

## Cover Story



## COVID-19: the world held at gun point

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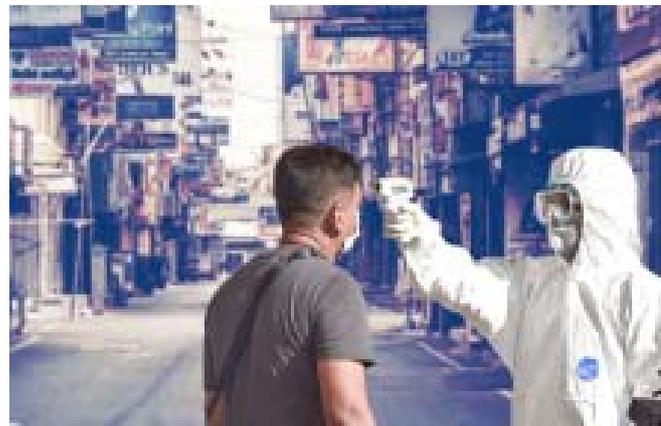
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As depicted in this issue's cover, the world is held at gun point. The world is yet to learn whether the weapon is its true ally or enemy. A microscopic virus has put all countries – big or small, to defense. So far, almost 700,000 people have tested positive and more than 30,000 have succumbed to SARS-CoV-2. It has so far crashed economies, devastated health care systems, emptied otherwise crowded places and distanced people from their loved ones. Despite invincible disruption of the societal networks, the world is fighting back. In this fight, perhaps the most reliable armor every country has is the evidence documented by the scientific community including public health specialists around the globe who wrestled with a pandemic and three major epidemics during the 21<sup>st</sup> century, namely Swine flu (2009-10), SARS (2002-03), Ebola (2014-16) and MERS (2015-present). It is due to their untiring efforts that we are able to fight back this deadly virus with evidence-based strategies.



In the absence of a vaccine or pharmaceuticals for combating the SARS-CoV-2 to date, and limited supply of intensive-care equipment especially ventilators, non-pharmaceutical interventions are likely to dominate the public health

response in the current pandemic. The two fundamental strategies identified for reducing the transmission of virus are suppression and mitigation. Both strategies essentially include a combination of interventions based on centuries-old public health principles in outbreak containment.

**Suppression** aims at reducing the reproduction number ( $R_0$ ) to  $<1$  within a geographical location, and thereby arrest the virus spread and eliminate human-to-human transmission, as it was done for Ebola and SARS outbreaks. This is the strategy adopted by China, South Korea (in the latter part of their outbreak) and Sri Lanka, to reverse the epidemic curve by reducing the case numbers to low levels and maintaining the situation indefinitely. Evidence-based interventions used comprise social distancing (including closure of schools and universities), early detection and isolation of cases and quarantine of close contacts, all of which require close supervision. The major challenge in suppression is that it requires early action well before the health systems are overwhelmed with cases, and maintenance until a definitive protection becomes available, until such time the interventions would have to continue at the cost of economic and societal life disruptions. Further, with limited transmission

for developing herd immunity in community, there is a high possibility of the infection rebounding if the interventions are loosened. With the drop in cases, interventions could be relaxed intermittently, but measures need to be re-introduced if or when the numbers rise. In the Sri Lankan context, suppression perhaps was the best option available in the backdrop of limited capacity in the curative healthcare system for COVID-19 cases.

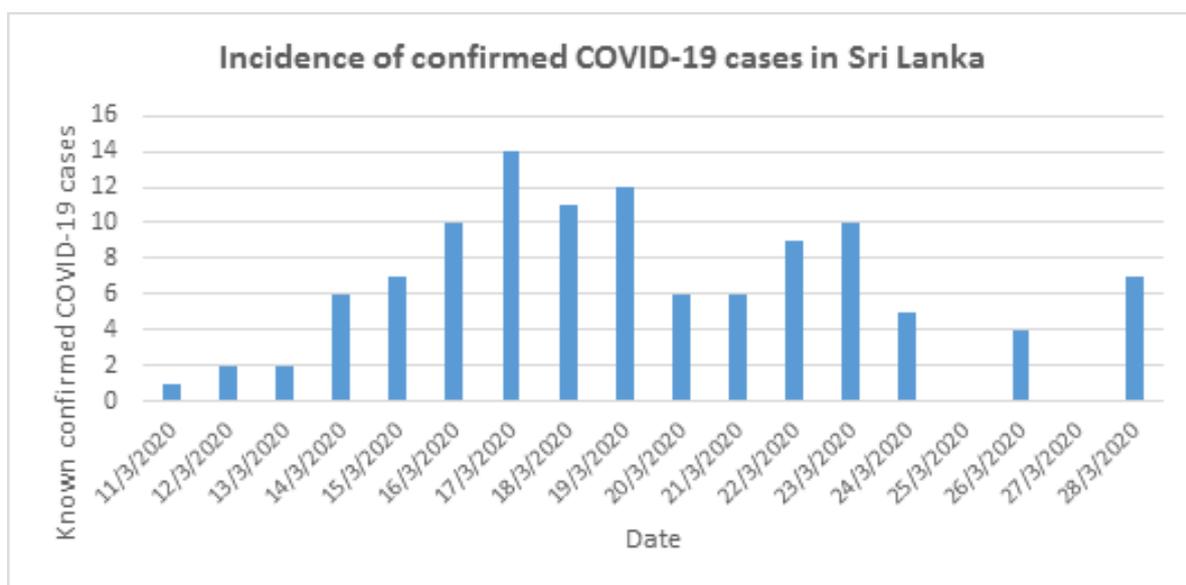
**Mitigation** focuses on slowing and ‘flattening’ the epidemic curve, but not necessarily reversing it. The aim is to reduce  $R_0$  but not to  $<1$ , so that cases would still occur but at a reduced speed over a longer period. This strategy intends to minimize mortality, by reducing the peak healthcare demand to protect those most at risk, e.g. severe infection, elderly and those with co-morbidities. Public health interventions comprise home isolation of suspect and mild cases, home quarantine of suspect cases living in the same household and social distancing of the elderly and others at risk of severe disease, while early case detection is not given much emphasis. Consequently, this strategy may result in mild disease in the majority (80-85%) of infected cases, with spontaneous recovery and development of passive immunity, leading to overall herd immunity to prevent future outbreaks and protect the most-at-risk populations, and lesser healthcare demand by those with moderate-severe illness. However, the results should balance-off the timing of

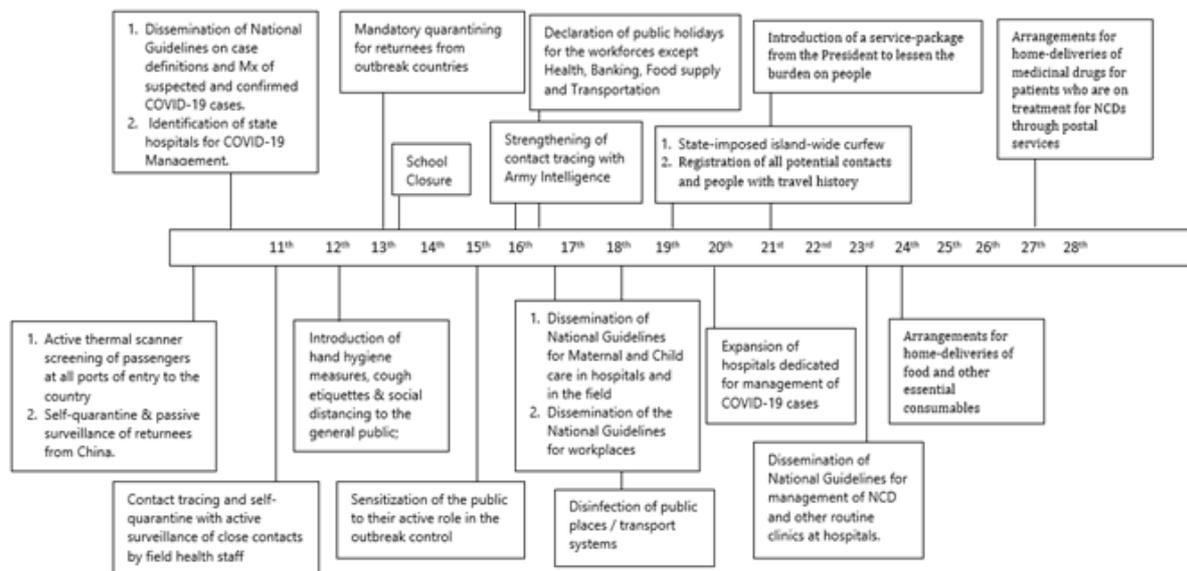
introduction, which justifies the wait until the caseload rises to a substantial level to act.

This was the preferred initial strategy in many developed countries, including United Kingdom, USA, Italy and Spain, in view of achieving herd immunity to prevent secondary outbreaks and minimal disturbances to the economy and societal life. Unfortunately, the main aim of social distancing only of the most-at-risk populations was proven to be wrong, with irresponsible behaviour of communities, such as not heeding health warnings and continuing their daily lives. Lack of public health infra-structure geared to cater to infectious disease outbreaks as well as less experience in similar outbreaks unlike in China and Singapore, and undermining the virulence of the virus resulted in shifting the epi-centre of the pandemic from China, where it was initiated, to the Europe, and then to the USA.

Sri Lanka was one of the few countries in the world, and the first in South Asia to respond proactively to the current outbreak from an early stage. Several health and non-health interventions were found to be in place long before the cumulative case load hit 50 in the country (Figure 1).

The success Sri Lanka has achieved so far in the COVID-19 outbreak could be attributed to three driving forces: 1) The availability of a strong, well-structured public health system geared to contain infectious disease outbreaks, with epidemiologists well equipped





**Figure 1. Timelines of health and non-health sector responses to contain COVID-19 outbreak in Sri Lanka**

with knowledge and experience in applying interventions in the local context; 2) Commitment of the decision makers including the President of the country, with due recognition given to the recommendations made by the public health experts; and 3) Supportive social response by the majority of population, probably resilient following past experiences of disasters faced. All these factors seem to catalyze the expected outcomes.

The experts are discussing three possible end-games for the COVID-19 pandemic: 1) Every nation manages to simultaneously bring  $R_0$  to  $<1$ , which is highly unlikely in the given extent of the spread; 2) The epidemic leaves behind enough immune survivors to create herd immunity, so that a second wave of outbreak will not occur or may occur in a manageable scale; and 3) The world suppresses the outbreak with all intensive interventions until an effective vaccine is developed. The latter seems to be the most viable option at present yet, seems long drawn.

The world will soon learn that preparedness is not just about masks, vaccines and laboratory tests, but also on addressing policies and social determinants of health at population level. It is time that attention reverts back to public health for preserving the most precious asset known to the mankind – health.

**Further reading**

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