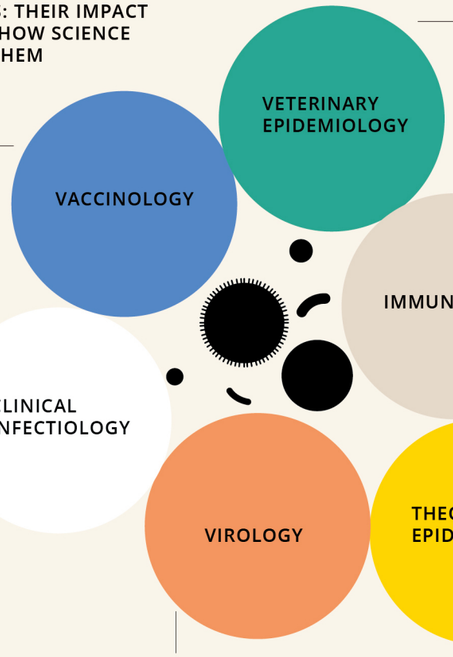
Utrecht University

Veterinary Medicine

Fighting infectious diseases

INFECTIOUS DISEASES: THEIR IMPACT ON THE WORLD AND HOW SCIENCE WORKS TO COMBAT THEM



VETERINARY EPIDEMIOLOGY
Studies the spread of infections between animals, between animals and humans and between animal populations

VACCINOLOGY
The science of developing, producing, evaluating and applying vaccines

IMMUNOLOGY
Studies the immune system which protects the body from danger coming from within or outside

CLINICAL INFECTIOLOGY
Contributes to combating infectious diseases and antimicrobial resistance in humans and animals

VIROLOGY
Studies how viruses infect cells and how they are transmitted from animals to other animals or humans

THEORETICAL EPIDEMIOLOGY
Focuses on the dynamics of infectious diseases and the complex systems underlying the spread of diseases in populations

VACCINES

10 to 15 years

Average time needed for developing a vaccine

28 diseases

For which a vaccine is available in the Netherlands

Eradicated
by vaccines

SMALLPOX

RINDERPEST

RESISTANT

10 million people

Potential annual deaths as a result of antimicrobial resistance by 2050, if we don't intervene

Densely populated
The Netherlands are home to:

17 million people

30 million companion animals

125 million farm animals

Millions of wild animals

Outbreaks since 1980
a selection

1980

1981 - PRESENT
HIV / AIDS
(30 million deceased)

1990

2002 - 2003
SARS
(770 deceased)

2000

2009 - 2010
SWINE FLU
(150.000 to 500.000 deceased)

2010

2014 - 2016
EBOLA
(11.000 deceased)

2019 - PRESENT
SARS-CoV-2/ COVID-19
(900.000 deceased)

2020

3x

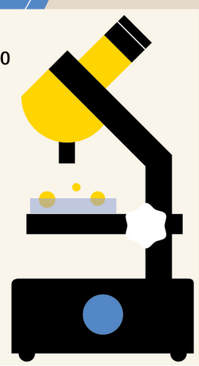
The number of outbreaks of infectious diseases in humans has tripled each decennium since the 80s

GROWTH FORECAST FOR THE DUTCH ECONOMY AS A RESULT OF CORONAVIRUS

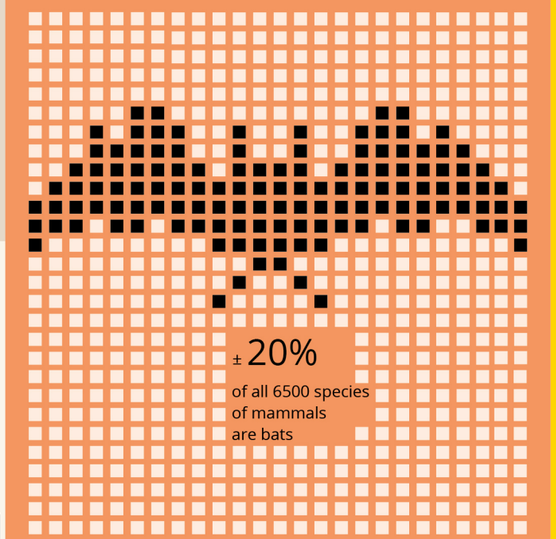
-7,5%
IMF April 2020

€1.000.000.000

EU funding for coronavirus research and innovation (May 2020)



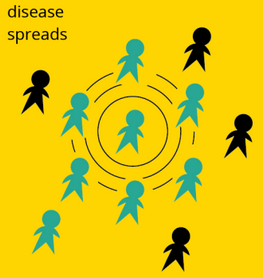
WHY DO DISEASES OFTEN SPREAD THROUGH BATS?



± 20%
of all 6500 species of mammals are bats

R0 = <1
disease declines and dies out

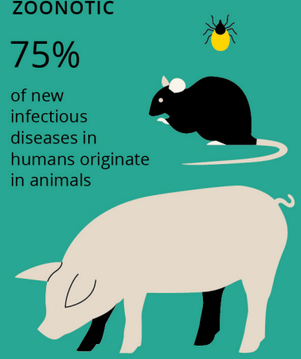
R0 = >1
disease spreads



4 coronaviruses
Previously transferred from animals to humans, regularly causing the common cold

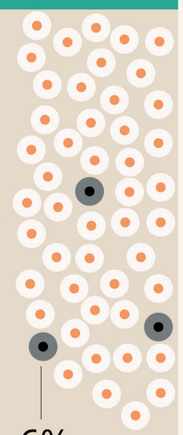
ZOONOTIC

75%
of new infectious diseases in humans originate in animals



1.7 million
estimated number of viruses

600.000 - 800.000
of these are possibly zoonotic



6%
of the European population is affected by autoimmune diseases and the prevalence is rising