



Review Article

# A Review: Epidemics and Pandemics in Human History

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Infectious diseases greatly increase death rate in world population that dysfunction or breakdown social life, effect on economy. Nature powers are erratic. Therefore it is truer that some infectious diseases come without giving any warning by nature. The diseases which spread one person to other person in particular area, city very rapidly is known as Epidemics and the diseases which spread from one country to others known as Pandemic. Choleric plague, smallpox, AIDS and influenza etc. was very dangerous communicable diseases in past years ago and some are also present now like AIDS and COVID, it is the most devastating example of pandemics. Disease outbreaks are occurring when disease spread unexpectedly and rapidly. Epidemics and Pandemics damage to humans in few time.

**Keywords:** Flu, Plague, HIV/AIDS, Virus, Pandemic, Epidemics, COVID.

## 1. INTRODUCTION

In communicable diseases enhance mortality rate [1] human beings are part of nature and we are not allowed to do anything wrong with nature if we do than it comes back to you in form of infectious diseases and many other disasters [2]. Epidemic is defined as appearance of diseases in area or population in excess [3] on other side pandemic is defined as epidemic which appears in wide range or area, spread to other countries and number of population suffer with it [4]. Epidemics and Pandemics like Small pox, Blackdeath, HIV/AIDS and many more diseases are most dangerous killers in human history [5]. These diseases are caused by virus, bacteria, influenza etc [6]. With Justinian of Plague number of people lost their lives [2]. Middle East

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Respiratory Corona virus (MERS Cov), Severe Acute Respiratory Syndrome (SARS Cov), common cold caused by corona virus which spread in wide area population [7].

**Difference between epidemic and pandemic**

- Epidemic spread rapidly in population where on other side pandemic is larger epidemic which spread from one country to other countries [8].
- Epidemic affects in weeks on other side pandemics take more time to spread and increase mortality rate.



Fig 1: Difference between epidemic and pandemic

**2. EPIDEMIC**

Epidemics is described from two Greek words epi “upon/above”, demos “people/population”[9].

Epidemics means any disease that spread very fastly/rapidly In given population to number of humans or animals in very short time period [9].

**History of Epidemic:**

With epidemics number of lives lost in past years. It spread by viral, bacterial, communicable diseases or health events like obesity in short time [10]

Table 1: Some worst epidemics

Epidemics	Time Period	Number of deaths estimated
Plague of Justinian	541-542	100,000,000
Black Plague	1346-1350	50,000,000
Fifth Cholera	1881-1896	981,899
Russian Flu	1889-1890	1,000,000
Modern Plague	1894-1903	10,000,000
Sixth Cholera	1899-1923	1500,000
Flu Spanish	1918-1920	20,000,000
Asian Flu	1957-1958	2,000,000
HIV/AIDS	1960-Present Time	39,000,000
Hong Kong Flu	1968-1969	1,000,000

**Explanation of some epidemics:**

**• Plague of Justinian (541-542)-**

The Eastern Roman Empire claimed number of lives died by plague (Bubonic Plague, Black Plague)

Bacteria-*Yersinia Pestis* was reason for plague.

Infection spread rapidly because carried on backs of rodents(rats), whose fleas were infected with bacteria.[10]

**•Black Plague (1346-1350)-**

It is estimated that 60% of population died in Europe because of black plague [10].

Bacteria-*Yersinia Pestis* was reason for black plague.

Swelling of lymph nodes, armpit etc. was some symptoms that occur by black plague.

**•Human Immuno Deficiency Virus (HIV/AIDS) (1960, Present all over world)-**

Luc Antoine Montagnier French Virologist discover Human Immuno Deficiency Virus (HIV). HIV crossed species from chimpanzees to people/human, originated Democratic republic of congo, kinshara near 1920.[11]

Fatigue, aching muscle, sore throat, swollen lymph nodes, headache, fever, bruises are some symptoms that occur in HIV [12].

**3 Stages of HIV-**

- 1.Acute HIV Infection: Acute stage, first few weeks after transmission
- 2.Chronic Infection: Clinical latency or chronic stage[12].
- 3.Ultimately Aquired immune deficiency syndrome (AIDS).

**How caused-**

1. Transmit by body fluid – blood, semen, vaginal and rectal fluids, breast milk [12].
2. Sexually transmitted disease [12].

**Future Epidemics:**

Due to increase in temperature of global warming may cause future Epidemic and if its happen in future number of people get suffer by it [10].

**3. PANDEMIC**

Pandemic is described from two words pan means “all” and demos means “people”. Pandemic is defined as disease which affects whole country or world [13].It is rapidly transferred from one country to other. Pandemics have occurred throughout history and appear to be increasing in frequency, particularly because of the increasing emergence of viral disease from animals [1].

**History of Pandemic:**

Some most bad killers in human history like small pox, influenza, bubonic plague, Cholera across international countries these disease outbreak are pandemic [5].

**Some Worst Epidemic:**

**1. Flu Pandemic (1918)**

Place: Flu Pandemic infect over third of World’s population

Cause: Flu Pandemic was caused by Influenza.

Death: It was estimated that about 20-50 million humans died with flu pandemic (Influenza is the most likely pathogen to cause a severe pandemic) [1].

**2. Asian Flu (1956-1958)**

Place: Start/Originated in China and spread in Singapore, United States, Hong Kong

Cause: Asian flu caused by Influenza A of H2N2 Subtype [5]

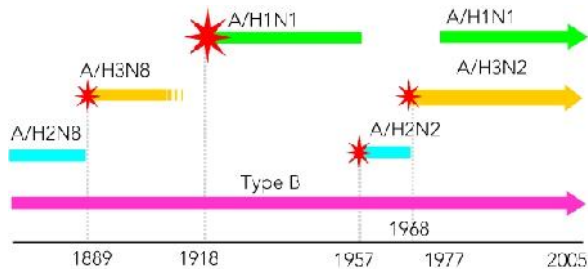
Death: It was estimated that about 2 million humans died with Asian flu.

### 3. Flu Pandemic (1968)

Place: Originated Hong Kong and spread Singapore, Vietnam, India, Australia, Europe and U.S

Cause: Caused by H3N2 strain of Influenza A virus

Death: It was estimated that about 1 million humans died with Flu Pandemic [5].



★ = Pandemic

Fig 2: History of influenza virus

### 4. Third Cholera Pandemic (1852-1860)

Cholera is an acute diarrhoeal infection caused by ingestion of contaminated water or food [5]

Place: Originated in India and spread Asia, Ganges River, Europe, North America, Africa, London

Cause: Caused by cholera

Death: It was estimated that about 1 million humans died with Third Cholera Pandemic

### 5. HIV/AIDS Pandemic (Present in World)

Place: Worldwide.

Cause: HIV/AIDS [5]

Death: It was estimated that number of humans died.

•Between 31-35 million people living with HIV. But due to new searches, researches many new treatments are developed that prevent HIV infection.

### 6. Plague of Justinian

Place: Europe, Byzantine Empire.

Cause: Caused by Bubonic Plague

Death: It was estimated that about 35 million humans died with Plague of Justinian

### 7. Antonine Plague

Place: Asia Minor, Egypt, Greece, Italy

Cause: Not known, maybe it was cause of small pox or measles but real cause is not found

Death: It was estimated that about 5 million humans died with Antoine Plague.[5]

### 8. Flu Pandemic (1889-1890)

Place: Bukhara in Central Asia, Canada, Greenland

Cause: Caused by Influenza A virus subtype H2N2 H3N8

Death: It was estimated that about 1 million humans died with Flu Pandemic.

### 9. Sixth Cholera Pandemic (1910-1911)

Place: Originated in India and spread Middle East, North Africa, Eastern Europe, Russia and America

Cause: Caused by Cholera

Death: It was estimated that about 800,000+ humans died with Sixth Cholera Pandemic [5]

### 10. Black Death (1346-1353)

Place: Europe, Africa, Asia

Cause: It was caused by Bubonic Plague

Death: It was estimated that about 75-200 million humans died with Black Death [5].

### Malaria

Malaria is still pandemic in world's some places [14]

### Future Pandemic:

Fevers like Rift Valley fever, Ebola virus, Marburg virus, and Bolivian haemorrhagic fever are highly infectious and deadly diseases that have chance to comes as pandemics in future[15]. Ebola Virus disease (EVD) is a severe, often fatal, haemorrhagic fever, caused by a virus belonging to the family of *Filo viridae* [16].

## 4. CORONAVIRUS

Middle East Respiratory Corona virus (MERS CoV), Severe Acute Respiratory Syndrome (SARS CoV) and common cold caused by corona virus which spread in wide area population [7]. There is a virus called novel corona virus which is not appears before [7].

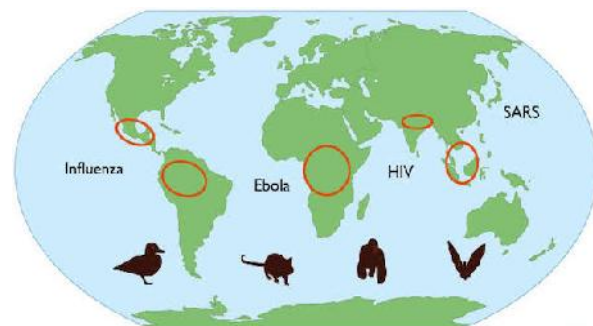


Fig 3: Pandemic warning system

### •MERS:

People died – 858 in Saudi Arabia

Year – 2012

Also spread –Middle East, Africa, Asia, Europe, Korea[17]

America –First case of MERS was occur in Indiana and other in Florida [17]

### •SARS:

People died – 774

Year – 2003

Not any case of SARS reported after 2015 [17]

### •Covid19: (2019-Present)

A new Corona Virus family member is Covid19 which is not seen before.[18] The World Health Organisation declared Covid19 as Pandemic.

Symptoms– Cough, high temperature ,runny nose , breathing problems ,pain , pneumonia etc.[18]

Patients – In 180 Countries more than 1 million population suffer and 53,000 deaths with COVID-19 as of 3 April 2020 [18].

## VIRUS

As genetic material virus contain RNA or DNA [19]. A parasite that is not able to reproduce by itself is known as virus therefore the cells which manufacturing different substance (cell machinery) is used to produce virus[19]. It consists of protein outer shell, nucleic acid and entire particle known as the complete infective form of virus that is virion [19].

## 5. CONCLUSION

In History number of human lost their lives by Epidemics and Pandemics and it will happen in future also if not stop before spreading any disease to other population or countries. Communicable diseases spread very fast because it caused by breathing in an airborne virus ,bitten by insects, sexual intercourse ,skin contact by patient who is already suffer with that disease. To prevent epidemics and pandemics make sure that your surroundings and yourself are properly clean, don't share personal things, clean hands properly, always take good and safe food, get vaccinated when sneeze and cough always cover your mouth. After 1970's many new vaccines and antibiotics are developed, from last year's progress increase very rapidly, new treatments and technologies come. As Jesse Steinfeld, MD, US Surgeon said "the time to close the book on the problem of infectious diseases"

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