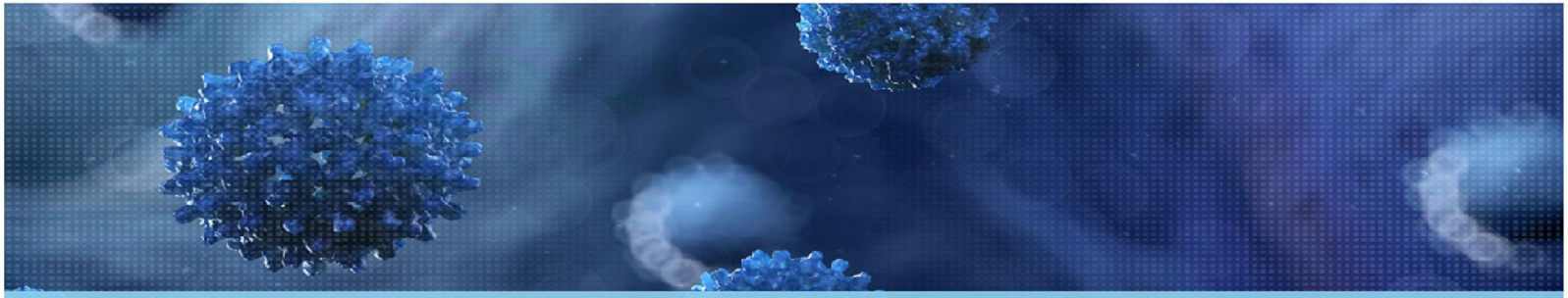
Erasmus MC

WHO collaborating centre for
Arbovirus and Hemorrhagic
Fever Reference and Research

Viroscience lab

WHERE SKILLS MEET TO STUDY & PROTECT



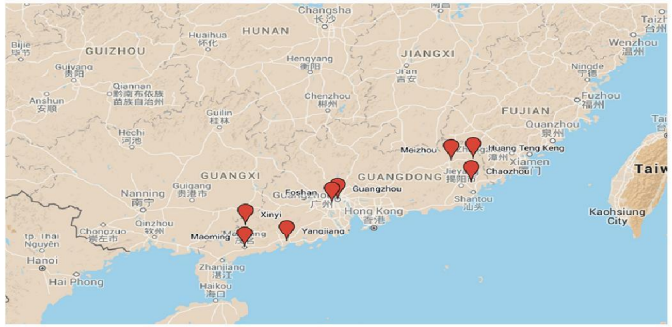
Van nCOV-Wuhan naar pandemie

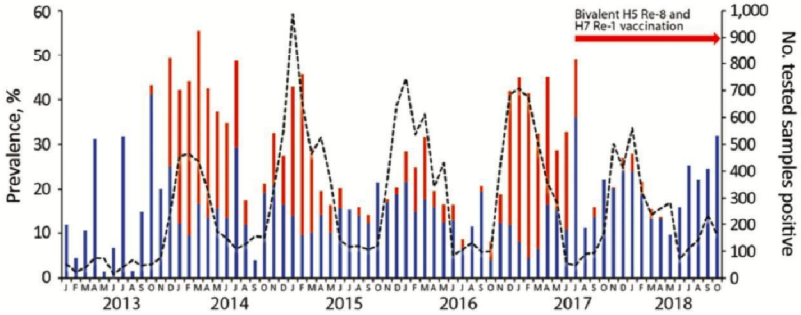
www.pdpcenter.nl

5.1.2e @erasmusmc.nl; 5.1.2e


新浪财经
https://finance.sina.cn
武汉不明原因肺炎已隔离 检测结果将第一时间公布
一财网
12月31日 10:16
+ 关注
原标题
On the evening of the 30th, an "urgent notice on doing a good job in the treatment of pneumonia of unknown causes" was settled as a redhead document of the Medical, Administrative and Medical Office of the Wuhan Municipal Health Committee, which was widely spread on the Internet.
On the morning of the 31st, the reporter of China Business News dialed the official hotline of Wuhan Municipal Health and Health Committee 12320 and learned that the content of the document is true.

China en levende dieren markten



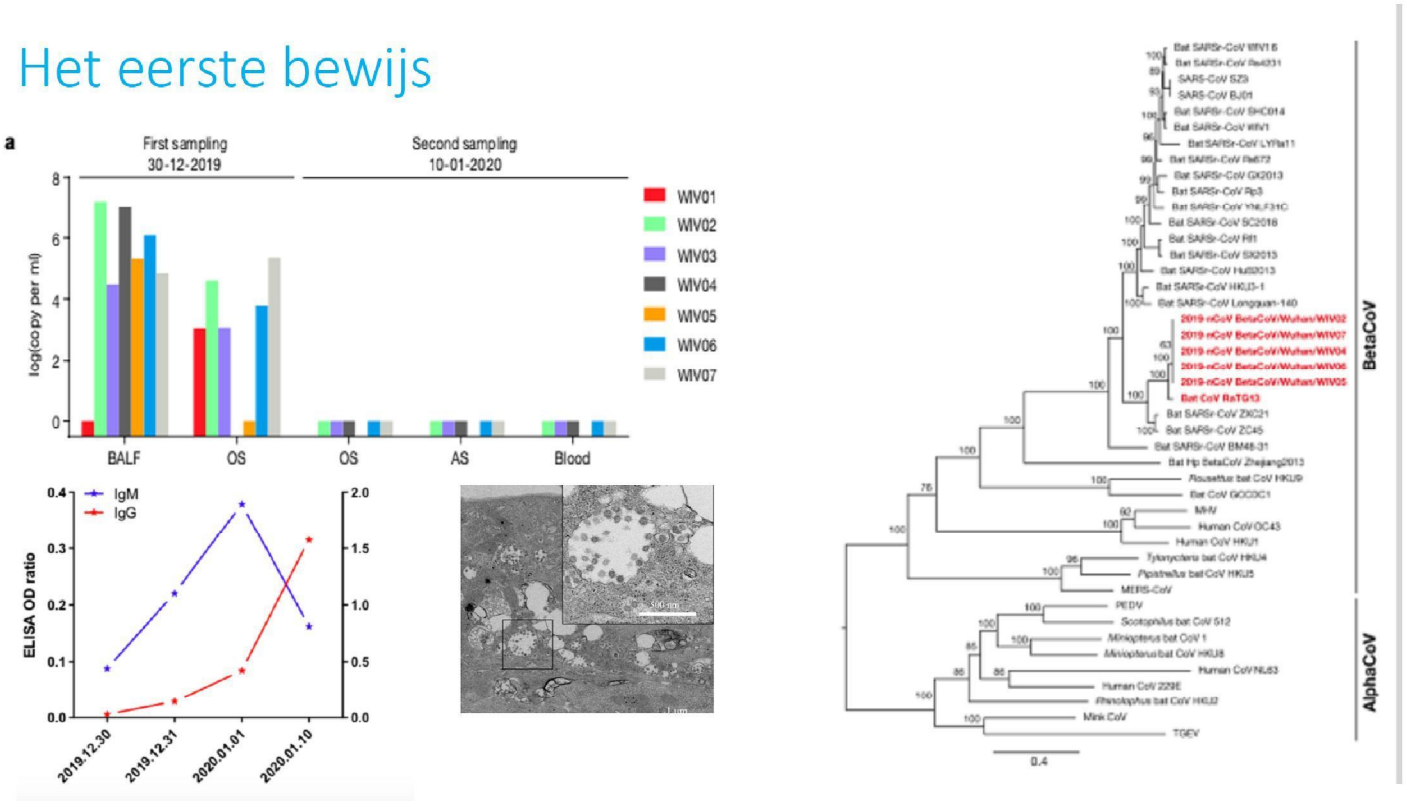


5.1.2e *et al., 2019;* 5.1.2e *et al, in preparation*

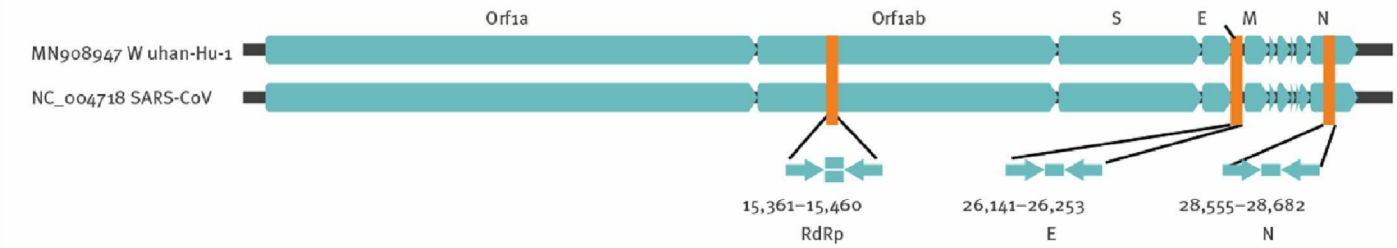
SITEMAP

KONINKLIJKE NEDERLANDSE
AKADEMIE VAN WETENSCHAPPEN

Het eerste bewijs



5.1.2e *et al. 2020 https://www.nature.com/articles/s41586-020-2012-7?rel=outbound; shared online in preprint Jan 23d*



- Sequence provided virological.org: Jan 12th
- Primers shipped Rotterdam, London, HongKong Jan 13th
- Validation from biobanked resp samples and from SARS RNA
- Protocol shared on WHO site Jan 17th, published 20th

EVD-LabNet

ecdc EUROPEAN CENTRE FOR DISEASE PREVENTION AND CONTROL

https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance

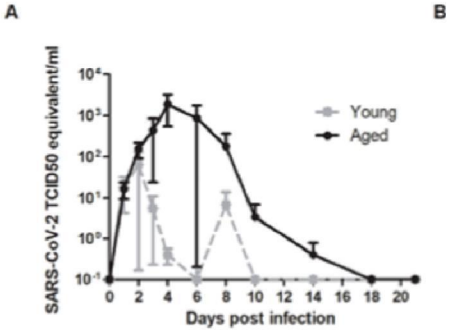
5.1.2e *et al. 2020*

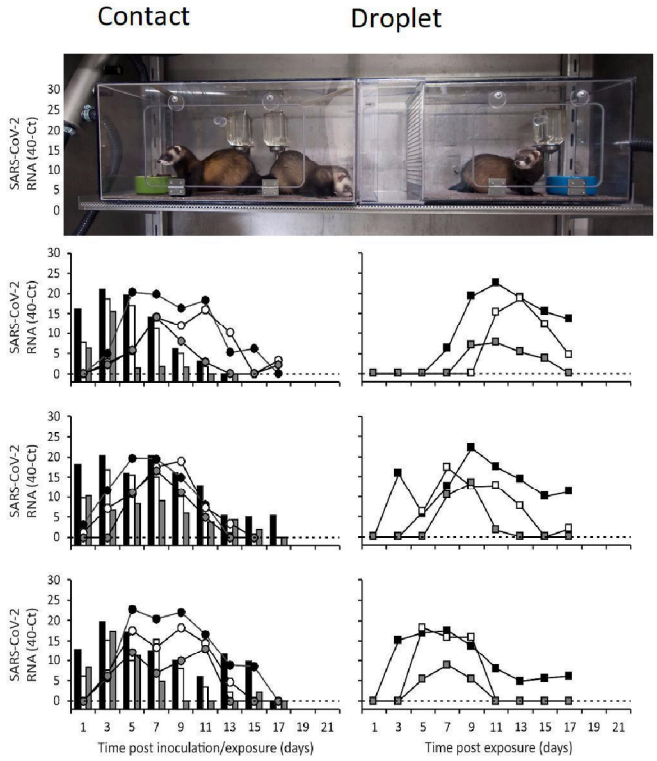
Belangrijke vraag: hoe verspreidt het precies? De eerste inschatting

1. Droplets: yes
2. Aerosols: in high risk situations ⟵ Hot topic debates, challenging science
3. Feces: ?
4. Surfaces: ?

Onderzoek naar SARS Cov 2 transmissie

Macaques:
Virus replicates in the nose
(and in the lungs)

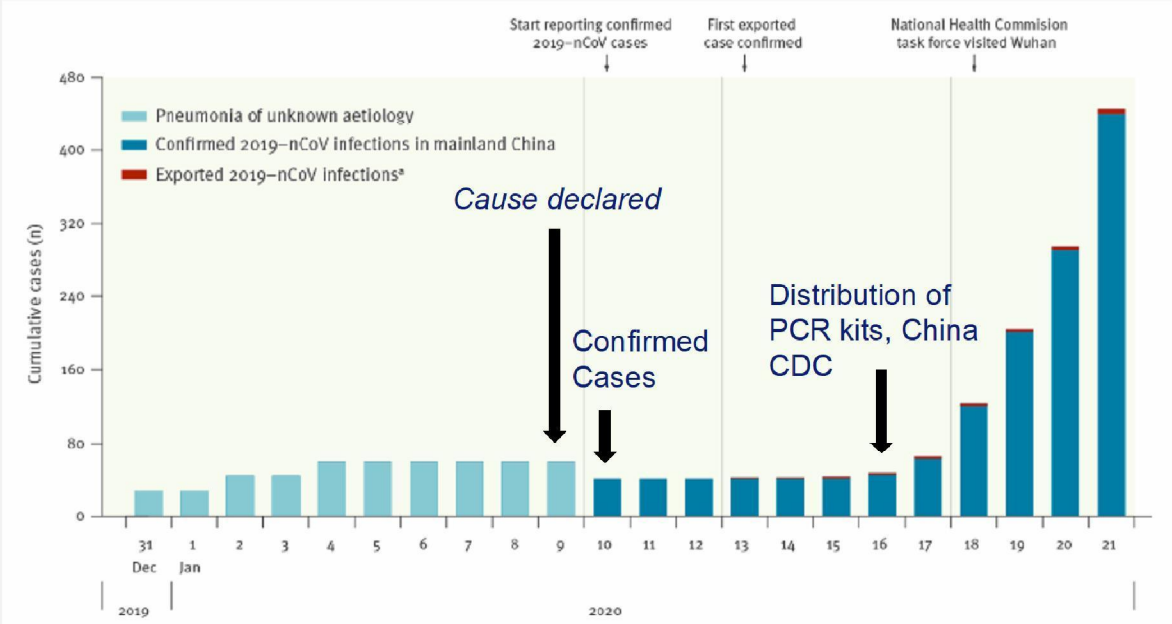




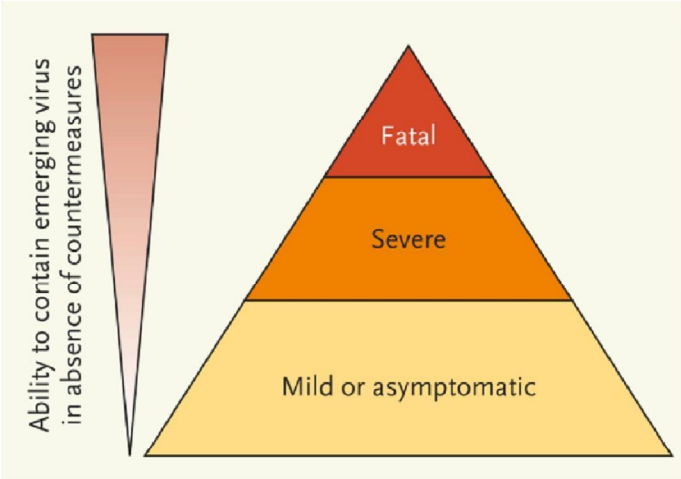
5.1.2e *et al., 2020; Richard et al, Sci Rep 2020*

De eerste gegevens uit Wuhan

Figure 1. Increase in laboratory-confirmed cases of 2019-nCoV infection over time, as at 21 January 2020



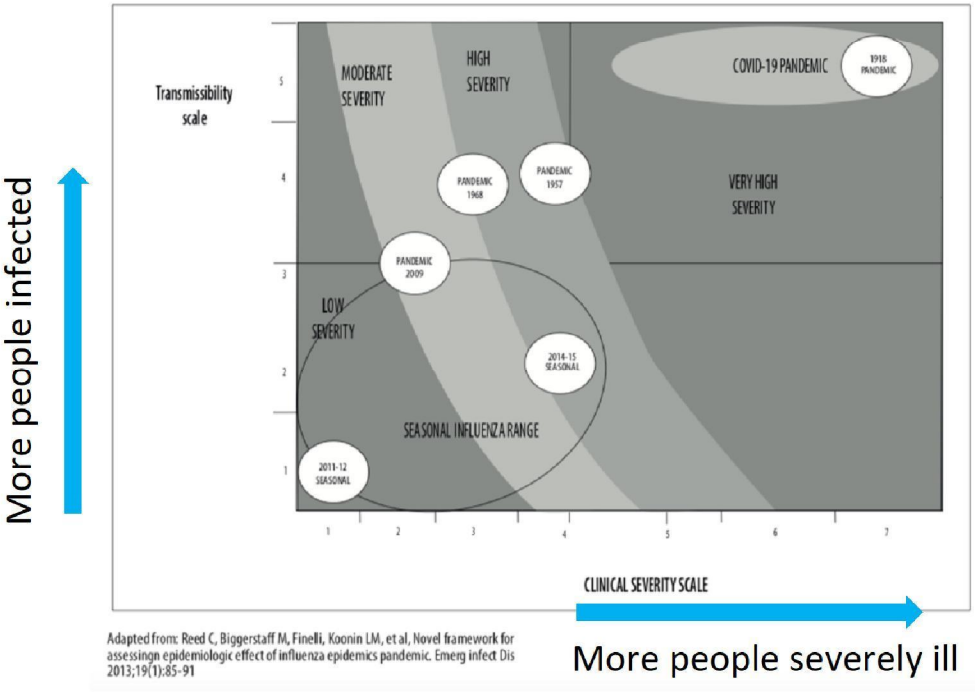
Ernst en omvang van de uitbraak vaststellen: een lastige vraag



1. Diagnostiek ontbreekt
2. Klachten zijn niet specifiek
3. Personen met milde klachten zijn niet in beeld
4. Serologische studies nodig
5. Onderzoek kost tijd
6. Combinatie van uitbraak onderzoek en bestrijding kan conflicteren

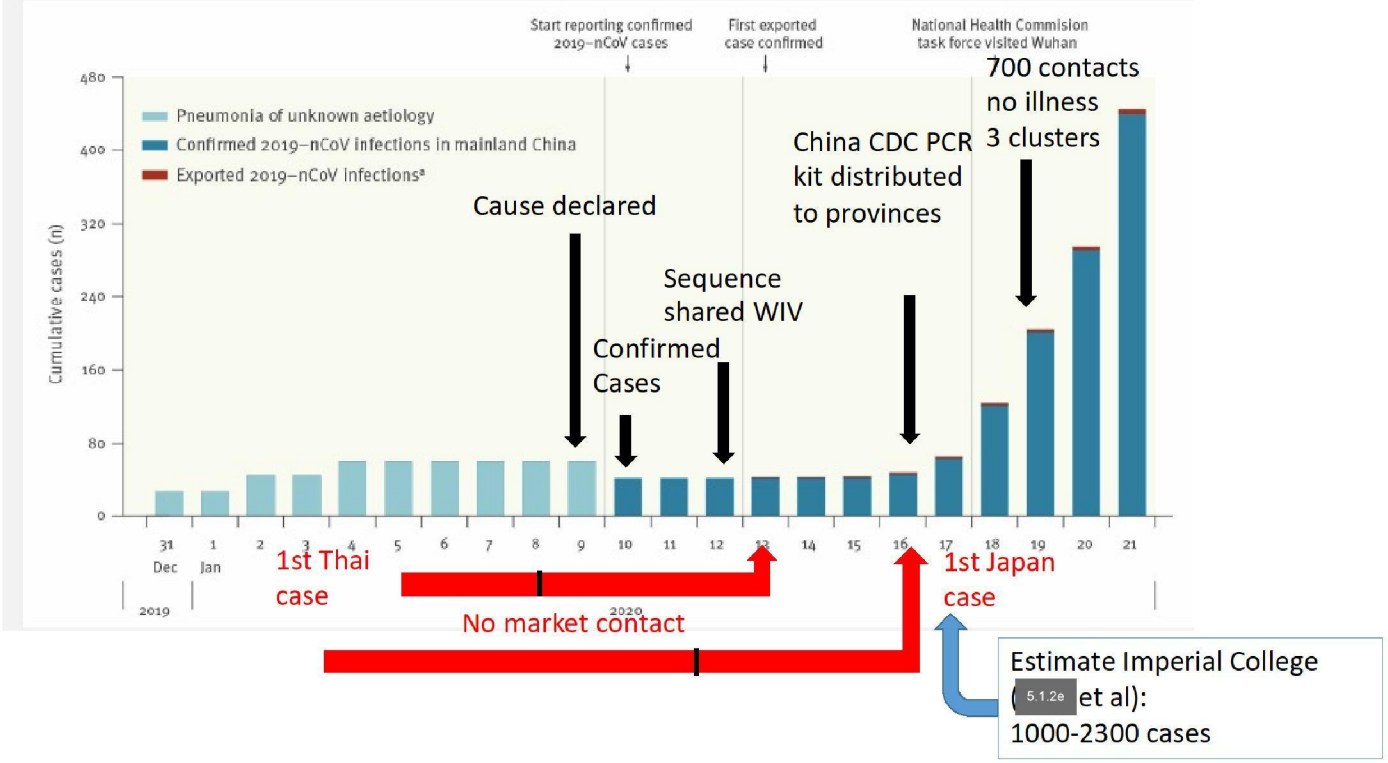
5.1.2e *et al., 2020*

Impact of a pandemic is determined by transmissibility and severity



Adapted from: Reed C, Biggerstaff M, Finelli, Koonin LM, et al, Novel framework for assessingn epidemiologic effect of influenza epidemics pandemic. Emerg infect Dis 2013;19(1):85-91

Figure 1. Increase in laboratory-confirmed cases of 2019-nCoV infection over time, as at 21 January 2020



De Europese seeding: wat zou jij hebben geadviseerd?

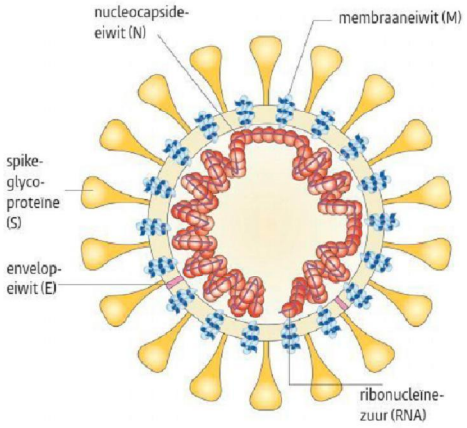
Feb 2020 Wintersports Austria, Switserland, Italy

Feb 2020 Carnaval South of the country

Tot Feb 21, 47 bevestigde gevallen in Europa

5.1.2e *et al, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7068164/*

Doorbraak: real-time sequencing



Schematische voorstelling van het nieuwe coronavirus sars-cov-2 (diameter 60-140 nanometer). Illustratie: Peiris e.a., Nature Medice Review, 2004 (met aanpassingen)

Informatie die in de genetische code zit opgesloten

Wat is het?
Waar komt het vandaan?
Hoe verschilt het van bekende virussen?
Is het onderdeel van een uitbraak?
…….

Hospital A
Hospital B
Hospital C
Hospital D
Hospital E
Hospital F
Nederlandse patient

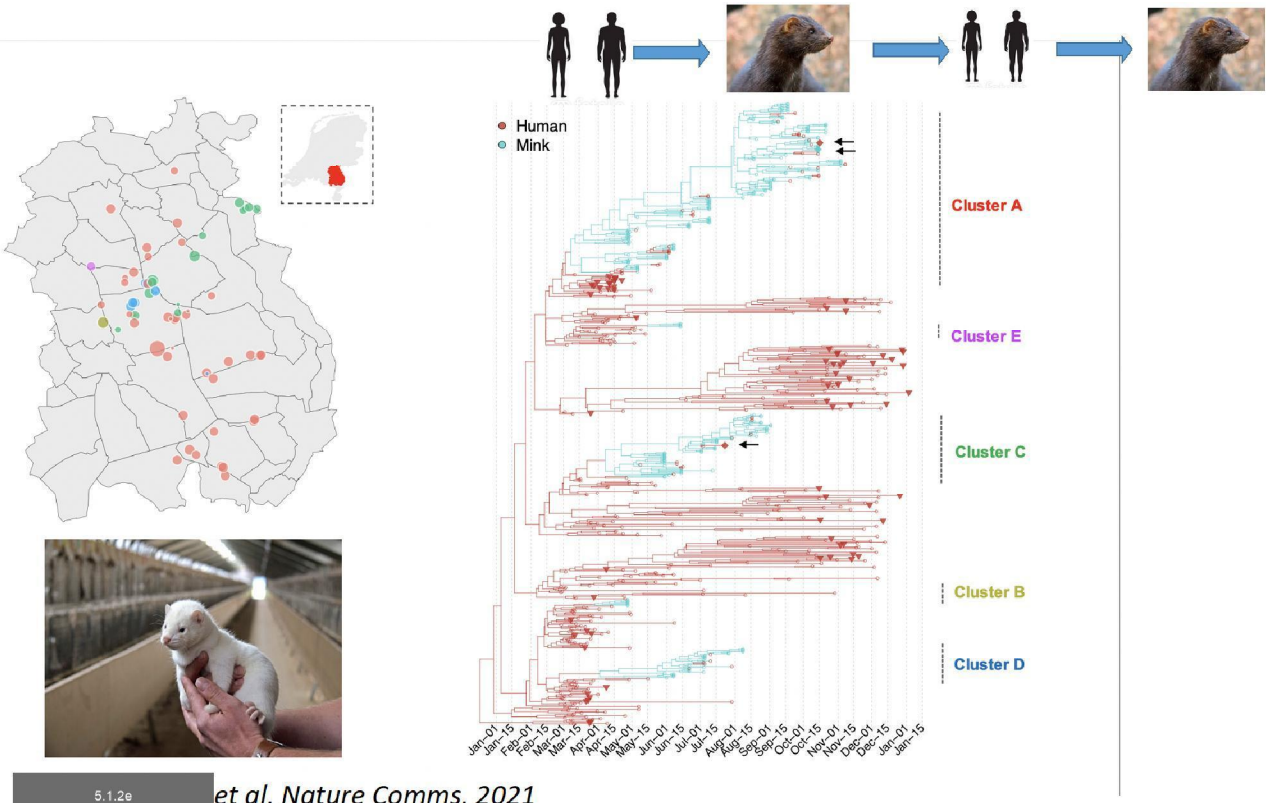
Phase 2: Weekend 5-8 March, screening HCW
Hospitals in Brabant

- "bombardment" of viruses
- Enhanced control measures

5.1.2e

et al, 2020; Oude
al., 2020;
al., 2020;
al., 2020

Erasmus MC



5.1.2e

et al, Nature Comms, 2021

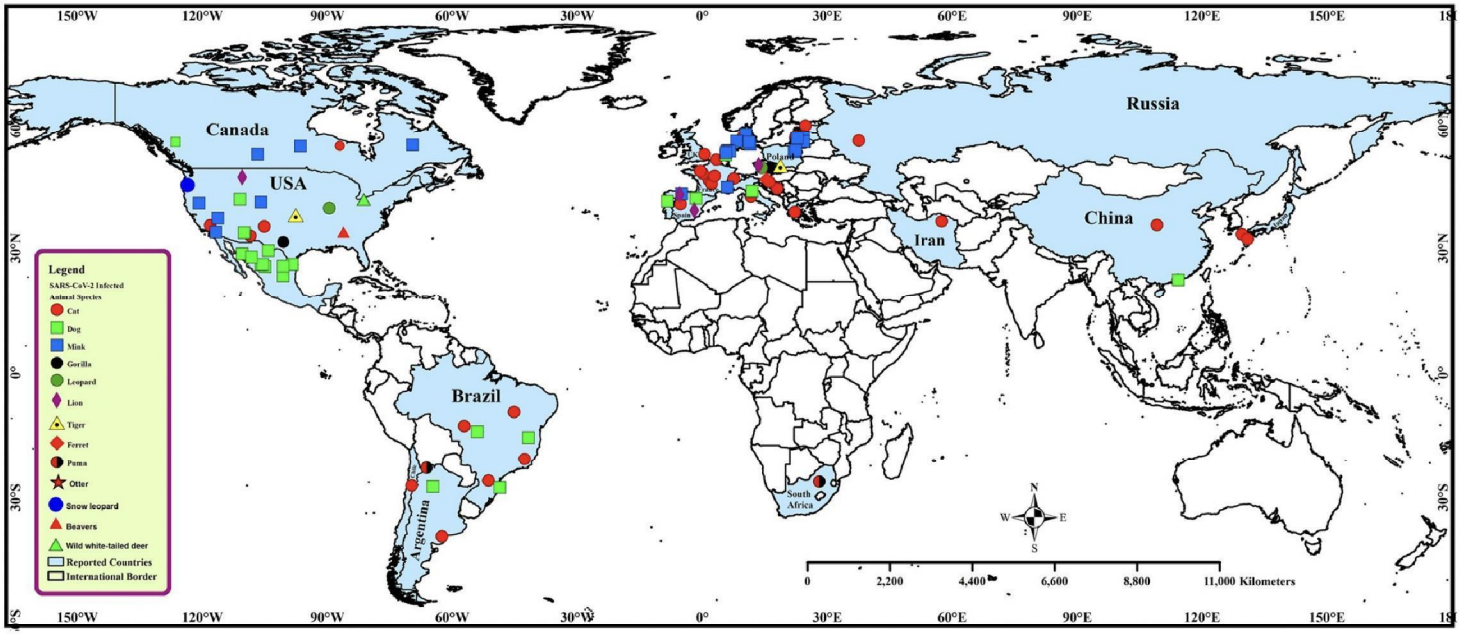
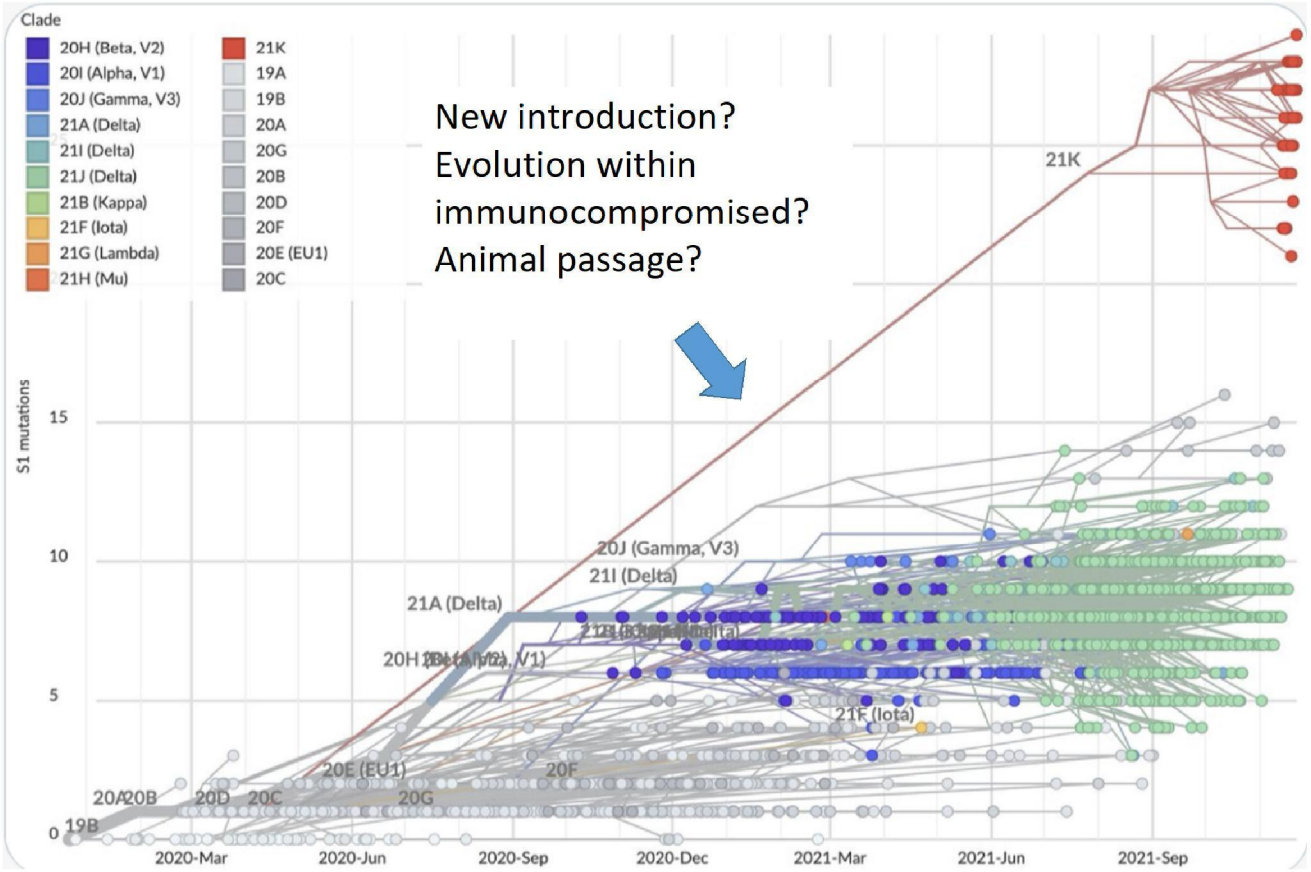
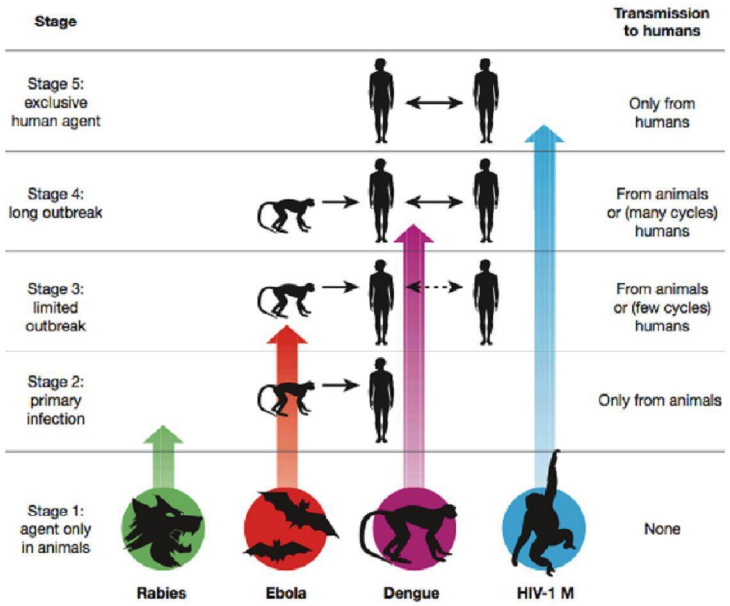


Fig 3. Spatial distribution of SARS-CoV-2 in domestic and wild animals in the world.

https://doi.org/10.1371/journal.pone.0260635.g003


Clade
20H (Beta, V2)
20I (Alpha, V1)
20J (Gamma, V3)
21A (Delta)
21I (Delta)
21J (Delta)
21B (Kappa)
21F (Iota)
21G (Lambda)
21H (Mu)
21K
19A
19B
20A
20G
20B
20D
20F
20E (EU1)
20C
New introduction?
Evolution within immunocompromised?
Animal passage?
S1 mutations
15
10
5
0
20J (Gamma, V3)
21I (Delta)
21A (Delta)
20H (Beta, V2)
21F (Iota)
20E (EU1)
20F
20A
20B
20D
20C
20G
19B
2020-Mar
2020-Jun
2020-Sep
2020-Dec
2021-Mar
2021-Jun
2021-Sep

Vragen bij een virale spillover

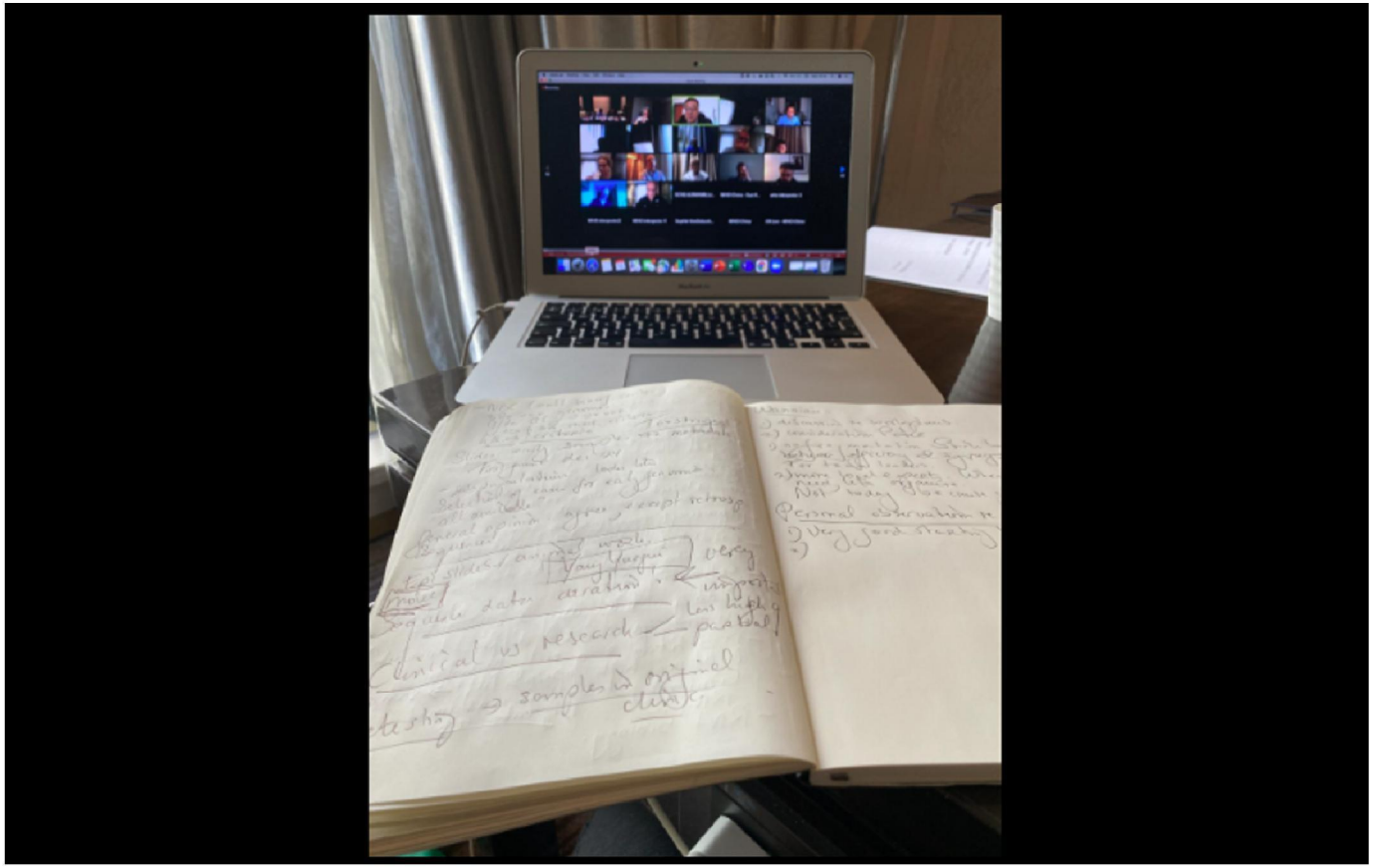


5.1.2e *et al., 2007;* 5.1.2e *et al., 2017*

1. Wat is de oorzaak?
2. Waar komt het vandaan?
3. Hoe ver is het verspreid?
4. Hoe ernstig is de ziekte?
5. Is het besmettelijk?
6. Zijn mensen (deels) beschermd?
7. Hoe is het te stoppen?


Face Shield
scoot


SEASONS
by Stadelz

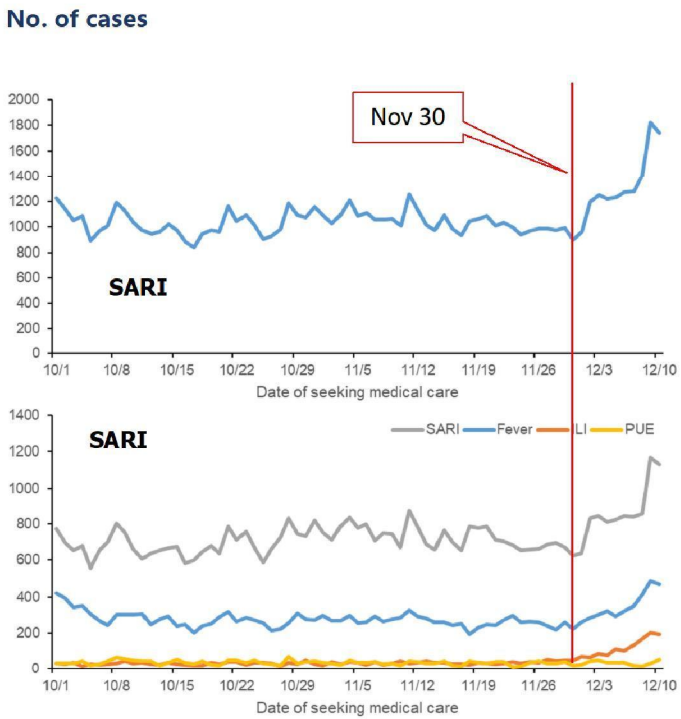


Studies

Meldingen van mensen met griepverschijnselen tweede helft 2019

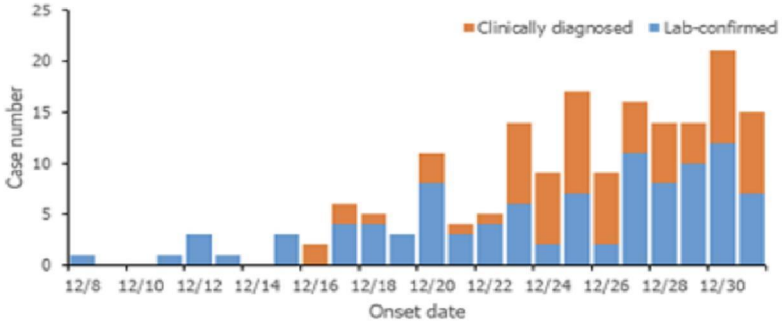
>76,000 patienten dossiers van 233 gezondheidscentra in 15 districten van Wuhan, Oct 1 tot Dec 10, 2019

Hertesten van verdachte patienten cases October 2019-December 2019



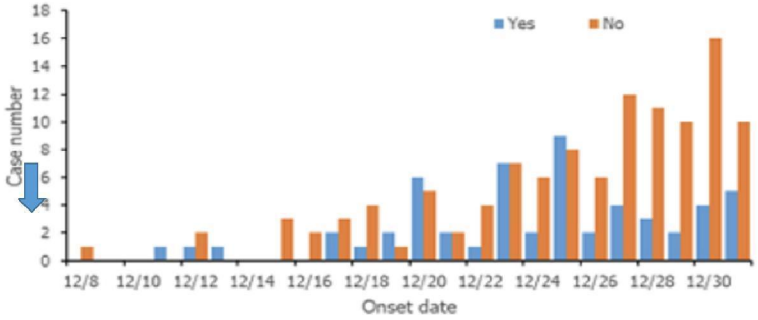
COVID-19 gevallen en vermoedelijke gevallen uit onderzoek

Aantal cases

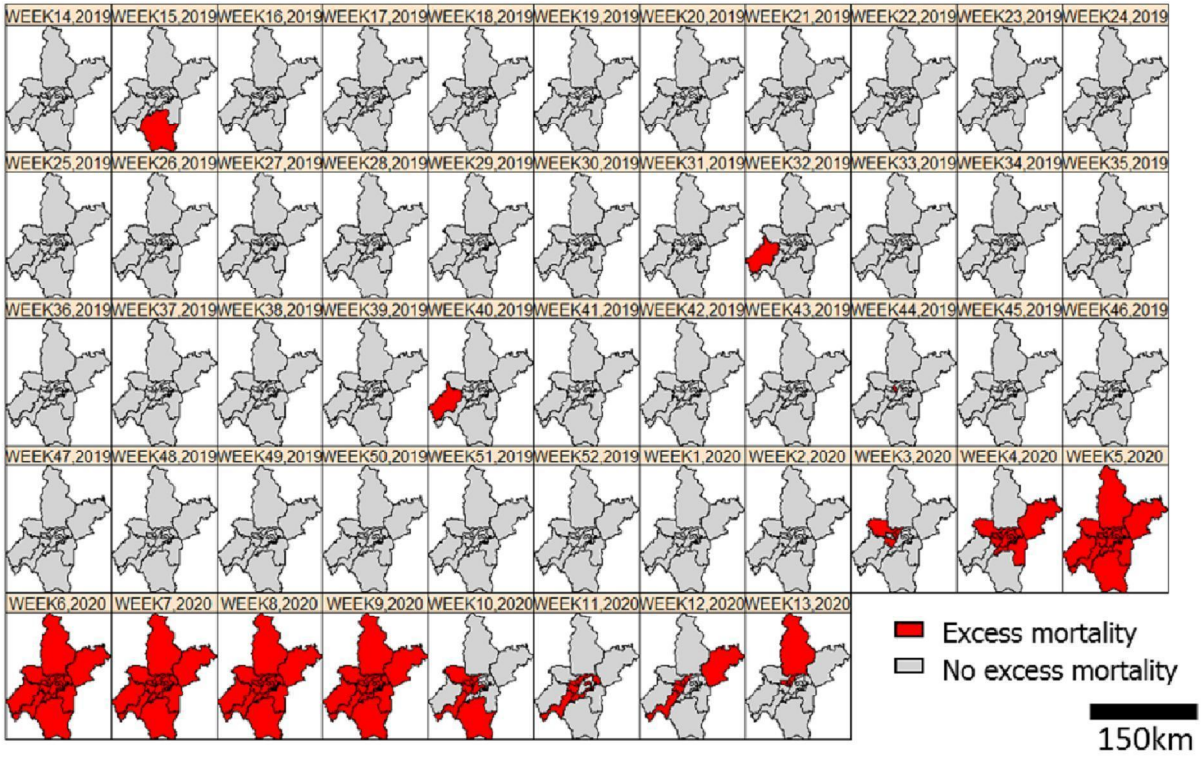


N =174

Contact met de markt



2/3d no contact


WEEK14,2019
WEEK15,2019
WEEK16,2019
WEEK17,2019
WEEK18,2019
WEEK19,2019
WEEK20,2019
WEEK21,2019
WEEK22,2019
WEEK23,2019
WEEK24,2019
WEEK25,2019
WEEK26,2019
WEEK27,2019
WEEK28,2019
WEEK29,2019
WEEK30,2019
WEEK31,2019
WEEK32,2019
WEEK33,2019
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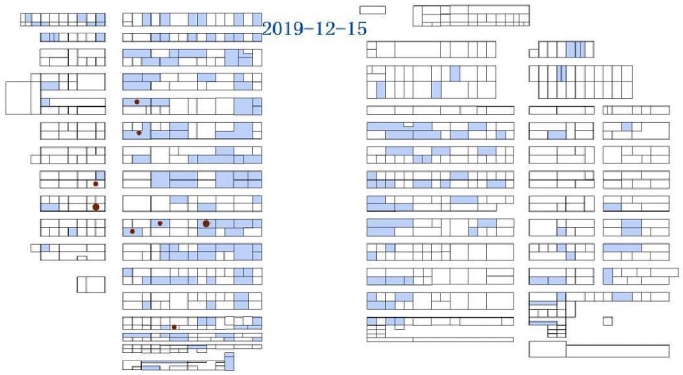
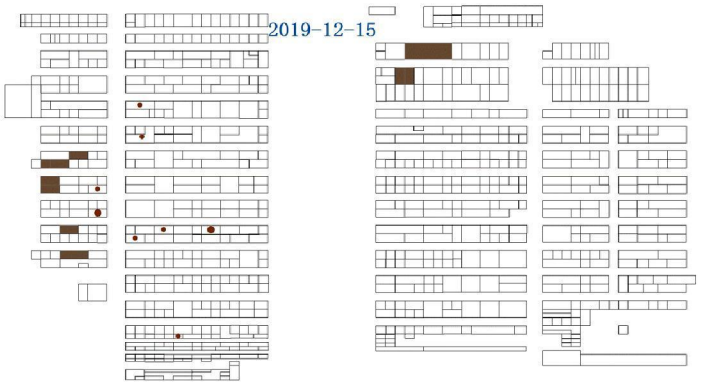
WEEK35,2019
WEEK36,2019
WEEK37,2019
WEEK38,2019
WEEK39,2019
WEEK40,2019
WEEK41,2019
WEEK42,2019
WEEK43,2019
WEEK44,2019
WEEK45,2019
WEEK46,2019
WEEK47,2019
WEEK48,2019
WEEK49,2019
WEEK50,2019
WEEK51,2019
WEEK52,2019
WEEK1,2020
WEEK2,2020
WEEK3,2020
WEEK4,2020
WEEK5,2020
WEEK6,2020
WEEK7,2020
WEEK8,2020
WEEK9,2020
WEEK10,2020
WEEK11,2020
WEEK12,2020
WEEK13,2020
Excess mortality
No excess mortality
150km

Case notification: December 27th 2019

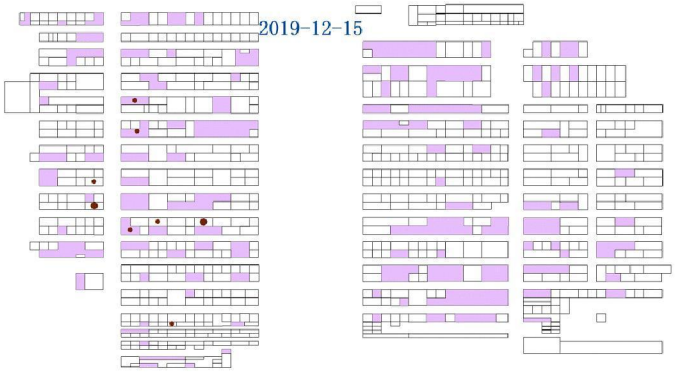
1474860



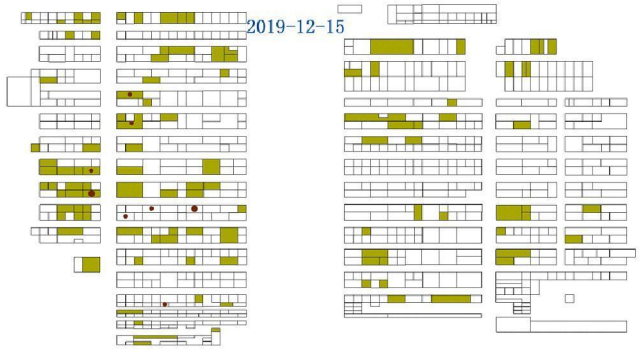
Aquatic products



Wild animal meat

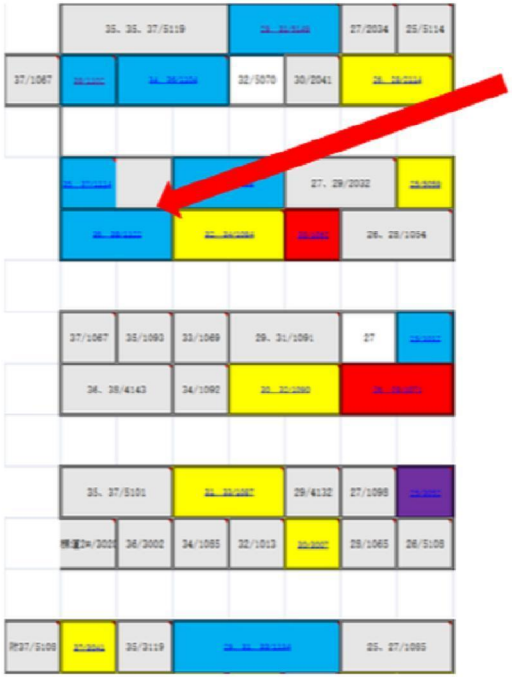


Meat



Poultry

西8-36,38 （1122）
West 8-36,38 (1122)



摊位	编号	摊主姓名	售卖类型	来源
大众家禽批发	西8-36,38（1122）	曾**	鸡	未知
			蛇	陕西山阳县建惠生态种养专业合作社 刘*
			竹鼠	云南永德县竹鼠产销专业合作社 尹**
			兔	未知
			暹罗鳄	广州黄沙 洪**
			白条野鸡	武汉黄陂区三里桥 丁**

Stall	Serial number	Owner	Animal type	Sources
Dazhong wholesale poutry	West 8-36,38 (1122)	Zen **	chicken	unknown
			snake	Liu *, Shanyang, Shanxi
			Bamboo rat	Yin **, bamboo farms, Yongde, Yunnan
			rabbit	unknown
			Siamese crocodile	Hong **, Huangsha, Guangzhou
			pheasant	Mr. Ding, Sanliqiao, Huangpi district, Wuhan, Hubei

Survey wild animals on markets in Wuhan

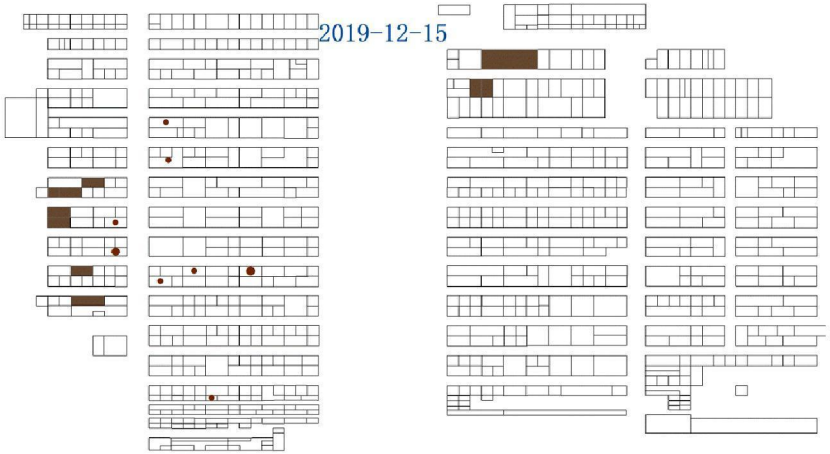
Between May 2017 and November 2019

47000 individuals, 38 species, including 31 protected

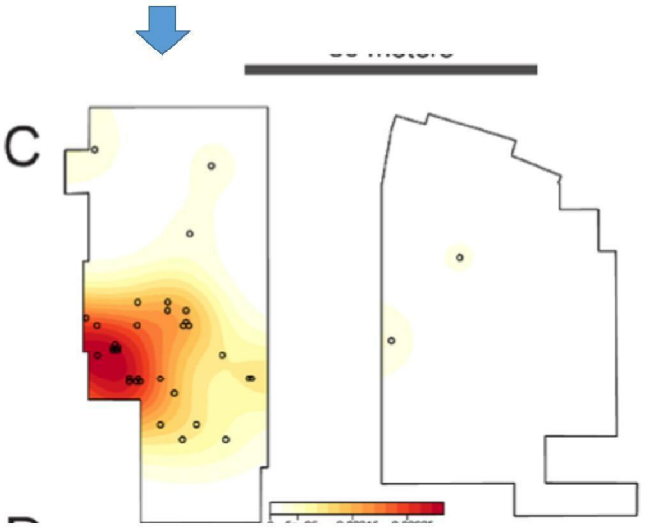
Several susceptable species

5.1.2e *et al, 2021 https://www.nature.com/articles/s41598-021-91470-2.pdf*

Map of the Huanan market



Positive environmental samples



Strong association with location of stalls selling live wild animals

5.1.2e *et al. https://zenodo.org/record/6299116#.Yh5IlC1Q23V*

Laboratorium hypothese

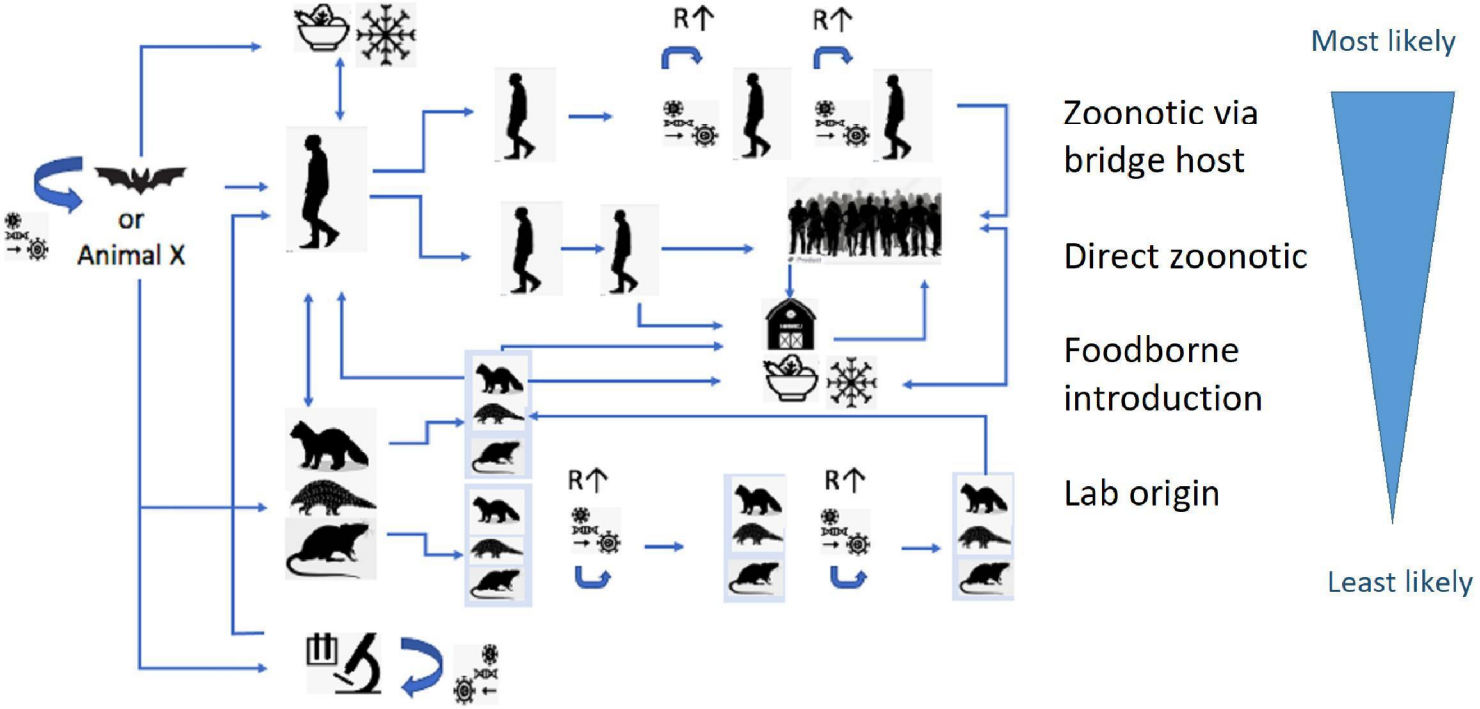
Wuhan instituut voor virologie doet onderzoek naar virussen in vleermuizen

Vooral genetisch onderzoek (seqeuncing van vleermuizen poep)

Meerdere publikaties met gegevens en onderzoekers doen mee aan congressen , presenteren veel

Geen aanwijzingen voor aanwezighied virus in lab

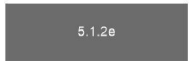
Geen aanwijzingen voor zieke medewerkers (ook getest dmv bloedonderzoek)



https://www.who.int/publications/i/item/who-convened-global-study-of-origins-of-sars-cov-2-china-part

“Every day is a brand new day with this pandemic”

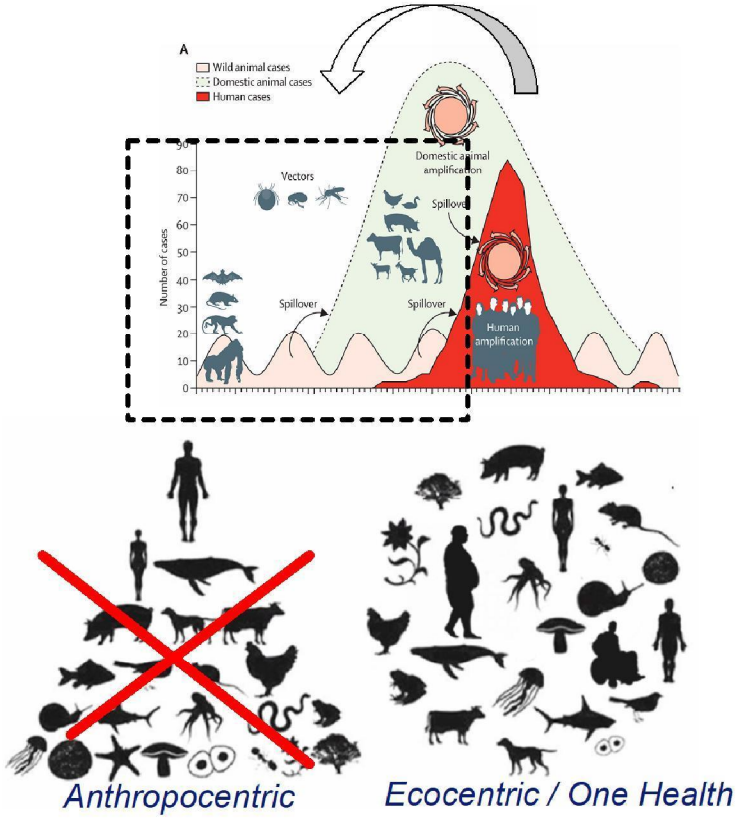
“We all long to go back to normal but normal led to this”



EID preparedness research

Can we:

- Predict Risk?
- Develop capacity to detect all relevant pathogens / infections?
- Detect outbreaks early?
- Prevent?



Propositions for discussion

The human-animal-ecosystem interface is a crucial part of emerging disease outbreaks

A new immune-escape variant with increased transmissibility that evolved from passage through Dutch mink, we would not have been detected timely enough for control

The current One Health response systems work for slow evolving outbreaks, but lack a sense of urgency needed for timely intervention