

BSSb1194

Life kills life

JAKUB DRMOLA



Historical cases

- mostly flu, smallpox, cholera and plague
- ancient pandemics
 - 166 – smallpox, thousands of Romans dying daily
 - 250 - flu, half the population dead in some places, Roman Empire nearly collapsed
 - 541 – “Justinian plague” across Mediterranean, up to 100 million dead and 50% mortality

There were many more, but the ones in Mediterranean are best documented.

Plague

- bacteria *Yersinia pestis*
- often spread by fleas, sometimes through air
- 3 variants by progression:
 - 1) bubonic plague (through lymphatic nodes, swelling)
 - 2) septicemic plague (through blood, leads to surface necrosis)
 - 3) pneumonic plague (lung infection, highest mortality)
- it still exists

Black Death

- plague
- brought by Tartars through Crimea in 1346 (-1353)
- 100-300 million dead
- approx. half of Europe died out
- corpses piled up in streets with no one to bury them
- societal collapse, labor shortage






Americas

- Aztec empire (pop. of 25 million)
 - Spaniards arrived 1517
 - 1520 – smallpox and drought, 8 million dead
 - 1521 – conquest complete
 - 1545 – *cocoliztli* (typhoid fever), 14 million dead
- Inca Empire (pop. of 17 million)
 - 1520s – smallpox arrived (up to 50% died)
 - 1526 – first contact with Spaniards
 - 1532 – conquest mostly complete

50-90% of Native Americans killed by infections...



Spanish Influenza

has endangered the prosecution
of the **WAR** in Europe.

There are 1500 cases in the Navy Yard
30 deaths have already resulted

**SPITTING SPREADS SPANISH
INFLUENZA DONT SPIT**

Spanish flu

- 1918-1919
- global population 1.75 bil.
- WW1: 15-20 mil. dead
- WW2: 20-50 mil. dead
- Spanish Flu: 50-100 mil. dead

- up to 20% mortality of deadly second wave
- (post)WW1 had perfect conditions



Smallpox

- vaccine in 1796
- campaigns since 19th cent.
- 2 million deaths per year in 20th century
- eradicated in 1977
- samples retained



Intentional use?

- during sieges
- Native Americans
 - the infamous blankets...
- 20th century
 - use against animals
 - use in China
- some terrorism attempts
- quite ineffective and hard to control

Ongoing pandemics

Malaria

- 0.5-1 million deaths per year
- sickle red blood cells adaptation

HIV

- 1 million deaths per year (via AIDS)
- zoonosis from SIV

covid-19

- 6+ million dead so far

Recently ...

- SARS (2003) – 1000 dead, zoonosis from bats
- H1N1 “swine” flu (2009) – 100 000 dead
- zika (2015-2016) - microcephaly
- seasonal flus – 3-500 000 dead
- Ebola – avg. 50% mortality, 12 000 dead during the 2013-2016 outbreak

Causes and complications

- large concentrated populations
- fast travel between populations
- living in proximity with animals



Antibiotic resistance

<https://www.youtube.com/watch?v=yybsSqcB7mE>

- antibiotic misuse and overuse
- deaths probably already in millions, will get worse
- bacteriophages as solution?

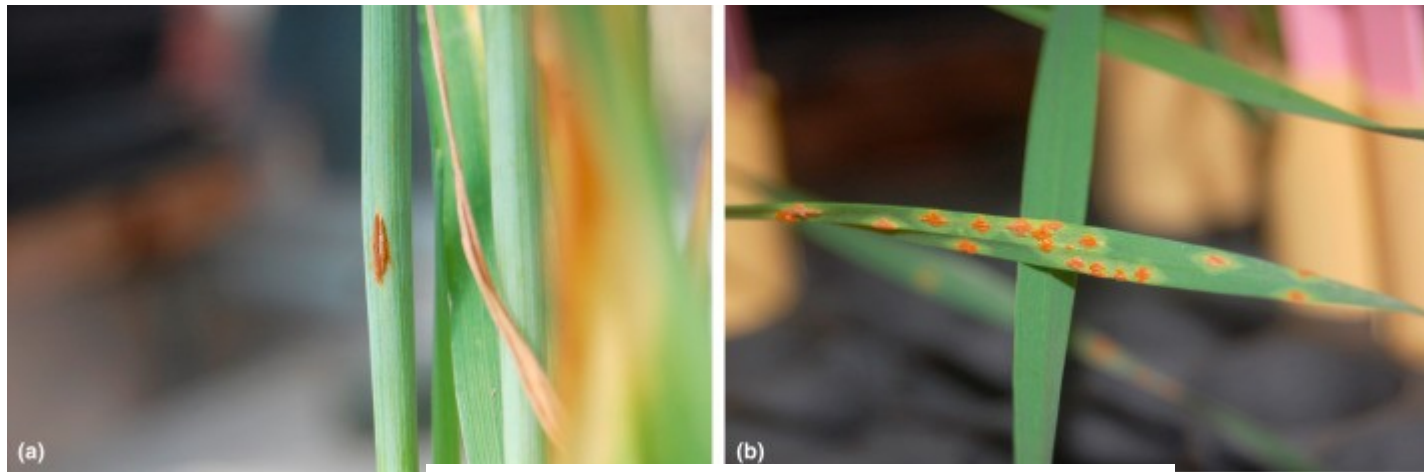
Zombies?

- cordyceps
 - fungi spores
 - arthropod parasites (insects, arachnids, etc.)
- horsehair worms
 - silent, thirsty crickets
- rabies
 - change in behavior
- toxoplasmosis
 - around 1/3 of humans
 - risky behavior?



Theres more...

Ug99 - *Puccinia graminis* f. sp. *Tritici*



Nipah - *Nipah henipavirus* (NiV)

Nipah Virus Transmission and Mortality

