COVID-19 PANDEMIC: A TALE OF A BAT VIRUS FROM CHINA THAT CHANGED BELGIAN HISTORY

23/09/2021 Symposium Diergezondheid, Ciney

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Federal Spokesperson

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The beginning

30 December Wuhan: severe cases in hospital

Severity?

WHO 3 March: 3,4%

Italy 10 March: 10% !

Strategy: hospital problem cfr Mers, SARS
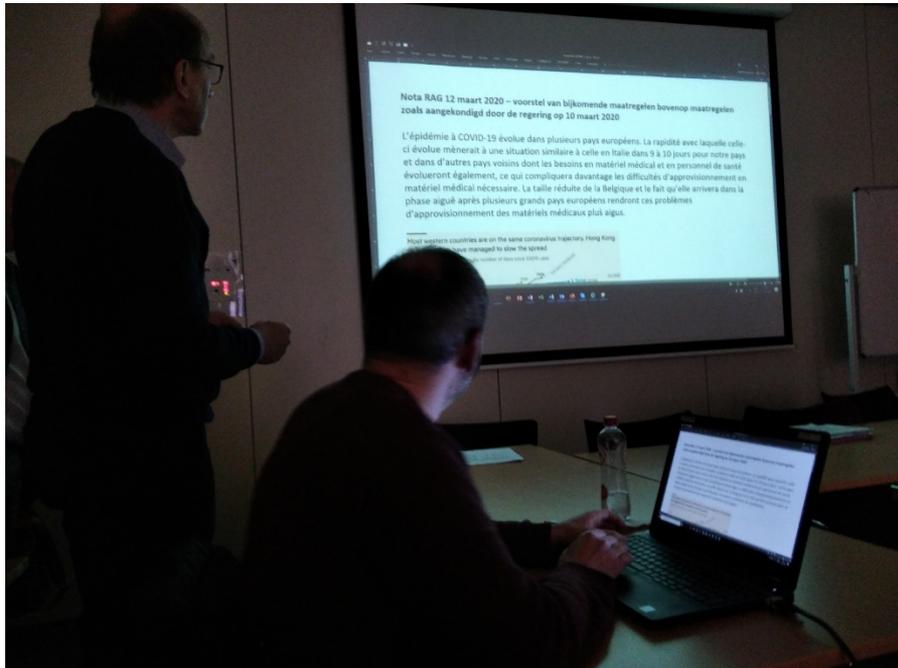
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February 3: A devil in disguise enters

March 1: second case detected

March 12, 20PM: Lock down meeting at Eurostation

- 13/3: closure schools, bars and restaurants, events, shops weekend (559 cases, 3 deaths)
- 18/3: closure non-essential shops, companies, stay-at-home

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The first wave

Early reaction: contain and break transmission

Shortages: masks, alcohol, tests, ventilators,…

Surge hospital capacity: 2000 regular ICU beds + 800 extra beds
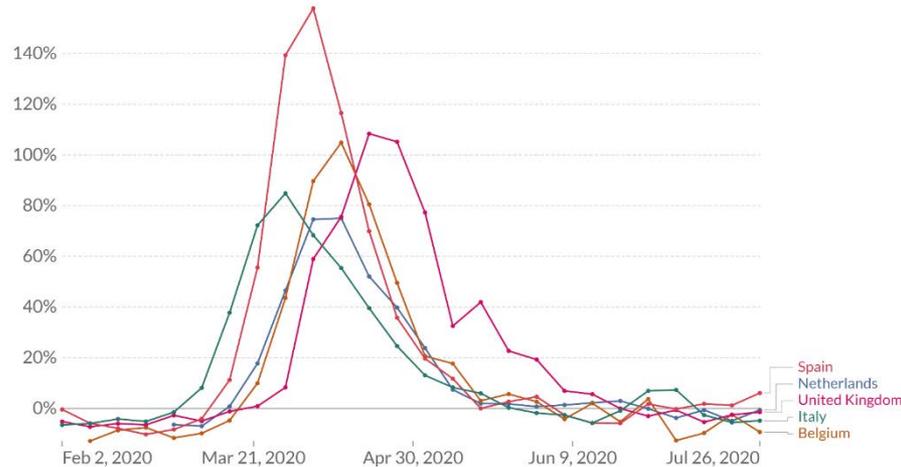
Accurate reporting

Set up test and trace

Prepare nursing homes

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Excess mortality wave 1

Excess mortality: deaths from all causes compared to previous years

Shown is how the number of weekly or monthly deaths in 2020–2021 differs as a percentage from the average number of deaths in the same period over the years 2015–2019. This metric is called the P-score. The reported number of deaths might not count all deaths that occurred due to incomplete coverage and delays in death reporting.
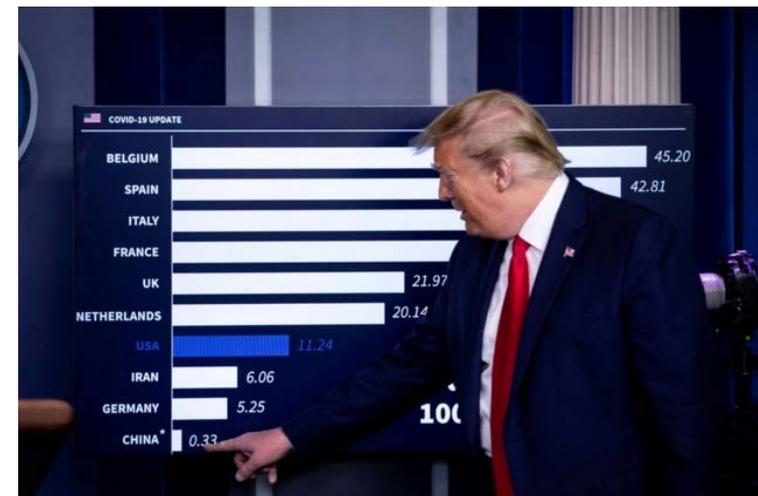

Source: Human Mortality Database (2021) and World Mortality Dataset (2021)   CC BY

Spain:	158%
UK:	108%
Belgium:	105%
Italy:	85%
Netherlands:	75%
USA:	39%

Accurate reporting!
Science and politics

# Steven Van Gucht: 'Ik hou mijn hart vast voor het najaar'

Steven Van Gucht: 'Mondmaskers bieden een kleine extra bescherming, maar geen garantie.' ©Diego Franssens

JASPER D'HOORE | 11 april 2020 01:02

Excess mortality wave 2

Autumn 2020: late reaction, high excess mortality

Excess mortality: deaths from all causes compared to previous years
Shown is how the number of weekly or monthly deaths in 2020–2021 differs as a percentage from the average number of deaths in the same period over the years 2015–2019. This metric is called the P-score. The reported number of deaths might not count all deaths that occurred due to incomplete coverage and delays in death reporting.
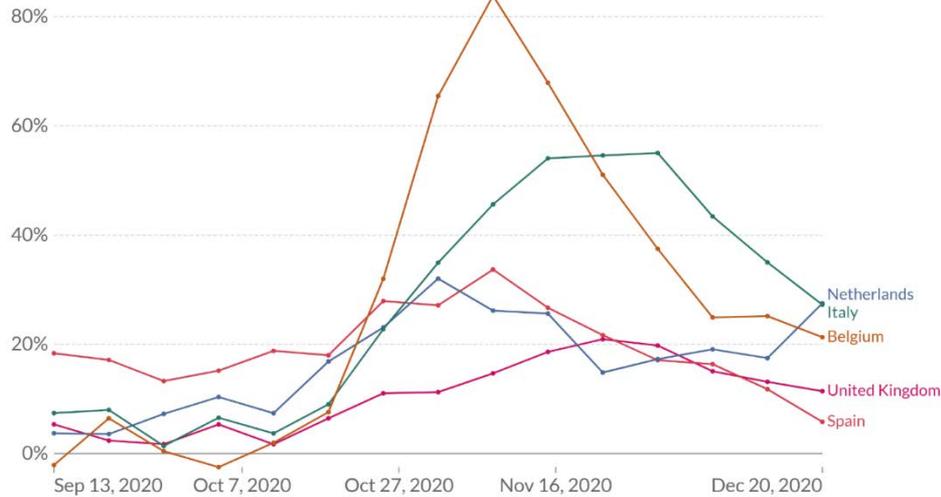
Source: Human Mortality Database (2021) and World Mortality Dataset (2021)   CC BY

Belgium:	84%
Italy:	55%
Spain:	34%
Netherlands:	32%
UK:	21%

Masks off: Belgium relaxes virus rules despite rise in cases

Excess mortality wave 3

The alpha wave: consistent and balanced reaction

Excess mortality: deaths from all causes compared to previous years

Shown is how the number of weekly or monthly deaths in 2020–2021 differs as a percentage from the average number of deaths in the same period over the years 2015–2019. This metric is called the P-score. The reported number of deaths might not count all deaths that occurred due to incomplete coverage and delays in death reporting.
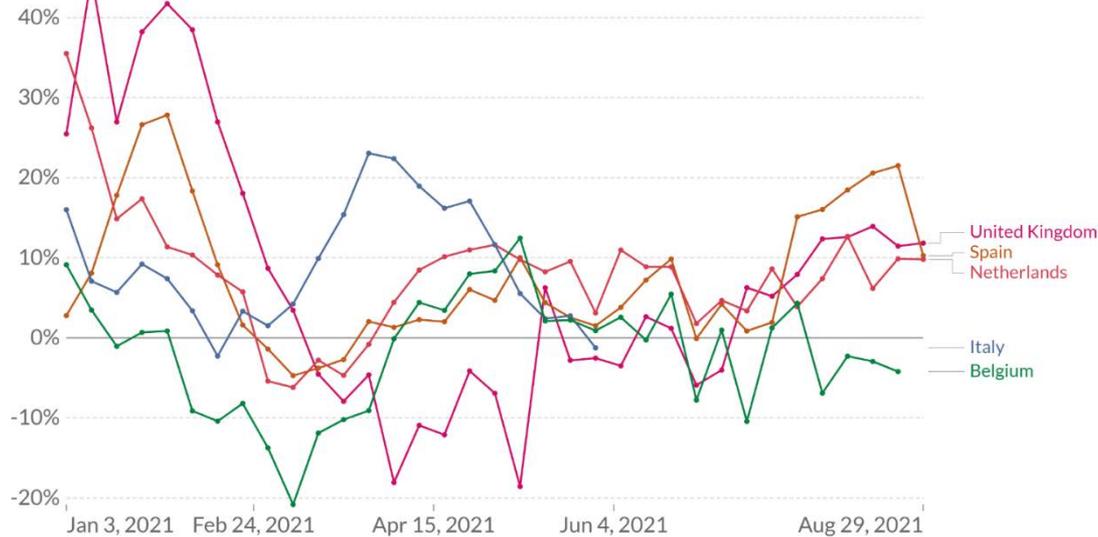
Source: Human Mortality Database (2021) and World Mortality Dataset (2021)   CC BY

UK:	45%
Netherlands:	36%
Spain:	28%
Italy:	23%
Belgium:	12%

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Comparison mortality pandemics

Pandemic	year	Excess deaths	Mean age	% population
COVID-19	2020	>6 million	70y	>0,08%
Mexican flu H1N1	2009	0,4 million	37y	0,005%
Hong Kong Flu H3N2	1968	2,2 million	62y	0,03%
Asian flu H2N2	1957	3,1 million	65y	0,04%
Spanish flu H1N1	1918	75 million	27y	1%

Flu pandemics: 2 to 4 waves in 2 to 3 years

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Infection fatality rate

Age	IFR %
0-24	0,0005
25-44	0,02
45-64	0,2
65-74	2,2
75-84	4,3
85+	11,8
All ages	**1,3**

Infection Fatality Ratio of COVID-19 vs. Seasonal Influenza
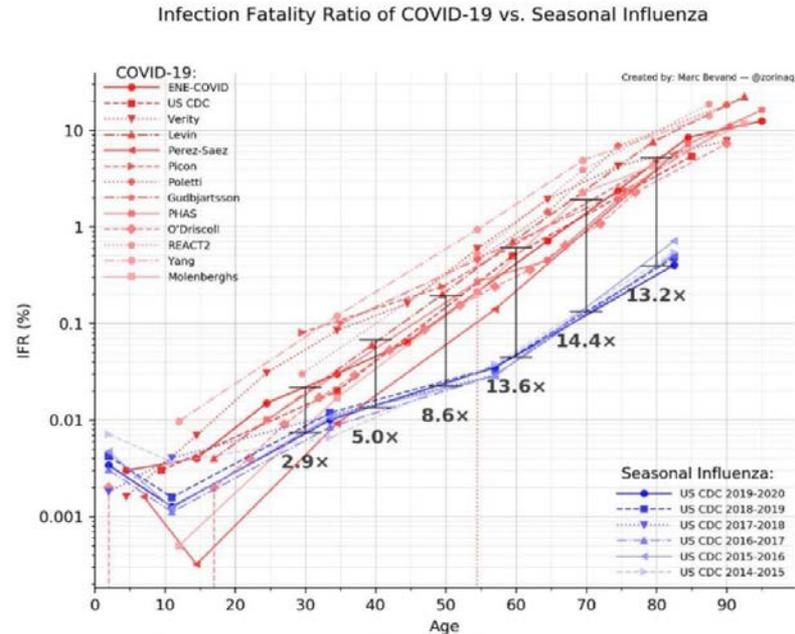
Source: https://github.com/mbevand/covid19-age-stratified-ifr
Note: the vertical lines on two COVID-19 IFR curves (Poletti and O'Driscoll) are caused by the IFR being estimated to be zero by Poletti for age groups 0-19 and 20-49, and by O'Driscoll for 5-9 and 10-14.

IFR seasonal influenza: 0,1-0,2%
3 to 13 times more deadly than influenza

Belgium: 25500 deaths with lockdown/NPI, without NPI 60-80000?

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Molenberghs et al., 2020. BMJ.

Variants and evolving fitness

New paradigm: continuous evolving viral fitness:

- increased spread

- possibly also severity
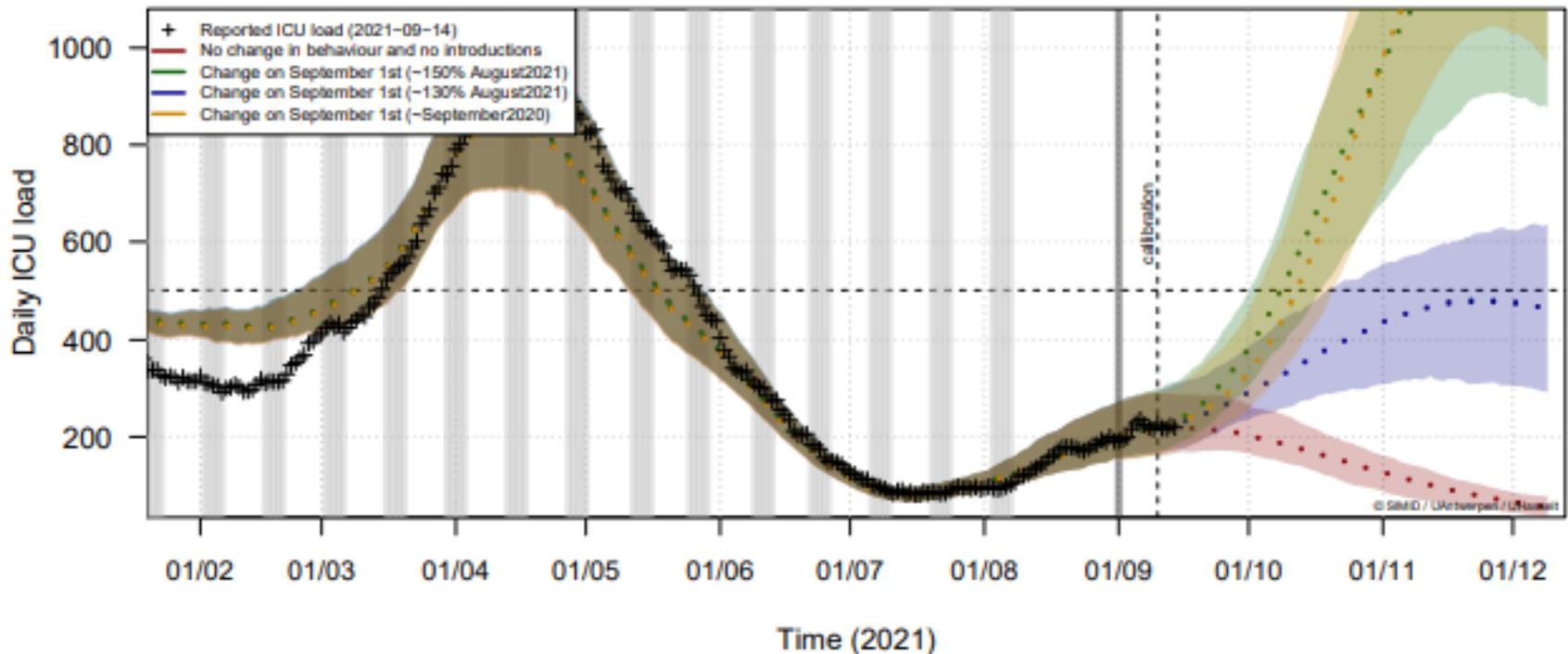
Time to rewrite the text books!

- Alpha (UK): increased transmissibility
- Beta (SA): antibody evasion, re-infection
- Gamma (Brazil): antibody evasion, re-infection
- **Delta (India): increased transmissibility <u>and</u> antibody evasion**
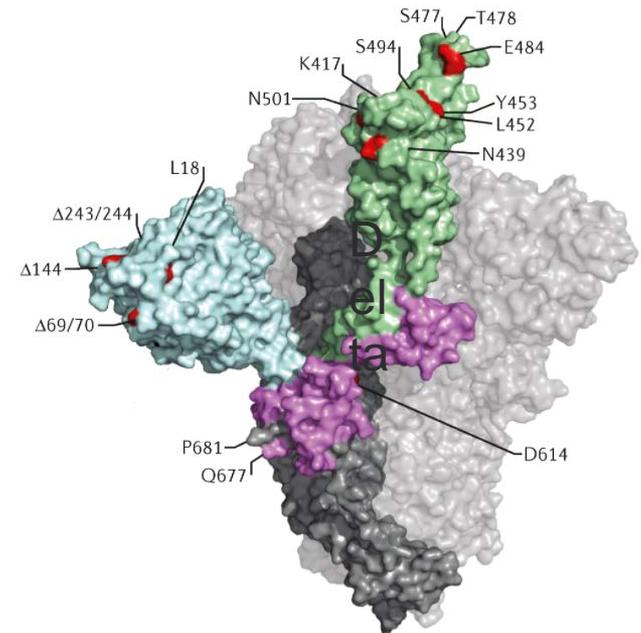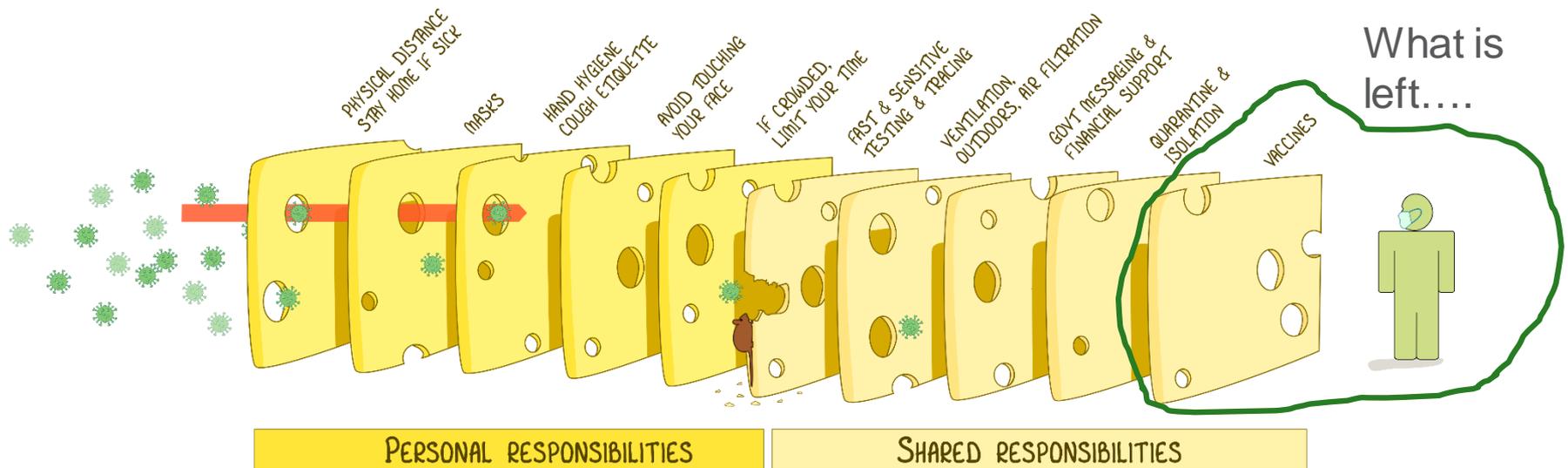
This autumn and winter?

Prepandemic behavior

- **Let's hope the models are wrong!**
- **Or that people stay cautious**

A layered approached

The Swiss Cheese Respiratory Virus Pandemic Defence

RECOGNISING THAT NO SINGLE INTERVENTION IS PERFECT AT PREVENTING SPREAD

PHYSICAL DISTANCE STAY HOME IF SICK

MASKS

HAND HYGIENE COUGH ETIQUETTE

AVOID TOUCHING YOUR FACE

IF CROWDED, LIMIT YOUR TIME

FAST & SENSITIVE TESTING & TRACING

VENTILATION, OUTDOORS, AIR FILTRATION

GOVT MESSAGING & FINANCIAL SUPPORT

QUARANTINE & ISOLATION

VACCINES

What is left….

PERSONAL RESPONSIBILITIES

SHARED RESPONSIBILITIES

EACH INTERVENTION (LAYER) HAS IMPERFECTIONS (HOLES).
MULTIPLE LAYERS IMPROVE SUCCESS.

Ian M Mackay
virologydownunder.com
with thanks to Jody Lanard, Katherine Arden & the Uni of Qld
Based on the Swiss cheese model of accident causation, by James T Reason, 1990
version 3.0
update: 24oct2020

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The future?

From pandemic to endemic

- 90-95% immunity?

- Spring 2022,….?

- Flu-like or cold-like?

- Dual burden: flu + COVID-19

- Seasonality?

- Annual or multiannual surges?

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COVID-19 > Winter viral respiratory diseases

Reduce peak burden:

- Vaccination
  - Booster doses ?
- **Ventilation and/or air filtration**
- Stay home when sick
- Teleworking
- Masks?
- Antivirals?

Sentinel surveillance system parallel to flu:

integrated genomic, antigenic and clinical surveillance

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Pandemic preparedness

EC: European Health Emergency preparedness and Response Authority (**HERA**)

- Anticipate

- Response capacities

- Stockpiles

- Collaborate with industry, R&D

- Central command

Belgium: **Pandemic Law** 14th of August 2021

- Coordination Federal Minister of Health

Invest more in structural public health and prevention!

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Origin?

Zoonosis

- Wildlife
- Intermediate host
- Farmed wild animal
- Domestic animal

(Laboratory leak)
(Frozen food)
(Laboratory design)

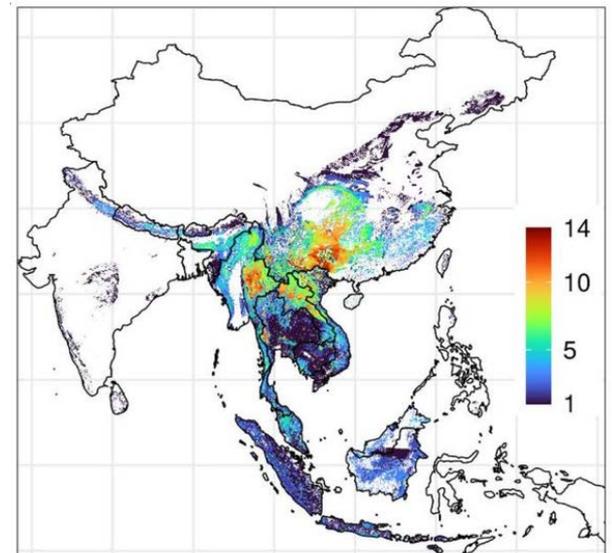# Ancestral host

Rhinolophus (horseshoe) bats
South-East Asia

SARS-CoV-1 (80%)

MERS-CoV (50%)

RaTG13 (96.2%) > horseshoe bat 2013

Hunting

Guano collection

Intermediate hosts?

Deadly pig disease could have led to Covid spillover to humans, analysis suggests

African swine fever led to mass cull of pigs in China and may have increased human-virus contact as people turned to other meat

New animal reservoirs

SARS-CoV-2 and SARS-like viruses are generalist viruses

New animal hosts

Carnivores:
- Mink, Ferrets, otters
- Raccoon dogs
- Domestic and wild cats

Rodents:
- Deer mice, Hamsters (exp)
- Beavers (Mongolia)

*Cervidae***:**
- White-tailed deer (30% seropositive US)

Bats

Primates

Livestock: not or poorly susceptible

Monitor, but **human-to-human spread is biggest concern**

One health

- Surveillance wild animals
- Regulate/stop wild animal hunting, farming, trade
- Monitor domestic animals
- Early detection in humans

Reduce drivers for emergence and spread of infectious disease

One health approach:
"Healthy people and healthy animals in a healthy environment"

Thanks for your attention