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Beyond COVID-19: Global Priorities Against Future Contagion

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SYNOPSIS

Given the credible threat of disease re-emergence and evolution, governments today should allocate resources to preventing future novel diseases, even as they face 'wartime conditions' in battling COVID-19.

COMMENTARY

IN A twist of fate, even as China battles with COVID-19, it has also seen the re-emergence of another disease, the bird flu epidemic also known as H5N1, with more than 17,000 chickens culled as of the beginning of February.

Yet, this sequence of events may only be the 'tip of the iceberg', if one considers the findings of the Economist Intelligence Unit's (EIU) assessment of global health capacities, released five months ago. For instance, India, the world's second most populous country, had battled with the very same diseases although at a smaller scale, in recent weeks.

Ill-prepared World

In October 2019, the EIU Global Health Security Index had indicated that "(no) single country in the world is fully prepared to handle an epidemic or pandemic". Granted, a 100% preparedness level may be hard to achieve. What is surprising, however, is *how far* countries are from the ideal state: the global average score is 40 out of 100, and even among the richest, high-income countries, the average score is 51.9.

Worse still, this comes 15 years since the World Health Organisation (WHO) released its International Health Regulations in 2005, one of the references for the EIU's index.

It recommended "strengthen(ing) national disease surveillance, prevention, control and response systems… (and) public health security in travel and transport".

No one can say that the global community had not been forewarned. As early as March 2019, scholars from the Wuhan Institute of Virology and the Chinese Academy of Sciences had already published, presciently. They warned: "It is highly likely that future SARS- or MERS-like coronavirus outbreaks will originate from bats, and there is an increased probability that this will occur in China."

Overwhelming and Intractable

What those Wuhan scholars did not anticipate then though, was that while COVID-19 would not be nearly as deadly as Severe Acute Respiratory Syndrome (SARS), it would instead be many times more contagious, closer in fact to the swine influenza, H1N1.

The trait of being highly contagious but less (yet still) lethal, has been interpreted previously as the virus' own evolutionary mechanism to adapt and raise its own probability of survival.

Indeed, if COVID-19 had killed off its first victims immediately, then after migrating from animals to man, it would have been less likely to 'travel' abroad too, and situate itself in over 29 countries and a cruise ship, "Diamond Princess". We do not yet know how its lethal properties may worsen in the long run, as there are still multiple pending cases.

This trend of evolution of viruses is making disease diagnosis more time-consuming, almost impossible for any single country, with the global community paying the higher costs of delays in findings. For instance, it took three weeks to confirm COVID-19's human-to-human transmission (21st January), since the time when the Chinese government reported its 'mystery pneumonia-like disease' (31 December 2019).

The exponential spread of the virus within China (with spill-overs abroad), could have been significantly slowed had earlier action been taken.

Yet, one cannot blame China, as its investment in infectious disease testing and monitoring far outstrips other countries, at US$1.94 billion, approximately triple that of the next biggest investor, Japan ($640 million), as reflected in the EIU's recent web briefing on COVID-19.

Other countries today are thus more likely than not to have been caught off guard had they faced the same plight. In spite of these, China still saw a preponderance of 'false-negatives' such that its testing accuracy was only at 30-50%. Moreover, it took three days to generate tests results in Beijing, and only seven hospitals were equipped with some genome sequencing capacity for virus diagnosis, the EIU shared.

Keeping Watch: Some Lessons

WHO data shows that COVID-19's spread is slowing, having reached the highest number of daily new, lab-confirmed cases (approx. 4,000) on 5 February 2020; by 16 February this number had decreased to close to 1,000.

Nonetheless, three key lessons can be gleaned from this experience thus far, if countries are to avoid the same plight. First, early research efforts are needed in preparing for future disease outbreaks, long before wartime conditions occur; in fact, doing so can shift global action from 'fire-fighting' to prevention.

Global collaboration, seen today, should have begun with this, rather than in responding to the virus after it became an international phenomenon.

Second, inputs from the academic and scientific community need to be given more weight. It is one thing to have faced COVID-19, but it is quite something else to have faced it even after warnings had been given in the previous first quarter in 2019.

Third, as the types of novel forms of diseases have virtually multiplied over time, with each branch of the organism giving birth to sub-branches of different levels of contagiousness and lethality, potentially hitting multiple countries at the same time, it is imperative that an equally vigilant and *networked approach* is taken by the international community.

Going Forward: Three Lenses

A networked approach to preparing for novel diseases in future would be akin to holding three types of lenses at the same time: wide-lenses to see the full range of diseases as they occur; a microscope to investigate each one of them; and binoculars to foresee how these viruses are transforming far into the future.

This is embodied in the Global (genome) Microbial Identifier (GMI) initiative advocated by scientists in 2011. The GMI is a "global system to aggregate, share, mine and translate genomic data for microorganisms in real-time". This could provide 'wide-lenses' through real-time information sharing among scientists, governments and the private sector.

For instance, the EIU shared involvement by Singapore's own Agency for Science, Technology and Research (A*STAR) in developing new diagnostic tests for COVID-19; China Mobile in tracking and minimising spread; Alibaba in mitigation; and Glaxosmithkline in designing treatments and vaccines, among others. It also gives 'binoculars', through synergistic research on the rapid evolution of pathogenic micro-organisms.

However, it requires capacitating states with super 'microscopes', using whole-genome sequencing (WGS) or next generation genome sequencing (NGS) tools, as a previous RSIS report recommended.

These are magnitudes more comprehensive than existing tests known as reverse transcription polymerase chain reaction (RT-PCR) tests mentioned in the EIU's website. They require training and sufficient lead time to institutionalise. If anything, this is the type of early action needed today in facing potential contagions of tomorrow.

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