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### Correspondence:

Adewunmi J. Falode

adewunmi.falode@lasu.edu.ng



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# History of Pandemics in the Twentieth and Twenty-First Century

Adewunmi J. Falode<sup>1</sup>, Moses J. Yakubu<sup>2</sup> & Olusegun J. Bolarinwa<sup>3</sup>

<sup>1</sup> Department of History & International Studies, Lagos State University, Nigeria

<sup>2</sup> Institute for African and Diaspora Studies, University of Lagos, Lagos, Nigeria

<sup>3</sup> Nigeria Institute of International Affairs (NIIA), Lagos, Nigeria

This work is the historical analysis of pandemics in the Twentieth and Twenty-first century. It shows that the influenza virus has been responsible for major pandemic outbreaks in the two centuries. The work shows that bacteria and viruses, especially *Yersinia pestis* and the influenza virus, have been responsible for the outbreaks of major pandemics in recorded history. It carries-out a comprehensive and extensive analysis of the various impacts of historical and contemporary pandemics like the Plague of Justinian, Bubonic plague, Spanish flu, Cholera pandemics and also the novel COVID-19 had on the trajectory of world history. The work shows that such pandemics profoundly affects political, economic, social, religious, technological, health and educational developments in states in the post-pandemic periods. Additionally, this work comprehensively identified the commonalities among the pandemic-causing diseases in the Twentieth and Twenty-first century. It shows, among other things, that pandemic-causing diseases usually strikes in waves and that globalization plays an active role in the transmission of infection in the two centuries. The work concludes by showing that pandemics usually strikes in three waves and based on this assertion the world should be prepared to respond to the second and third waves of the COVID-19.

### Key words:

History, Pandemic, Coronavirus, COVID-19, Disease, Plague, Virus

## INTRODUCTION

Diseases are as old as mankind. Right from the earliest centuries, mankind has had to contend with different kinds of diseases and coped with the symptoms and infirmities that they wrought on their bodies. Infectious diseases like Bubonic Plague, Swine Flu and Spanish flu have both altered the lives of the people they touched and had great geopolitical ramifications beyond where the diseases primarily originated. The COVID-19 disease of 2019, for good or ill, has also

fundamentally altered human and states relations, both at the personal, interpersonal and international level. Infectious diseases are not created equal. Some, like Lassa fever, have impacts that are limited to fixed geographical areas in a country [endemic] (Iroezindu, Unigwe, Okwara, Ozoh, Ndu, Ohanu, Nwoko, Okoroafor, Ejimudo, Tobin, & Asogun, 2015); while those of others, like Zika virus disease, are restricted to regions [epidemic] (Khan, M., Khan, R., Khan, S., Jan, S. A., Shah, A. H., & Ahmad, T., 2019). Yet, others, like the Spanish Flu, have global ambitions and their effects goes beyond countries and regions to encompass continents [pandemic] (Breitnauer, 2019). One will be hard put to compare the devastation and misery of the Zika virus in the Americas between 2016 and 2019 to the incalculable mortality and socio-political and economic disruption that Black Death of 1347-1351 engendered in the 14<sup>th</sup> century (Wiechmann, Benedictow, Bianucci & Kacki, 2012). In the same vein, one cannot compare the effects that Lassa fever outbreaks have on Nigerians with the far-reaching and empire-crumbling devastation of the Plague of Antonine between 166-270 CE (Cunha & Cunha, 2008).

### CONCEPTUAL CLARIFICATIONS

Although the focus of this work is on diseases that became pandemics in the Twentieth and Twenty-first century, with special emphasis on the coronavirus family, it is necessary to explain some important concepts that are relevant to the work. These words are endemic, epidemic, pandemic, plague and coronavirus. Which brings us to an interesting question: what makes an infection endemic, epidemic, pandemic or a plague?

**Endemic:** An endemic disease is that pathogen that continuously infects or seasonally affects a given geographic area or population group (Tulchinsky & Varavikova, 2015). A disease is said to be endemic to a state when the rate of infection is constantly maintained at a baseline level in a geographic area. It is endemic in a population when it is maintained without the need for external inputs. Each regions of the world has its own endemic diseases. For example, malaria is endemic to Nigeria while Zika virus is a rarity. Ebola virus is a constant threat in the Congo while Lassa fever is not.

**Epidemic:** A disease is said to be epidemic when its occurrence in a region or a state is in excess of the usual or expected number of cases (Rosenberg, 1989; Tulchinsky & Varavikova, 2015). A good example is the Ebola virus disease and Zika virus disease outbreaks in East Africa and the Americas, respectively. The number of cases constituting an epidemic vary with the disease. Factors like previous epidemiological of the disease, time and place of the occurrence, rates of dispersal and the total number of the population involved are the determinants of what makes a disease an epidemic.

**Pandemic:** Although, there is no generally acceptable definition of what pandemic is, one can still say it is a disease that has spread, *simultaneously*, into multiple countries and continents at the time of its outbreak. According to Morens, Folkers

and Fauci (2009) examples of such pandemic diseases that had occurred in history, based on spectrum etiologies, mechanisms of spread and eras of emergence include acute haemorrhagic conjunctivitis (AHC), acquired immune deficiency syndromes (AIDS), cholera, dengue, influenza, plague, severe acute respiratory syndrome (SARS), scabies, and West Nile Disease. A pandemic disease necessarily has the following characteristics: wide geographic dispersion, high attack rates and explosiveness, novelty, rapid infectiousness, contagiousness, disease motility and severity (Morens, Folkers, & Fauci, 2009). It is based on all these attributes that one can conveniently label the COVID-19 of 2019 a pandemic.

**Plague:** According to Wiechmann (2012), a plague is a zoonotic disease caused by the bacterium *Yersinia pestis* that belongs to the Enterobacteriaceae family. It is chiefly found in rats and spread in the main by infected fleas to humans. Once the rats have been killed off by the disease, the infected fleas move to human hosts (Ziegler, 1998). There are four possible human forms of the plague: bubonic, septicemic, pneumonic and the abortive plague (Wiechmann, 2012). It is the Bubonic plague, commonly known as the Black Death, that ravaged Europe and Asia in the Middle Ages.

**Coronavirus:** Coronavirus have been largely responsible for most of the pandemics in the 20<sup>th</sup> and 21<sup>st</sup> centuries. Coronaviridae are a family of viruses that circulate among animals but can also be found in humans. History has shown that the novel coronavirus comes from a long line of viral infectious diseases that had ravaged humanity since the dawn of time. To this group belongs such deadly strains like the Spanish flu, Hong Kong flu, Swine flu and Asian flu. They become particularly deadly when they can jump from animals to humans (zoonotic). And deadlier still when they can jump from one human to the other. Coronavirus has been responsible for the five major influenza pandemics that have ravaged mankind in the 20<sup>th</sup> and 21<sup>st</sup> centuries (Saunders-Hastings & Krewski, 2016). The first was the Spanish flu of 1918-1920, followed by the Asian flu of 1957-1958, followed by the Hong Kong flu of 1968, followed by the Swine flu of 2009 and lastly the Wuhan flu or novel coronavirus of 2019. Each of these diseases have almost the same effects on its human hosts: chills, fever, weakness, pain, inflammation in the throat and lung, compromised immune system, opportunistic secondary infections and ultimately death.

From the foregoing, one can say that a disease that affects just one individual or two or three or four is just that, a disease. But when it seasonally affects a whole community, it becomes endemic. If it progresses from affecting a community to a state plus other states in the country, it becomes an epidemic. If it leaves the state and the country and infects other countries in the region, it is still an epidemic. It becomes a pandemic when it leaves a continent and infect every other continents. So, **endemic** simply means the constant presence of a disease in specific location (malaria in Nigeria). An **epidemic** is a disease that affects a large number of people within a community, population or a region (Ebola virus in West Africa). A

**pandemic** is an epidemic that has spread over multiple countries or continents (Spanish flu, Swine flu and COVID-19). A plague, on the other hand, is a zoonotic disease with severe clinical presentations caused by the bacterium *Yersinia pestis*.

## PANDEMICS IN HISTORY: A CONSPECTUS

What will be done here is to provide a general overview of selected instances of diseases that has caused pandemics since the dawn of civilization. The objectives here are twofold: to show that pandemics had been caused by both bacteria and viruses, and to concentrate on those viruses that are largely responsible for the majority of pandemics in the 20<sup>th</sup> and 21<sup>st</sup> century. Historically, pandemics in human society have been caused by either a virus or a bacterium (Morens, Folkers, & Fauci, 2009): bacteriological (caused by bacteria) or virological (caused by a virus). It is usually either of these two types that has morphed from an epidemic to a pandemic. The novel coronavirus was an epidemic when it emerged out of Wuhan China before it got out of hand and morphed into a pandemic. It is worth pointing out here that the discovery and quotidian adoption of anti-biotics has greatly reduced the incidences of pandemics caused by bacteria compared to those caused by viruses (Managing Epidemics, 2018).

*The Great Plague of Athens, 430-426 BC* was the first pandemic of note in recorded history. It was highly infectious and once contracted, kills within 7 to 9 days. The disease had either a bacteriological (Typhus Typhoid) or virological (smallpox and measles) origin (Martinez, 2017). It killed over a 100,000 Athenians and had such symptoms like redness and inflammation of the eyes and throat, violent coughing, difficulty in breathing and vomiting. The disease originated from Africa in Sudan and spread from Egypt to Libya and across the Mediterranean into Persia and Greece (Patel, 2019). It struck Athens in three waves: in 430, 429 and 427 BCE, respectively. Its effect was particularly devastating on Athens because the disease broke out during the Peloponnesian war of 431-403 BCE. Just as will be noticed in other pandemics that will be analyzed in this research, the disease caused widespread social disruption like the breakdown of law and order in the society, loss of belief in religions, the rebellion of oppressed minority groups and the disintegration of familial relationship. The plague had important consequences on Greek society the most important of course was the destruction of Athenian democracy and rise of Spartan oligarchy which was as a result of the defeat Athens suffered at the end of the war. Other important consequences included a demographic shift that favoured foreigners compared to the native population in Athens and an attendant rise in xenophobia. It should be noted that the highlighted consequences are now playing out in the novel coronavirus outbreak of 2019.

*The Antonine Plague, 166-270 CE*. By the second century CE, Rome had a great empire that stretched across Europe, Africa and the Middle East (Wilson, 2016). However, the Antonine plague played a significant role in the crumbling of the Roman Empire. The pandemic was caused by Smallpox (Theves, Biagini & Crubezy,

2014). Smallpox scars were first recognized on the skin of Egyptian mummies and this made it possible for researchers to place its earliest origin around 3<sup>rd</sup> century BC (Wertheim, 2017). It became a pandemic in both the 2<sup>nd</sup> and 18<sup>th</sup> century (Wertheim, 2017). Smallpox has killed over 900 million people worldwide and is contracted via human-to-human transmission. Smallpox is caused by the *Variola* virus and is spread by droplets through mouth, nose and lesions on skin. The disease is highly contagious. It was endemic to Egypt but became a pandemic when it was brought to the Empire by homebound Roman soldiers from the Middle East (Cunha & Cunha, 2008). From there, the disease then spread via trading routes to different parts of the world. Smallpox had a profound negative impact on the spiritual, political, economic, social and military aspects of the Roman Empire (Fears, 2004). The plague contributed in no small measure to the eventual collapse of the Roman Empire. A vaccine was developed for it in 1796 by Edward Jenner and by 1980, smallpox had been globally defeated (Stewart & Devlin, 2006). One significant factor that aided in the eradication of smallpox is the fact that the virus can only be transmitted via human and not an animal host.

*Plague of Justinian* occurred between 542-590 A.D. The disease was so named because it occurred during the reign of Justinian, the Roman Emperor (Cunha & Cunha, 2008). This is the first recorded and historical instance of the bubonic plague and it is traditionally regarded as the first of three human plague pandemics that originated from either Central Asia or Africa (Wagner et al., 2014). The name of the bacteria that caused the plague is *Yersinia pestis* and it followed the conquering Roman soldiers back to Europe and from the trading routes in the Empire expanded into Asia. Humans usually become affected by the disease when bitten by infected fleas. Symptoms include diarrhoea, fevers and chills, weakness, seizures and toward the end the skins of the infected would literally turn black. Hence, the name Black plague. By the time the Plague came to an end in 590 AD, it had killed over a 100 million people, contributed to the end of the Roman Empire and, just like its successor the Black Death ushered in the Renaissance in the 15<sup>th</sup> century, signalled the dawn of the Medieval period in world history (Little, 2007).

*The Black Death*, also known as the Bubonic plague of 1347-1351 was caused by the same bacteria that started the Plague of Justinian, *Yersinia pestis* (Benedictow, 2010). Morelli et al. (2010) have argued that the Black Death originated in either East Asia, China, or Eastern Russia, and from there to the European continent via trading routes. The Bubonic plague was a deadly bacterial disease that caused fever and painful swollen lymph nodes called buboes (DesOrmaeux, 2007). The plagues that devastated Europe during the Medieval period had three different clinical types: bubonic, pneumonic and septicaemic (Quinlan, 2020). According to Quinlan (2020), the Black Death killed more than 40 percent of the European population and killed millions worldwide. The Black Death had wide ranging impacts on human society during and after the middle Ages. The first was that its end ushered in the Renaissance era in Europe and secondly, led to the rise of



ethno-nationalism and racial stigmatization in Europe (DesOrmaeux, 2007). More importantly, the plague was developed as a major bacteriological weapon in the 20<sup>th</sup> century and deployed by the Imperial Japanese Army against the Chinese during the second Sino-Japanese war of 1937 to 1945 (Barenblatt, 2005).

*The Spanish Flu* of 1918 to 1919 has been called the greatest medical holocaust in history (Waring, 1971). The origin of the Spanish Flu is mired in controversy but there is a general consensus that the first wave came out of China around 1917 (Breitnauer, 2019). Chinese labourers were sent first to Canada and then the United States for onward transmission to France to aid in the war efforts of the Allies against Germany. The contact with different nationalities at the war front aided the rapid transmission of the disease to different parts of the world. Fighting conditions, especially the use of trench warfare, facilitated the intense distribution of the disease among the combatants. The virus killed between 50-100 million people worldwide before it finally tapered off in 1920 (Kolata, 2000). Symptoms include cyanosis, severe haemorrhage from orifices, encephalitis, acute respiratory distress syndrome and finally complete immune system collapse (Gewald, 2007). The disease was highly contagious and it was transmitted via human-to-human contacts. Three waves of attacks were noticed during the Spanish flu pandemic of 1918-1920: the first was in the Spring (March-May) of 1918. A second and deadlier mutated version of the virus struck in September of 1918; and the third final wave occurred in January 1919 (Gritti, 2019). It will be shown in the subsequent analysis that the 'waves' are a leitmotiv in almost all viral pandemics in the 20<sup>th</sup> and 21<sup>st</sup> centuries. It caused massive socio-economic disruptions and efforts to control the disease relied heavily on non-pharmaceutical interventions (NPIs) like quarantine, bans on public gathering and infection prevention practices like cough and sneeze etiquette and the use of facemasks (Breitnauer, 2019). Just like at the beginning of COVID-19 in 2019, there were no effective vaccines or antibiotics to prevent the flu and the opportunistic infections it engendered and medical personnel and materiel were in short supply.

*The Asian Flu* of 1957-1958 originated in Yunnan province in China (Yoneyama & Krishnamoorthy, 2010). From there, the virus spread into Hong-Kong, Singapore, Japan and within months had spread all over the globe. Trading routes played important role in the spread of the Hong-Kong Flu. The virus is believed to be zoonotic and it jumped from either birds or swine to humans (Lina, 2008). It killed close to 2million people and caused massive socio-economic disruptions. Vaccines were later deployed to curb the pandemic and these eventually brought it under control (Lina, 2008).

*The Hong-Kong Flu* pandemic of 1968 started in that country and spread from there to Asia, Europe and the United States (Jester, Uyeki, & Jernigan, 2020). The Hong-Kong Flu is believed to be a mutated version of the Asian Flu. The disease caused massive socio-economic disruptions and killed close to 2 million people worldwide. As was noticed in previous influenza pandemics, the Hong Kong virus

struck in three waves. Measures to control the spread of the disease included a combination of both NPIs and the pharmaceutical interventions like the use of vaccines and, to combat opportunistic infections, antibiotics (Taubenberger & Morens, 2010). Antiviral drug, Amantadine, was deployed for the first time in history to combat the pandemic (Jester, Uyeki, & Jernigan, 2020). Just like the First World War did, the Vietnam War in Asia aided the rapid spread of the virus into both Asia and the Americas. Vaccines were eventually deployed to contain the pandemic.

The *Swine or Mexican Flu* occurred between 2009 and 2010. A highly contagious respiratory infection, the Swine Flu spread to more than thirty countries within weeks of the initial discovery of the disease. The zoonotic disease that originated from pigs was first noticed in Mexico and then the United States in 2009 (Bijl & Schellekens, 2011; Sencer, 2011). Globalization, especially the trade aspect, helped in the rapid spread of the virus globally. For comparison, it took the Swine Flu just three weeks to achieve a geographical dispersal that took the Spanish Flu six months to achieve (Saunders-Hastings & Krewski, 2016)! It should be noted here that zoonosis is also an important feature of the novel COVID-19 – a zoonotic disease that jumped from either a bat or a snake to a human. The mortality rate of the virus was high and it caused massive socio-economic disruptions. Containment efforts relied on a mix of both pharmaceutical and non-pharmaceutical interventions. Particular emphasis was placed on the use of antiviral drugs like Zanamivir and Oseltamivir as both prophylactic and cure to counter and contain the spread of the disease (Gangurde, Gulecha, Borkar, Mahajan, Khnadare & Mundada, 2011).

*The novel coronavirus* (nCov) or severe acute respiratory symptom coronavirus-2 (SARS-COV-2) or coronavirus disease-19 (COVID-19) or the Wuhan Virus allegedly started in China in December 2019 (World Health, 2020, April 23; Xie & Chen, 2020). It is a zoonotic disease that is believed to have jumped to humans from either a bat. The disease is highly contagious and its rapid spread is helped by the fact that it is effectively transferable via human agents. Specific means of infection are through the droplets from the cough or sneeze of infected persons, touching of droplets-contaminated surfaces and then touching eyes, nose and mouth (European Centre, March 20). By February 2019, the disease had infected all the known continents and has touched approximately 198 countries (WHO, 2020, April 23). It induces symptoms like fever, cough, shortness of breath muscle pain, severe pneumonia, acute respiratory distress syndrome, sepsis, septic shock and ultimately death. By 30 January and March, 2020, the WHO declared the disease both a Public Health Emergency of International Concern (PHEIC) and a pandemic, respectively (WHO, March 11). Population groups that have been more heavily impacted by COVID-19 are those above 60 years and those with underlying health conditions like hypertension, diabetes and chronic respiratory disease (Chen et al., 2020).

The outbreak of the novel coronavirus and the disease it spawned COVID-19

has created severe social, economic, political, technological and religious disruption in the global system. Since there is no known cure for the virus, countries have had to rely heavily on NPIs like quarantine, social-distancing, curfew, bans on public and religious gathering, face masks and strict observance of sneeze and cough etiquette to keep the virus in check. This over reliance on NPIs has taken its toll on the global system. It should be emphasized here that based on the known trajectories of previous 20<sup>th</sup> and 21<sup>st</sup> century influenza pandemics, the COVID-19 outbreak has only gone through its first iteration or wave. Indeed, in May 2020, Chinese authorities sounded the alarm that a mutated version of the novel coronavirus had suddenly emerged in Jilin and Heilongjiang provinces that had previously been virus-free (Bloomberg News, 2020).

The table below shows a more vivid accounts of the various pandemics.

**Table 1**

Name	Type	Time Period	Death Toll	Origin	How it Ended	Response of States
Plague of Athens	Virus/ Bacteria	430-426 BC	75,000-100,000 (in Greece alone)	Africa (Sudan)	Petered Out	Prayer to gods
Antonine Plague	Virus	166-270 CE	5 million	Egypt	Petered out	Prayer to gods
Plague of Justinian	Bacteria	524-590 AD	30-50 million	Central Asia/ Africa	Petered out; herd immunity	Prayer to gods
Black Death	Bacteria	1347-1351	75-200 million	China/Eastern Russia	Petered out	Quarantine
Spanish flu	Virus	1918-1919	50 million	China	Petered out; herd immunity	*NPI
Asian flu	Virus	1957-1958	1 million	China	Petered out	NPI; vaccination
Hong Kong flu	Virus	1968	1 million	Hong Kong	Petered out	NPI; vaccination
Swine flu	Virus	2009-2010	200,000	Mexico	Petered out; herd immunity	NPI; vaccination
COVID-19	Virus	2019-	**2.5 million	China	On-going	NPI; vaccination

\*NPI means non-pharmaceutical intervention such as quarantine, wearing of face and nose masks and social distancing

\*\*This is up to February 2021. Source: Michael S, Rosenwald, "History's Deadliest Pandemics, from Ancient Rome to Modern America," *The Washington Post*, 22 February, 2021. [www.washington.com/graphics/2020/local/retropolis/coronavirus-deadliest-pandemics](http://www.washington.com/graphics/2020/local/retropolis/coronavirus-deadliest-pandemics)



## CHARACTERISTICS OF PANDEMICS

Although, pandemics in history had been caused by either a virus or bacteria, there seems to be a common thread in their routes of dispersion and impacts on human society. It is some of these common themes such as globalization, xenophobia and non-pharmaceutical intervention, among others, that are explored in this section.

**Trading routes** have acted as a means of rapid dispersal for these diseases. This is particularly true for the pre-globalization era and globalization period. For example, the Black Death followed merchants from Asia into Europe in the 14<sup>th</sup> century. The rapid spread of the disease was aided by the wide-ranging trading activities of Chinese and Indian merchants. Of course, the extensive trading network of China contributed to the rapid spread of COVID-19 in 2019 and 2020. The index cases for Italy, one of the worst hit country in Europe, all came back from China in January 2020 (Giovantti, Benvenuto, Angelletti, & Ciccozi, 2020). China's pre-eminent position as the world's industrial and manufacturing hubs made it easier for citizens of different countries to come into early contact with the disease and took it to their home bases when they left the country.

**Globalization** played a prominent role in the rapid infectious rate and continent-wide dispersal of diseases in the 20<sup>th</sup> and 21<sup>st</sup> centuries (Saker, Lee, Cannito, & Campbell-Lendrum, 2004). Just as globalization has aided the interconnectedness in the communication sector and interdependence in the economic sector, it has also aided the rapid dispersal of diseases all over the world. Globalization has brought about the intensification of societal interaction to a miniscule level and has been further aided by advancement in technology such as faster airplanes, trains and ships, that have also impacted the spread of the diseases. Diseases that would have taken upward of six months to get from one geographic area to the other got there within weeks. This is true for the rapid dispersal of both the Swine Flu of 2009-2010 and the COVID-19 outbreak of 2019 (Saunders-Hastings & Krewski, 2016).

**Non-pharmaceutical interventions (NPIs)** like quarantines, shelter-in-place, social distancing, banning of public gathering, use of face masks, intensification of personal hygiene and rigid observance of sneeze and cough etiquette have been the mainstay of primary response to pandemics right from the dawn of civilization (Tognotti, 2013). This was adopted for the Black Death, the Spanish Flu and presently to curb and contain the spread of Covid-19.

**Xenophobia and racism.** Pandemics usually breeds intolerance and heightened racial insensitivity. One can even argue that it leads to a rise in xenophobia. For example, the outbreak of the Black Death in Europe led to a sharp rise in anti-Semitism in the Middle Ages (Colet, Santiveri, Ventura, Saula, & Galdacano, 2014). The Jews, largely due to the strict hygiene regime imposed on them by Judaism, were exempted from the ravages of the Plague. This aroused suspicion in some quarters that since they seemed to be unaffected then they must be responsible for the disease. At the outbreak of the new coronavirus in 2019, Asians, especially Chinese,

were singled out and derided as responsible for the spread of the disease globally (Jun, Leshui, Wen, Nie & He, 2020). Africans were also looked at with suspicion globally because the usual medical consensus is that HIV, the disease responsible for AIDS came out of the continent. The desire to nip such a reoccurrence in the bud is one reason the World Health Organization (WHO) has tried to stop the practice of naming diseases after the location where it emerged (UNAIDS, 2020).

**Most deadly** influenza pandemics in modern times had its origins in Asia, particularly China. This is true for the Spanish flu, Asian Flu, Hong-Kong Flu and the novel coronavirus in 2019.

**The most** likely disease to become a pandemic in the 20<sup>th</sup> and 21<sup>st</sup> centuries is a virus. This is a historical truism. Poliomyelitis, Smallpox, Spanish Flu, Swine Flu, Hong-Kong Flu and the novel COVID-19 diseases are all caused by viruses like Poliovirus and Variola virus. A major reason for this is because there is no one-size-fits-all medicine that can effectively combat all viruses the same way anti-biotics have been successful in combating bacteria. Another is the fact that viral mutation rates are faster and outpaces the development of vaccines and antivirals.

**Zoonosis** is a major cause of viral pandemics in humans. The deadliest influenza diseases that goes on to become pandemics are the zoonotics. A zoonosis is a disease with both a human and animal reservoir. It is easier to tackle such a disease in human but virtually difficult to eradicate it in the wild. This explains why it has been easy to curb and contain the spread of the polio virus and to also contain the smallpox virus but very difficult to destroy pandemic influenza like the Spanish Flu, Swine Flu and COVID-19.

**Most pandemics** influenza occurs in three waves. This is true for the Spanish Flu, Asian Flu and Hong Kong Flu. For example, the Spanish flu that attacked the United States in the Spring and September of 1918 [1<sup>st</sup> and 2<sup>nd</sup> waves] and peaked in January of 1919 [3<sup>rd</sup> wave]. Japan had its first wave of the Asian Flu of 1957-1958 in January, second wave from June to July and the third wave from November to December of 1957 (Yoshikura, 2014). Looking at COVID-19 from this perspective, it will mean the disease is going to be around for a long time since the world has only witnessed the first phase. Indeed, with the discovery of a new mutated version of the virus in Jilin and Heilongjiang provinces in China, one can assume that the second wave of the disease is about to start (Bloomberg News, 2020).

**Post-pandemic periods** usually spurred a new sense of urgency to improve public health that will in turn act as a catalyst for advances in medical sciences, better public health planning and international cooperation to combat the disease (Saunders-Hastings & Krewski, 2016). This is true for the Spanish Flu, Swine Flu, AIDS pandemic and of course the ongoing SARS-CoV-2.

## IMPACTS OF PANDEMICS

As has been noted earlier in the Introduction, the outbreaks of pandemics have left indelible impacts of human history. The COVID-19 is not an exception. It has

impacted the 21<sup>st</sup> century world in the social, political, technical, religious, economic, health and educational spheres.

### *Social Impacts*

Firstly, pandemic outbreaks over the centuries have affected socialization among people in the society. This has been one important adverse effect of the pandemics on human interaction right from recorded history. To minimise the rate of spread of the diseases and to shield those who are yet to be infected from coming into contact with it, health authorities all over the world introduced NPIs measures like quarantine and social distancing. While the quarantine is a way of isolating those who had been infected, both the asymptomatic and symptomatic, the social distancing is meant to prevent the spread of the disease to the uninfected by the asymptomatic. Social distancing is also meant to flatten the curve of the infection. Such measures have cancelled access to bars, beaches, concerts, festivals, cinemas and stadiums where people could easily socialise. However, all these measures have the unintended consequence of isolating people from one another thereby increasing social tensions at the individual and inter-personal levels. This social impact of pandemics was noticeable during the Spanish Flu, Hong-Kong Flu and COVID-19 outbreaks.

Secondly, outbreaks usually breed a high level of racial intolerance and stereotyping, stigmatization and xenophobia. This is true for most pandemics throughout the centuries. The outbreak of HIV not only led to racially-motivated insults against Africans (blacks) since the disease is believed to have emerged from the Congo but also stigmatization for people with alternative sexual dispositions (especially homosexuals). The Jews in Europe during the Black Death experienced waves of xenophobic attacks because of the pervasive believe that they were responsible for the disease. China and its citizens were subjected to a high level of racial stereotyping and profiling because COVID-19 emerged out of that country. Also, with the resurgence of the virus in South Korea in May 2020 and the source of the new outbreak traced to a gay bar, Lesbian, Gay, Bisexual and Transgender (LGBT) have now been discriminated against in that country (Thoreson, 2020).

### *Political Impact*

Pandemics over the years have led to a restructuring of political system and world order. This sometimes has important geopolitical and geo-strategic ramifications. The Plague of Athens in the 5<sup>th</sup> century B.C. destroyed Athenian democracy and ushered in the autocratic Spartan oligarchy. This had important political impact on the subsequent trajectory of European political development. The Bubonic Plague in the 15<sup>th</sup> century not only contributed to the destruction of the Roman Empire but also ushered in a new era in European political and social development, the Renaissance. The Renaissance period owed its origin to the end of the Plague. The novel coronavirus is also playing an important geo-political and geo-strategic

role in the international system in the 21<sup>st</sup> century. There is presently an important struggle going on between the United States (political liberalism) and China (authoritarian liberalism) on how best to order the post-Covid-19 world (Campbell & Doshi, 2020).

### *Technological Impact*

Though this particular impact was not really noticeable in pre-21<sup>st</sup> century pandemics, it is however an important feature of the Covid-19 disease in 2019. With the outbreak of the highly transmittable virus and to minimise its rapid spread among people, coupled with the restrictions that NPIs like quarantine, lockdown and social distancing have imposed, societies have come to frequently rely on machines, drones, computer and the Internet to carry out most of their activities and meet their daily needs. The relevance and presence of such technological giants like Amazon, Alphabet (Google), Facebook, Skype, Zoom and Microsoft, which have always been there but in the background, are now more visible and quotidian. Such technological giants and their applications now carry out ordinary day-to-day transactions like shopping and business meetings that would have required physical human interactions and touch (Olaniwun, 2020).

### *Religious Impact*

Unlike in the outbreaks of previous pandemics, religions have been greatly impacted by the CO-SARS-2 virus. Since the virus is a highly contagious disease and easily transmittable via human contacts, governments the world all over have had to put measures like social-distancing and lockdowns in place to discourage the gathering of people in large numbers. For example, Iran, India, Pakistan and Malaysia all witnessed rapid spikes in the rate of infections because of their failure to restrict mass religious gathering at the outbreak of the disease in the respective countries (Quadri, 2020). The NPIs have affected both mosque and church attendance. For the first time in their histories, when the world is not even in a state of war, Saudi Arabia, Israel and Italy have stopped pilgrimages to Mecca, Jerusalem and Rome, respectively. Crucially, unlike in the other pandemics that faith-based institutions had been able to succour the afflicted and provide a sense of normalcy for the populace even when the governments had failed in this important mission, the lethality and virulence of Covid-19 has made this impossible. Faith-based institutions now rely on technology and the Internet to get their messages across to their adherents.

### *Economic Impact*

The economic impact of pandemics on states, though difficult to calculate, is quite substantial. This difficulty arises from the fact that there are both direct and indirect costs to every outbreaks. Direct costs are those that the state can easily calculate such as the decline in Gross Domestic Product (GDP) due to the forced

closure of industries, businesses and international trade; costs related to the treatment of the disease such as the equipping and building of isolation centres, research and development of vaccines, hospitalizations and management of opportunistic infections (Jackson, Weiss, Schwarzenberger & Nelson, 2020; Delivorias & Scholz, 2020). Indirect costs include the longer-lasting impacts related to infection-prevention efforts, shift in consumer habits and reduced tourism among others. All these has been experienced by states in one form or the other since the outbreak of the new coronavirus in 2019. Indeed, globalization has magnified the impacts of pandemics on 21<sup>st</sup> century economies. For example, the outbreak of COV-SARS-2 in Wuhan in 2019 and the subsequent shut-down of China had a devastating impact on global economy. The first direct cost was the total collapse of the oil industries in the United States, Middle East, Russia and Africa (Jackson, Weiss, Schwarzenberger & Nelson, 2020). The price of crude oil fell to a level that had never been seen before even during war period and it is yet to rebound to the pre-Covid-19 high as of mid-2020. Other related costs include the shortages of critical medical equipment like ventilators, reagents and N95 masks because most of these materials are produced in China (Sutter, Schwarzenberg & Sutherland, 2020). To wit, the virus has exposed the underbelly of global international trade and shown the extent of economic interconnectedness and interdependence among states.

### *Health Impact*

Admittedly, pandemics are bad to the well-beings of societies. However, the outbreaks of pandemics have aided in advancing medical sciences and in the formulation and implementation of better public health policy. This is particularly true for the Spanish Flu, Asian Flu, Swine Flu and COVID-19 pandemics. For example, the Asian flu outbreak in 1957 forced the creation of a worldwide network of laboratories linked to the Influenza Research Centre in London to track and study the new strain (Jackson, 2009). The end of the Swine Flu in 2010 forced the World Health Organization (WHO) to enhance the capacity of the Global Influenza Surveillance Response System (GISRS) to monitor and coordinate respond to influenza outbreaks in the world (Widdowson, Bresee & Jernigan, 2017). Till date, WHO is the preeminent medical organization that is at the forefront of combatting endemic, epidemic and pandemic outbreaks of diseases the world all over. Indeed, pandemic outbreaks have also spurred medical advances in the creation of vaccines, antivirals and anti-biotics to curb and contain the different strain of viruses and their opportunistic bacteriological counterparts (Tse, Meganck, Graham & Baric, 2020). For example, penicillin became an important antibiotic to combat bacterial infectious outbreaks from 1943 (Chiou, 2006). Moreover, the end of such pandemics has usually forced governments to improve on public health institutions. Structures and facilities. This was witnessed at the end of both the Asian Flu and Swine Flu outbreaks. The COVID-19 pandemic has pushed governments in both developing and developed countries to put in place policies that will improve their

health services sector and make it possible for them to be better prepared to contain and weather the next pandemic. One should remark here that it was the improved health policies immediately after the Hong Kong flu and Swine flu pandemics that stopped both the severe acute respiratory syndrome (SARS) in 2002-2004, and Middle East respiratory syndrome (MERS) in 2012 from becoming pandemics.

### *Educational Impact*

The impact of pandemics on the educational sector can not be overemphasized. Apart from the disruptions to the educational calendar that each pandemic had necessitated over the centuries, COVID-19 has wrought a tectonic and fundamental shift in the global educational system. Unlike the Spanish, Hong Kong and Asian Flus that only necessitated the temporary shut down of the educational sector for a limited period, Covid-19 has ensured a total and indefinite closure of all academic activities (Trade Union, 2020). This has altered the traditional model of knowledge transference that has been honed over the centuries since the emergence of western and formal educational system. Schools at all level of the educational system have been forced to embrace virtual learning and the traditional model of knowledge impartation that rely on fixed structures like lecture halls and theatres has now been rendered obsolete. Technology and the Internet have now assumed a preeminent role in knowledge acquisition and delivery. Applications like Zoom, Skype, WhatsApp, Google Meet and Telegram now play the crucial role that connects students to their teachers in the ether.

### **CONCLUSION**

This research has shown that virological and bacteriological pathogen have been responsible for the outbreaks of pandemics since recorded history. In the Twentieth and Twenty-first century, however, viral infectious agents have been responsible for most of the pandemic outbreaks. A mix of factors has been responsible for this ranging from the rapid rate of mutation of viruses to the difficulty of creating a single anti-viral drug that can tackle all variants. These two factors have been responsible for the world's inability to cope with the sudden outbreak of COVID-19 in 2019. Indeed, medical research has shown that the SARS-COV-2 is a mutated version of a previous influenza virus. Importantly, this work has shown that pandemics usually strikes in waves. This meant that the world has only experienced the first wave of the COVID-19 virus and it must prepare for the second and third waves.

Interestingly, research has shown that countries in Asia such as China have been able to effectively check the spread of the disease compared to their counterparts in Western Europe and the United States. For example, China was able to put the Wuhan province, with a population of about 10 million and the epicentre of the initial outbreak of the disease in 2019, on effective lockdown between January and March 2020 (Mei, 2020). This prevented the rapid spread of the virus to other



regions in China. However, countries like Italy, Britain and United States were unable to achieve the same feat. A major factor responsible for the Chinese success was its centralized and totalitarian political system that made it possible for her to impose a lockdown that severely restricted and brought to zero civil liberties of any form in the province; and at the same time rapidly mobilize resources to combat the disease (deLisle & Kui, 2020). The military and police were also deployed to enforce strict compliance. Such ‘draconian’ measures would have been well-nigh impossible to deploy in democratic and decentralized Western societies. This explains the high mortality rate that was recorded in Western Europe and the United States throughout 2020.

Moreover, the implicit and enforced trust that the communist system has repeatedly reinforced made it possible for the people to easily comply with the onerous restrictions imposed by the state (European Parliament, 2020). However, this was not the situation in Western societies. The costly missteps and discordant policies of the different leaders of countries like the United States and the United Kingdom created deep distrust in the people for their governments (). This then made it impossible for such states to effectively combat and contain the rapid spread of the virus that ravaged the Western world throughout 2020. From the foregoing research, one could see that the COVID-19 Infection has only just begun and based on the effects of previous pandemic outbreaks, it will have political, economic, social, religious, educational and technological effects on the world at large.

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## Istorija pandemija u dvadesetom i dvadeset prvom vijeku

Adewunmi J. Falode<sup>1</sup>, Moses J. Yakubu<sup>2</sup> & Olusegun J. Bolarinwa<sup>3</sup>

<sup>1</sup> Odjeljenje za istoriju i međunarodne studije, Državni univerzitet Lagos, Nigerija

<sup>2</sup> Institut za afričke studije i studije dijaspor, Univerzitet Lagos, Lagos, Nigerija

<sup>3</sup> Nigerijski institut za međunarodne odnose (NIIA), Lagos, Nigerija

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Ovaj rad predstavlja istorijsku analizu pandemija u dvadesetom i dvadeset prvom vijeku. On pokazuje da je virus influence odgovoran za velike pandemije u ova dva vijeka. Rad pokazuje da su bakterije i virusi, posebno *Yersinia pestis* i virus influence, odgovorni za izbijanje velikih pandemija u zabeleženoj istoriji. On sprovodi sveobuhvatnu i opsežnu analizu različitih uticaja istorijskih i savremenih pandemija na tok svjetske istorije poput Justinijanove kuge, bubonske kuge, španskog gripa, pandemije kolere, ali i novog COVID-19. Rad pokazuje da takve pandemije duboko utiču na politička, ekonomska, socijalna, vjerska, tehnološka, zdravstvena i obrazovna kretanja u državama u periodima poslije pandemije. Pored toga, ovaj rad je sveobuhvatno identifikovao sličnosti među bolestima izazvanim pandemijom u dvadesetom i dvadeset prvom vijeku. To, između ostalog, pokazuje da bolesti izazvane pandemijom obično udaraju u talasima i da globalizacija igra aktivnu ulogu u prenošenju infekcije u ova dva vijeka. Zaključak rada pokazuje da pandemije obično udaraju u tri talasa i na osnovu te tvrdnje svijet treba da bude spreman da odgovori na drugi i treći talas COVID-19.

### Ključne riječi:

Istorija, pandemija, korona virus, COVID-19, bolest, kuga, virus

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