

Coping with COVID-19 Pandemic: Comparative Analysis

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Abstract: At the end of 2019, COVID-19 disease spread worldwide and severely affect public health, the economy and society. Each country imposes different control policies and preventive measures to curb the infection rate. **Objectives:** This comparative analysis aims to study different epidemic control policies and measures dealing with COVID-19 among the top 10 countries with the best recovery rate and compare the advantages and disadvantages of the imposed measures in each of these countries. **Methodology:** Selection of 6 target countries from the group, i.e. Denmark, the USA, the UK, Israel, Sweden and Singapore. The selection criteria for the study were based on countries with severe outbreaks in 2020 and the top 10 countries with the fastest recovery rate measured based on their lockdown restrictions. **Results:** It was discovered that these 6 countries both have similarities and differences in measures. The fundamental measures they shared include comprehensive vaccination against COVID-19; 14 days quarantine measures for infected people; emphasis on self-protection by wearing masks; the new normal; social distancing; and lockdown measures. Whereas, the intensity of investment policy in vaccine research development as well as patient monitoring and active surveillance varies from country to country. Moreover, other key measures include vaccination as well as include vaccination from the government which the public can trust, understand and cooperate with. Furthermore, this also requires the public's cooperation and shared responsibility in following lockdown measures to restrain the rate of infection producing a beneficial effect on saving many lives. Inversely, they cause a severely negative effect on the economy and society. Thus, the government had to introduce some financial support and relief measures to help businesses and individuals affected by COVID-19 at the same time. As for social policy, measures have started to loosen periodically and most importantly, the release of lockdown restrictions for businesses to reopen. Ultimately, the focus was to achieve a balance between public health safety, the economy and society simultaneously.

Keywords: COVID-19, Coping with COVID-19, Comparative COVID-19 policy.

1. INTRODUCTION

The case of pneumonia of unknown cause was first detected in the city of Wuhan, Hubei Province of China on 8 December 2019. By the end of December 2019, there were reports of many similar cases where the new coronavirus later named COVID-19 were identified as the cause. COVID-19 disease affects the respiratory system in humans and is fatal in severe cases. Epidemiologically, it was discovered that cells that are at risk of being invaded are located below the airway, leading to respiratory failure. The elderly and males are found to have shown more severe symptoms than females when infected with COVID-19 [1].

The virus easily spreads by coming in contact with droplets of discharge from the nose or saliva via a respiratory tract when an infected person sneezes, coughs, or speak at close range. This also includes rubbing the eyes, nose or mouth with the contaminated hands after touching surfaces with COVID-19 viruses.

In addition, the virus has a long incubation period before showing any signs or symptoms after 5-14 days while the transmission period lasts between 8-10 days or longer. This increases the chances of spreading the diseases considerably

[2] urging countries to issue various measures to stop the infection from spreading. This includes speeding up production and roll-out of vaccines for the public; imposing social distancing and using a mask, and issuing lockdown. Meanwhile, the COVID-19 virus has also mutated into new variants leading to many periodic outbreaks widely around the world.

As of 21 September 2021, there were 229,817,782 infected cases worldwide with 206,481,588 recovered and 4,711,678 cumulative deaths [3] disrupting both the economy and society. Subsequently, each country had to adjust their policies and measures to control the spread of COVID-19 as well as reboot the economy. As each country issued different policies, this research studied the policy implementation of each country in response to COVID-19.

Objectives

1. Study the COVID-19 response policy of the countries with the top 10 recoveries from COVID-19.
2. To compare the advantages and disadvantages of the policy and how each country deals with the COVID-19 situation.

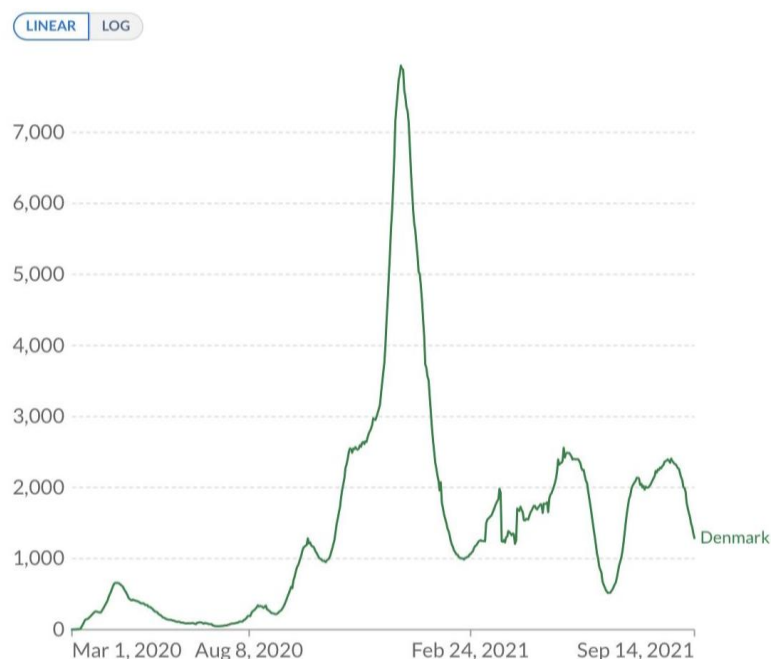
2. METHODOLOGY

The target groups were narrowed down to 6 countries, i.e. Denmark, the USA, the UK, Israel, Sweden and Singapore based on the following selection criteria:

1. Countries with a severe outbreak in 2020.
2. Top 10 fastest recovering countries in the world measured by the relaxation of their lockdown policies.

COVID-19 Pandemic in 2020 and Comparative analysis on COVID-19 measures among different countries

COVID-19 Situation in Denmark



Biweekly confirmed COVID-19 cases per million people: Denmark

Source: Our World in Data [4]

Denmark underwent a new wave of outbreaks since 8 July 2021 with 904.49 people infected for every 1 million people. By 13 September 2021, there were 1,356.37 infected people for every 1 million people as the infection rose by 0.5 times. On 8 July 2021, there were 1.90 deaths of COVID-19 patients per 1 million people. By 13 September 2021, this had increased to 5.85 deaths of COVID-19 patients per 1 million people with the mortality rate increasing by 2.07 times. It

was learned that 100% of the variant causing the new outbreak was the Delta strain [4]. The main vaccines in Denmark were Astrazeneca (recently discontinued), Pfizer, Moderna and Johnson & Johnson (discontinued) [5].

The Danish government eases measures preventing the spread of COVID-19 by issuing policies allowing restaurants and businesses in the city to reopen. While the majority of the population had to be accustomed to using “Corona Pass” which displays their details and a negative test result before engaging in social events. Although the government had shut down many activities and imposed many restrictions previously, the Danish people understand and cooperate as instructed. This is partly due to the nature of their society and the clarity of the communication by the government on the reason for their decisions - to prevent and stop the spread of the virus effectively and control the number of patients to not exceed the capability of public healthcare as key priorities. The fundamental reason for allowing the Danish people to deal with COVID-19 effectively is simple and easy to understand the education of COVID-19 while including only useful information for the general public [6]. As for economic policies, there were several measures, such as providing financial support for businesses on payment of employee’s wages, compensating 90% of lost income for self-employed individuals, etc [7].

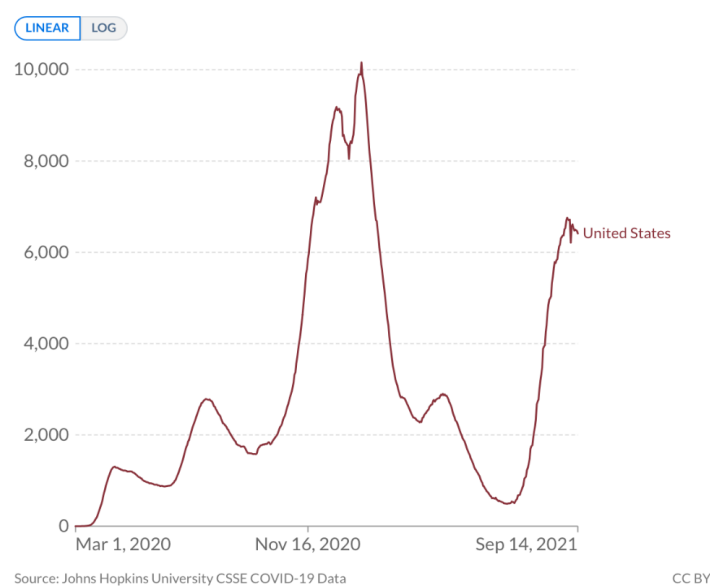
Denmark’s response to COVID-19

The government has announced plans to lift all remaining COVID-19 measures with only tight border control remaining after the epidemic became “controllable”, and its rating of COVID-19 as a critical crisis for the society expired on 10 September 2021. This extensive cancellation of measures also included the use of “Corona Pass” and the requirement for a document confirming full vaccination dosage before entering indoor facilities. Furthermore, the measure enforcing mask-wearing was also cancelled in mid-August. Denmark has now reached a point where vaccinations are high [8].

Overview of Denmark’s response to COVID-19

The fundamental reasons allowing successful implementation of the key policies in Denmark were their vaccination programme and the mutual trust between the citizen and the government. The government is on track to cancel a few COVID-19 measures remaining including the use of “Corona Pass” which started for some places while the measure enforcing people to wear masks was cancelled back in mid-August. Eventually, they plan to discontinue all the unnecessary measures.

COVID-19 Situation in the United State of America



Biweekly confirmed COVID-19 cases per million people: United State of America

Source: Our World in Data [4].

The new wave of outbreaks was detected in the USA on 16 July 2021 with 1,044.18 infected people per 1 million. On 13 September 2021, 6,465.91 were infected per 1 million as the infection rate increased by 5.19 times. On 16 July 2021, there were 10.08 deaths of COVID-19 patients, which went up by 5.7 times by 13 September 2021, recording 67.61 deaths of COVID-19 patients per 1 million. The strain that circulated in the outbreaks to date the Delta variant up to 100% [4].

Key vaccines in the roll-out were Moderna and Pfizer [9]. The US policies on COVID-19 are as follows: in mid-March 2020 when the number of daily infections and deaths rose, the Federal Government supported free COVID-19 diagnosis tests; research on medical product security; and expanded compensation for hospitals. At the same time, various states also announced lockdown measures which were not lifted until May in stages. At first, most states would grant reopening of restaurants, retail shops, beauty salons, churches and fitness centres.

The Federal Government had also promulgated economic measures to support and stimulate businesses in crisis. To date, at least 3 laws were passed to tackle the COVID-19 crisis, namely Coronavirus Preparedness and Response Supplemental Appropriations (approving \$8.3 billion credit line as a start-up fund to support vaccine development); Families First Coronavirus Response (approving \$105 billion to provide paid sick leave, unemployment aid and food support); and Coronavirus Aid, Relief, and Economic Security (approving \$1.7 trillion to help individuals and businesses while stimulating the economy). This also included the Paycheck Protection Program and Health Care Enhancement with a \$484 billion budget to provide funding for small businesses and hospitals, and the Paycheck Protection Program Flexibility to relieve repayment terms for small businesses that had been affected by the COVID-19 crisis.

With regards to vaccination, the US Congress had allocated more than \$10 billion in vaccine research and development under the CARES Act through Operation Warp Speed, a public-private partnership. Initial plans for vaccine distribution by local government consisted of 3 phases: Phase 1a focuses on public health personnel and long-term care centres residents; Phase 1b extends to people aged 75 and over and frontline workers who are not public health personnel; lastly Phase 1c covers population group aged 65–74 and 16–64 with underlying diseases or at high risk of developing severe symptoms if infected and other key personnel workers [10].

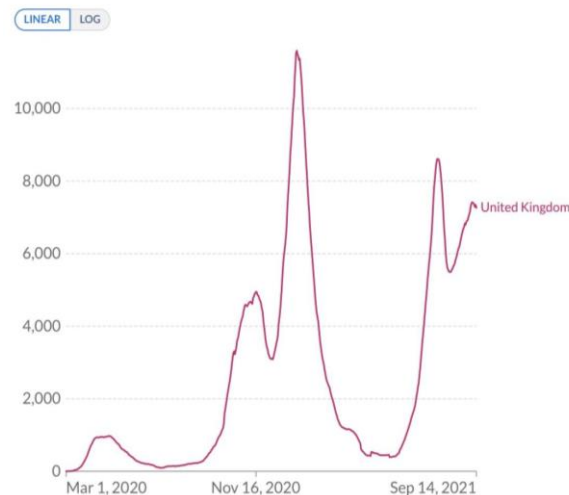
The US response to COVID-19

In order to curb the COVID-19 infection rate, there were 7 key measures in place:

1. Ensure that all Americans have access to consistent, reliable and free COVID-19 diagnosis tests.
2. Solve problems related to personal protective equipment (PPE) effectively.
3. Provide clear, consistent, evidence-based recommendations for the public on how to deal with the outbreak
4. Plan the distribution of treatments and vaccines efficiently and equitably by designating authority in making decisions on vaccines safety and efficacy to scientists free from political influence.
5. Protect the elderly and people in the high-risk group by forming a Nationwide Pandemic Dashboard where Americans can monitor the COVID-19 situation in real-time.
6. Build and expand defences used to anticipate, prevent and mitigate threats from the pandemic including one from China.
7. Enforcing a nationwide mask mandate Currently, some measures have been partially lifted such as the mask mandate as the COVID-19 situation in the US gradually improved with the cumulative infected cases standing at 33.7 million and over 600,000 deaths of COVID-19 patients [11].

Overview of the US response to COVID-19

With the government's swift action in widening the number of drive-through testing sites for COVID-19; overproduction of face shields; PPE kits and a nationwide mask mandate with social distancing; providing clear instructions on how to treat themselves; plan for effective and equitable distribution of vaccines; allocating budget to help individuals and businesses affected by the COVID-19 crisis. while stimulating the economy concurrently.

COVID-19 Situation in the United Kingdom

Biweekly confirmed COVID-19 cases per million people: United Kingdom

Source: Our World in Data [4].

England faced a new outbreak on 11 June 2021, 1,079.91 people per 1 million people. As of 13 September 2021, 7,344.97 per 1 million people were infected with the rate of infection went up by 5.8 fold. On 11 June 2021, the number of COVID-19 deaths was 1.74 per 1 million people. By 13 September 2021, there were 18.25 deaths of COVID-19 patients per 1 million people as the mortality rate increased by 9.488 times. The variant in circulation since the new outbreak was the Delta strain, up to 100% [4]. The main vaccines approved were AstraZeneca and Pfizer [12].

The British policies are as follows: lifting certain implementation of COVID-19 control measures as of 19 July 2021 including the cessation of an indoor mask mandate; social distancing; and recommendation to work from home. The final lockdown release was postponed from 21 June 2021 to 19 July 2021 to vaccinate as many adults as possible. The fourth stage of lockdown relief starting on 19 July 2021 was on the condition that the government has fulfilled the "four test criteria" to control the epidemic, namely vaccination to the public; vaccine efficacy; the rate of inpatients and new mutation of the virus. The "living with coronavirus" strategy which Prime Minister Boris Johnson announced on 5 July 2021 included the reduction of waiting time for the second vaccine dose to ensure that people aged 18 and over receive the second dose within September 2021. In addition, this also included a third booster dose for the most vulnerable individuals; the cessation of mandatory mask mandate indoor; social distancing; cancellation of the cap on the number of visitors to concerts, theatres and sports events; and resuming all business operations including nightclubs [13].

Concerning the economy, the government rolled out various financial aid packages for individuals and businesses such as grants to help low-income and unemployed people and a paid furlough by providing 80% of gross monthly wages up to a maximum of £2,500 [7].

UK's response to COVID-19

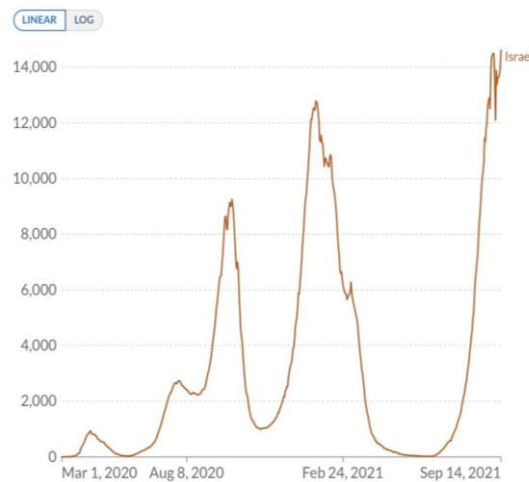
The 3 main strategies for dealing with diseases outbreaks on a global scale by the UK government are as follows:

1. Race through it - allow the infection to spread naturally until enough people are infected and recovered to a point that herd immunity is finally formed.
2. Delay and Vaccinate - promulgating strict lockdown measures; enforcing strict social distancing practice and mask mandate to slow the spread of the disease extending the window for vaccines research and development. The epidemic will end when the population has been vaccinated to achieve herd immunity.
3. Coordinate and Crush - this strategy is similar to the latter where each country coordinate or cooperate in closing their borders to prevent the spread of the disease to neighbouring countries. This essentially involves the cooperation of the people in the country and nearby too, going AstraZeneca the reduce the number of infections sufficiently [14].

Overview of UK's COVID-19 response

The UK employed a variety of strategies where the infections were allowed to spread naturally; imposing a mask mandate with lockdown and social distancing measures; and shutting down borders. At the same time, the government also offered financial relief for both the public and businesses by compensating income for self-employed people. Presently, almost all lockdowns measures have been lifted to allow almost all businesses to resume as normal.

COVID-19 Situation in Israel



Biweekly confirmed COVID-19 cases per million people: Israel

Source: Our World in Data [4].

The new wave of infections in Israel was detected on 15 July 2021 with 832.65 people infected per 1 million and by 13 September 2021, the infection rate went up by 15.74 times to 13,944.04 infected per 1 million. COVID-19 patients deaths were at 1.62 per 1 million people on 15 July 2021 with 41 and 41.30 deaths per 1 million people on 13 September 2021 raising the mortality rate by 24.49 times. It was discovered that up to 98% of the variant causing the outbreak was Delta while the rest belonged to the Wuhan strain [4]. The main vaccine approved was Pfizer [15].

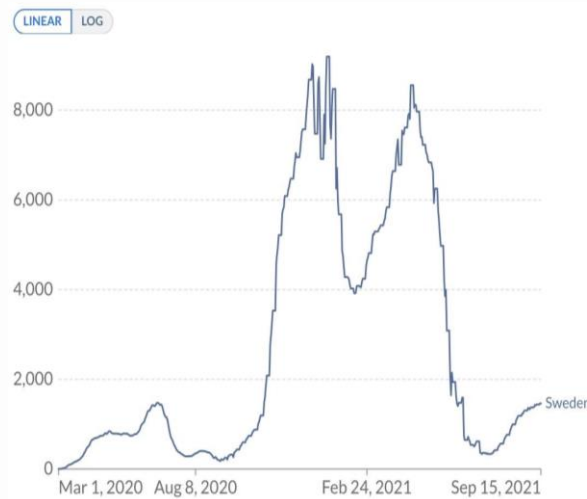
The Israeli policies announced on 18 April 2021 included ending a mask mandate, being one of the first countries to introduce it. However, this was limited to outdoor or open spaces only as masks were still required indoors. The Israeli government initiated vaccination through the “Give a Shoulder” programme from 20 December 2020 where 20% of the population received their first dose within the first 3 weeks. After vaccination, the public would be granted a “Green Pass” which was required to be shown before entering public facilities and would expire after 6 months [16]. These strategies were coupled with the National Economic Safety Net Program to support affected businesses and minimise the damage to the labour market [17].

Israel's response to COVID-19

Israel is considered one of the first countries to successfully cope with COVID-19 as on 18 April 2021, Israelis are no longer required to wear masks in public places. The relaxation of measures was possible as Israel had the highest number of vaccinated populations in the world, leading to 68% herd immunity. As a result, the number of new COVID-19 patients continuously declines. Moreover, lockdown measures and the use of Green Pass also contributed to this. [18].

Overview of Israel's response to COVID-19

The implementation of lockdown measures and the application of the Green Pass coupled with economic relief policies for the public and economy had reduced the impact of the COVID-19 crises. The discontinuation of a mask mandate began on 18 April 2021 where Israelis gradually abandoned their mask when going outdoors. However, when they are indoor and at a large gathering, masks must still be worn. Schools are resumed and almost all aspects of their life returned to “normal” as the society was able to cope with the COVID-19 situation and stepped into herd immunity.

COVID-19 Situation in Sweden

Biweekly confirmed COVID-19 cases per million people: Sweden

Source: Our World in Data [4].

A new wave of outbreaks emerged in Sweden on 25 July 2021 with 421.71 infected people per 1 million and by 14 September 2021, there were 1,462.58 infected people per 1 million with the infection rate increased by 2.468 times. On 25 July 2021, the number of COVID-19 deaths were at 0.79 cases per 1 million people escalating to 3.64 infected cases per 1 million people on 14 September 2021 with the mortality rate going up by 3.6 times with the Delta variant responsible for up to 100% of the new outbreak [4]. The key vaccines in circulation were AstraZeneca and Pfizer [18].

Sweden turns down lockdown measures and those that restrict strict personal freedoms. Therefore, most outbreak control policies are based on a provision of advice and plea for cooperation from the public and businesses. There were only a few mandatory policies in place such as the prohibition of over 500 people in gatherings and the initiation of a vaccination programme on 27 December 2020. Some economic and social policies are issued to help the public and businesses.

This notably involved injecting funds to affected businesses; increasing credit and investment limits with government financial institutions to stimulate investment; expanding export guarantees and credit limits to assist the export industry. This also includes providing compensation from the first day of absence from work; increasing the budget for social security assistance; and easing the criteria for receiving assistance, such as exempting medical certificates [19].

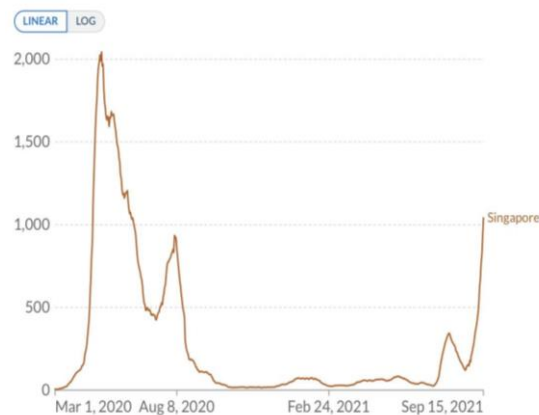
Sweden's response to COVID-19

Sweden differs from other countries in the world as their policies were mostly based voluntarily on the public in observing the rules of disease control with only mandatory measures to limit the opening hours of restaurants and the number of people gathered. In the second week of July 2021, Sweden eased these mandatory restrictions significantly by allowing people to attend a 3,000-seat sports stadium as well as the cancellation of stores and other businesses opening times. The border has also been reopened since this past Spring. At this time, the number of infection rates dramatically declined as vaccination rates rose. Warmer weather leads to more people spending time outdoors and the requirement for people to test for COVID-19 before entry is also a factor [20].

Overview of Sweden's response to COVID-19

As the measures in effect are non-mandatory, driven by the public's cooperation in complying with the outbreak control guidelines. The only strict measures in place are restaurant opening hours and the number of people gathering in various locations during the two weeks in July 2021. Sweden had eased control measures drastically including cancelling opening hours restrictions of shops and businesses. A range of economic policies was issued to support individuals and businesses financially such as injecting money to affected businesses and increasing the amount of social security assistance, etc.

COVID-19 Situation in Singapore



Biweekly confirmed COVID-19 cases per million people: Singapore

Source: Our World in Data [4].

The new outbreak in Singapore came to light on 21 July 2021 with 164.33 infected cases per 1 million people. On 15 September 2021, this went up to 1,040.92 infected cases per 1 million people as the infection rate climbed up to 5.33 times. On 21 July 2021, there were no deaths from COVID-19. On 15 September 2021, 0.51 deaths of COVID-19 patients per 1 million people was recorded with the mortality rate growing 1 time. The new variant responsible for the outbreak was the Delta strain up to 100% [4]. The vaccines in circulation were Sinovac, Pfizer, and Moderna [21]. Singapore has announced a policy to control the nationwide epidemic cycle from 7 April to 4 May 2021 which was extended until 1 June 2021. The fundamental factors were limiting travel outside to only one member per family at a time; various measures for different types of businesses; study from home trials for the educational sector including reopening of schools for younger children who cannot study from home. Other initiatives included compensation for labour affected during the transitional period; maintaining social distancing; mandatory mask mandate at all times; and controlling access in the workplace. In addition, governments enforce strict laws to punish individuals or establishments that violate official measures. Another noteworthy measure is the use of technology to track people's movement and interaction where the system was designed for people's encounters without infringing on the citizen's privacy. Furthermore, travel restrictions for migrant workers are tightened. As for the economic and social policies, a variety of assistance measures are issued to different groups such as tax deferrals and an attempt to form a travel bubble with other countries. Regarding vaccination measures, the government has issued Pfizer for healthcare workers and people in a high-risk group from 30 December 2020 and will extend it to the general public in February 2021.

Singapore's response to COVID-19

Vaccines is the key to ensuring Singapore maintains a high level of protection against COVID-19 extensively with the possibility of a third booster or more to stimulate immunity again. The government plans to continue a comprehensive vaccination program for several years. The strategies also include a quick and easy infection detection of COVID-19 test by distributing rapid antigen test kits as well as self-testing kits to homes, hospitals, private clinics, drugstores and groups of employees of various companies. Meanwhile, the government is working to procure equipment from new technologies such as a breath test kit which takes only 1-2 minutes to know the results and a test kit of wastewater which can tell if there is a hidden infected cluster. Endeavour to find more effective treatments with social responsibility remains priorities. The new normal entails an infected person being treated and recuperated at home until recovered as they're vaccinated. The risk of severe symptoms and death is very low, and the likelihood of infection by those close to them is also slim. Authorities do not need to closely track the source or route of disease transmission including the need to quarantine the infected people once found every time [23].

Overview of Singapore's response to COVID-19

The fundamental measures issued are acceleration of vaccination programmes for the public; restriction on leaving home; and application of technology to track people's gatherings. For economic and social policies, measures in place included

financial aid to various groups of people; tax deferrals and the establishment of a travel bubble with other countries. The government also pleaded with their citizens to continue to take care and maintain a high protective measure against COVID-19 before other measures were to be relaxed.

3. CONCLUSION

Overall, the study has found that these six countries share both similarities and differences in terms of management policies against COVID-19. Fundamental measures that were similar include emphasis on comprehensive vaccination roll-out, 14 days quarantine measure; focus on self-protection by wearing masks; new normal incorporating social distancing; and lockdown restrictions.

Investment policies in vaccine research and development, as well as patient monitoring and proactive surveillance policies in each country, vary in intensity and rigidity depending on the strategy in each country. Besides the vaccination programme, other key policies against COVID-19 include clear and transparent communication from the government on the basis that the public can trust, understand and abide with. The cooperation and social responsibility of the public with lockdown measures to restrict the spread of COVID-19 also contributed remarkably to saving many lives from COVID-19. However these factors inversely affected the economy drastically, thus governmental financial aid was issued to support affected individuals and businesses simultaneously. As for social policy, restrictions were gradually lifted such as cancellation of a mask mandate outdoor, easing of lockdown measures, and reopening of businesses. All of the above are in place to reinstate the balance between public health, the economy and society side by side and allow the public to return to normal life steadily.

The results of the study reflect that:

- 1) Vaccines can only reduce the severity in infected people but do not curb the spread of COVID-19. Important factors contributing to reducing the spread of COVID-19 are a measure of social distancing; lockdown; focus on self-protection such as wearing a mask, washing hands regularly. Nevertheless, these measures are only successful only if all parties cooperate and take responsibility with the public and governments working based on trust.
- 2) Planning for effective and equitable distribution of treatments and vaccines. The decision of vaccines safety and efficacy was delegated to health sciences experts with an emphasis on more investment in research, development and medical innovation.
- 3) The lockdown measures "close the city, close the country" can help reduce the pandemic, it will be visibly effective if implemented swiftly from the beginning of the outbreak. But these are also conditional on clear communication between parties and basic discipline instilled among the society. Although many view lockdown measures as damaging for the economy and disrupting business operations, in the long run, they can potentially help the economy recover faster. By lifting lockdown restrictions while the epidemic rate is still high, the economy would not recover as it should. Most importantly, lockdowns must be done in parallel with helping vulnerable groups that are economically affected. Subsequently, the strategy of "opening the city, opening the country" should be balanced with optimising the lives of public health while ensuring that the economy and society ensue with containment of the epidemic.
- 4) In addition, guidelines of a new normal to coexist with COVID-19 should be instructed by maintaining a balance between public health and the economy. This also covers the study of the policies in each country that has been particularly successful in controlling and dealing with COVID-19 to devise additional policies for 2022.

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