130 vaccine candidates in various stages of development and testing. However, even in the most optimistic scenarios, it will be months before one undergoes the full spectrum of clinical trials needed and mass production is mature. No medicines save for dexamethasone have been found to be useful in treating COVID-19, and even dexamethasone is NOT for prevention or for mild cases. It is beneficial for more severe cases requiring oxygen therapy. Hence there is little choice but to depend on public health interventions for the time being.

The effectiveness of public health measures has been studied through analysis of past pandemics (influenza) and observational data. Research have shown that the rapid implementation of such measures during early disease detection can reduce transmission. Public health measures should aim at breaking person-to-person transmission, surveillance and testing, isolation, clinical care for all cases, contact tracing and appropriate quarantine. It has to emphasized that these public health interventions are a suite and are not mutually exclusive. In fact, they work best when deployed together.

Masks

"Wearing of face masks in public corresponds to the most effective means to prevent interhuman transmission" reported the authors of a study published in the Proceedings of the National Academies of Sciences of the United States of America on 11th June 2020.



The major paradigm in COVID-19 to understand is the phenomenon of **asymptomatic transmission**, that is persons infected can show no symptoms throughout the course of infection, and infected cases can be most infectious, in terms of viral shedding before the onset of symptoms. Hence masks are used to protect others from the user who may be infected but

without symptoms. If everyone wears masks, then we all protect each other. There is a nice video (https://www.a-star.edu.sg/News-and-Events/a-star-news/news/covid-19/why-is-it-important-to-wear-a-mask-to-prevent-the-spread-of-covid-19) produced by Singapore's Agency for Science Technology and Research which using a high speed, high sensitivity camera elegantly demonstrated how far droplets could be expelled during coughing or sneezing and how effectively a mask could minimize this.

It should also be noted that the use of masks to protect the user from others is limited in the case of standard surgical masks or cloth masks given the incomplete seal, and studies have shown that lay persons use the N95 masks wrongly, thus negating any benefits.

Hand Washing and Hand Sanitizing



Hand washing is simple and effective, with compelling science supporting the anti-microbial effects of soap and water. It should be recognized however that in situations with high volumes of human interactions, hand washing between each contact can be impractical and hence the wider adoption of hand sanitizers. CDC recommends using anti-microbial hand rubs with greater than 60% ethanol or 70% isopropanol in healthcare settings, but given the global shortages of manufactured hand sanitizers, local compounding guidelines have been issued also by various organizations including US Pharmacopeia (https://www.usp.org/sites/default/files/usp/document/about/public-policy/usp-covid19-handrub.pdf).

Safe Distancing (Formerly known as Social Distancing)

Studies have shown that the SARS CoV 2 virus can be disseminated via droplets. The degree of spread is dependent on the number of persons, degree of physical proximity, duration of exposure and the activities generating droplets, with shouting and singing generating more droplets spreading further distances, but in general safe distancing of at least 1 meter would be needed.

The consequences of this in terms of public health interventions would thus be that cancelling or reducing mass gatherings, avoiding crowded areas and settings (e.g. public transport, malls, cinemas, bars and entertainment), working from home and adaptations for workplaces and schools to maintain the minimum 1-meter distancing would be prudent. However, safe distancing has the largest economic and societal implications and hence needs to be examined more holistically.

Our view is that **public health measures such as mask wearing in all public places and hand washing/ sanitizing are safe, inexpensive and incur minimal inconvenience, and as such should be widely adopted**. **For safe distancing, the acceptable levels of risks viz a viz economic implications should be formally evaluated**. There is no threshold of zero risk and the probabilistic risks of business activities versus health system capacity to cope with a surge in cases are what should be used in decision making. There is no ex ante right or wrong here and options should be openly debated by officials across health and economic agencies. There is useful, albeit dynamic information published on risks of various business activities (including the graphic below based on data from the US Department of Labor which analyses three physical attributes: contact with others, level of physical

proximity, exposure to disease and infection). Public officials should study these carefully and use them in decision making for their own economies.

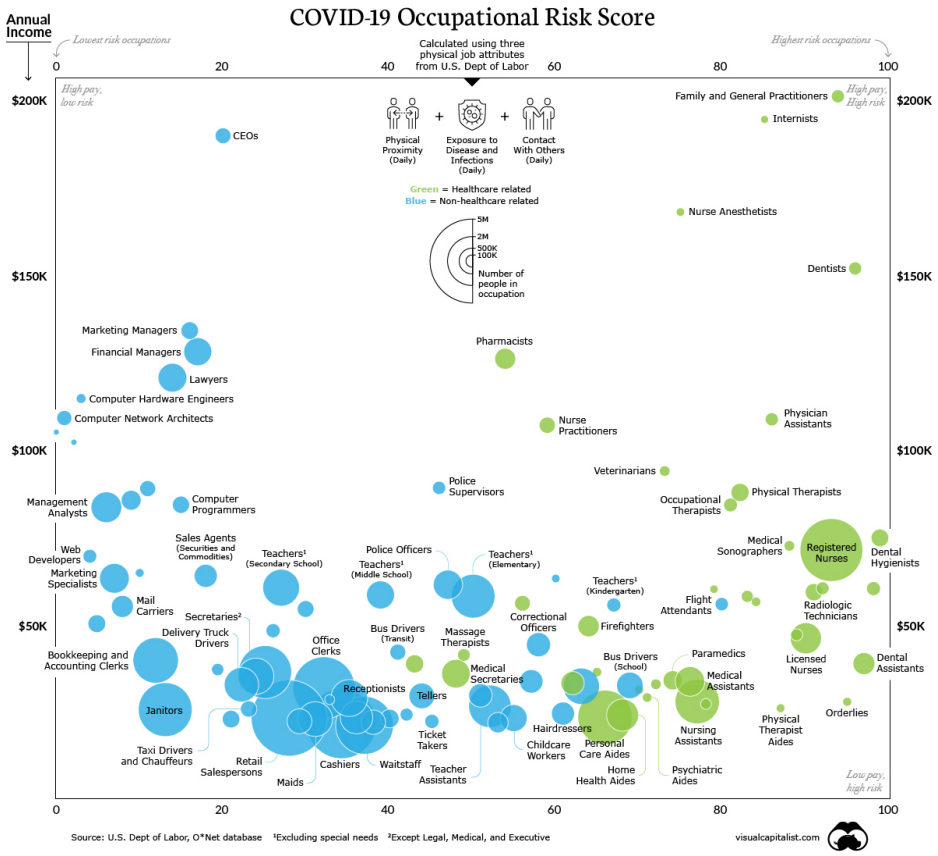


Image taken from visualcapitalist.com

Technologies and Measures for Environmental Disinfection

COVID-19 has unleashed innovation in the disinfection sector and many interventions that were previously confined to healthcare settings have diffused into retail, transport and many other sectors. For example, high contact surfaces on public transport vehicles in Singapore are coated with a special anti-microbial layer. In India, some premises such as hotels and clinics are deploying Ultra Violet UV-C lights coupled with sensors which are controlled by a smart phone app-based control system to disinfect enclosed spaces. In China, autonomous robots equipped with UV-C lights roam hospitals do likewise.

Technology can be a powerful force multiplier to enable disinfection and other COVID-19 control measures. Coupled with geospatial and risk profile analytics, public officials can determine where to best deploy scarce disinfection and control resources, both human and machine.

Vulnerable Populations

Even as public officials work on reopening after lockdown, vulnerable populations remain major risk points and perhaps even more so with reopening and consequent increase in exposures.

Urban Slums and Low-Income Housing Areas

The Singapore experience has amply highlighted how quickly COVID-19 can spread in these populations. In Singapore, previously lauded as a 'gold standard' in COVID-19 response, an initial 90 cases reported in 2 migrant worker dormitories on 5th April 2020 exploded into a high of 1,396 cases just 15 days later on 20th April. As of 18th June 2020, 39,082 out of 41,473 cases in Singapore were dormitory residents.

Age

Seniors citizens are at higher risk of infection, with more severe course of infection due to their lower immune status. It has been estimated that 1 in 5 seniors will require oxygen therapy and even ventilatory support. Nursing and aged care homes are particularly at risk and in Sweden, care home deaths accounted for almost half the overall mortality.

Health and Co-morbidities

Comorbidities (e.g. hypertension, heart diseases, diabetes) contribute to the susceptibility to the infection and risk of mortality when infected. Furthermore, fear of COVID-19 may deter individuals with comorbidities from seeking medically necessary care, or render access much more onerous and increase the risk of complications from sub-optimal follow up of existing illnesses.

Case study: Singapore

*"Reopening means there will be an increase in activities and human contact, and more opportunities for the virus to spread. That is why we decided to implement a **phased approach** and not open the floodgates all at once"*

--Lawrence Wong
Singapore National Development Minister and
Co-Chair of the Multi-Ministry Taskforce for COVID-19

Singapore is a wealthy country in the South-East Asia region, and known as a global financial centre. Its economy is largely driven by financial and professional services, tourism, exports in manufactured goods, trading, and healthcare. It is highly digital with aspirations of being a 'Smart Nation' and citizens have easy internet access and digital services such as banking, grocery shopping and food delivery apps.

It entered into a Circuit Breaker (local term used but conceptually very similar to a lockdown) on 7th April followed multiple outbreaks of cases especially in the migrant worker dormitories and exited from this on 2nd June 2020. Singapore has designed its exit in 3 phases as below with Phase 2 commencing on 19th June:

Image taken from Singapore Ministry of Health.



Circuit breaker to Phase 1 (7th April to 1st June)	Phase 1 to 2 (2nd June to 18th June)	Phase 2 to 3 (19th June to ….)
• Daily number of new community cases declining significantly • Dormitory situation is controlled	• Low community and unlinked transmission rates • Situation is under control for 2-4 weeks	• Ramp up contact tracing • Remain at phase 3 until effective vaccine or treatment is available
	• Low risk of transmission activities allowed to re-open gradually • Limited resumption of economic and social activity	• More activities permitted including opening of food and retail outlets • All schools to re-start in person lessons from 29th June • Businesses and offices to re-open with work from home if possible, 'Rule of 5' if not, and safe distancing, masks and hand sanitizing measures adhered to

Phase One: Safe Re-opening

The focus in Phase 1 was on gradual re-opening of economic activities with low risk of transmission and some allowance for social activities to mitigate the mental health effects of prolonged separations. Residents could only leave home for essential activities as per the Circuit Breaker, and be masked at all times in public spaces except during strenuous exercise. Seniors were advised to continue to stay at home. The 'Safe Re-opening' was further divided for ease of communications into the major domains of societal functioning:

- **Safe Workplaces:** select businesses such as "motor vehicle servicing, aircon servicing, basic pet services, and hairdressers or barbers" were permitted to re-open with additional measures such as limited numbers of patrons, compulsory use of a visitor registration system called SafeEntry, and temperature screening at entry points. Retail and food outlets had to remain closed whilst employees across all sectors were told to continue to work from home unless special permission was granted.



- **Safe Home and Community:** Households with parents or grandparents could receive a maximum of 2 visitors per day limited to 1 visit per day. Childcare by grandparents was also

permitted. Significant events such as marriages and funerals could be held but attendance was restricted to 10 persons. Public worship services remained closed.

- **Safe School:** Half the school going cohorts were permitted to return to school with priority given to graduating cohorts. However, extra- or co-curricular activities were not permitted to re-start

- **Safe Care:** Healthcare services, preventive health services, and one-to-one sessions for complementary healthcare services will resume.

Phase Two: Safe Transition

In Phase 2, most businesses have re-opened other than cinema theatres, museums and mass events with people in close proximity for extended periods of time. The logic of the phased approach was to allow Singapore residents to become 'used' to the safe distancing measures and routinize these habits. Social gatherings are allowed but only up to 5 persons, whether in public places or in households.

[On 20th June 2020, Singapore penalized a number of dining outlets for failing to adequately implement 'safe distancing' measures. The ongoing vigilance and quick action against errant businesses will be necessary to maintain overall discipline in Phase 2]

Behind the Scenes Preparation for Un-Locking

During the time of Circuit Breaker, in addition to managing the cases of COVID-19 and creating more infrastructure to house and care for the largely migrant worker patients afflicted, Singapore also prepared for a smooth transition through to Phase 1 and then Phase 2. These efforts can be conceptually divided into the following:



COVID-19 Surge Preparations- Given the need to trace, test and isolate quickly, **contact tracing teams** have been augmented and now number 500 staff strong divided into 50 teams working around the clock. Their work has become less difficult with use of **technology for contact tracing**. Chief amongst these would be SafeEntry (mandatory registration upon entry into all buildings and premises, public and private other than homes) and TraceTogether mobile applications and the soon-to-be-launched TraceTogether tokens (exchanges and logs Bluetooth signals between nearby devices, both phones and tokens to track close contacts). In terms of **laboratory diagnostic capacity**, Singapore has also steadily ramped up manpower and equipment and is planning for the ability to test 40,000 cases per day. The health system has also been discharging COVID-19 patients into newly-created community facilities hence **freeing up healthcare capacity** to cater to 'Business as Usual' clinical demands and any new COVID-19 cases. At the time of writing, there are only 2 COVID-19 cases in the Intensive Care Unit nationwide.

Digital World Preparation- In anticipation of a prolonged Phase 2, Singapore has also established multiple schemes to assist businesses and individuals to 'Go Digital'. Beyond the typical grants and

advisory support, Singapore has been piloting novel initiatives to shift mindsets. For example, wet markets which traditionally have been all about face-to-face transactions and seeing (and often feeling!) fresh produce, have started to experiment with 'live streaming' and selling of produce virtually.

Manpower Preparation- Safe distancing enforcement ambassadors/ officers whose roles were to remind residents to maintain safe distancing, wear masks etc were recruited and deployed in areas of high human traffic such as markets. Digital ambassadors were also recruited and trained to teach hawkers and other vendors how to use e-payments and hence enable 'contactless' transactions as well as teach seniors use of various digital platforms for essential services and social contact

Cross Border Harmonization of Standards

Given the high dependence of most countries on international trade of goods and services including tourism, it is imperative that alignment of minimum public health standards occurs across countries. This is much more difficult than it sounds as many public health interventions are applied differently even within the same country. For example, as of the time of writing 19 states in the United States of America do not mandate mask wearing. Different countries in Asia also impose different requirements for mask wearing depending on whether one is in an enclosed space, riding public transportation and so on. Testing requirements as well as standards also widely differ across Asia and unfortunately there have also been well-documented cases of fraudulent laboratory testing including in Bangladesh where a hospital owner was arrested after authorities accused him of providing over 6,000 fake COVID testing certificates.

The author's view is that cross-border travel will first be enacted bilaterally, for example, Singapore-China Green Lane and the Malaysia-Singapore Reciprocal Green Lane (RGL) and Periodic Commuting Arrangement (PCA), and then with the learning from these bilateral experiences, countries will coalesce bilateral into multilateral travel bubbles based on individual countries' disease load as well as public health measures undertaken including extent of testing, tracing and isolation. Regions will also need to establish supra-national structures to set out policies and regulations and to police them as well as to address any disputes between countries (See Appendix 2 for a commentary co-authored by J Lim published in the Straits Times 16th July 2020 on ASEAN travel bubbles which articulate many of the principles and practices needed for successful resumption of border crossings).

Perhaps region-wide production of public health supplies including personal protection equipment (masks, gowns, face shields etc), harmonization of contact tracing technologies including development of QR codes that can be used across the region and regional cooperation in public health messaging could be less contentious first steps and help to set countries on the trajectory of greater alignment.

What to Do Post-lockdown

"… the faster all cases are found, tested, isolated & cared for, the harder we make it for the virus to spread. This principle will save lives & mitigate the economic impact of the pandemic."

--Tedros Adhanom Ghebreyesus, WHO Director-General

The World Health Organisation (WHO) has recommended that any country seeking to unlock or lift restrictions should ensure the following 6 conditions:

1. Disease transmission is under control
2. Health systems are able to "detect, test, isolate and treat every case and trace every contact"
3. Hot spot risks are minimized in vulnerable places, such as nursing homes
4. Schools, workplaces and other essential places have established preventive measures
5. The risk of importing new cases "can be managed"
6. Communities are fully educated, engaged and empowered to live under a new normal

We recognize that different countries have vastly different resources with very different socio-political and cultural contexts and these will drive how lifting of restrictions practically are implemented. Government officials will need to adapt and apply general principles as exemplified by the WHO guidance to specific settings and evolve the measures based on evidence emerging globally virtually every single day as well as the results they obtain. A recent commentary published in The Lancet (15 July 2020) on assessing national performance provides a useful listing of factors to consider and specific indicators which can be used by countries to evaluate their own performance and through comparative analysis, learn from other countries.

We have provided here a **stepladder approach** based on resource availability to what we deem as minimum measures for a post-lockdown period for policy makers to consider. That said, there is no single formula for all and careful consideration is needed based on a country's capacity and infrastructure. Note also that it is common for advanced economies to offer donations of technology such as sophisticated contact tracing systems and recipient countries will need to examine whether these can be utilized meaningfully and whether the implementation will be worth the resources invested in time and manpower.

Level 4 **(digitalisation and additional support initiatives)**	Personal: - Authorities can provide masks to all citizens Physical and social distancing: - Recruitment of more safe distancing enforcement officers and ambassadors - Introduce work-from-home for workers, and home-based learning for schools, and virtual meetings - Encourage use of e-payment and services Movement: - Contact tracing: utilising digital systems through mobile applications, QR code scans, or signal devices - Engage the use of digital ambassadors to increase digital literacy Special protection: - Advocate for psychological protection among high-risk groups Others: Automated disinfection, heat sensor temperature taking, further ramp up testing and screening capacity, providing support grants to citizens, increase traineeship opportunities, support medical research and advancements, recruit more manpower as necessary
Level 3 **(more manpower and support)**	Safe distancing: - Anti-microbial coating on high touch surface areas - Recruitment of safe distancing enforcement officers Movement Restrictions: - Enhance manual contact tracing and national screening with increased manpower - Placement of demarcations in public places for social distancing Special protection: - Increase healthcare manpower by training and supervision

	- Set up more remote medical centres, isolation/ quarantine areas - Increase social and financial support for vulnerable groups Others: Increase testing and screening capacity
Level 2 **(better coordination and care)**	Personal: - Provide materials for basic hand hygiene (e.g. hand sanitizer) - Encourage use of disinfection at home Safe distancing: - Workplace: staggered shifts, flexible leave policies, protection for front-line and service workers - Close non-essential businesses should transmissions increase - Schools: rotate in attendance, temporary closing of school buildings Movement Restrictions: - Arrange travel in advance for students, workers, and repatriation - Simple manual contact tracing Special protection: - Coordinate community care and health facilities - Teleconsultations Others: create emergency response units, introduce proper testing and screening measures, communicate to public on updates and recommendations on current situation
Level 1 **(fundamental, relatively easier to implement)**	Personal: - Basic hand hygiene, cleanliness, etiquette - Physical distancing, reduce mixing between individuals from different households in the same neighborhoods - Use of masks in all public spaces Safe distancing: - Reduce crowd at common areas, workplaces or schools, public spaces and transportation - Increase ventilation at close public spaces (open windows, reduce use of air-con) - Cancel or adapt mass gatherings (e.g. limit events, cinema closure, adapt customs) Movement Restrictions: - Set up isolation/ quarantine areas - Collect data on self-reported contact with others (simple contact tracing) - Reduce non-essential travel - International border restrictions Special protection: - Conduct risk assessment - High risk groups advised to stay home Others: Basic education (signs and symptoms, transmission of disease), essential medical care, global tracking of data and new scientific findings that may influence policy decisions

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Special thanks to Ms Francine Seah, National University of Singapore for her assistance with the research and writing of this brief.

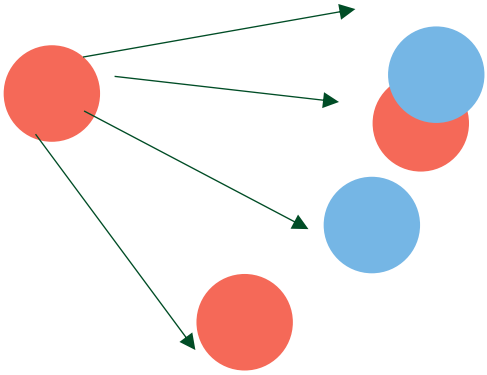
Appendix 1- Key Principles of Outbreak/Pandemic Management

Features of Infectious Diseases

- Result from the transmission of an infectious agent (e.g. certain viruses, bacteria, parasites)
- Transmission from person-to-person occurs from an *infectious* individual to another *susceptible* individual
- The infected individual becomes a source of exposure to others
- Infected persons often develop immunity to subsequent infection
- Epidemics occur if there is insufficient protection in the population
- Pandemic occurs if the disease affects a large geographic spread (a country or the entire world)

Basic Reproductive Number

R_0 is the average number of secondary cases arising from a single primary case in a *totally susceptible* population. It is a key measure of transmissibility.



Case Example:

Red = Infected; Green = Not Infected

Here, one person develops the infection and

- **R_0** depends on the infectiousness of the pathogen, duration of infectiousness, infection dose, population density, proportion of susceptible people, population intermingling patterns, recovery or deaths, etc.
- The **R_0** can vary between different populations

Possible scenarios

R_0 > 1: Infection spreads exponentially, disease incidence will increase

R_0 < 1: Infection spreads slowly, disease incidence will decrease and eventually die out

R_0 = 1: Each case gives rise to an average of another new case. The disease incidence will be constantly maintained at baseline

*The higher the value of **R_0**, the faster the progression of the epidemic, and vice versa.*

Effective Reproductive Number, R_e (number of susceptible people at any specific time)

- Some contacts of the primary case may be protected by natural immunity/ immunization. When there is partial immunity, **R_e is generally lower than R_0**.

Appendix 2- There's a pilot for the ASEAN travel bubble. Here is how to make it work

Khor Swee Kheng and Jeremy Lim
The Straits Times, 16th July 2020

The recently announced reciprocal green lane agreement between Malaysia and Singapore is a small but significant step forward, not just bilaterally but also in the broader context of how countries in Southeast Asia can safely reopen their borders amid an ongoing pandemic.

Set to begin on Aug 10, it could be the precursor for an eventual Asean-wide 'travel bubble'. More immediately, it offers an important first test case of how countries can successfully lift restrictions bit by bit while keeping the spread of the coronavirus in check.

The Malaysia-Singapore green lane is, as the name suggests a lane, not a highway. It limits cross-border travel to long-term pass holders and travellers on essential or official business. There are also restrictions under the accompanying periodic commuting arrangement. For instance, those allowed to travel under this arrangement must remain in their country of work for at least three consecutive months before being allowed to return home for short-term leave.

Health protocols and other procedural details are still being worked out and will only be published 10 days before the implementation date. In short, the rules of the road, as it were, are still being worked out and will likely need to be adjusted along the way as these are put to the test in real life.

As things improve and greater confidence is gained, the hope is that other ASEAN member states can learn from it, adopt it and adapt it, and in time, smaller bilateral travel bubbles in the region will coalesce finally into an ASEAN one.

For that to happen, a number of things need to happen.

COMMON RULES AND STANDARDS
First, greater harmonization of standards is needed.
The Malaysia-Singapore agreement has taken a step in that direction by mandating that travelers will need to abide strictly with "COVID-19 prevention and public health measures mutually agreed upon by both countries". Beyond the regulatory harmonization, there will also need to be downstream mutual recognition of testing, laboratory and epidemiologic surveillance standards.

The experience after the agreement goes 'live' on Aug 10 will provide practical knowledge on how that works out and will be useful for other ASEAN members planning similar bilateral arrangements.

In similar vein, all members of a region-wide travel bubble should strive to avoid duplication and confusion for travelers by agreeing on a common standard for essentials such as health declaration forms and movement tracking apps.

Second, ASEAN as a supra-national entity must take greater leadership in building the infrastructure and institutions in order to lay the foundations for a Southeast Asian "safe travel zone".

For starters, common rules need to be established and enforced. Provisions must also be made for unforeseen changes in circumstances and unexpected scenarios given the volatile nature of the pandemic. A way must be found to resolve disputes, such as over border controls, should the existing

guidelines prove to be inadequate. ASEAN's founding principle of non-interference will likely be sorely tested if there is no binding means of decision-making.

AN ASEAN CDC

We believe an ASEAN Centre for Disease Control and Prevention (CDC) will be a useful component in efforts to set up a regional travel bubble. Just as the European Medicines Agency determines regulations for pharmaceuticals across the European Union and is binding on members, so an ASEAN CDC can independently set out public health policies for regional travel, coordinate testing standards, laboratory standards and conduct multi-country surveillance.

It can also play the role of 'neutral arbiter', one that is critical as countries understandably have national interests to protect in the event of disputes. Along with the ASEAN CDC, there should be a mechanism to resolve differences and avoid full-scale withdrawal from the regional travel bubble.

Third, we recommend a formal fortnightly review process, similar to the EU model, to be built into the regional travel framework given the fluid nature of COVID-19.

RULES-BASED EXITS

Fourth, it is best if all are agreed on an objective, measurable trigger for a country's temporary exclusion from the bubble so that decisions can be taken quickly and apolitically.

These "temporary exclusions" from travel bubble arrangements should be built into the legal instruments signed between sovereign countries to establish travel bubbles in order to protect public health and the relationships between countries.

Without these rules-based automatic exits, there is a risk of diplomatic fallout if countries experiencing spikes in COVID-19 find their travel privileges suspended. Indeed, the threat of temporary exclusions is also useful to motivate all countries to maintain high COVID-19 prevention standards and hence maintain their travel privileges.

Fifth, re-opening should be managed with care. This is discernible in the Malaysia-Singapore arrangement's restricted list of who gets to be allowed in first. In the region-wide context, a similar gradual opening can, for instance, put healthcare workers, diplomats and businesspeople in the priority list, followed by others such as students, those travelling for family reasons and conferences. Tourists should come in at the end, divided into short-term and longer-term visitors.

Finally, the regulatory frameworks between governments are necessary but insufficient. Much more is needed and insurers, employers and healthcare providers will need to step up too. Travelers don't just need to cross borders, they also need peace of mind. And this peace of mind will come from clarity on matters such as access to healthcare in each other's countries, coverage of travel insurance, repatriation processes and so on.

MUCH AT STAKE

Since March 2020, almost all Southeast Asian countries have instituted border controls to prevent the importation of COVID-19 cases. These border controls have been helpful to buy time to ready countries for the surge in COVID-19 cases but they cannot remain in place indefinitely, especially since it may take several years to find, manufacture and administer an effective COVID-19 vaccine.

Reopening borders is inevitable despite the public health concerns. Our trade, supply chains, food security, education and familial ties are simply too inter-linked to sustain prolonged border closures. The critical question before us is how do we safely reopen borders in Southeast Asia in a way that protects public health, minimizes disruptions and maximizes effectiveness?

All of us are in uncharted territory and the Malaysia-Singapore pilot will be an essential precursor to an ASEAN travel bubble. It is important that we draw as many useful lessons from it as possible and make the pilot work.

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B-I-G PROGRAM

The Brunei Darussalam-Indonesia-Malaysia-Philippines East ASEAN Growth Area (BIMP-EAGA), the Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT) and the Greater Mekong Subregion (GMS)- B-I-G Capacity Building Program- is a regional capacity development initiative for government officials to enhance capacities in developing policies, programs, and projects that support physical, institutional and people-to-people connectivity in Southeast Asia and the People's Republic of China (PRC). The B-I-G Program provides opportunities for knowledge and experience sharing, and networking between and among the three subregional programs given their unique roles as building blocks for Asian integration. It is funded by the Asian Development Bank (ADB) and the governments of the Republic of Korea and the PRC.

PACER DIALOGUES

Bouncing Back Policy **A**ctions for **C**OVID-19 **E**conomic **R**ecovery **(PACER) Dialogues**, supported by the ADB under B-I-G Capacity Building Program, are organized to share cutting-edge knowledge and best practices that can help "B-I-G" member countries, Singapore and Timor-Leste "bounce back" from the COVID-19 pandemic and accelerate economic recovery.

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