

Viruses and Bacterial Diseases

(Source: Wikipedia)

Are viruses alive? Most biologists say no. Viruses are not made out of cells, they can't keep themselves in a stable state, they don't grow, and they can't make their own energy. Even though they definitely replicate and adapt to their environment, viruses are more like androids than real living organisms.

1) Black Plague / Black Death / Bubonic Plague

Bacteria

The bacterium *Yersinia Pestis*, which results in several forms of plague (septicemic, pneumonic and bubonic) is believed to have been the cause of this bubonic plague.

Date

From 1343 to 1353.

Infections

The total number of infections is not known, but it is believed that over 80% of the populations of Eurasia were affected.

Death Toll / Mortality Rate

Treated with antibiotics, the bubonic plague has an 11% mortality rate, but without treatment, 80% die within eight days (pneumonic plague has a mortality rate of 90 to 95 percent, while septicemic plague has a mortality rate of around 98%). The plague resulted in the deaths of an estimated 75 to 200 million people in Eurasia, and between 30% and 60% of Europe's population. In total, the plague reduced the world population from 475 million to about 350 million. It took 200 years for Europe's population to recover to its previous level and some other regions took much longer.

Origin

It is believed that the Black Death originated in East Asia. However, one study has suggested the opposite view, in which the Black Death originated in Europe and spread eastward.

Symptoms

The first symptom was the appearance of buboes (or *gavocciolos*) in the groin, the neck and armpits, which contained pus and blood. This was followed by acute fever and vomiting of blood. Most victims died two to seven days after initial infection. Skin rashes also appeared and most victims suffered from respiratory problems.

Transmission

The plague travelled from East Asia along the Silk Road, reaching Crimea. From there, it was probably carried by fleas living on black rats, that travelled on Genoese merchant ships around the Mediterranean Sea, reaching all parts of Europe. Other ships then took the rats (and the plague) to Scandinavia and Russia.



Abb. 66. Pestarzt beim Vesenaufschneiden. Holzschnitt aus: Hans Fels, Spruch von der Pestilenz. Nürnberg 1482.

Notes

The Black Death, also known as the “Pestilence”, the “Great Plague” or the “Black Plague”, was one of the most devastating pandemics in human history. The Black Death was the first major European outbreak of plague and the second plague pandemic. The plague created a number of religious, social and economic changes, with profound effects on the course of European history. There were several other smaller outbreaks of the plague until the early 20th century.

2) Spanish Influenza (Spanish Flu)

Virus

The Spanish flu was an influenza pandemic involving the H1N1 influenza virus.

Date

January 1918 – December 1920.

Infections

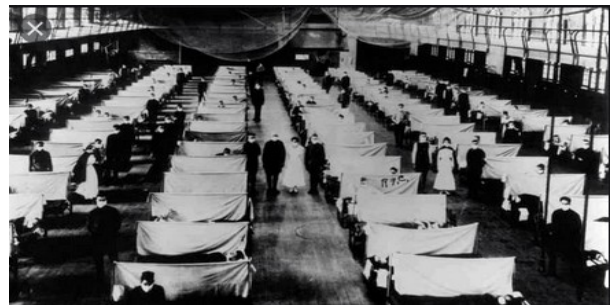
It infected 500 million people around the world, or about 27% of the world's population, including people on isolated Pacific islands and in the Arctic.

Death Toll / Mortality Rate

The death toll is estimated to have been 40 to 50 million, and maybe as high as 100 million. The mortality rate was therefore somewhere between 8% and 20%.

Origin

Historical and epidemiological data are inadequate to identify with certainty the pandemic's geographic origin, but it is believed to have originated in the USA.



Symptoms

The symptoms were similar to those of other influenzas, and included fever, cough (typically a "dry cough"), headache, muscle or joint pain, sore throat, chills, fatigue, runny nose, diarrhea and vomiting.

Transmission

When an infected person sneezes or coughs, more than half a million virus particles can spread to those nearby. The massive troop movements of World War I hastened the pandemic. The soldiers' immune systems were weakened by malnourishment, as well as the stresses of combat and chemical attacks, which increased their susceptibility. A large factor in the worldwide occurrence of this flu was increased travel. Modern transportation systems made it easier for soldiers, sailors, and civilians to spread the disease.

Notes

It was one of the deadliest pandemics in human history. It was named the “Spanish Flu”, because the Spanish authorities were the first to report its existence.

3) SARS (Severe acute respiratory syndrome)

Virus

SARS is a viral respiratory disease of zoonotic* origin caused by the SARS coronavirus (SARS-CoV).

Date

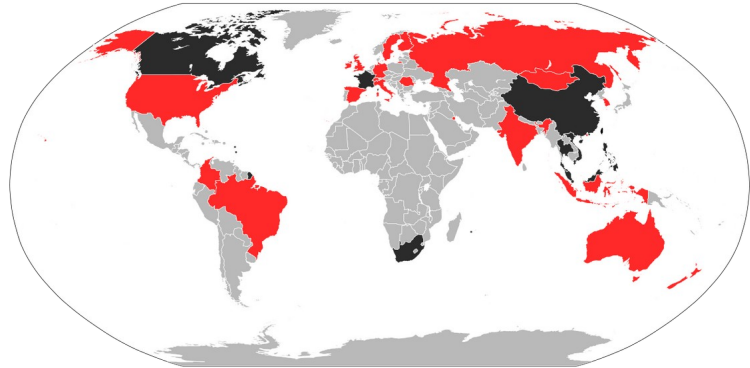
November 2002 to July 2003.

Infections

Around 8,100 cases, with the majority of cases in mainland China and Hong Kong.

Death Toll / Mortality Rate

774 deaths were reported in 17 countries (9.6% fatality rate).



Black – Deaths, Red - Infections

Origin

Southern China. Chinese scientists traced the virus to horseshoe bats in Yunnan province. It seems that civets became infected from the bats and passed it on to humans.

Symptoms

Symptoms are similar to seasonal flu and include fever, muscle pain, lethargy, cough, sore throat and a high fever. SARS can also cause lack of breath and pneumonia.

Transmission

Sneezing (not covering your nose when you sneeze) and diarrhea. In both cases, not washing your hands thoroughly can also transmit the virus.

Notes

There is no vaccine for SARS. Clinical isolation and quarantine remain the most effective means to prevent the spread of the virus. No cases of SARS have been reported since 2004.

* Zoonotic: a disease that can be transmitted from animals to people - a disease that normally exists in animals but that can infect humans. There are many zoonotic diseases, including anthrax.



Horseshoe Bat



Civet

4) Swine Influenza (Swine Flu)

Virus

The Swine flu pandemic also involved the H1N1 influenza virus. The virus appeared to be a new strain of H1N1, which resulted when a triple assortment of bird, swine and human flu viruses combined with a Eurasian pig flu virus.

Date

Early 2009 to late 2010.

Infections

It is estimated that between 700 million and 1,400 million people contracted the disease (11–21% of the global population). In absolute terms, this was more than the number of Spanish flu pandemic infections.

Death Toll / Mortality Rate

With about 150,000 to 575,000 fatalities, this virus had a very low fatality rate of between 0.01% and 0.08%.

Origin

This H1N1 infection was first recognized in the state of Veracruz, Mexico.

Symptoms

Fever, cough, headache, joint pain, sore throat, chills, fatigue, runny nose, diarrhea and vomiting.

Transmission

Spread of the H1N1 virus occurs in the same way that seasonal flu spreads. Flu viruses are spread mainly from person to person through coughing or sneezing. Sometimes people may become infected by touching something with a flu virus on it and then touching their face.

Notes

Since a Eurasian pig was involved in the creation of the virus, the name "swine flu" was adopted.



5) Corona Virus

The virus has been named "COVID-19" - it is a virus closely related to the SARS virus.

Date

The virus was first reported in December 2019. Human-to-human transmission was first reported in January 2020.

Infections

As of January 2024, there have been 7 million deaths and 703 million confirmed cases across 231 countries (Source: <https://www.worldometers.info/coronavirus/>).



Mortality Rate

The fatality rate is between 1.0% and 2.0%.

Origin

There are two theories:

- 1) An animal-to-human zoonotic event occurred at the Huanan Seafood Wholesale Market in Southeast China.
- 2) The virus was manufactured and escaped from the Wuhan Institute of Virology. A laboratory that had previous complaints during health inspections.



Symptoms

Those affected may develop a fever, a dry cough, fatigue, and shortness of breath. A sore throat, runny nose and sneezing are other possible symptoms. Some cases can progress to pneumonia and multi-organ failure, resulting in death. Some symptoms can continue for many months, including the loss of smell or taste.

Transmission

Transmission is usually by coughing or sneezing. Time from exposure to onset of symptoms is generally between 2 and 14 days, with an average of 5 days.

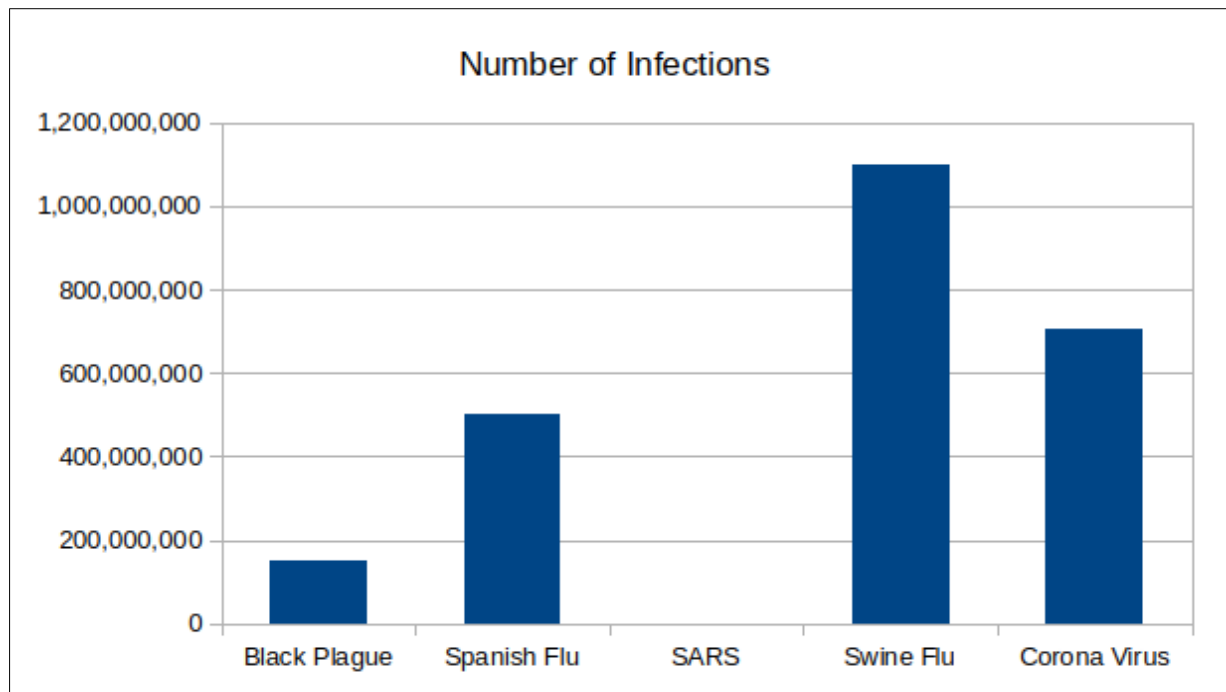
Notes

Thorough hand-washing is vital, as is maintaining distance from people who are coughing or sneezing. It is also recommended not to touch your own face with unwashed hands. It is important to cover your nose and mouth when coughing or sneezing. Those who suspect that they are carrying the virus are recommended to wear a face mask and seek medical advice by calling a doctor, but not visiting a clinic in person. It seems that weak and old people are the most vulnerable groups.

Comparisons (Jan 2024)

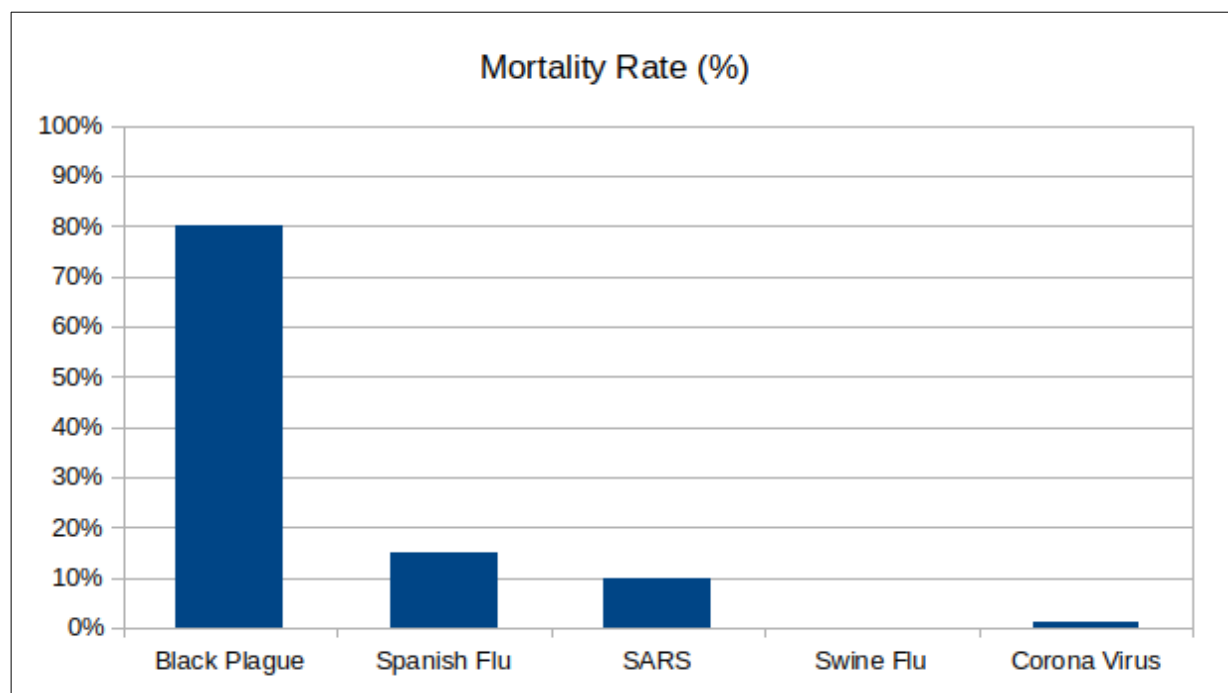
1. Number of Infections – How far did it spread?

Black Plague	Spanish Flu	SARS	Swine Flu	Corona Virus
150 million	500 million	8000	1,100 million	705 million



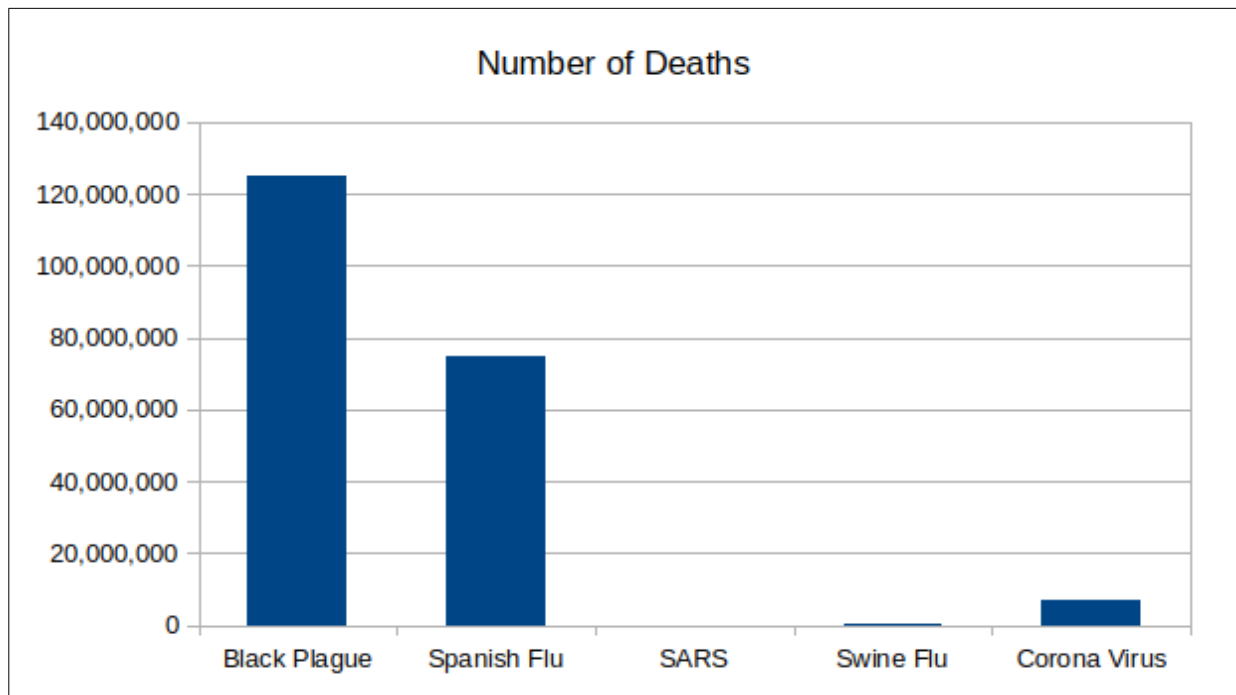
2. Mortality Rate (%) - How dangerous is the virus/bacteria?

Black Plague	Spanish Flu	SARS	Swine Flu	Corona Virus
80%	15%	10%	0.03%	1%



3. Number of Deaths (Death Toll)

Black Plague	Spanish Flu	SARS	Swine Flu	Corona Virus
125 million	75 million	800	350,000	7,010,000



4. World Population Affected (%)

Black Plague	Spanish Flu	SARS	Swine Flu	Corona Virus
80%	27%	0.0001%	17%	8.8%

