

COVID-19 RESPONSES: PREPAREDNESS ALONG WITH TRACE, TEST AND TREAT AND A ROBUST CONTAINMENT POLICY IS KEY IN RESOURCE LIMITED SETTINGS

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COVID-19 Responses: Preparedness along with trace, test and treat and a robust containment policy is key in resource limited settings.

In December 2019, a series of pneumonia cases of unknown cause emerged in Wuhan, Hubei, China, with clinical presentations resembling viral pneumonia. Deep sequencing analysis from lower respiratory tract samples indicated a novel coronavirus, which was named 2019 novel coronavirus (2019-nCoV)¹. Human coronaviruses, including hCoV-229E, OC43, NL63, and HKU1, cause mild respiratory diseases. Fatal coronavirus infections that have emerged in the past two decades are severe acute respiratory syndrome coronavirus (SARS-CoV) and the Middle East respiratory syndrome coronavirus. At the time of writing this review 21st June 2020, there have been over 8.8 million reported cases globally with 464,952 deaths². These cases are dominated from United States, Brazil, Russia, India and UK. (Fig 1) This observation has challenged the notion that expertise in the West



with a well-developed and funded healthcare systems deliver better outcomes in survival and containment of outbreaks in infectious diseases³. Countries in the Far East like Taiwan, South Korea, Vietnam and Malaysia have shown innovative and rapid pandemic responses that are different in key areas and have kept infections and deaths relatively low compared to the West. One of these countries is Malaysia. As a middle-income country with a population of 32 million people, it has a record in a number of public health achievements – eliminating mother-to-child transmission of HIV and syphilis⁴. and granting access to the use of

generic Hepatitis C drugs to treat the emerging HCV infected “hard to reach” population including those co-infected with HIV with the aim of elimination⁵.

Planning and preparedness started when reports of clinical cases were reported in China both in the popular media and medical literature, including coordination with public health teams, plans for renovation of hospitals for surge capacity, and plans for procurement of laboratory and medical equipments including ventilators.

Previous experience with MERS and the 2002-2003 severe acute respiratory syndrome (SARS) epidemic, and the Nipah Virus outbreak (1998-1999) with the expertise of experienced contact tracing teams was key in enabling such a rapid response.

Planning and preparedness activities started in December 2019, diagnostic reagents procurement in January 2020, and a number of renovations to hospital facilities done in February 2020. In the West, the EU had made an announcement that they would assist countries in the EU in COVID-19 joint procurement schemes on 31st January 2020, with countries in the EU being at various stages of procurement for both protective and medical gear in April 2020⁶.

Optimising diagnostics capacity was undertaken within both public and private laboratories. Laboratories within the Institute for Medical Research (IMR), the biomedical research arm of the Ministry of Health collaborated with interested parties resulting in an 86% increment in diagnostic laboratories. A joint effort was initiated between the Ministry of Higher Education (MOHE – in charge of university hospitals) and the Ministry of Science, Technology, and Innovation (MOSTI) to mobilise 10 university labs as well as an

additional lab at the Malaysian Genome Institute under MOSTI. This meant that diagnostics capacity for COVID-19 increased from an initial 6 laboratories to 43 laboratories including those in public hospitals, public health laboratories, IMR, both public and private university laboratories, laboratories within the Malaysian Armed Forces, the Malaysian Genome Institute, and private laboratories managed by independent hospitals.

The first series of cases of COVID-19 cases imported to Malaysia started when eight Chinese nationals entered Malaysia on 23rd January 2020 via Johor Bahru on Malaysia's Southern border with Singapore. This group of travellers had been holidaying in Singapore and were close contacts with a proven COVID-19 index case who was admitted acutely ill to a Singapore hospital. All eight were tested for COVID-19. On 25th January 2020, a public announcement was made that three of these individuals had tested positive for COVID-19 and had already entered Malaysia on a holiday tour. Malaysia subsequently recorded 22 cases in January 2020, all of which were imported cases⁷. On 26 January 2020, the Ministry of Health (MOH) advised Malaysians to avoid travelling to China unless it was essential travel. Cases in February 2020 were largely imported cases. On 9th March 2020, health officials from Brunei Darussalam alerted MOH, Malaysia about a positive COVID-19 case diagnosed in their country who had just returned from Malaysia after attending an annual mass religious assembly at Seri Petaling Mosque, Kuala Lumpur which was held between 27th February to 1st March 2020 involving more than 14,500 local and 1,500 international attendees⁸. By mid-March, more than half of Malaysia's 673 confirmed cases were linked to this mass religious event.

On 11th March 2020, the WHO declared the COVID-19 outbreak as a pandemic. On 12th March 2020, the government made the decision to designate Sungai Buloh Hospital, a public hospital approximately 25kms northwest of Kuala Lumpur, as the country's main COVID-19 hospital. It has the largest Infectious Department and facilities for isolation in Malaysia⁹.

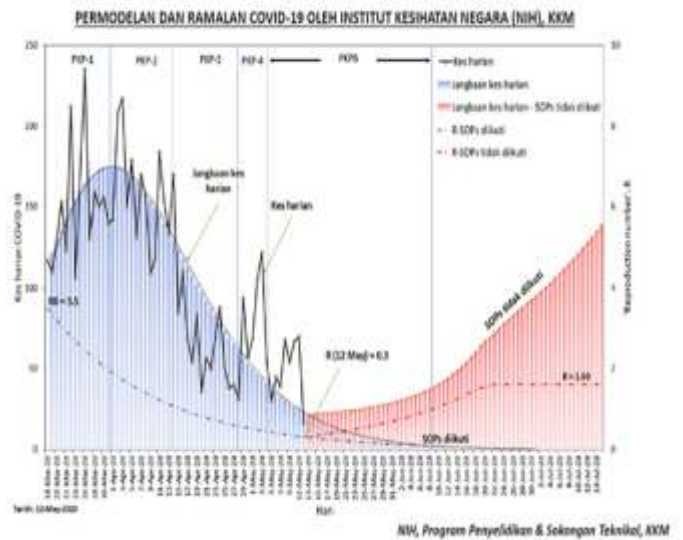
The number of hospitals treating COVID-19 patients was subsequently increased from 26 hospitals to 40 hospitals including 7 which function as full COVID-19 hospitals in the key states of Malaysia ; along with the number of screening hospitals from 56 to 120 in all states within Malaysia.

Following the substantial number of COVID-19 cases reported following the religious gathering in Sri Petaling, the Government of Malaysia made the decision to implement a legal Movement Control Order (MCO) nationwide, beginning from 18th March 2020. This MCO is equivalent to what many other countries would describe as a “lockdown”.

The Government declared the first MCO from 18th March 2020 to 31st March 2020. The government then extended the second MCO period from 1st April 2020 to 14th April 2020, the third MCO from 15th April to 28th April and the fourth stage MCO from 29th April to 12th May 2020 based on current clusters and the dynamics of transmission of cases with the objective to curb the spread of the COVID-19 infection. The government has also announced the conditional MCO from 4th May 2020 to 9th June 2020, and has now extended to recovery MCO from 10th June 2020 to 31st August 2020 allowing certain part of the employment sectors to operate in compliance with SOP issued by relevant governmental agencies and travel between states permitted.

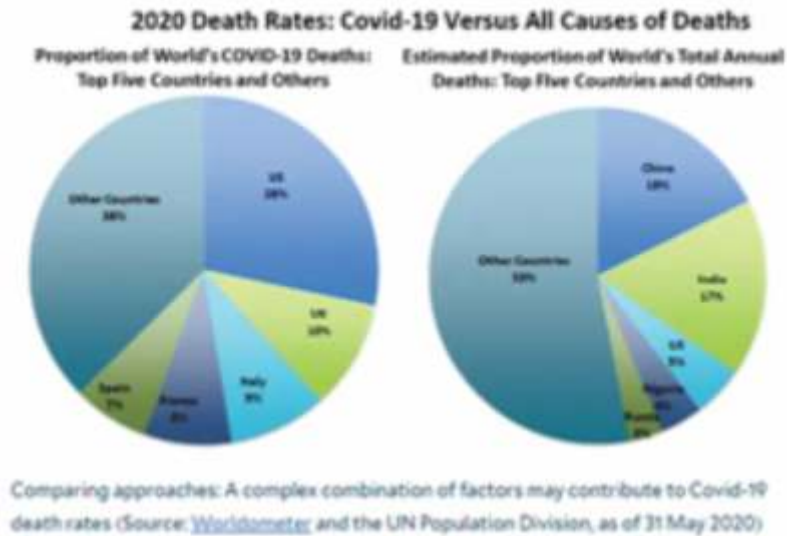
At the start of the 1st MCO; the National Institute of Health Malaysia calculated the R_0 Index to be around 3.5 and at 12th May (Figure 2); this has reduced to 0.3 showing the effect of the MCO with the other public health measures including *social distancing, advocating the wearing of face*

masks in public spaces, contact tracing, frequent hand-washing.

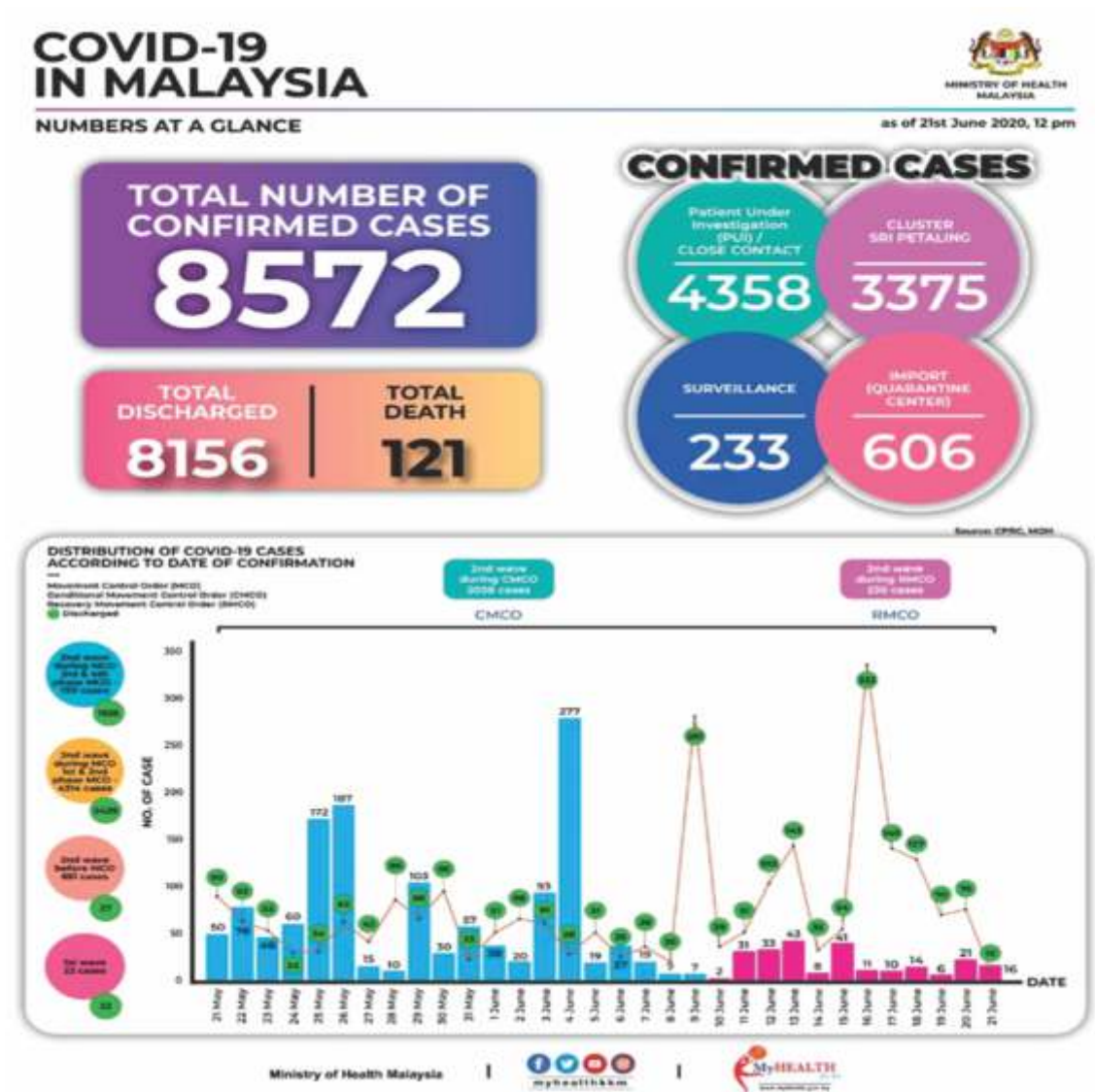


In contrast to countries in the West, Malaysia hospitalised all individuals diagnosed as COVID-19 positive, including asymptomatic patients and individuals who have reported close contacts with confirmed COVID-19 cases, or with travel history to high burden areas. All patients with COVID-19 were monitored closely and be given appropriate treatment

when warranted. Patients Under Investigation (PUI) with close contact or travel history and SARI were also admitted. The objective of admitting these patients is to rule out COVID-19 infection. A standard clerking format was used to ensure key clinical data are recorded. Close monitoring on a daily basis identifying patients who may deteriorate and medical interventions were instituted promptly. Such interventions may have contributed to the low mortality rate. Socio-demographic factors such as having an overall younger population than countries in the West would be one of the contributing factors. The aggressiveness of isolation and quarantine actions would have an impact on the transmission dynamics.



Daily updates were released by the MOH to the media on various platforms chaired by the Director General of the MOH as highlighted below





Contact tracing as a method to control infections was evident throughout Malaysia's COVID-19 response. Malaysia's Public Health System is used to regular dengue, tuberculosis outbreaks that require contact tracing algorithm.

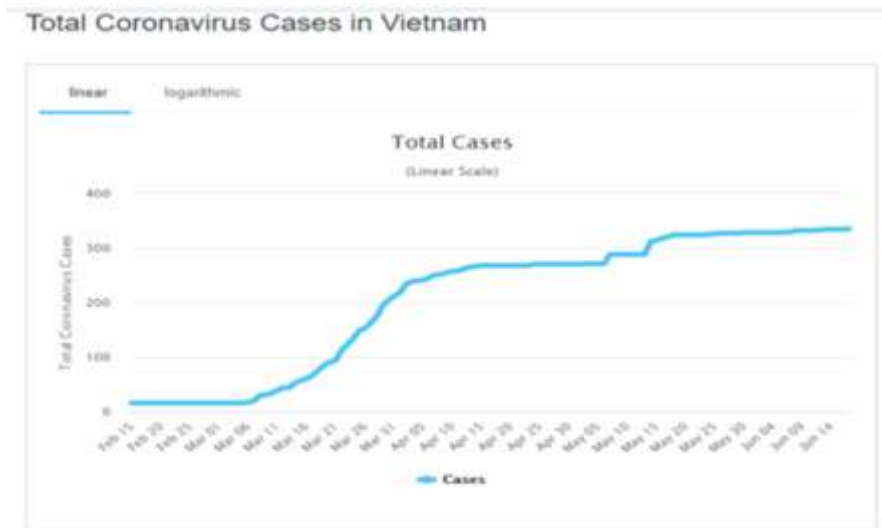
This success was also reflected in a number of other countries in the Far East, including Taiwan, South Korea, and Vietnam, challenging the belief that health security, expertise, and robust health systems were concentrated in the West. It would be timely to review and assess on what criteria the 2019 Global Health Security Index was based on as it ranks the United States and the United Kingdom first and second in terms of global health security but these two countries are in the top 5 reporting COVID-19 deaths presently in mid-June 2020¹⁰.

Vietnam, a lower-middle income country, did not have the diagnostics capacity to deal with

such an outbreak. It began initiating responses earlier in January 2020, with strict containment measures which significantly reduced the spread of the epidemic in the country. This was achieved through the use of emergency control measures in the epidemic areas and integration of resources from multiple sectors including health, mass media, transportation, education, public affairs, and defense¹¹. Border control measures such as temperature screening, and extended contact tracing (where once a positive case was identified, contacts through five generations were traced) were implemented early¹². A nation of around 95 million population, Vietnam confirmed its first COVID-19 case on Jan. 23. However, it has so far reported 328 cases with zero deaths and 307 recoveries. The country has 1,450 kilometers (900 miles) of land border with China. This developing country – lacking Singapore or South Korea's resources – has tested more than 210,000 samples. That is a moderate number in relation to its population but high in the context of the size of its outbreak.

Vietnam has conducted more than 780 tests per confirmed case, a higher figure than New Zealand or Taiwan, showing a vast proportion of its tests are coming back negative. Malaysia on the other hand undertook targeted screening in specific groups including attendees at Seri Petaling Religious Assembly, Tahfiz/ / Madrasah Center and

Depot Home Immigration Centres where initial clusters of cases have occurred. Travellers from overseas had to undergo COVID-19 testing either prior to entry or at ports of entry. In addition, a strict 14 day quarantine measures in approved facilities was part of the condition on entry.



Malaysia largely had similar responses and with quicker responses relative to the Global North. Taiwan and South Korea have the testing capacity and a well resourced health care system and a robust public health infrastructure that responded promptly contributing to its success to the control of the pandemic.

The early preparedness, robust contact tracing teams, diagnostics capacity and efficiency, treatment teams that worked on the current prevailing public health surveillance data and resources with strict lockdown measures are key to the relative success of the response. It also highlights the importance of a publicly funded health system to ensure testing and treatment for all without any discrimination of immigration status.

These examples of countries which mount a coordinated and comprehensive response in a

pandemic requires an effective public funded health system capable of responding promptly and timely. Effective communication and multi-disciplinary team working is key in pandemic response.

In summary, Malaysia's and Vietnam's relative success is attributable to a combination of early preparedness and planning, experiences in previous pandemics, diagnostics, public health system, contact tracing, and a strict lockdown.

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