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The global impact of pandemics on world economy and public health response

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3.1 History of pandemics

Pandemics are considered large-scale disease outbreaks involving many countries. Along with war, natural disasters, and famine, pandemics were the major predictor of the human population till the 16th century (Jordà et al., 2021). The epidemiological transition theory categorizes human history into three phases depending on the effect of mortality and fertility: age of pestilence and famine, age of receding pandemics, and age of degenerative diseases (Omran, 1971). Even during the last two centuries, we faced their wrath in form of four influenza pandemics: Spanish Flu of 1918, Asian flu of 1957, Hong Kong Flu of 1968, and Swine Flu of 2009. It is estimated that nearly half a billion people were infected globally out of which 50 million died (2.1% of the world population at that time) during the 1918 influenza pandemic. The effect was more pronounced due to the concurrent effects of the first World War. The 1957 pandemic led to nearly 4.5 million cases and more than 1000 deaths in India (Menon, 1959). Apart from influenza, cholera and plague have led to the wiping of a significant proportion of the global population between the early 18th and 19th centuries. It is difficult to ascribe to the current concept of pandemics before the scientific elucidation of microorganisms, germ theory, and diagnostics. Moreover, the record-keeping of vital statistics such as deaths and their possible causes was not so comprehensive and organized a few millennia back. These pose difficulties in our understanding of earlier pandemic behavior. Still, the accounts of three pandemics of bubonic plagues find mention in most of the medical histories. The Justinian plague of 5th century ravaged the Mediterranean countries, Africa and Europe. Scientific advancement and globalization have reshaped the concept of modern

pandemics, India being a key cog in this chugging wheel. India had its own share of grief in form of recurring epidemics and pandemics of Cholera during British India with 2 million deaths due to the 1896 plague epidemic. During the black plague, more than 90% of the global deaths occurred in India. During the current COVID-19 pandemic, there has been considerable human misery in terms of global caseloads and deaths (Fig. 3.1).

3.2 Impact of pandemics on global economy

Pandemics have economic, political, and social repercussions due to their sheer involvement in terms of space and time. These effects are often for a prolonged duration, in contrast with wars. Not much is known directly about the effects of earlier pandemics, except for estimates. Direct effects would include the increased cost of healthcare access, both by individuals and governments. Indirect costs consist of loss of wages due to prolonged illnesses and the need for caregiving, especially in the prime-age working population. Early deaths and chronic disability due to any disease will have economic ramifications on the family. During pandemics, this has amplified exponentially. Large-scale panic as well as enforced social disruptions owing to lockdowns and closures affect the productivity of manufacturing sectors. Migrant workforces often are stigmatized and disowned during pandemics. Tales of trails of bloody reverse migrations during pandemics are known from historical as well as current accounts. An estimate puts that

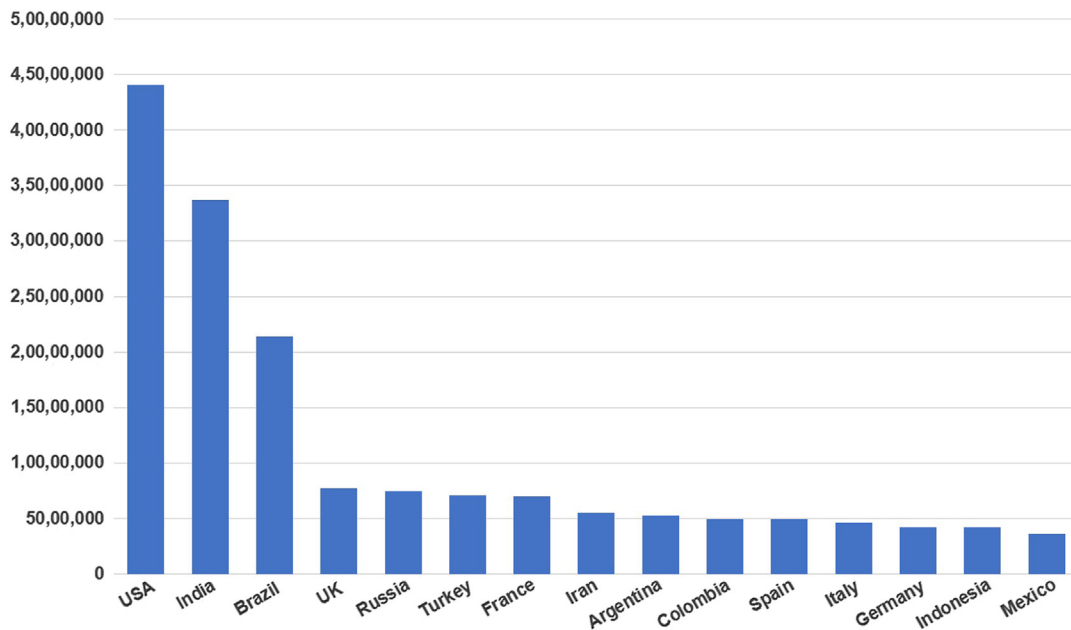


FIGURE 3.1 Distribution of Coronavirus disease 2019 cases across countries. Source: From *Coronavirus Live Update* (2021). <https://www.worldometers.info/coronavirus/#countries>. The data has been obtained from <https://www.worldometers>.

during the 1896 plague, nearly 380,000 people fled from Bombay, a city having 850,000 population at that time (Arnold, 2020). Closure of schools, colleges, and nonurgent business establishments led to a tremendous negative effect on the economy of households, as well as governments. Decreased production may increase inflation, while decreased demand would decrease the price to a certain extent. The purchasing power of a significant number of people would have decreased owing to the loss of jobs and business avenues. It has been estimated that the US economy lost 0.8% of GDP (~ US\$330 billion) during the 1918 influenza pandemic, while as much as 50% of GDP in certain developing countries. Nearly 12.6% of global GDP was lost due to this pandemic (McKibbin & Sidorenko, n.d.). The effect on GDP was estimated to be higher for the influenza pandemic than the first World War by some economists and comparable to the effects of climate change (Barro & Ursúa, 2008; Fan et al., 2018). The economic impact of this pandemic was seen till 2–4 decades later even in developed countries like France, Germany, Italy, United Kingdom, etc. (Jordà et al., 2021).

On the other hand, these pandemics had been boon to certain economic sectors such as pharmaceutical industries (both indigenous and industrial), computer hardware-software, grocery delivery giants like Amazon, etc. There has been a revival of Ayurveda in India. It has also been reported that the influenza pandemic of 1918 led to a relative increase in wages due to labor shortages.

3.2.1 Impact of Coronavirus disease 2019 pandemic on global economy

The cost incurred during COVID-19 pandemic has been studied in more detail. Apart from the usual direct costs incurred on diagnosis, treatment, and rehabilitation of infected cases for both individuals and governments, there are additional costs for the government due to the need for contact tracing, enforcing NPIs for behavior changes, providing stimulus packages to boost economies, etc. However, there have been contrary views by certain economists on the additional cost of NPIs (Correia et al., 1918). For individuals and families, the current COVID-19 pandemic has forced reallocation of budget to accommodate preventive behaviors like increased costs on mandated mask use, hand sanitization practices, etc., as well as decreased costs of social gathering. Economists consider COVID-19 pandemic as the second most devastating event of this century after the 1918 influenza pandemic in terms of global deaths. A United Nations agency has predicted that the cost of COVID-19 would be at least \$2 trillion globally leading to a fall of 2.4% of GDP. China is likely to have a lower economic growth of 5% in 2020 as compared to 6.1% in 2019. Between 5.3 and 24.7 million jobs are likely to be lost due to COVID-19 induced economic crisis globally (Açikgöz & Günay, 2020). Large stimulus packages are being announced by both International Monetary Fund (IMF) and World Bank. Countries have given monetary support to their unemployed citizen.

3.3 Public health response to pandemics and other public health emergencies of international concerns

Understanding of the etiopathogenesis of the pandemic-prone diseases in the 18th century led to a sanitary awakening in Europe. International sanitary conferences were held

from 1866 onwards. The concept of inspection, quarantine, and isolation of suspected and confirmed cases of these diseases had already started following the plague in 13th century Europe. But most of these measures were initiated with the overt and covert aim to protect the “civilized west” from “unruly and stinky east.” The 1896 plague in erstwhile Bombay in India led to the enactment of the Epidemic Disease Act of 1897, considered draconian by some experts. Soldiers had to be brought in to enforce the unpopular sanitary regulations. The public health movement in India was heralded with the promulgation of the Quarantine Act of 1825 by the British. The Vaccination Act was passed in 1880 (Rao, 1968). Vital statistics collection, sanitation, and vaccination were organized during the British occupation of India.

Most of the diseases causing pandemics do not have specific treatments except for symptomatic treatment of mild and supportive therapy of severe cases. Therefore non-pharmacological interventions (NPIs) were introduced as public health measures, often enforced through legal routes in countries of Europe and the United States. Mandated mask use, social distancing, hand hygiene, obligatory notification of cases, surveillance or closure of schools and colleges, closure of public meeting places (e.g., theaters, malls), restriction in movements in form of partial or full lockdowns, etc., are some of these public health restrictive measures. Disinfection of public spaces and homes of affected cases was practiced during influenza pandemics of 1918 as well as the later ones till SARS of 2002. There were, however, not found very effective.

World Health Organization (WHO) led the formulation of International Sanitary Regulations in 1951 as an international agreement to prevent the spread of Cholera, Yellow Fever, Plague, Smallpox, Typhus, and Relapsing Fever. It was redesigned as International Health Regulations (IHR) in 1969. With IHR, the concept of global surveillance of diseases with pandemic potential was started. The 2002 SARS helped define the six stages of disease outbreak that may lead to a pandemic. The latest revision of IHR in 2005 has revamped the way global health risks are managed. It obligates members countries to report and respond to public health emergencies of international concern (PHEIC). There are four internationally notifiable diseases (i.e., smallpox, wild poliomyelitis, novel human influenza, and SARS) and many pandemic prone diseases which require assessment (e.g., cholera, pneumonic plague, yellow fever, viral hemorrhagic fevers) (Gostin & Katz, 2016). The IHR was tested during the H1N1 influenza pandemic of 2009 with much criticism. The WHO also called polio and Ebola as PHEIC in 2014. The criticism faced during H1N1 and Ebola PHEICs has led to the formulation of public health risk communication frameworks and guidelines to streamline the response mounted by governments.

3.3.1 Public health response to the Coronavirus disease 2019 pandemic

Many of the global public health responses were similar to the earlier pandemics such as those seen during H1N1 influenza in 2009. The increased mortality and sheer caseload of COVID-19 have amplified the response mounted by countries. Moreover, poor agreement with WHO's responses has led to poor political support in certain countries, primarily in United States and Brazil which led to a massive surge in cases. Countries responded with travel restrictions and prohibitions in the initial days of the declaration of pandemics.

There was a mixed success with monitoring and tracing of the airline passengers. Countries like Australia, New Zealand, Vietnam, etc., were quite successful in implementing these measures. On the other hand, in other countries like Brazil, India, Mexico, etc., the inbound passengers have not been appropriately monitored leading to quick import of the disease in the local population. Apart from international travel restrictions, countries also resorted to domestic restrictions of rail and road transport. Again, the implementation was patchy with even many areas of developed countries like the United States witnessing riots by their citizens against travel restrictions and lockdowns.

The WHO has been following the data trails in fine-tuning its mask guidelines. Within a few months of the pandemic, universal mask-wearing was advised and mandated by most of the countries. Social distancing and hand hygiene were other mandated preventive responses. Efforts to identify therapeutic agents and vaccines commenced immediately. Unlike previous pandemics, there was a tremendous success in the development of vaccine and vaccination drives. Global research collaboratives in form of “Solidarity” and “Recovery” trials were established to identify drugs and other evidence-based treatment modalities (Angus et al., 2020; Pan et al., 2021).

3.4 Future perspectives

WHO has been trying to form an internal agreement on ways to manage pandemics through efforts such as the formulation of IHR 2005. But during the current COVID-19 pandemics, there were controversies regarding the role of WHO and allegations of suppression of information on China. United States stopped funding WHO for some time. Fingers have been raised on the developed countries on their perceived “selfishness” in COVID-19 vaccination. Misinformation has been another challenge. These misadventures undermine the global efforts to protect humanity from preventable health disasters. Governments of the world and other global advocates need to keep on their negotiations towards developing internationally binding guidelines on identification and mitigation of pandemics as well as equitable public health response. Field-based surveillance needs to be complemented by infodemiology (Satpathy et al., 2021). Public health risk communication needs to be given due attention while engaging with citizens to help them make evidence-informed decisions.

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