K2: On duty in the grey zone of science and policy (Thea Kolsen Fischer)

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COPRODUCTION MEETING, OPEN TO ALL, TOMORROW MORNING

Room C1 M4

08:00 - 09:00 CEST

ON DUTY IN THE GREY ZONE BETWEEN SCIENCE AND POLITICS

THEA KØLSEN FISCHER, MD, DMSc (PhD), MPG, EIS

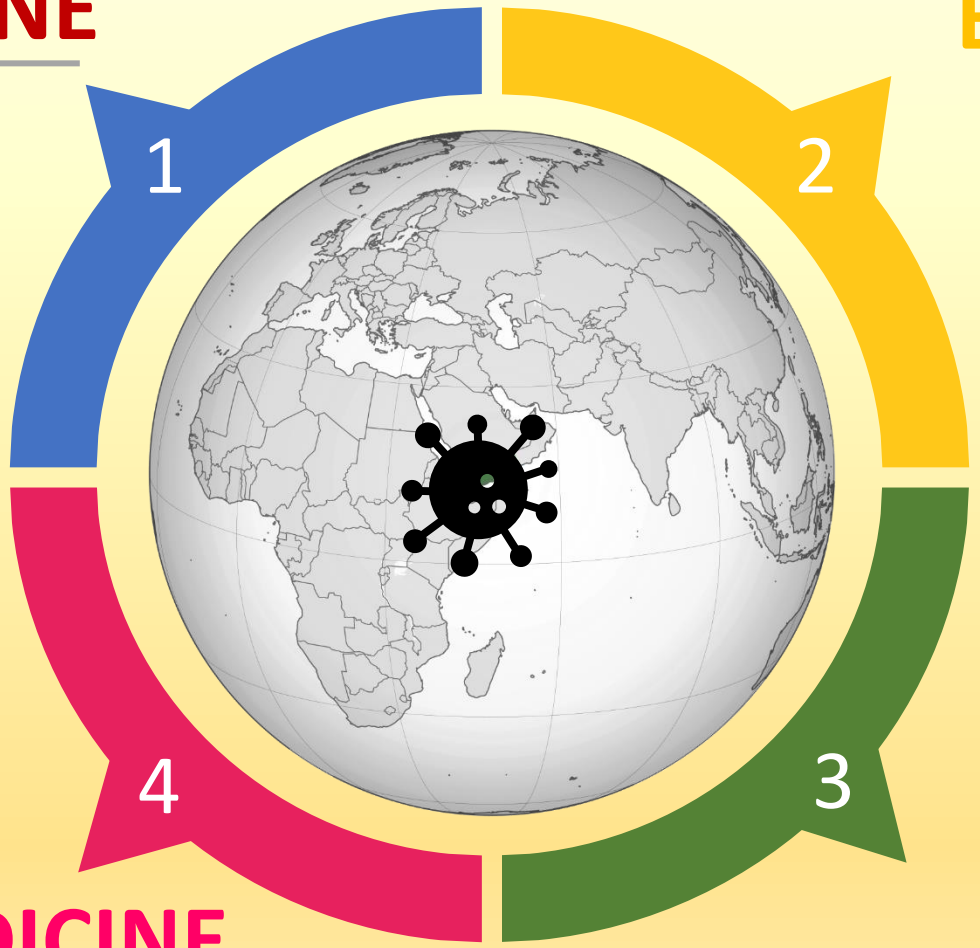
Professor in Public Health Science, Virus Infections and Epidemics,
University of Copenhagen
Director of Clinical Research,
North Zealand University Hospital, Hillerød, Denmark

KØBENHAVNS UNIVERSITET

”4 PILLARS”: 360° AROUND VIRUSES & EPIDEMICS

CLINICAL MEDICINE

EPIDEMIOLOGY



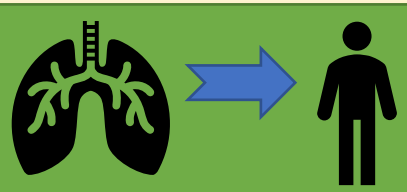
VIROLOGY

PREVENTIVE MEDICINE

SARS-COV-2

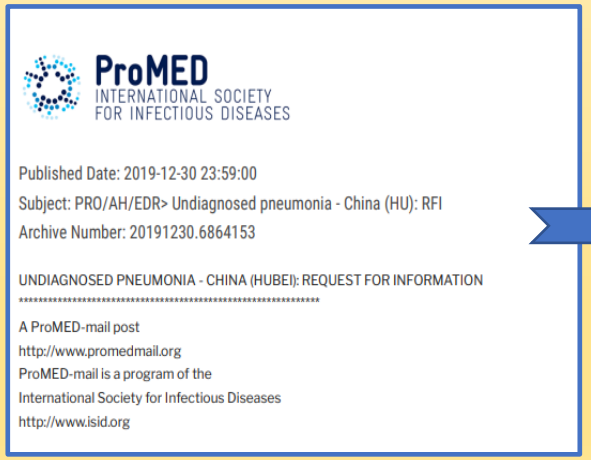
A new virus

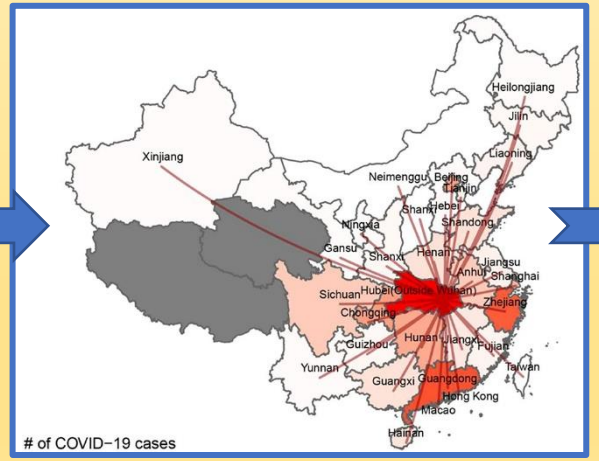
- Disease manifestations
- Morbidity & mortality
- Risk Factors
- Virus transmission

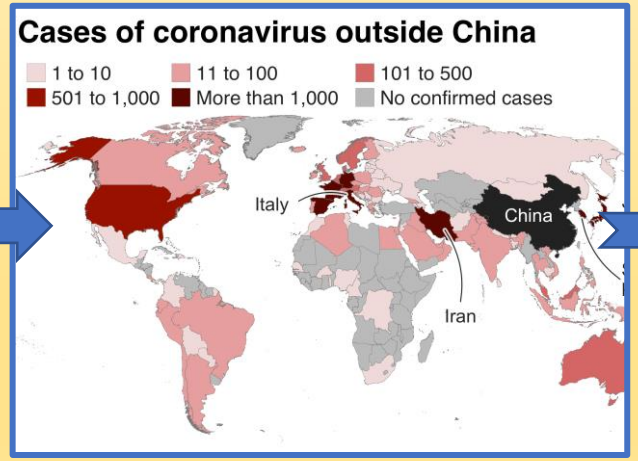


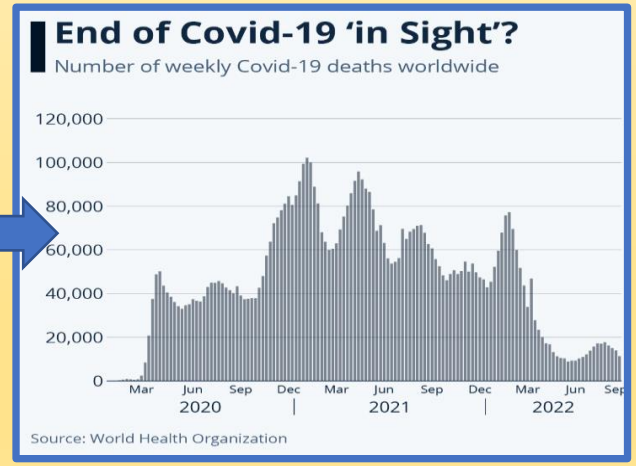
Immunity
Long COVID

Virus (escape) variants
- new vaccines + best program?
- effective treatment?



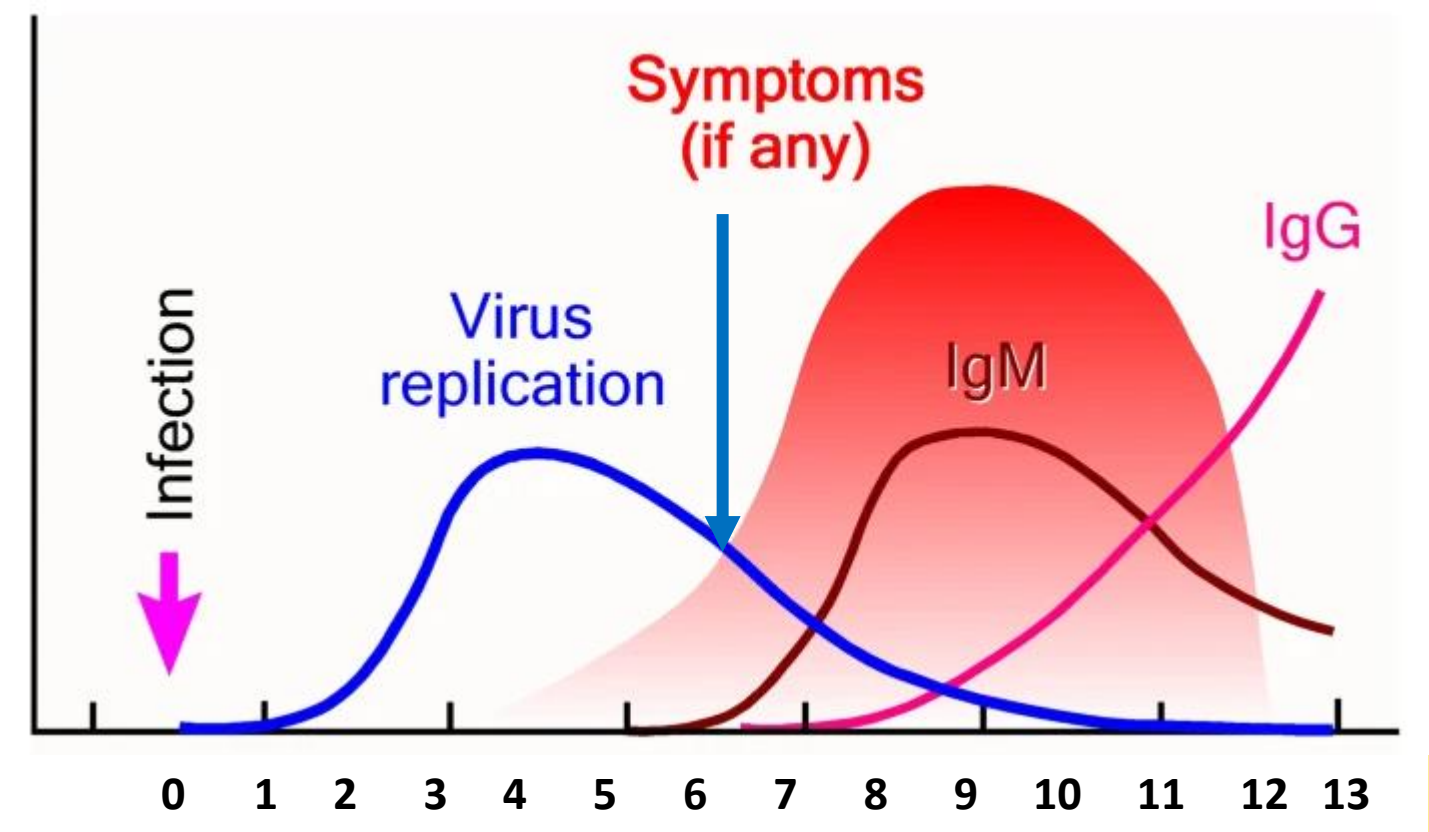






30 Dec. 2019 | **Jan. – Feb. 2020** | **Feb. - March 2020** | **May 2023**

MORE QUESTIONS THAN ANSWERS…



”Sneaky” features of SARS-CoV-2:

1) Patient transmits virus **before** symptoms onset (if symptoms)

2) Short generation time

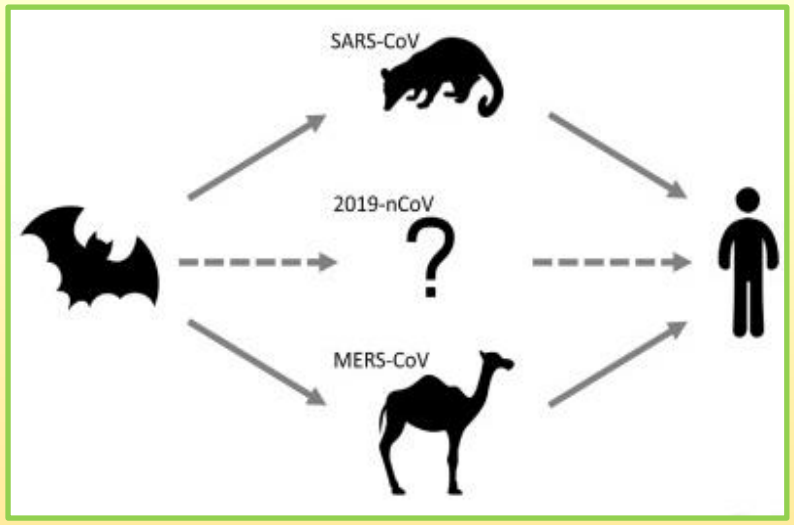
References:
Miyazawa Inflammation and Regeneration (2020) 40:39 Inflammation and Regeneration

WHERE DID IT COME FROM?

- From a lab in Wuhan?

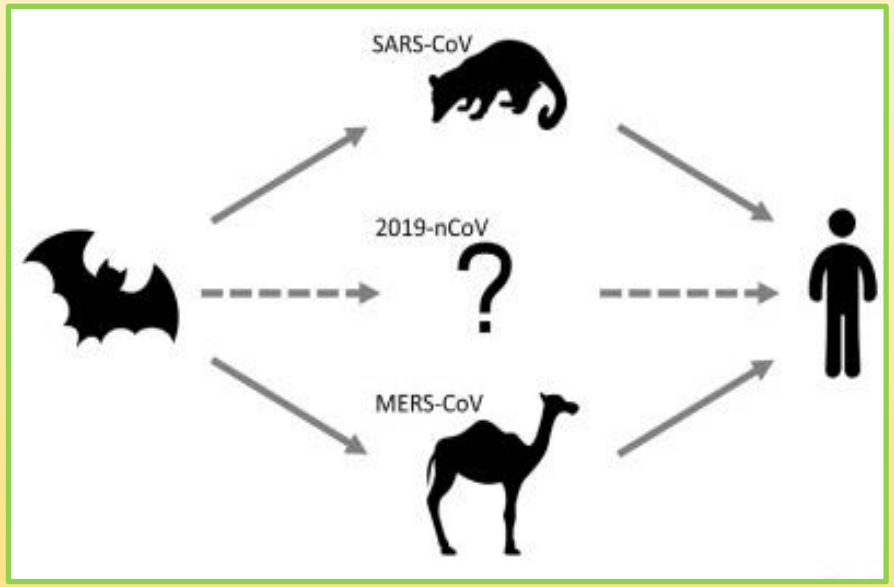
From a bat?

Bat -> Interm. host animal?



WHY CHASE THE ORIGIN OF THE PANDEMIC?

1. Prevent future re-introductions of virus to humans following same mechanisms.
2. Prevent future coronavirus pandemics.




COVID-19
25 YEARS
gettyimages
YEAR IN REVIEW: 2020

WHERE TO BEGIN?

ISID **ProMED**
INTERNATIONAL SOCIETY FOR INFECTIOUS DISEASES

30 Dec 2019

Published Date: 2019-12-31 00:59:00 CET
Subject: PRO/AH/EDR> Undiagnosed pneumonia - China (HU): RFI
Archive Number: 20191230.6864153

UNDIAGNOSED PNEUMONIA - CHINA (HUBEI): REQUEST FOR INFORMATION

A ProMED-mail post
http://www.promedmail.org
ProMED-mail is a program of the
International Society for Infectious Diseases
http://www.isid.org

[1]
Date: 30 Dec 2019
Source: Finance Sina [machine translation]
https://finance.sina.cn/2019-12-31/detail-ihrusahk1074832.d.html?from=wap

Wuhan unexplained pneumonia has been isolated test results will be announced [as soon as available]

On the evening of [30 Dec 2019], an "urgent notice on the treatment of pneumonia of unknown cause" was issued, which was widely distributed on the Internet by the red-headed document of the Medical Administration and Medical Administration of Wuhan Municipal Health Committee.

On the morning of [31 Dec 2019], China Business News reporter called the official hotline of Wuhan Municipal Health and Health Committee 12320 and learned that the content of the document is true.

12320 hotline staff said that what type of pneumonia of unknown cause appeared in Wuhan this time remains to be determined.

According to the above documents, according to the urgent notice from the superior, some medical institutions in Wuhan have successively appeared patients with pneumonia of unknown cause. All medical institutions should strengthen the management of outpatient and emergency departments, strictly implement the first-in-patient responsibility system, and find that patients with unknown cause of pneumonia actively adjust the power to treat them on the spot, and there should be no refusal to be pushed or pushed.

The document emphasizes that medical institutions need to strengthen multidisciplinary professional forces such as respiratory, infectious diseases, and intensive medicine in a targeted manner, open green channels, make effective connections between outpatient and emergency departments, and improve emergency plans for medical treatment.

Another piece of emergency notification, entitled "City Health and Health Commission's Report on Reporting the Treatment of Unknown Cause of Pneumonia" is also true. According to this document, according to the urgent notice from the superior, the South China Seafood Market in our city has seen patients with pneumonia of unknown cause one after another.

The so-called unexplained pneumonia cases refer to the following 4 cases of pneumonia that cannot be diagnosed at the same time: fever (greater than or equal to 38C); imaging characteristics of pneumonia or acute respiratory distress syndrome; reduced or normal white blood cells in the early stages of onset. The number of lymphocytes was reduced. After treatment with antibiotics for 3 to 5 days, the condition did not improve significantly.

It is understood that the 1st patient with unexplained pneumonia that appeared in Wuhan this time came from Wuhan South China Seafood Market.

12320 hotline staff said that the Wuhan CDC went to the treatment hospital to collect patient samples as soon as possible, specifically what kind of virus is still waiting for the final test results. Patients with unexplained pneumonia have done a good job of isolation and treatment, which does not prevent other patients from going to the medical institution for medical treatment. Wuhan has the best virus research institution in the country, and the virus detection results will be released to the public as soon as they are found.

--
Communicated by:
ProMED-mail
<promed@promedmail.org>

------
[2]
Date: 31 Dec 2019
Source: Sina Finance Mobile
https://tech.sina.com.cn/roll/2019-12-31/doc-ihrutfiz9428799.shtml

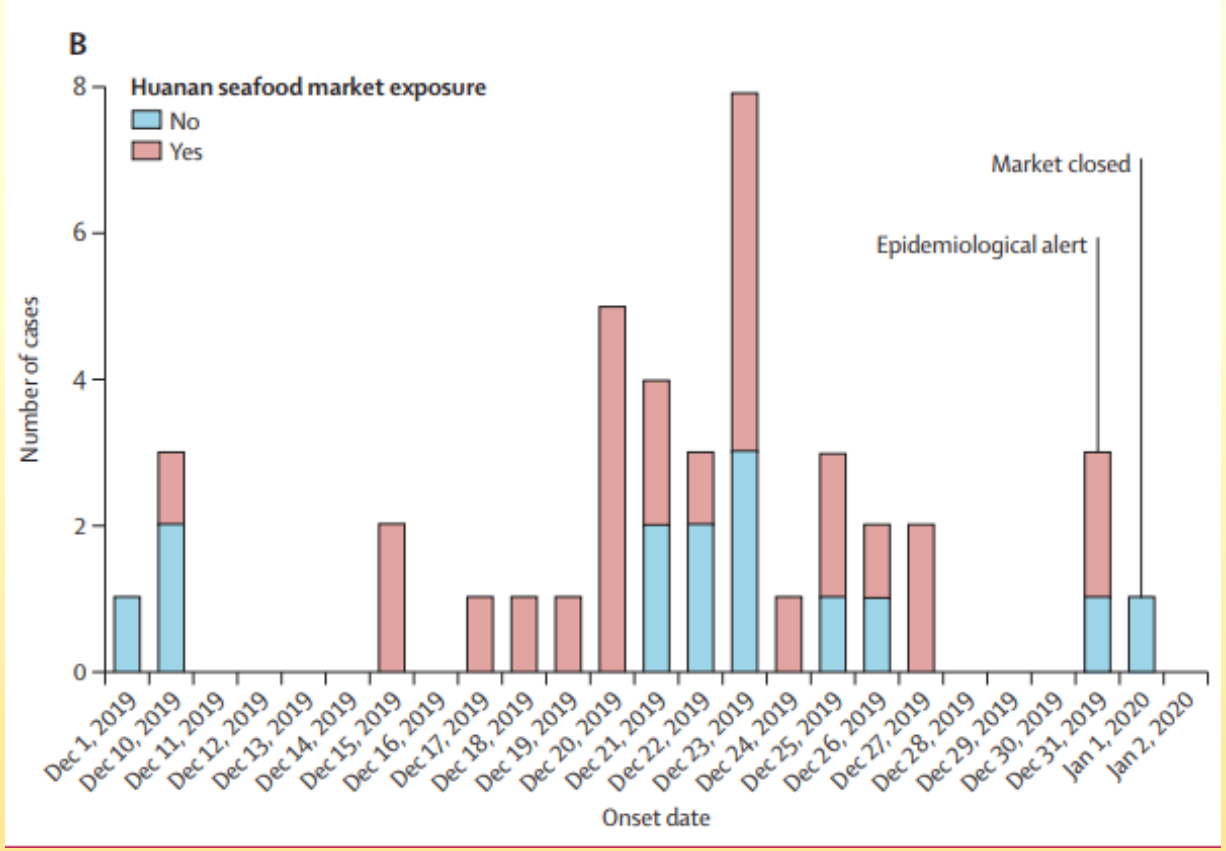
4 concomitant **cases of pneumonia that cannot be diagnosed**:

- Fever (≥ 38°C)
- Imaging characteristics of pneumonia or Acute Respiratory Distress Syndrome
- Low/normal white blood cells in the early stage (lymphocytes reduced)
- No effect of antibiotics for 3-5 days

DOCUMENTED KNOWLEDGE ABOUT EARLY COVID-19 CASES

2. January 2020:

- 41 patients admitted in Wuhan with severe pneumonia
- 73% men
- 66% had reported contact to Huanan Wet Market



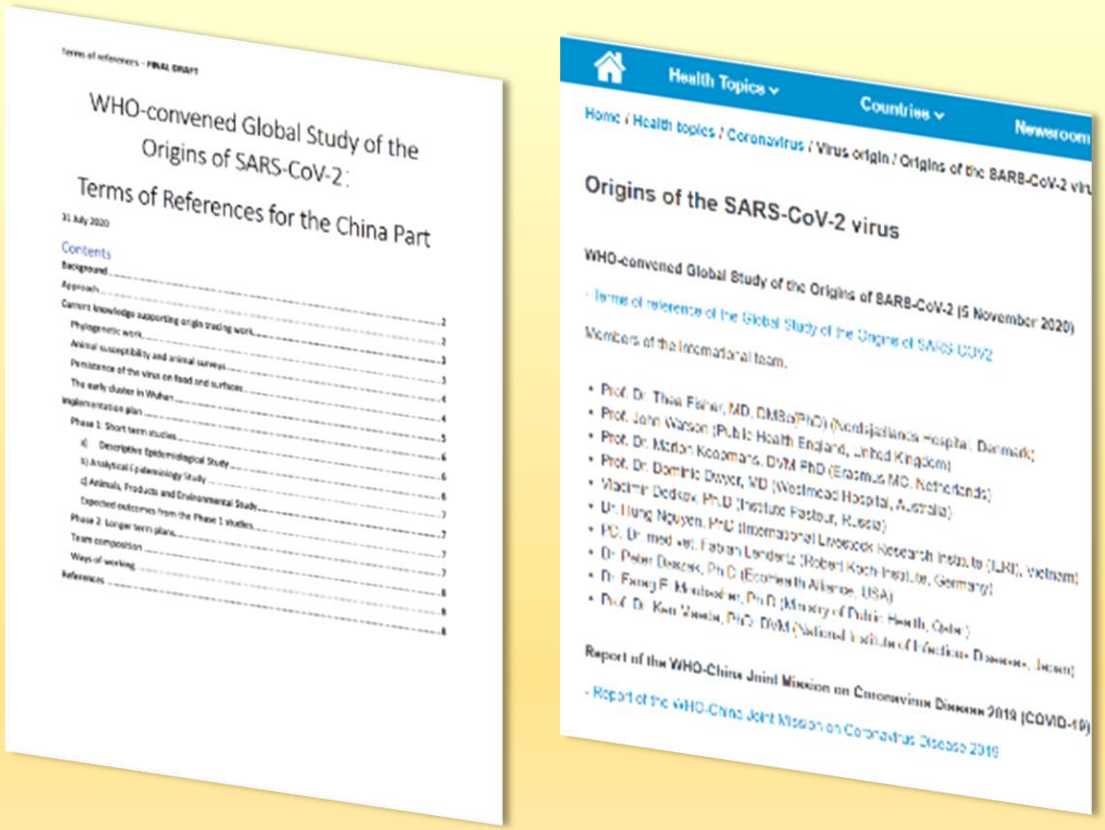
Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China

Chaolin Huang, Yeming Wang*, Xingwang Li*, Lili Ren*, Jianping Zhao*, Yi Hu*, Li Zhang, Guohui Fan, Jiuyang Xu, Xiaoying Gu, Zhenshun Cheng, Ting Yu, Jiaan Xia, Yuan Wei, Wenjuan Wu, Xuelei Xie, Wen Yin, Hui Li, Min Liu, Yan Xiao, Hong Gao, Li Guo, Jungang Xie, Guangfa Wang, Rongmeng Jiang, Zhancheng Gao, Qi Jin, Jianwei Wang†, Bin Cao†*

Lancet, 24/1-2020

SARS-COV-2 VIRUS ORIGIN: INT. TEAM & STUDIES IN CHINA

- Terms of reference for studies conducted by China & the composition of an international team to support the origin tracing in China.



SARS-COV-2 VIRUS ORIGIN: CHINA MISSION

- WHO convened an international team of 10 experts from 10 countries, and seven other experts and support staff from the OIE, GOARN partners and WHO.

Members of the international team:

- Prof. Dr. Thea Fisher, MD, DMSc(PhD) (Nordsjællands Hospital, Denmark)
- Prof. John Watson (Public Health England, United Kingdom)
- Prof. Dr. Marion Koopmans, DVM PhD (Erasmus MC, Netherlands)
- Prof. Dr. Dominic Dwyer, MD (Westmead Hospital, Australia)
- Vladimir Dedkov, Ph.D (Institute Pasteur, Russia)
- Dr. Hung Nguyen-Viet, PhD (International Livestock Research Institute (ILRI), Vietnam)
- PD. Dr. med vet. Fabian Leendertz (Robert Koch-Institute, Germany)
- Dr. Peter Daszak, Ph.D (EcoHealth Alliance, USA)
- Dr. Farag El Moubasher, Ph.D (Ministry of Public Health, Qatar)
- Prof. Dr. Ken Maeda, PhD, DVM (National Institute of Infectious Diseases, Japan)

Arrival WUHAN 14 JANUARY 2021

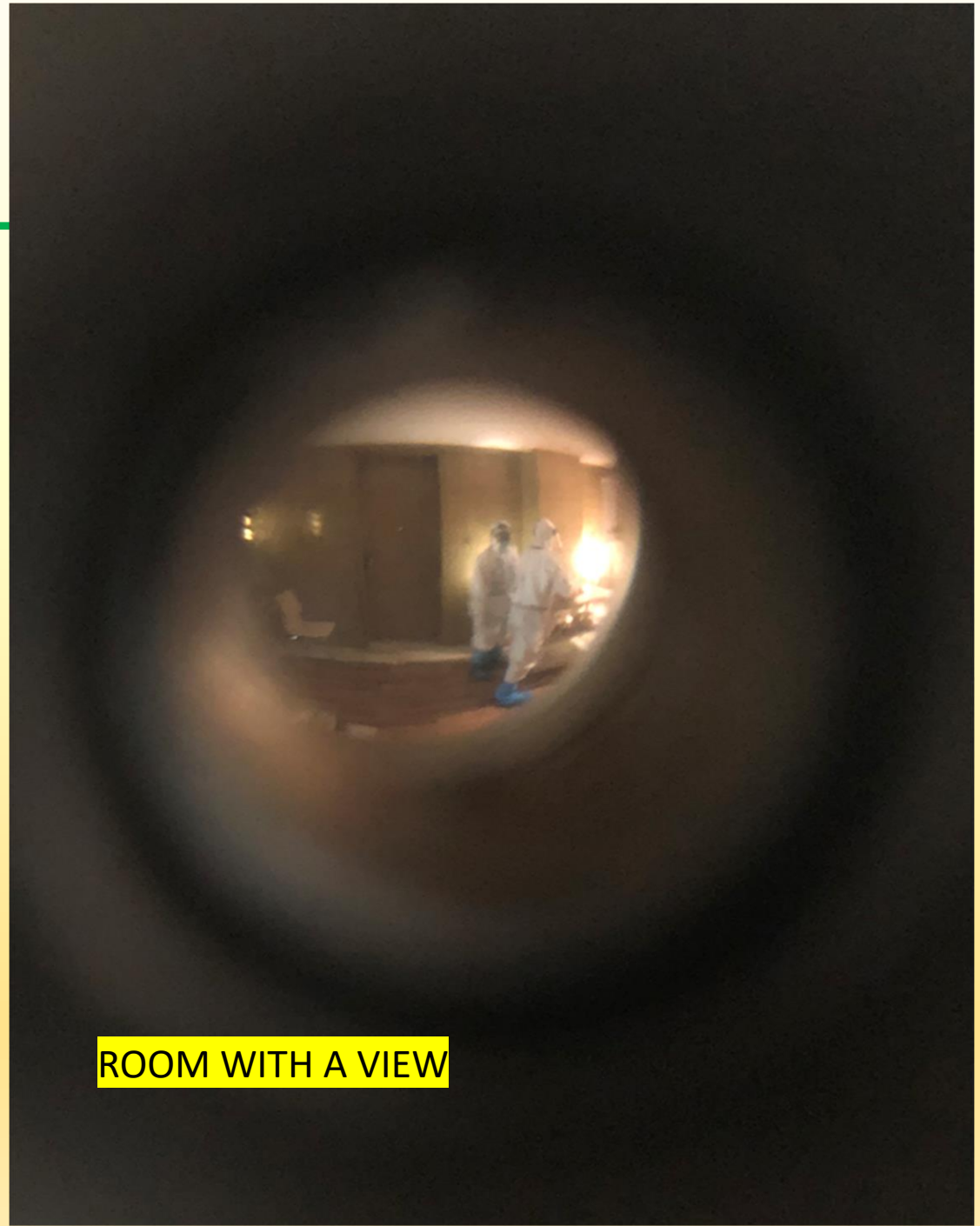
- 1 week delay

WHO team arrives in Wuhan to investigate pandemic origins

By SAM McNEIL and HUIZHONG WU January 14, 2021

14 DAYS OF ISOLATION – ROOM WITH A VIEW #801

HOTEL CHECK-IN – WARM WELCOME

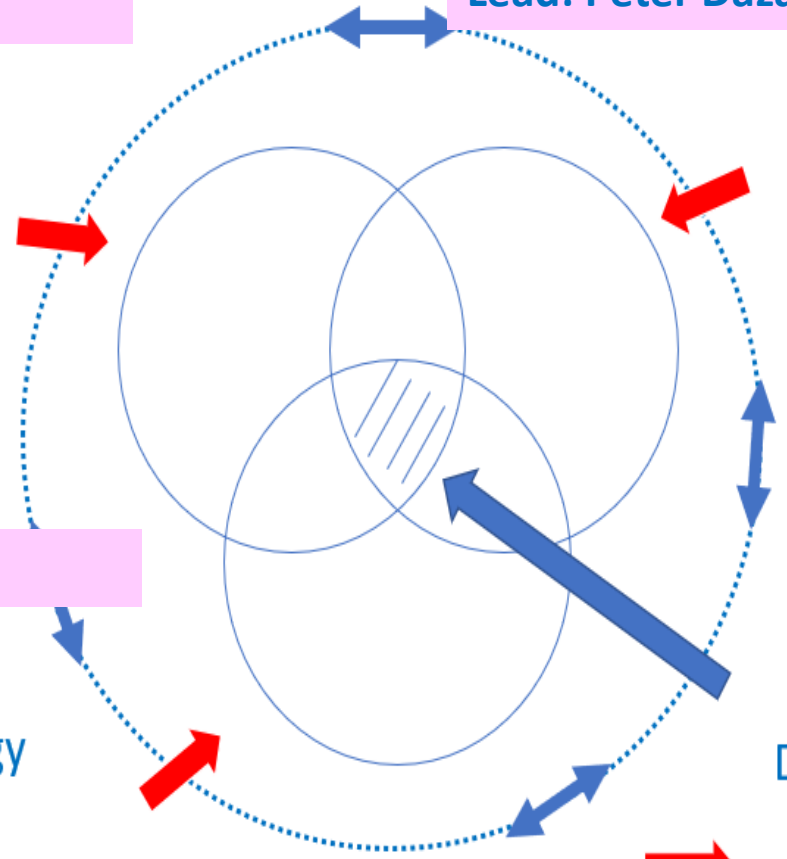


ROOM WITH A VIEW

3 MAIN TRACKS:

Lead: Thea K Fischer

Lead: Peter Dazak

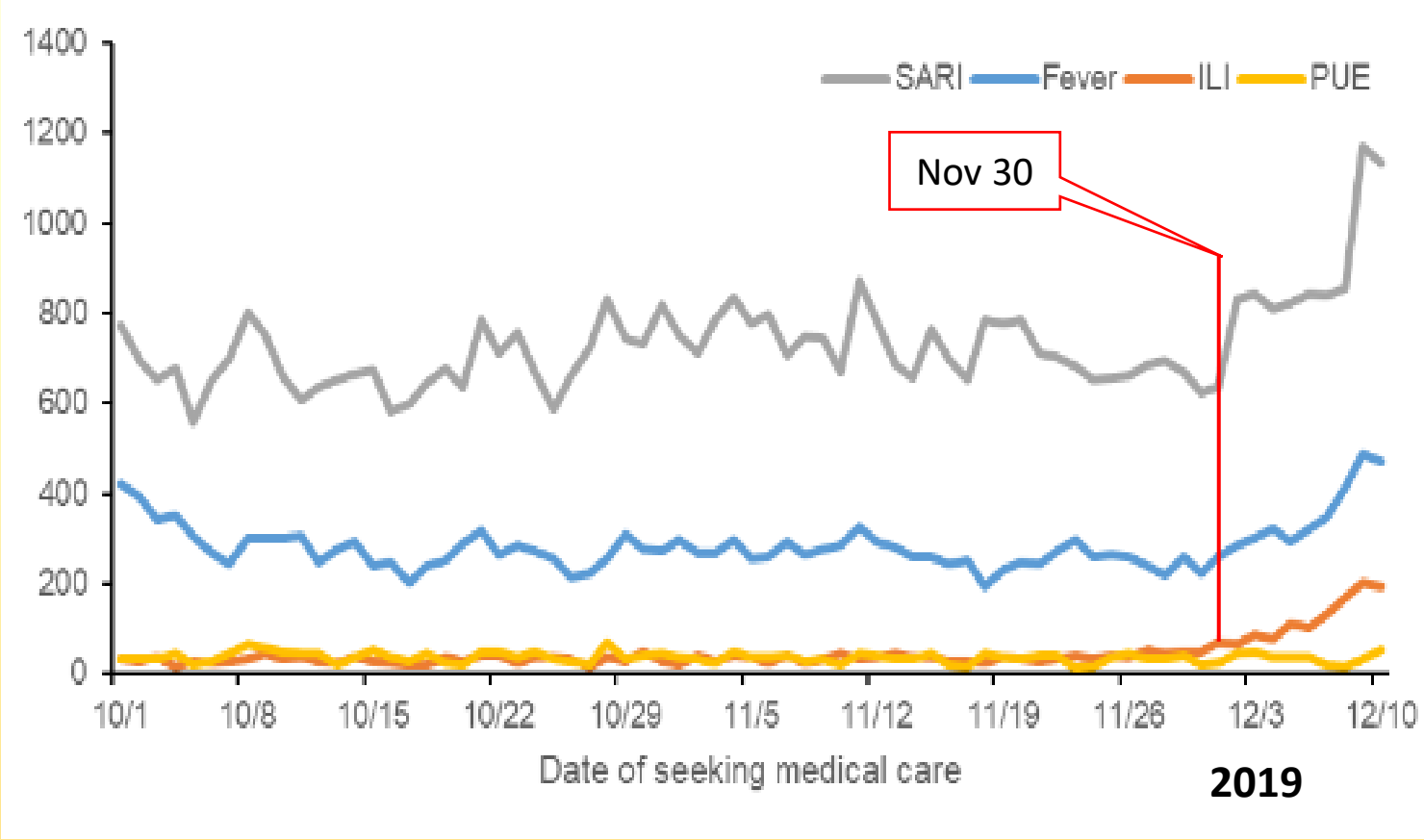


Lead: Marion Koopmans

EPIDEMIOLOGY – LOOKING FOR PATTERNS:

- Review of notifications of influenza-like illness (ILI) and severe acute respiratory infections in Hubei province
- Retrospective testing of samples from patients with ILI
- Review of 76,253 patient records (ARI, PUE, ILI & fever) for illness episodes compatible with COVID-19
- Review of mortality statistics, Wuhan & Hubei Province, 2019
- Descriptive epidemiology, including exposures and risk factors, of first COVID-19 cases

EARLY EPIDEMIC SPIKES?

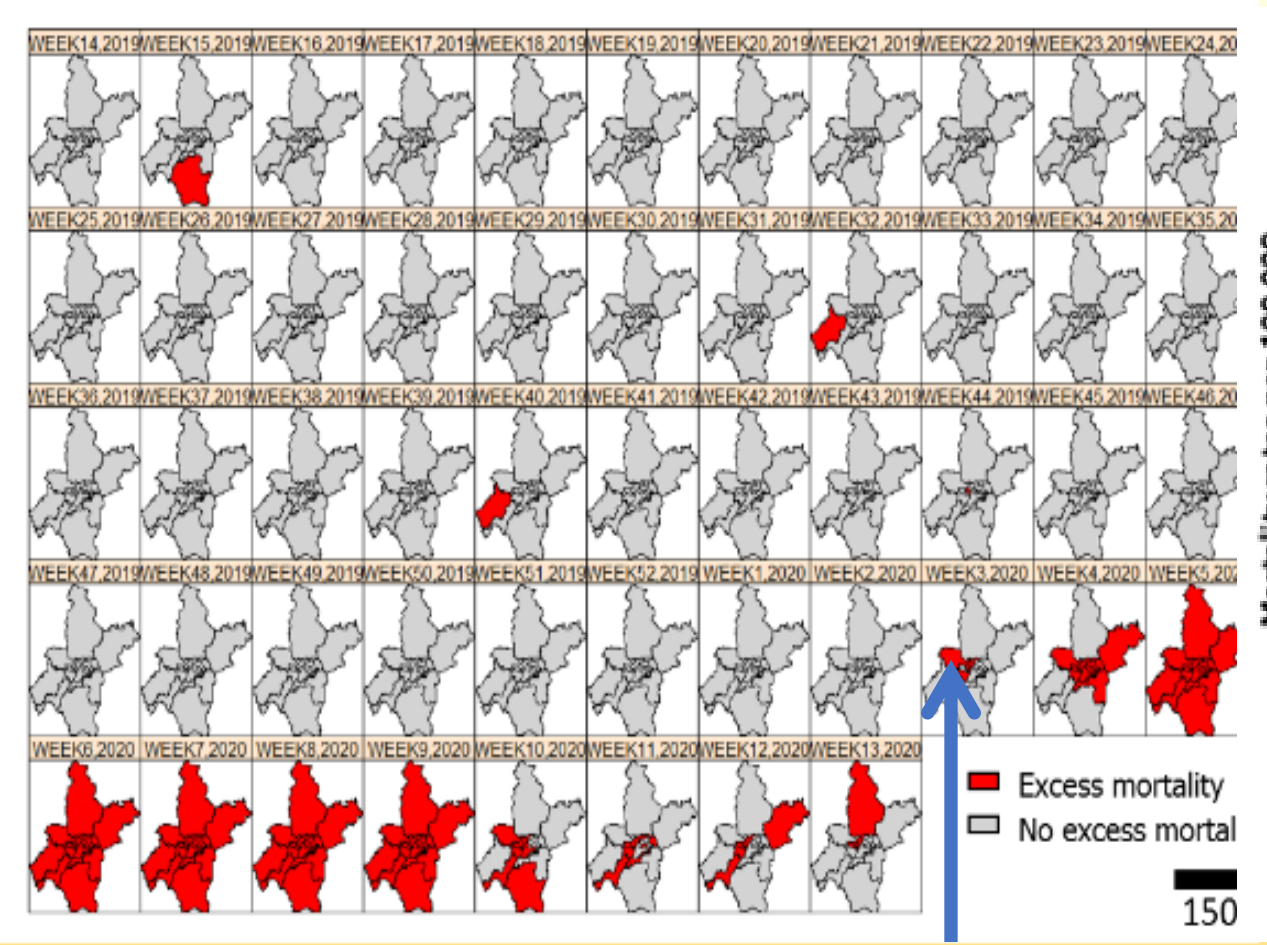


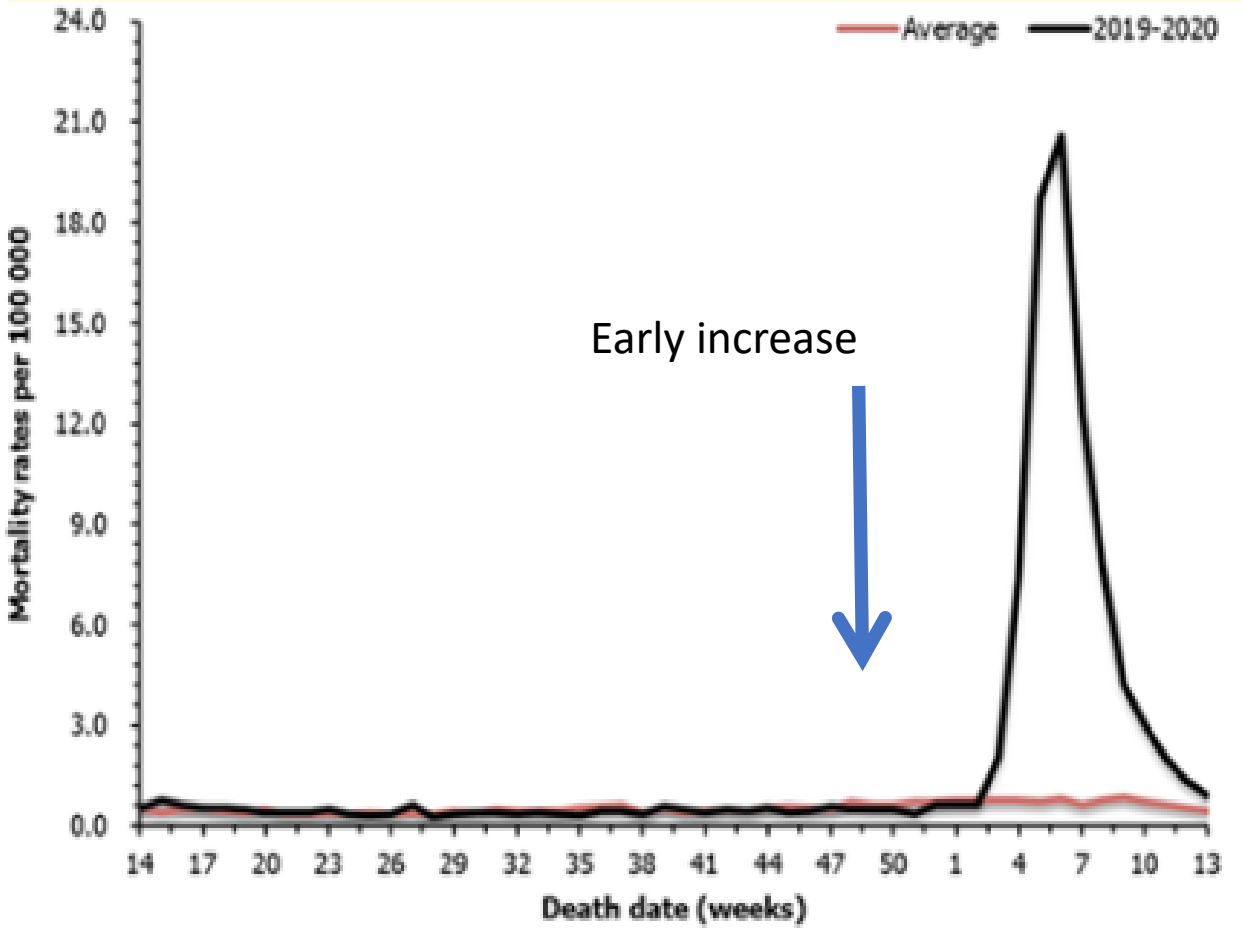
Trends of 76,253 records from 233 health facilities, Wuhan.

Increase Nov 30, 2019

Outcome: 92 COVID-19 compatible cases

REVIEW OF MORTALITY DATA FROM WUHAN & HUBEI PROVINCE



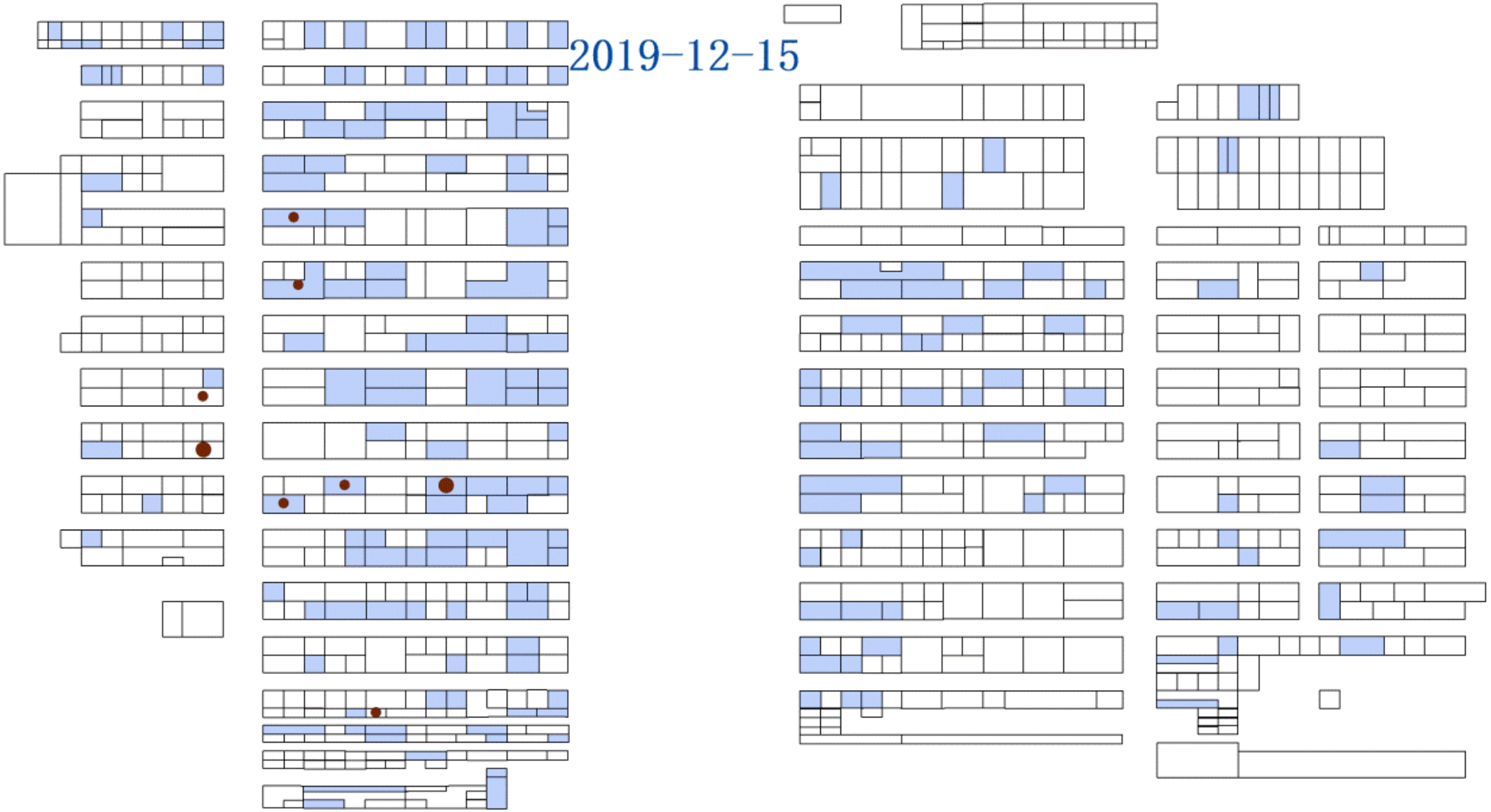


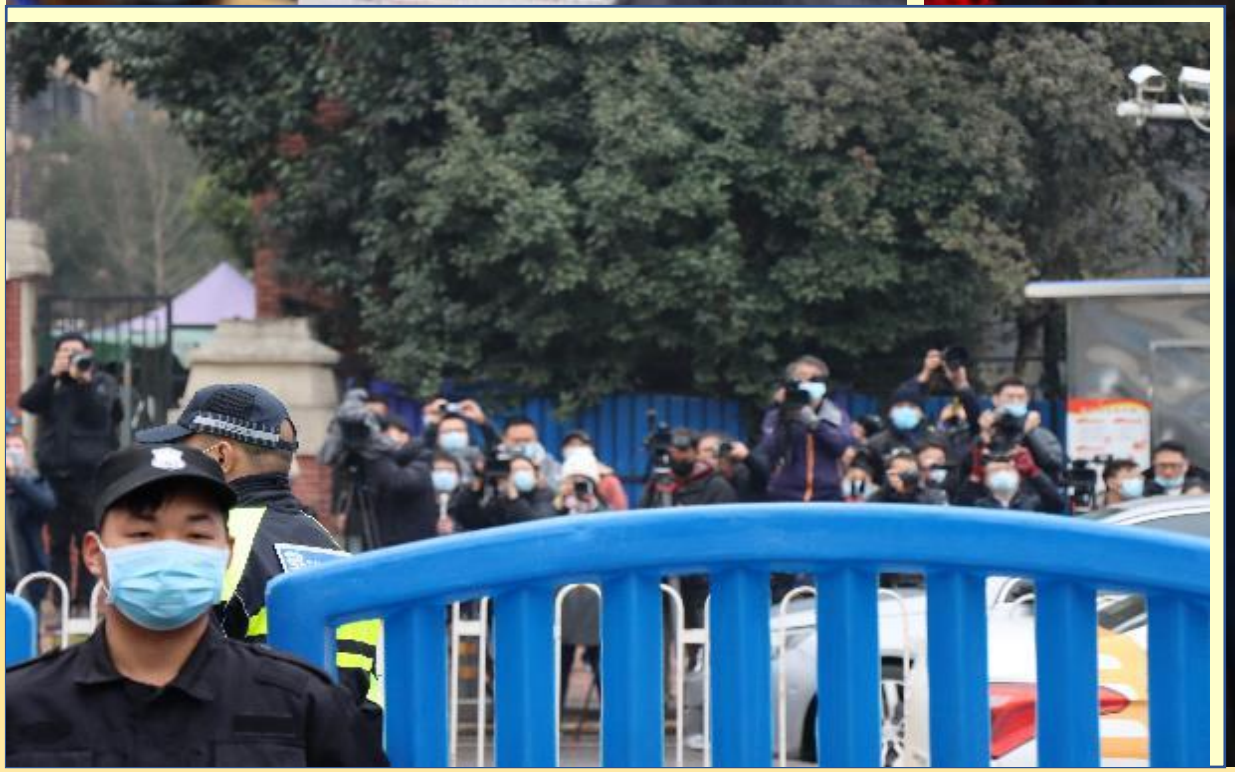
Huanan Market

Weekly excess mortality maps Week 14, 2019 to week 13, 2020

Trends in pneumonia mortality rate in 2019-2020 versus 2016-2018, Wuhan, all ages.

HUANAN WET MARKET BY HUMAN COVID-19 IN DEC 2019 CASES PLOTTED BY STALLS AND PRODUCTS SOLD





HUANAN WET MARKET – CRIME SCENE?

HUANAN WET MARKET

INTERVIEWS WITH MARKETCHIEF, SALESMEN AND CUSTOMERS

- ”No live animals sold”
- ”Only meat e.g. beef, pork, chickens and fish”
- ”The cleanest market in the country- maybe even in Asia”
- ”And absolutely NO stray cats or dogs ever at the market”

Figure 2. Poor welfare of animals on sale in Huanan seafood market: (**a**) King rat snake (*Elaphe carinata*), (**b**) Chinese bamboo rat (*Rhizomys sinensis*), (**c**) Amur hedgehog (*Erinaceus amurensis*) (the finger points to a tick), (**d**) Raccoon dog (*Nyctereutes procyonoides*), (**e**) Marmot (*Marmota himalayana*) (beneath the marmots is a cage containing hedgehogs), and (**f**) Hog badger (*Arctonyx albogularis*).

RECOMMENDATIONS:

- Serosurveys using retained blood samples from Sept – Dec 2019 from Wuhan/Hubei and other regions with evidence of early circulation.
- Review of earliest cases + serosurveys from central genetic cluster Sichuan and elsewhere.
- Re-review of clinical data and cases from retrospective search, using less stringent case definitions.
- Review of mortality data from other provinces with early cases as guided by phylogenetic analyses.
- Retesting of suspected cases (resulting from clinical review) by serology, or following vaccination (primary or booster reponse).
- Further tracing-back of wild animal farms following up-stream trade paths+ systematic serology testing based on supply chain analysis.
- Further bat surveys within China, in Southeast Asia, and in other countries where *Rhinolophus* bats are found.

EVIDENCE SYNTHESES PATHWAYS OF EMERGENCE

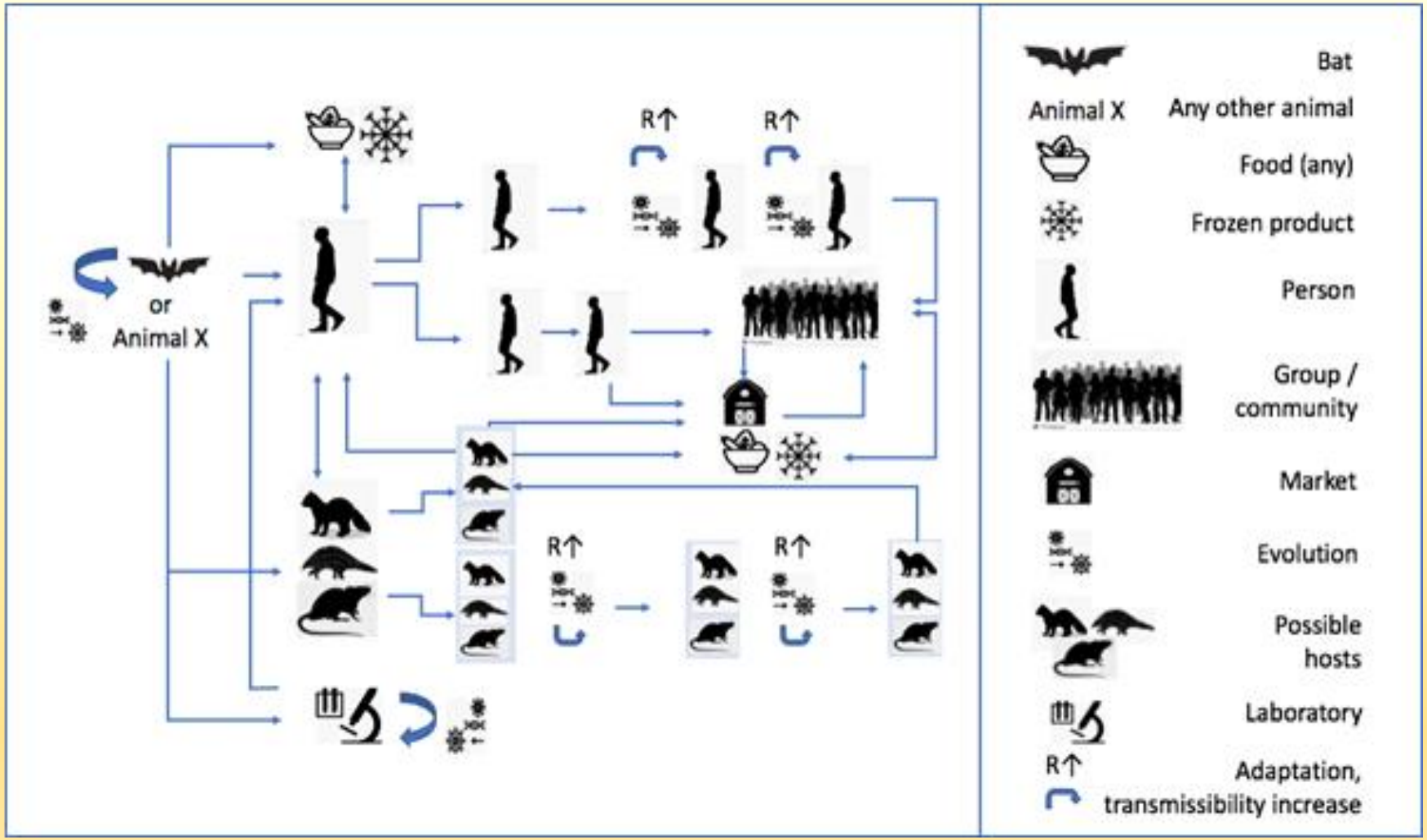
Arguments pro/con:

Zoonotic + intermediate host

Zoonotic

(Cold) food chain related

Laboratory related



Likelihood based on current evidence:

High

Low

REPORT FASE 1 STUDIES ‘CHINA PART’. PUBLISHED MARCH 30, 2021

WHO-convened global study of origins of SARS-CoV-2: China Part

Joint WHO-China study: 14 January - 10 February 2021

30 March 2021 | COVID-19: Animal-human interface and food safety

World Health Organization

Health Topics v Countries v News

Home / Health topics / Coronavirus / Virus origin / Origins of the SARS-CoV-2 vi

Origins of the SARS-CoV-2 virus

WHO-convened Global Study of the Origins of SARS-CoV-2 (including

Download (2.3 MB)

nature

NEWS EXPLAINER · 01 APRIL 2021

After the WHO report: what’s next in the search for COVID’s origins

A World Health Organization report makes a reasonable start, scientists say, but there are many questions yet to be answered.

Smriti Mallapaty

Food and surfaces are sampled for traces of the virus at a wet market in China. Credit: Wei Liang/China News Service via Getty

PDF version

Related Article

WHO report into COVID pandemic origins zeroes i animal markets, not labs

Meet the scientists investigating the origins the COVID pandemic

Can COVID spread from frozen wildlife? Scientists probe pandemic origins

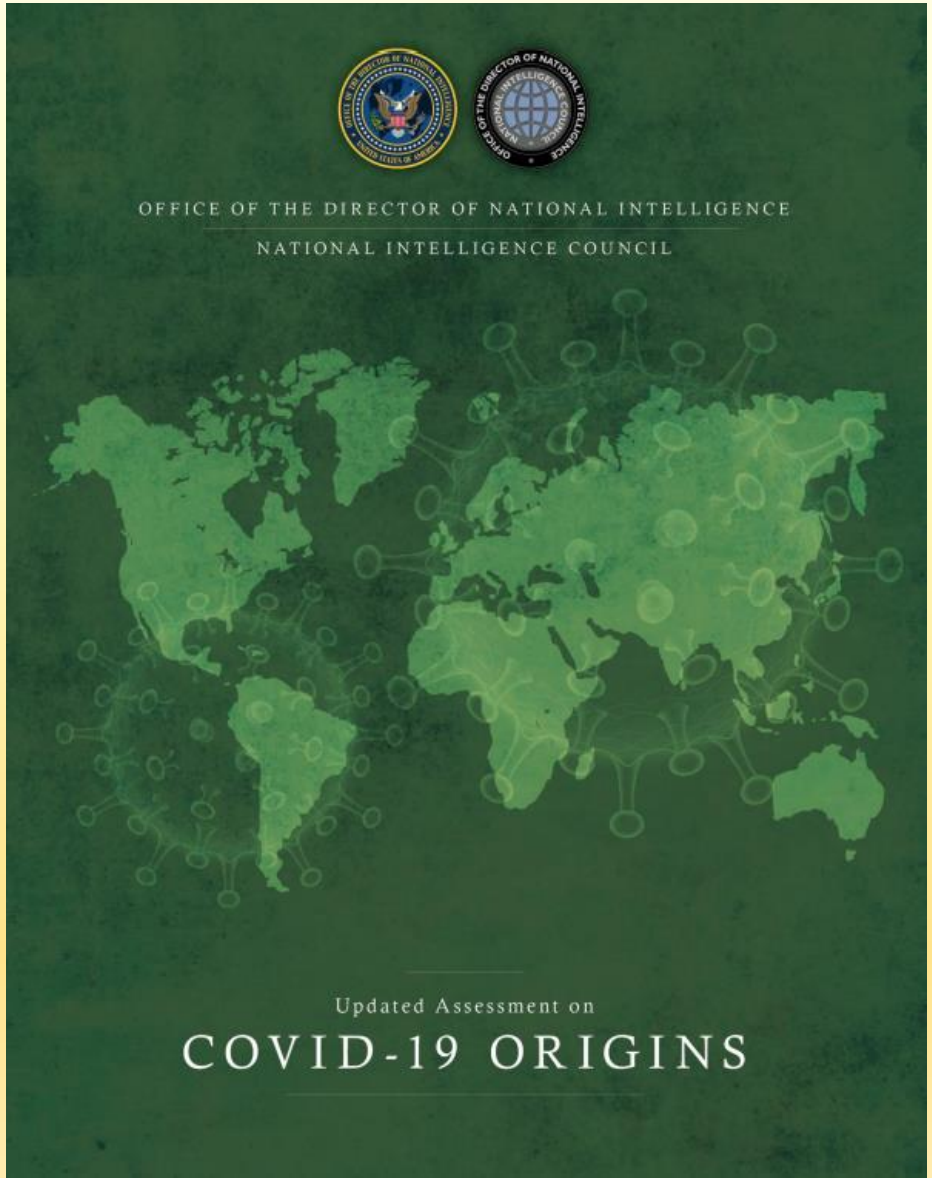
PROBLEMS?

Data obscured

Contradicting information --->

Changing narrative

2021 US IC REPORT



VIRUS NOT DEVELOPED AS A BIOLOGICAL WEAPON

UNCLASSIFIED

Key Takeaways

The IC assesses that SARS-CoV-2, the virus that causes COVID-19, probably emerged and infected humans through an initial small-scale exposure that occurred no later than November 2019 with the first known cluster of COVID-19 cases arising in Wuhan, China in December 2019. In addition, the IC was able to reach broad agreement on several other key issues. We judge the virus was not developed as a biological weapon. Most agencies also assess with low confidence that SARS-CoV-2 probably was not genetically engineered; however, two agencies believe there was not sufficient evidence to make an assessment either way. Finally, the IC assesses China's officials did not have foreknowledge of the virus before the initial outbreak of COVID-19 emerged.

After examining all available intelligence reporting and other information, though, the IC remains divided on the most likely origin of COVID-19. All agencies assess that two hypotheses are plausible: natural exposure to an infected animal and a laboratory-associated incident.

- Four IC elements and the National Intelligence Council assess with low confidence that the initial SARS-CoV-2 infection was most likely caused by natural exposure to an animal infected with it or a close progenitor virus—a virus that probably would be more than 99 percent similar to SARS-CoV-2. These analysts give weight to China's officials' lack of foreknowledge, the numerous vectors for natural exposure, and other factors.
- One IC element assesses with moderate confidence that the first human infection with SARS-CoV-2 most likely was the result of a laboratory-associated incident, probably involving experimentation, animal handling, or sampling by the Wuhan Institute of Virology. These analysts give weight to the inherently risky nature of work on coronaviruses.
- Analysts at three IC elements remain unable to coalesce around either explanation without additional information, with some analysts favoring natural origin, others a laboratory origin, and some seeing the hypotheses as equally likely.
- Variations in analytic views largely stem from differences in how agencies weigh intelligence reporting and scientific publications, and intelligence and scientific gaps.

The IC judges they will be unable to provide a more definitive explanation for the origin of COVID-19 unless new information allows them to determine the specific pathway for initial natural contact with an animal or to determine that a laboratory in Wuhan was handling SARS-CoV-2 or a close progenitor virus before COVID-19 emerged.

2022: ”MOST LIKELY RESULT OF RESEARCH-RELATED INCIDENT”

An Analysis of the Origins of the COVID-19 Pandemic
Interim Report

Senate Committee on Health Education, Labor and Pensions

Minority Oversight Staff

October 2022

Introduction

Three years after its emergence in Wuhan, exactly how SARS-CoV-2 first emerged as a respiratory pathogen capable of sustained human-to-human transmission remains the subject of active debate.[1] Experts have put forward two dominant theories on the origins of the virus.[2] The first theory is that SARS-CoV-2 is the result of a natural zoonotic spillover.[3] The second theory is that the virus infected humans as a consequence of a research-related incident.[4]

Understanding the virus's origin is essential to understanding how this outbreak happened, why detection and reporting systems did not work as anticipated, and to better prepare for future health threats. This report has reviewed open source, publicly available information relevant to the origins of the virus to consolidate additional information that can be contributed to the body of work investigating the answer to this question.

Establishing a clear picture of the likely origin of the virus has proven challenging. Since January 3, 2020, government officials in the People's Republic of China (PRC) have prohibited sharing or publishing any information on SARS-CoV-2 without state review and approval.[5] Restrictions on SARS-CoV-2 information remain in place today and, therefore, any information on SARS-CoV-2 and the COVID-19 pandemic published by government officials and scientists in China must be reviewed with these restrictions in mind.

As a result, establishing an approximate timeline for when SARS-CoV-2 first infected humans is difficult. Government officials and public health authorities in the PRC have claimed that there were no SARS-CoV-2 cases before early December 2019.[6] However, available epidemiologic evidence strongly suggests that SARS-CoV-2 began infecting humans in Wuhan or the surrounding area between mid-October and early to mid-November 2019.[7]

While precedent of previous outbreaks of human infections from contact with animals favors the hypothesis that a natural zoonotic spillover is responsible for the origin of SARS-CoV-2, the emergence of SARS-CoV-2 that resulted in the COVID-19 pandemic was most likely the result of a research-related incident. This conclusion is not intended to be dispositive. The lack of transparency from government and public health officials in the PRC with respect to the origins of SARS-CoV-2 prevents reaching a more definitive conclusion. Should additional information be made publicly available, and subject to independent verification, it is possible that these conclusions would be subject to review and reconsideration.

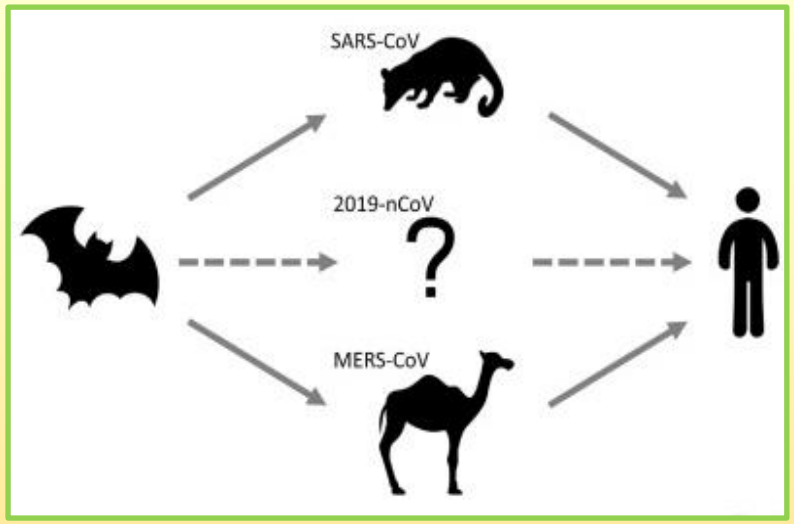
LACK OF DOCUMENTED SPILLOVER USED AS ”NEGATIVE EVIDENCE”

SCIENCE = EVIDENCE AND DATA

From a lab in Wuhan?

From a bat?

Bat -> Interm. host animal?



Data

SCIENCE + POLITICS = POLITICS

”SPILL-OVER EVENT”

- VIRUS
- ANIMALS
- HUMANS
- PLACE

SCIENCE

POLITICS

China-virus

No entry

Kung Fu virus

Cold food

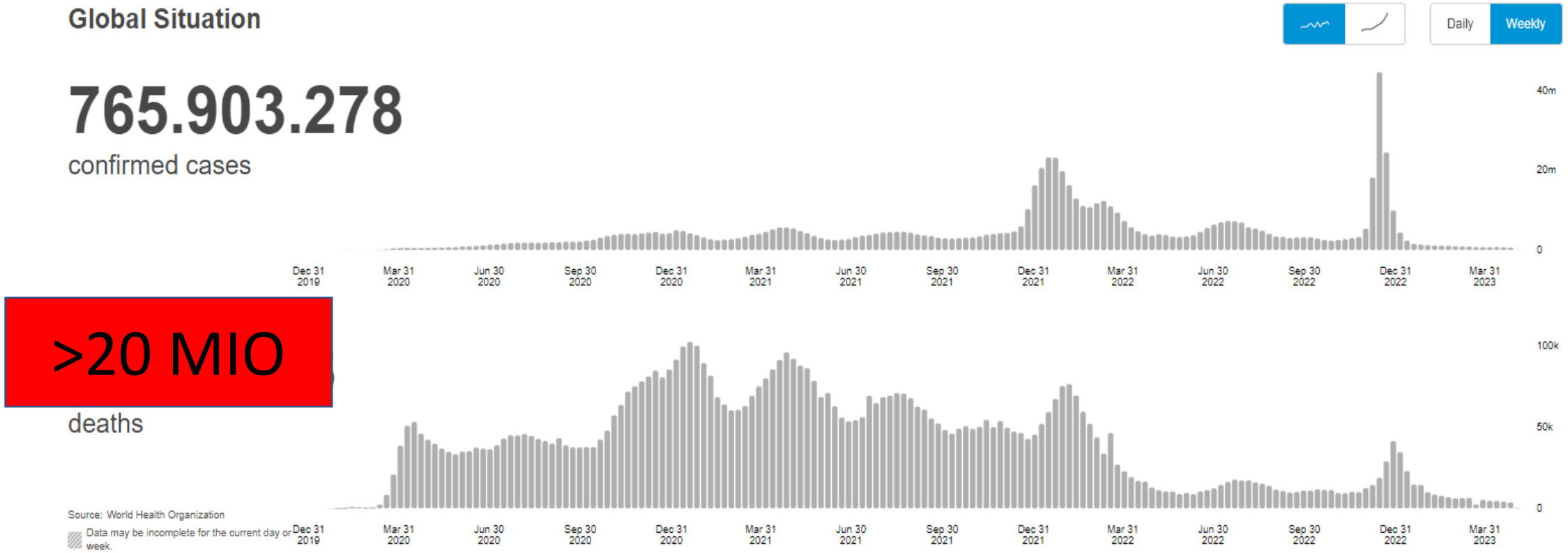
Lab Leak

Other countries

LIGHT AT THE END OF THE PANDEMIC TUNNEL?

IN THE MEAN TIME

Globally, as of **3:49pm CEST, 10 May 2023**, there have been **765.903.278 confirmed cases** of COVID-19, including **6.927.378 deaths**, reported to WHO. As of **9 May 2023**, a total of **13.350.487.934 vaccine doses** have been administered.



WORK CONTINUES -SAGO.

Scientific Advisory Group for the Origins of Novel Pathogens

The Director-General has established the WHO Scientific Advisory Group for the Origins on Novel Pathogens (hereinafter referred to as 'SAGO").

The SAGO will advise the Secretariat on technical and scientific considerations regarding emerging and re-emerging pathogens, and will be composed of experts acting in a personal capacity. It will be established in accordance with the WHO Regulations for Study and Scientific Groups, Collaborating Institutions and Other Mechanisms of Collaboration.

24 November 2021 | News release

First meeting of Scientific Advisory Group for the Origins of Novel Pathogens (SAGO)

Members

Professor Phillip Alviola ›
Associate Professor at the Animal Biology Division at the Institute of Biological Sciences, University of the Philippines

Dr Abdullah Asiri ›
Assistant Deputy Minister for Preventive Health at the Ministry of Health, Saudi Arabia

Professor Stuart D. Blacksell ›
Mahidol-Oxford Tropical Medicine Research Unit, Bangkok, Thailand; Nuffield Department of Medicine, University of Oxford, Oxford, United Kingdom of Great Britain and Northern Ireland

Dr Inger K. Damon ›
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Professor and director at the African Center of Excellence for Genomics of Infectious Disease (ACEGID), Redeemer's University, Ede, Nigeria

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Founder and Chief Executive Officer of an NGO named Conservation Through Public Health, Uganda

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A biosafety inspector at the Public Health Agency of Canada

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Deputy Head of Epidemiology and Public Health Unit at the Institut Pasteur du Cambodge

Dr Jean-Claude Manuguerra ›
Research Director of the Environment and Infectious Risks Unit, as well as the head for the Emergency Biological Intervention Unit at the Institut Pasteur, France

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Dr Chinwe Ochu ›
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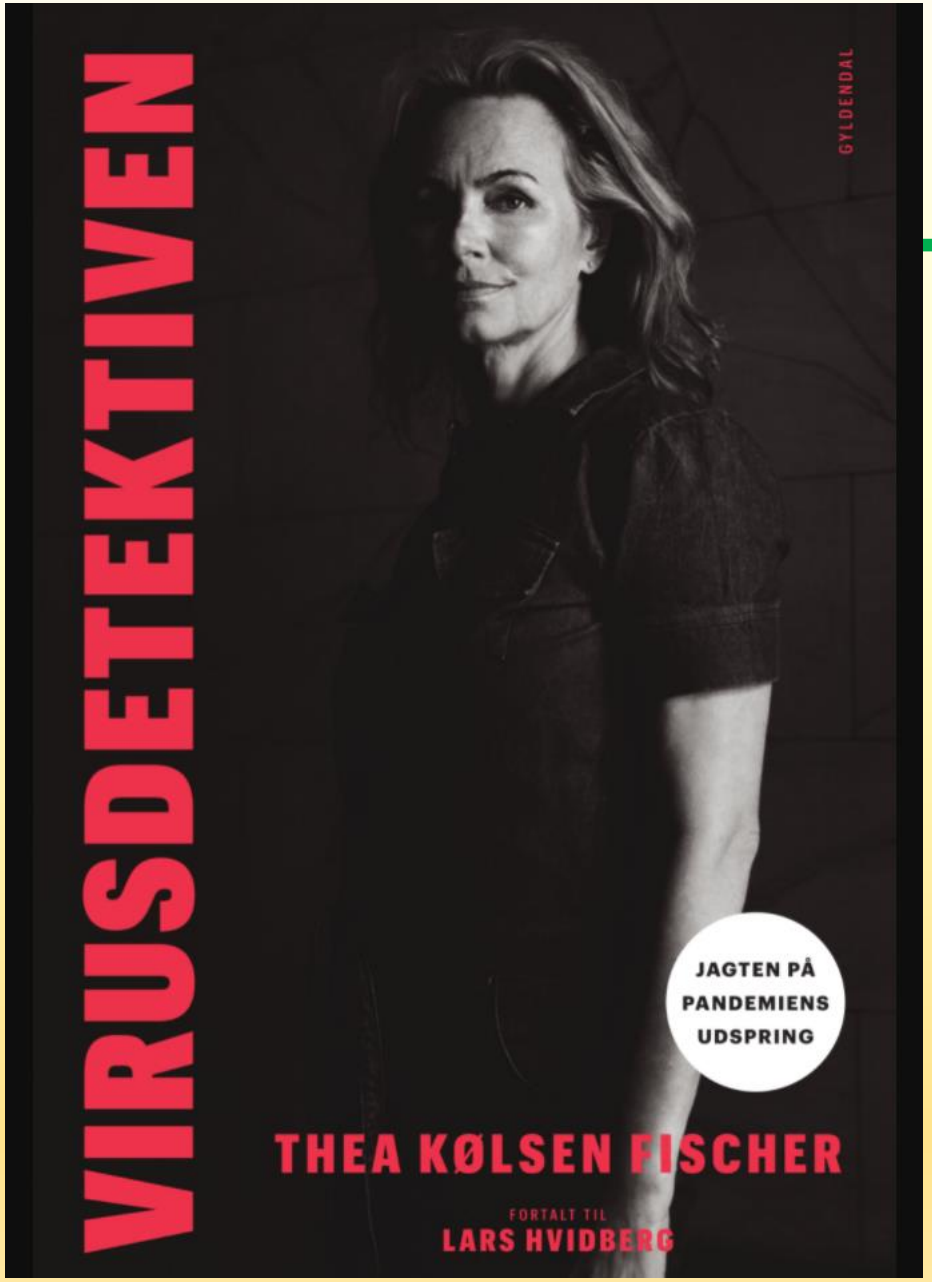
Dr Yungui Yang ›
Deputy Director at the Beijing Institute of Genomics at the Chinese Academy of Sciences in China

STILL LIGTH – BUT TUNNEL KEEPS GETTING LONGER AND LONGER…..

- Pandemic ongoing. With help from vaccines and new therapeuticals the world can figth back, ONLY
- IF all get equal access to vaccines + treatment.



FIRST PART OF THE STORY

- Published November, 26 2021
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Thea Kølsen Fischer, professor i medicin, bliver i 2020 udvalgt af WHO som én af 10 internationale eksperter til at deltage i den mission, der skal påbegynde arbejdet med at finde kilden til corona-pandemiens udbrud.

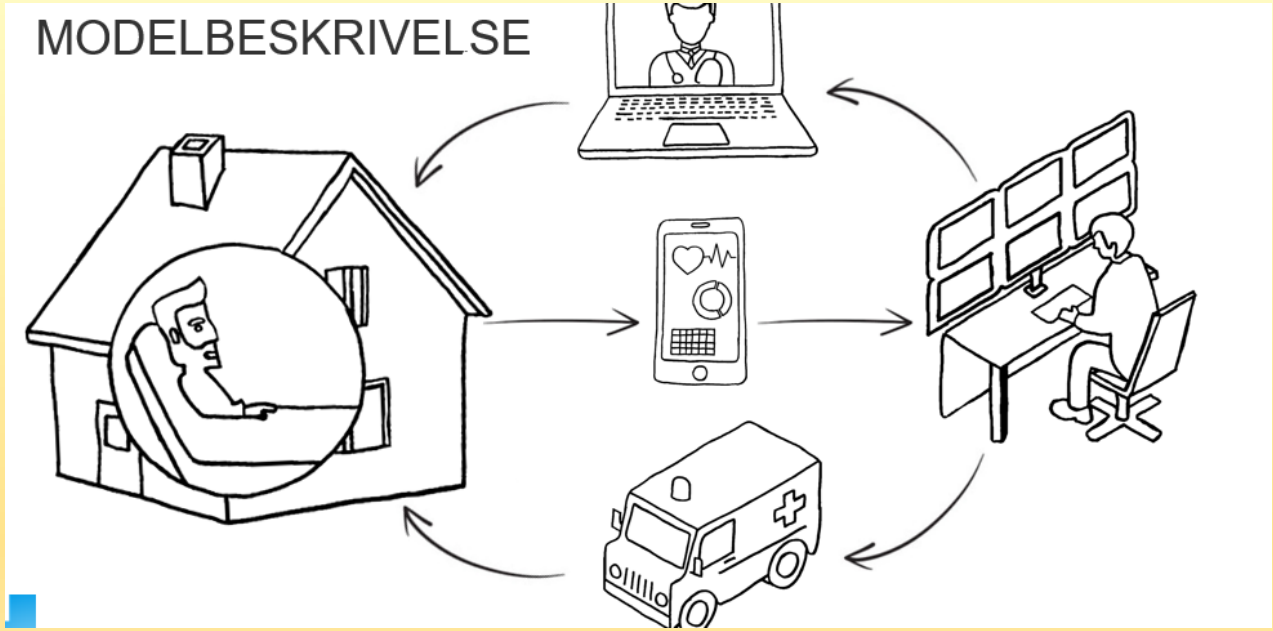
Holdet ankommer til Wuhan, Kina, i januar 2021. Efter 14 dages total isolation får de eksklusiv adgang til nogle af de centrale scener fra epidemiens allerførste dage: Huanan Wet Market, som har været forseglet, siden mange af de tidligste tilfælde blev opdaget her, det berømte og blandt konspirations-teoretikere berygtede Wuhan Institute of Virology samt flere af de hospitaler, hvor de første patienter blev indlagt. Eksperterne taler med de læger og sygeplejersker, som behandlede de første Covid-19-patienter og slog alarm, og de møder Patient 0.

Det er deres opgave at spole filmen så langt tilbage som muligt for at nærme sig det øjeblik, hvor det første menneske blev smittet med SARS-CoV-2. Men storpolitiske interesser risikerer at forstyrre det videnskabelige fokus for missionen.

Virusdetektiven er Thea Kølsen Fischers egen insider-beretning om at forfølge sporene fra det smitteudbrud, der førte til vor tids største globale krise.

NO TIME TO WASTE, IRRESPECTIVE OF POLITICS PANDEMIC PREPAREDNES →HIGH PRIORITY

- North Zealand Hospital has developed and now tests a hospital-at-home model for epidemic patients (with step-wise inclusion of other patients)



Status May 2023:
High level of patient safety and satisfaction:
Patients, staff and care-givers.

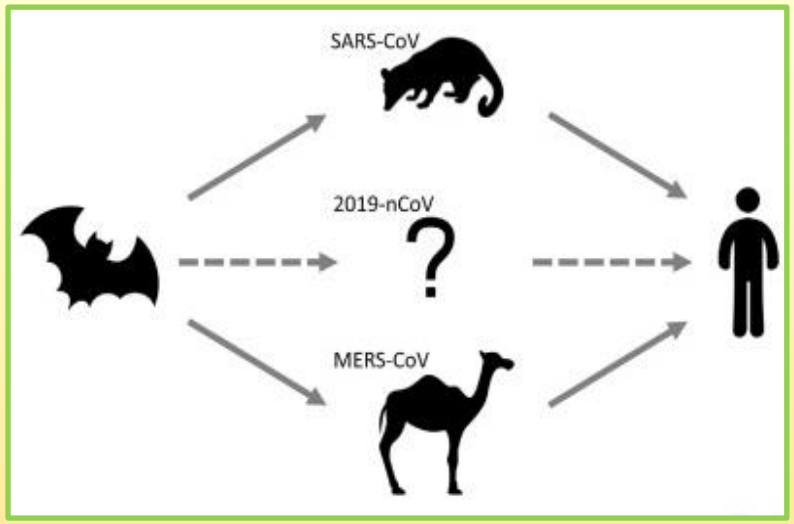
IN THE MEAN TIME – THANK YOU FOR YOUR ATTENTION

WHERE DID IT COME FROM?

From a lab in Wuhan?

From a bat?

Bat -> Interm. host animal?

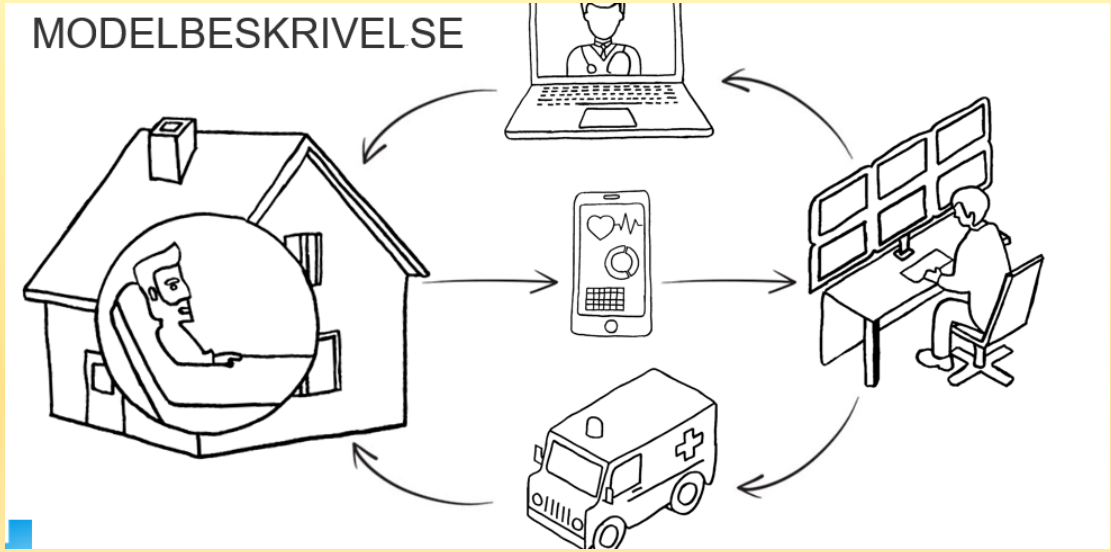


MANGE FORHOLD KORTLÆGGES/OPKLARES, bla:

- Hvornår blev den første patient opdaget? (muligvis ikke indlagt?)
- Hvilke symptomer blev forfulgt under de tidlige udbruds-opgaver?
- Blev alle smittekæder fulgt tilbage til index-case?
- Hvilken rolle spillede Huanan Wet Market (crime scene el forstærker?)
- Hvilke levende dyr blev solgt på markedet?
- Hvor kom dyrene fra? (farme, provinser mm)
- Sygdom blandt dyre -farmere, -salgskæder, -markedsforhandlere?
- Hvilke laboratorier håndterede prøver fra tidlige patienter?
- Fandtes der stadig prøvemateriale (fx halspodninger, blod mm)?
- Hvilke typer coronavirus forskning udgik fra laboatorierne?
- Havde der været syge laboratorieansatte tidligt under Wuhan udbruddet?

HØJ PRIORITET: PANDEMI BEREDSKAB ”Ingen tid at spilde”.

- Nordsjællands Hospital ved at afprøve hjemmeindlæggelse til epidemi-patienter (udvides trinvist til andre sygdomme).
- I samarbejde med Netcompany udviklet app og IT system så hospitalet kan overvåge patienten i eget hjem. Afprøves nu.



Status sept 2022:
5 patienter været hjemmeindlagt.
So far, stor tilfredshed m sikkerhed, kommunikation og viruel pleje.

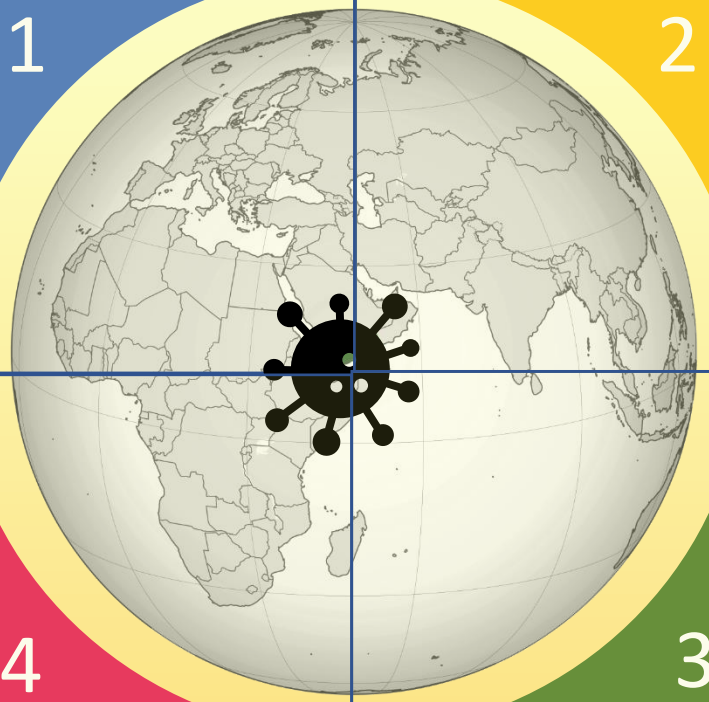
”4 PILLARS”: 360° AROUND VIRUSES & EPIDEMICS

CLINICAL MEDICINE

1

EPIDEMIOLOGY

2



VACCINOLOGY

4

VIROLOGY

3

4 PILLARS: 360° AROUND LEADERSHIP THEORY/PRACTICE

CLINICAL FUNCTIONS

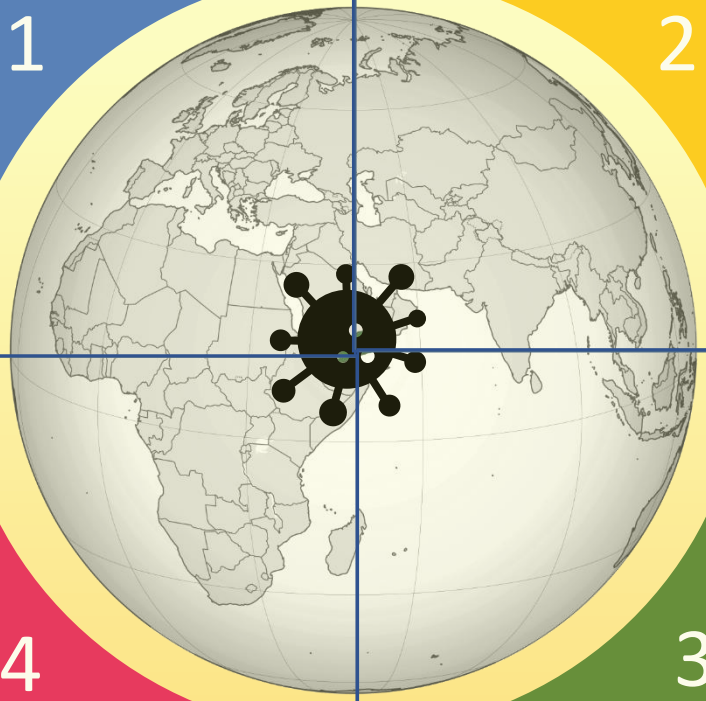
1

STAFF, PATIENTS

RESEARCH MANAGEMENT

2

STAFF, PROJECTS



PUBLIC GOVERNANCE

4

STAFF, LEADERS, CO-LEADERS

OUTBREAK MANAGEMENT

3

TEAM, AUTHORITIES

Cite as: M. Worobey *et al.*, *Science* 10.1126/science.abp8715 (2022).

The Huanan Seafood Wholesale Market in Wuhan was the early epicenter of the COVID-19 pandemic

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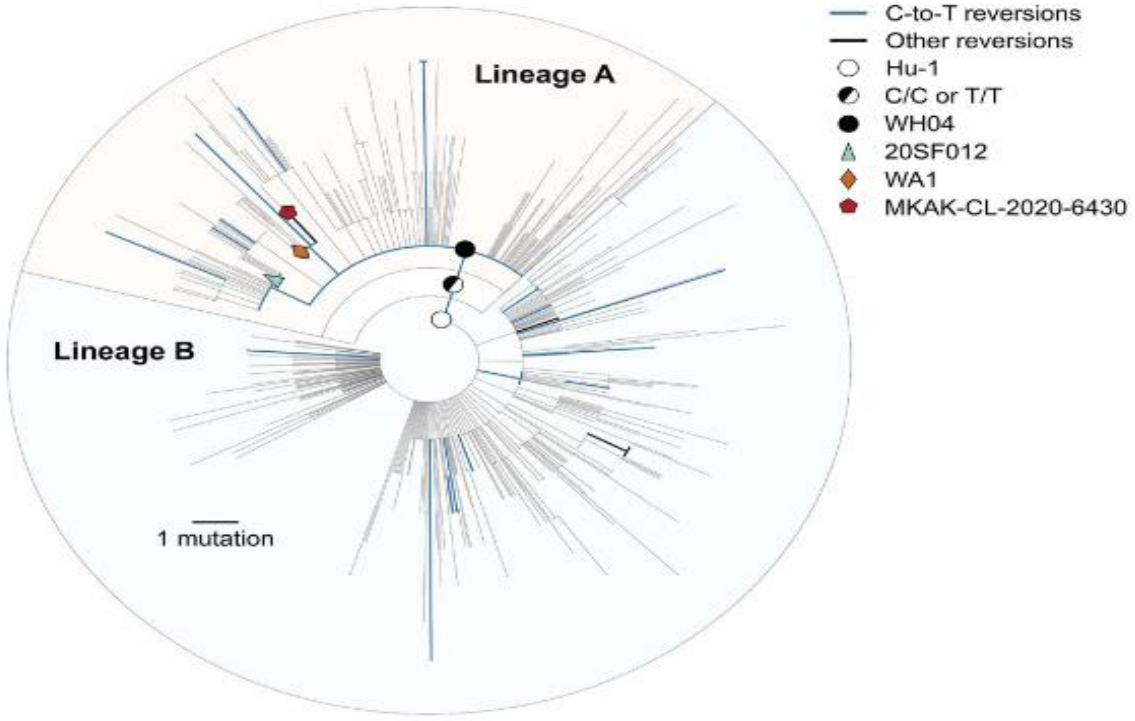
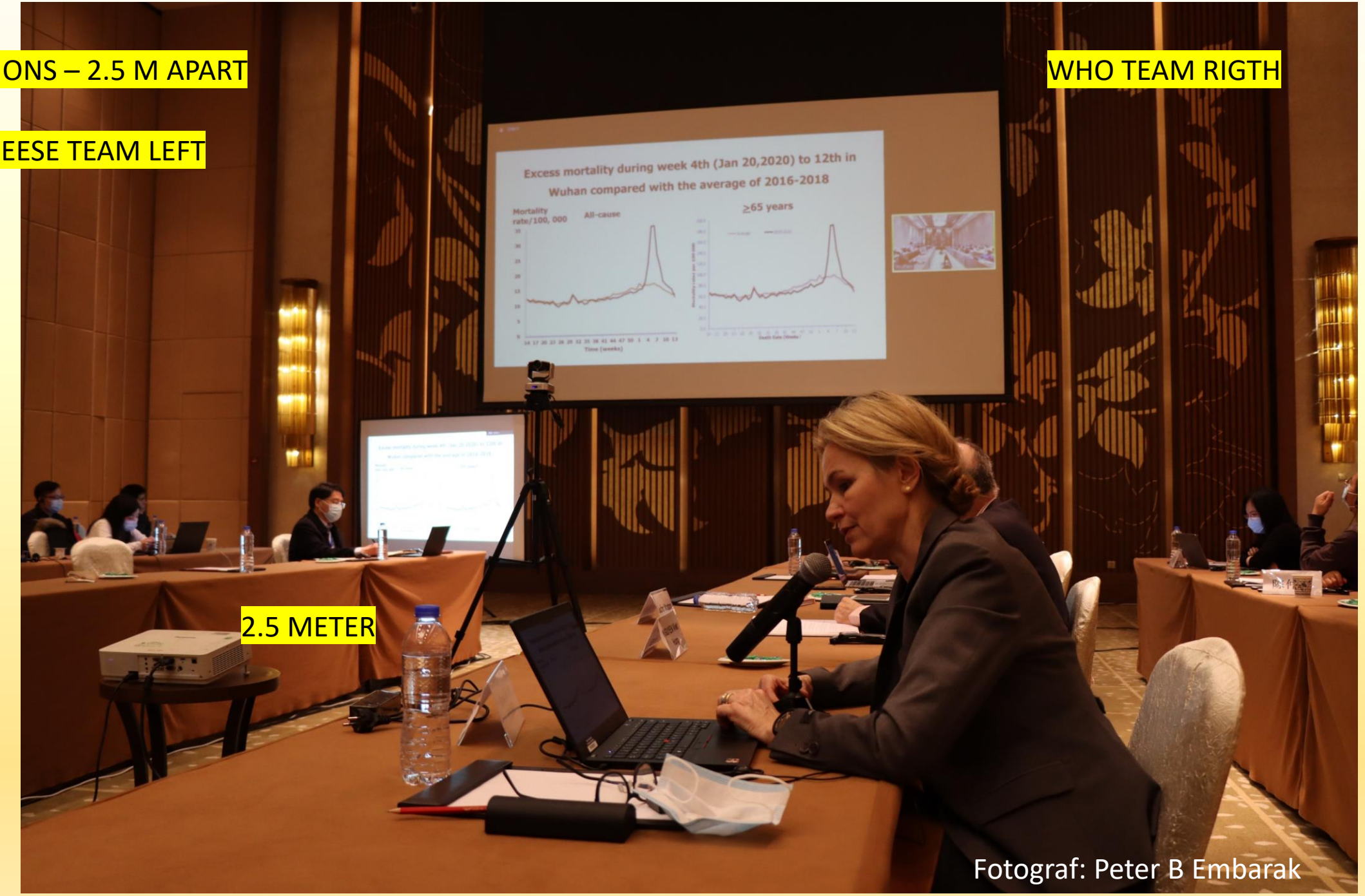


Fig. 1. Maximum likelihood phylogeny of the early SARS-CoV-2 pandemic, showing nucleotide reversions and putative candidates for the ancestral haplotype at the most common recent ancestor (MRCA). Putative ancestral haplotypes are identified with colored shapes. Reversions from the Hu-1 reference genotype to the recCA are colored. Blue represents C-to-T reversions and black indicates all other reversions. The tree is rooted on Hu-1 to show reversion dynamics to the recCA.

RELATIONS – 2.5 M APART

CHINEESE TEAM LEFT

WHO TEAM RIGTH



2.5 METER

Fotograf: Peter B Embarak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