Lessons of the COVID-19 pandemic

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The global response to COVID-19 represented a “catastrophic failure of the international community in showing solidarity and equity”. This is the opening line of the initial draft of the “Pandemic Treaty” that the World Health Organization (WHO) hopes to get all member countries to finalise in the months ahead, with the intention of working towards a better global response in future pandemics [1]. This frank assessment highlights the need of all of us to learn the lessons from our responses to COVID-19.

COVID-19 was the worst pandemic in the past hundred years. With increasing population immunity elicited by vaccination and natural infection leading to a reducing impact of the pandemic, the temptation to forget and move on to deal with other challenges is understandable. However, it is imperative that we learn the lessons from the pandemic experience, locally and globally.

As of February 2023, COVID-19 associated mortality is reported to be approx. 6.8 million [2], but the true COVID-19 mortality estimated from excess mortality estimates is 2-4 times higher [3]. COVID-19 is estimated to have led to a 7.3% reduction of global GDP growth overall, with the greatest and most prolonged impact in middle-income countries [4]. Thus, the pandemic highlighted the continued impact of novel emerging infectious diseases in today's globalized world. Future pandemics are inevitable and may well be more severe than COVID-19. SARS-CoV-1 in 2003 had a case-fatality ratio of 9-10%, far higher than that of COVID-19, although its spread was contained before it became pandemic.

The independent panel for pandemic preparedness and response [5] outlined a number of key recommendations to ensure that future outbreaks do not become pandemics. These were: a) invest in preparedness to prevent the next crisis, b) raise new international financing for pandemic preparedness and response, c) develop agile and rapid surveillance systems, d) strengthen independence, authority and financing of WHO, e) elevate pandemic preparedness and response to the highest level of political leadership, f) national and pandemic coordinators should have a direct line to heads of governments, g) establish a pre-negotiated platform for tools and supplies for emergency health responses.

The International Health Regulations of the WHO ratified by most countries in 2007 required all countries to develop capacity to detect and report unusual outbreaks of disease and respond effectively to such incidents. However, prior to the COVID-19 pandemic, many countries were not confident of their ability to meet these obligations. It is therefore important that surveillance and response capability is enhanced and that there is an external international system that monitors and provides ongoing feedback to enhance surveillance [6].

Effective epidemic surveillance starts with the alert health-care-worker trained to recognise, report and adequately investigate unusual clusters or patterns of disease, working with epidemiologists trained in outbreak investigations and laboratories able to carry out relevant investigations, and refer clinical samples to national or international reference laboratories, when required. Early detection of an outbreak provides the best opportunity for intervening to interrupt chains of transmission and reducing the magnitude of an outbreak. Since most novel emerging infectious diseases arise from spill-over of infection from animals to humans, establishing effective “One Health” surveillance systems where human health, animal health and environmental scientists work in close collaboration is critical for early detection of zoonotic spill-over events [7]. Furthermore, understanding the pathways of such spill-over events can lead to generic measures to reduce risk. For example, understanding the role of wild game animal markets in the emergence of SARS-CoV-1 in 2003 provided the information necessary to reduce this trade to reduce spill-over risk, which is not only is associated with emergence of novel infections but also contributes to loss of bio-diversity and to the survival of critically endangered species. If insight had been acted upon more energetically, the emergence of SARS-CoV-2 may have been avoided.

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Participatory surveillance that empowers local communities to report unusual disease patterns in humans and livestock can complement conventional health-care-worker based surveillance [8]. Digitalization of data provides more efficient means of collecting and analysing surveillance data and can facilitate early interventions. In urbanised environments with central sewage systems, wastewater surveillance provided useful non-invasive means for surveillance of COVID-19 infection patterns in the community, an approach that may be used for other infections [9]. The value of genomic epidemiology highlighted in Ebola and Zika was critical in COVID-19, where it was useful in tracking pathways of transmission and in detecting emergence of novel variants [10].

Rapid development and emergency use authorization of vaccines was one of the scientific triumphs during COVID-19. However, equitable sharing of vaccines with less developed countries was lacking [11]. Establishing regional vaccine manufacturing capacity is critical for avoiding this problem in future pandemics. Other issues such as waiving of applicable intellectual property (IP) rights for the duration of a pandemic is one of the suggestions in the draft Pandemic Treaty [1]. A recent analysis of COVID-19 infection and fatality rates in 177 countries concluded that the measures of government trust and inter-personal trust was significantly associated with lower infection rates in the community [12]. Some affluent countries judged to be well prepared for pandemic response failed to respond well to COVID-19, as judged by overall health outcomes. Future pandemic preparedness requires greater investment in risk communication and community engagement strategies.

References