

Are we preparing for the next pandemic?

Historically, very few phenomena have shaped societies in the manner that infectious disease outbreaks have done, with entire populations being wiped out, societies decimated and outcomes of wars determined by pandemic outbreaks.^[1] The shift from hunter-gatherers to agrarian societies facilitated the spread of infectious diseases. With trade and travel expanding between communities, interactions between humans and animals increased, as did the transmission of zoonotic pathogens. In addition, with the human population increasing, ecosystems have been affected leading to climate change, which also plays a part in the fuelling of infectious diseases outbreaks.^[2,3] Since the 16th century, pandemics have occurred at about 50-year intervals. With changes in the 21st century we have witnessed pandemics more frequently due to *inter alia* travel, trade, urbanisation and environmental degradation. COVID-19, with its unprecedented burden on human health, major disruptions in healthcare systems and grave social and economic consequences, could be considered as one of the greatest catastrophes in the history of human kind.^[4] It has affected a large part of the population, is already in its 3rd year and it is left to be seen as to how much longer it will last. In this editorial, I draw from specific historical examples to locate patterns that emerge. History can assist us in understanding how, why and under what circumstance some issues emerge, achieve international prominence, fade away and resurface as the crises recur.

The plagues

The earliest recorded pandemic in history is the plague. It was used as a general term for any epidemic disease causing a high rate of mortality or to denote the flea-borne *Yersinia pestis* virulent contagious febrile disease.^[2] The Athenian plague (430 - 26 BC), during the Peloponnesian War originated in Ethiopia and spread throughout Egypt and Greece. Many healthcare workers and other caregivers succumbed to the illness. While the cause of the Athenian plague has not been clearly determined, typhoid fever remains the most popular possibility. More recently however, it has been postulated that it could have been caused by Ebola virus haemorrhagic fever.^[1] The Antonine plague (165 - 180 AD), was possibly caused by smallpox. It reached the Roman Empire by returning soldiers. It had also affected Asia Minor, Egypt, Greece, and Italy and spread widely across the entire Roman Empire, an economically and politically integrated, cohesive society that occupied vast territory. In some areas it destroyed a third of the population.^[1-3] The Justinian plague, the first documented bubonic plague caused by *Yersinia pestis*, originated in mid-6th century AD, possibly in Ethiopia, and spread through Egypt or Central Asia where it travelled along the caravan trading routes, spreading widely throughout and beyond the Roman world. It generally followed trading routes and was therefore particularly ferocious in coastal cities. The spread from Asia Minor to Africa and Italy and other parts of Western Europe is attributed to military movement at that time.^[1,2] A global outbreak of bubonic plague originating in China in 1334, followed the Silk Road, spread through Central Asia and North India and arrived in Sicily, Europe in 1347. It was called "The Plague" (also the Black Death), and by 1400 (within 50 years), it had killed over 150 million. It broke

down the established divisions between the upper and lower classes and led to the emergence of a new middle class. Many professions, particularly medical doctors, were severely affected and young doctors were contracted as dedicated practitioners to deal with the duty of the plague doctor (*medico della pes*). Mandatory isolation was instituted and the first quarantine was enacted in Ragusa in 1377. Sanitary cordons at access points to cities, plague camps and plague hospitals were established.^[2]

The Spanish Flu

The Spanish Flu pandemic (1918 - 1920), the first true global pandemic and the first to occur in the era of modern medicine, was caused by the H1N1 strain of the influenza virus. Its true origin, despite its name, remains unknown. It occurred in the middle of World War I when advanced modes of transportation, including intercontinental travel had already been established, and within months, its deadly strain had spread across the world. Containment strategies for prevention of spread included the suspension of public gatherings and the closure of schools, churches and theatres. Also encouraged were respiratory hygiene and social distancing. Because of the war, these measures were unco-ordinated and implemented too late. Moreover, travel restrictions and border controls were impossible to institute.^[2] Between 50 and 100 million died and by August 1918, the virus had mutated to a much more virulent and lethal form killing many who had avoided it during the first wave. However, despite its impact, the Spanish Flu rapidly became the forgotten pandemic, as has been the pattern with pandemics that followed: immense interest, followed by horror and panic, and then dispassionate disinterest once the pandemic subsides.^[1]

Swine Flu

The 2009 H1N1 pandemic, also known as the Swine Flu, originated in Mexico in April 2009. It reached pandemic proportions within weeks, began to taper off toward the end of the year and by May 2010, after 10% of the global population were infected, was declared over. It was alarming as it disproportionately and severely affected previously healthy young adults, possibly because older adults had developed immunity due to a similar H1N1 outbreak in the 1970s.^[1] Hand washing, use of face masks and cough etiquette were implemented and this was the first pandemic where vaccines and antiviral use were combined.^[2] Of note, public alarm because of WHO releases and warnings rapidly transitioned to discontent and mistrust as the initial bleak outlook failed to materialise with health agencies being accused of creating "panicdemics" and pushing unproven vaccines to promote the pharmaceutical industry. The discord demonstrated how difficult it is to understand and manage public expectations and public sentiments when attempting to mobilise a response.^[1] We have seen a similar picture with the lack of confidence in state players during the current COVID-19 pandemic.^[4]

The Corona viruses

During the 2002 - 2003 outbreak, SARS-CoV infection, which originated in Guangdong Province (China), was reported in 29

countries in North America, South America, Europe and Asia. Bats were the likely natural reservoir. About 8 437 were infected, with 813 fatalities. Ten years later, MERS-CoV was reported in Jeddah in Saudi Arabia. The potential animal reservoirs were bats and dromedary camels. Between 2012 and 2020, there were 2 519 cases of MERS-CoV with at least 866 deaths in 27 countries. There was an outbreak in South Korea just before the current COVID-19 pandemic. The potential for MERS-CoV to spread around the world and pose a threat for global health must be kept in mind.^[2]

During December 2019 the first cohort of patients with pneumonia of unknown origin were admitted to hospitals in Wuhan, China. By 2 January 2021, there were already 41 patients with COVID-19 in the city. While there seemed to be an association between several of these patients visiting the Huanan Seafood Market in Wuhan and the pneumonia, not all had attended the seafood market, as contacts and family members of some of these patients also presented with similar patterns of pneumonia. 13 January saw the first case in Thailand and the first case to be confirmed outside of China – that of a woman who had travelled to Thailand from Wuhan on 8 January. Japan reported its first infection on 16 January.^[5]

On 5 January, the WHO officially alerted all national governments about the cluster and on 30 January, the WHO declared that the infectious disease outbreak constituted a public health emergency of international concern. At that time, 18 countries outside China had recorded 98 cases. COVID-19 was officially declared a pandemic on 11 March 2020. It has affected health and mortality catastrophically and has had disastrous consequences on the socioeconomic fabric of life, forcing painstaking decisions when balancing saving lives with saving livelihoods. Almost 90% of schoolchildren were unable to attend school at the peak of the pandemic in 2020. The workload of women substantially increased as they tried to maintain the family income and wellbeing, care for the elderly and sick and home-school their children.^[5]

Conclusion

Now in April 2022, pandemic fatigue has definitely set in. This pandemic needs to end as soon as possible. However, we should remember that COVID-19 is not the first pandemic and neither will it be the last one. Zoonotic outbreaks are becoming more frequent and the opening up of air travel makes it very easy for a virus to reach any place in the world in just a few hours. Who knows – a new infectious disease outbreak could occur at any time, even before the COVID-19 pandemic ends? The urgency for better detection and vigorous preparedness is critical. We cannot afford to sink into dispassionate disinterest, as has been the case after previous pandemics have ended. Preparing for the next pandemic should have already begun.

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