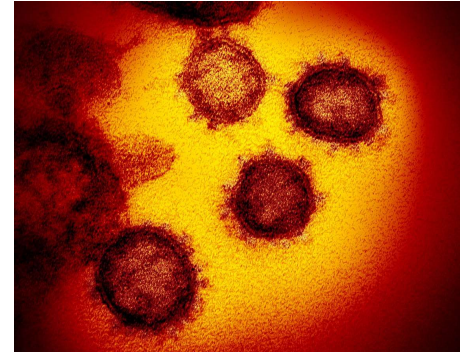COVID-19

COVID-19 coronavirus

- Coronaviridae family, Orthocoronavirinae subfamily

- RNA viruses

- It causes respiratory, enteral, liver and neurological diseases among mammals and birds

    - Seven of the human coronaviruses are known

- The lipid envelope can be disrupted by alcohol and chlorine

Clinical Characteristics of Coronavirus Disease 2019 in China
NEJM, March 3, 2020, Guan et al

- Data from 1099 patients were processed - in 30 regions of China
  - 3.5% health worker, 43.9% Wuhan resident
  - median age: 47 years
  - median incubation time: 4 days
  - median hospitalization: 12 days
  - 0.9% of patients under 15 years of age

- Symptoms: Fever (43.8%) - which occurred in 88.7% of patients during hospitalization, cough (67.8%); nausea, vomiting (5.0%), diarrhea (3.8%)

- Complications: pneumonia (91%), ARDS (3.4%), shock (1.1%)

- Primary outcome (intensive care, mechanical ventilation, death) 67 patients (6.1%); 15 patients (1.4%) - death

For the first 1,000 people to be infected,
MERS took **903 days or 2.5 years**

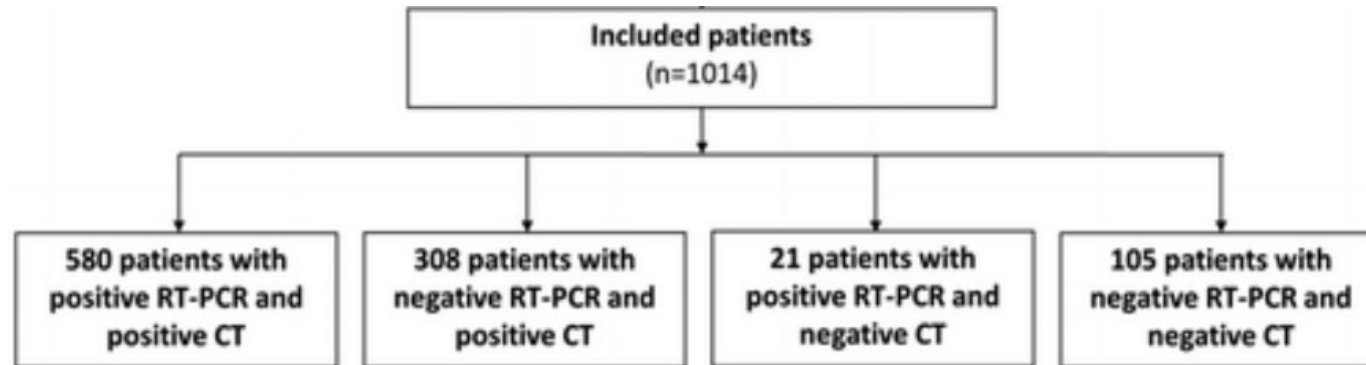SARS took **130 days**

and the new coronavirus took **48 days**

- Therapy: IV antibiotic therapy (58%), oseltamivir (35.8%), oxygen therapy (41.3%), mechanical ventilation (6.1%)

- Lymphocytopenia was reported: 83.2%

- The severity of clinical symptoms in patients varies widely

- Among 1099 confirmed COVID patients, 1.4% mortality was experienced

    this percentage would decrease to less than 1%, including those with

asymptomatic / mild symptoms

CT provides best diagnosis for COVID-19

Included patients (n=1014)

- 580 patients with positive RT-PCR and positive CT
- 308 patients with negative RT-PCR and positive CT
- 21 patients with positive RT-PCR and negative CT
- 105 patients with negative RT-PCR and negative CT

- The RT-PCR test showed the virus with only 59% accuracy, whereas chest CT identified 88% of the COVID-19 patients.

- Typical chest CT image: bilateral milk glass-like haze, multifocal consolidations

- RT-PCR test: COVID detectable in blood, nose, throat secretion (12-24h)

- CT provides a more accessible, practical and faster way to detect the disease

Correlation of Chest CT and RT-PCR Testing in Coronavirus Disease 2019 (COVID-19) in China: A Report of 1014 Case - Radiology, Feb 26 2020

Hungary
Last update: 08/03/2020

7	0	0	67	362
Fertőzött	**Gyógyult**	**Elhunyt**	**Karanténban**	**Mintavétel**
igazoltan új koronavírussal fertőzöttek száma	új koronavírus-fertőzésből gyógyultak száma	új koronavírus-fertőzés miatt elhunytak száma	új koronavírus gyanúja miatt elkülönítettek száma	akkreditált laboratóriumban vizsgált minták száma

Forrás: Nemzeti Népegyészségügyi Központ

Infected	Recovered	Deceased	Quarantine	Tested

Worldwide
Last update: 08/03/2020

106 165	59 965	3 594
Fertőzöttek	**Gyógyultak**	**Elhunytak**
igazoltan új koronavírussal fertőzöttek száma	új koronavírus-fertőzésből gyógyultak száma	új koronavírus-fertőzés miatt elhunytak száma

Updated data: www.koronavirus.gov.hu

Countries affected by confirmed COVID-19 disease (antsz)

Number of cases

- 1 - 9
- 10 - 99
- 100 - 999
- 1000 - 9999
- >= 10 000

Countries reporting cases

Date of production: 03/03/2020

The boundaries and names shown on this map do not imply official endorsement or acceptance by the European Union.
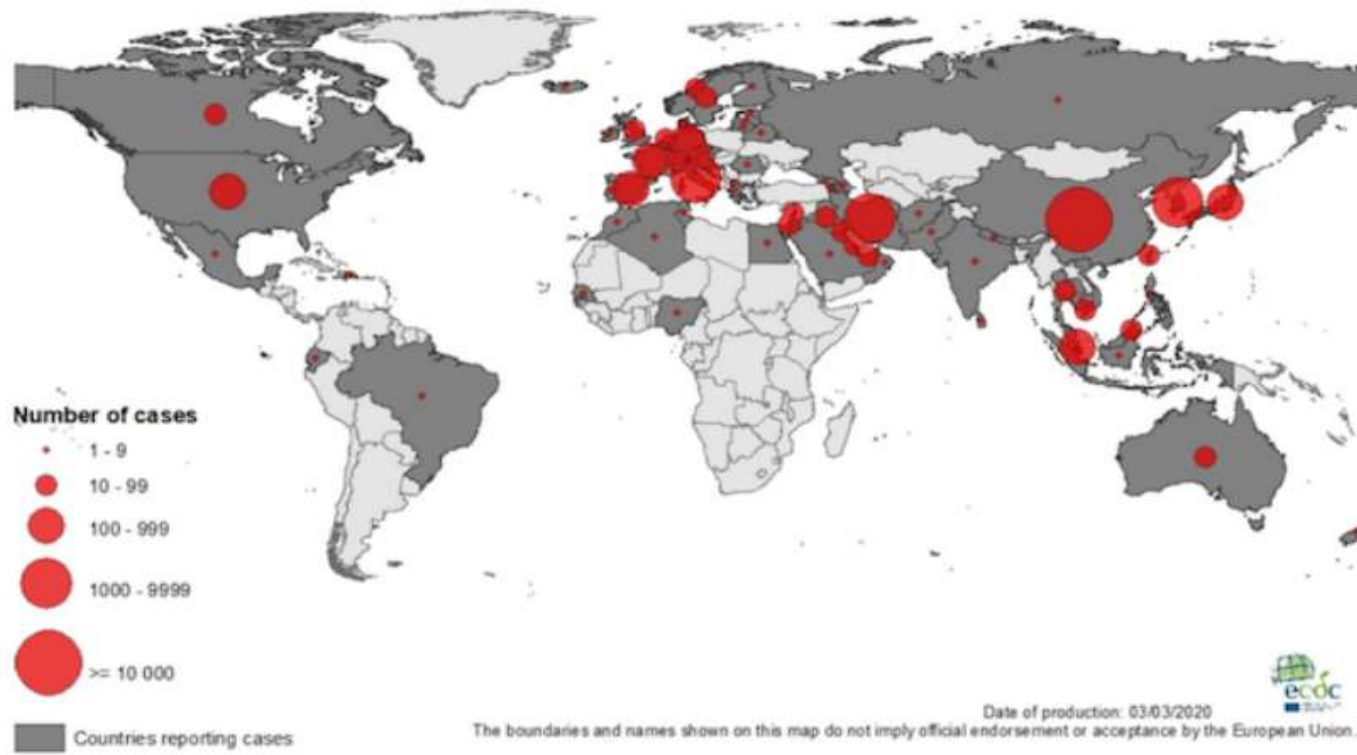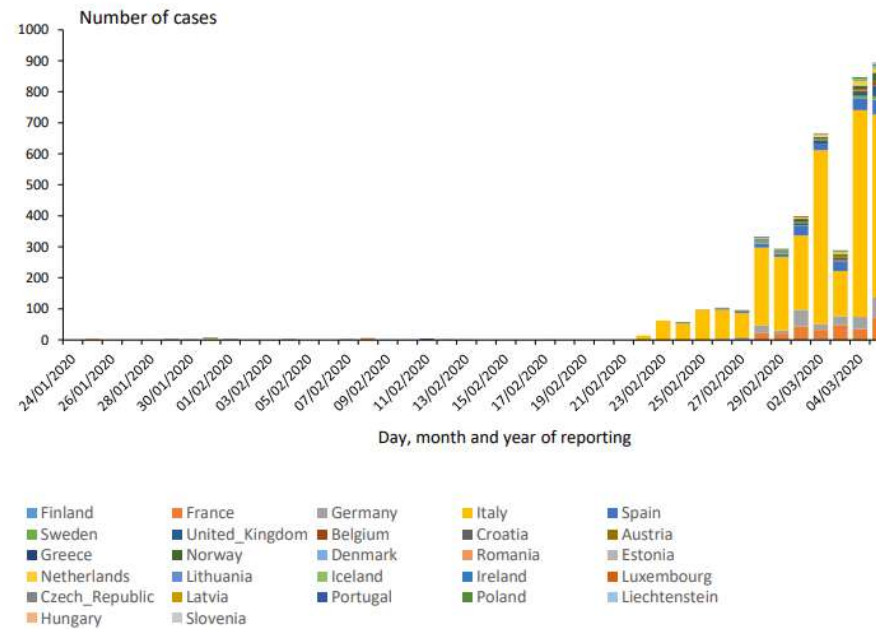
Figure 3: Distribution of confirmed COVID-19 cases by March 5, 2020 in the EU / EEA Member States and Great Britain (ECDC, 05/03/2020).

3. ábra: A 2020. március 5-ig az EU/EEA tagállamokban és Nagy-Britanniában előfordult igazolt COVID-19 megbetegedések megoszlása a jelentés ideje szerint (ECDC, 2020.03.05.).

Box. Key Findings From the Chinese Center for Disease Control and Prevention Report

72 314 Cases (as of February 11, 2020)
- Confirmed cases: 44 672 (62%)
- Suspected cases: 16 186 (22%)
- Diagnosed cases: 10 567 (15%)
- Asymptomatic cases: 889 (1%)

Age distribution (N = 44 672)
- ≥80 years: 3% (1408 cases)
- 30-79 years: 87% (38 680 cases)
- 20-29 years: 8% (3619 cases)
- 10-19 years: 1% (549 cases)
- <10 years: 1% (416 cases)

Spectrum of disease (N = 44 415)
- Mild: 81% (36 160 cases)
- Severe: 14% (6168 cases)
- Critical: 5% (2087 cases)

Case-fatality rate
- 2.3% (1023 of 44 672 confirmed cases)
- 14.8% in patients aged ≥80 years (208 of 1408)
- 8.0% in patients aged 70-79 years (312 of 3918)
- 49.0% in critical cases (1023 of 2087)

Health care personnel infected
- 3.8% (1716 of 44 672)
- 63% in Wuhan (1080 of 1716)
- 14.8% cases classified as severe or critical (247 of 1668)
- 5 deaths

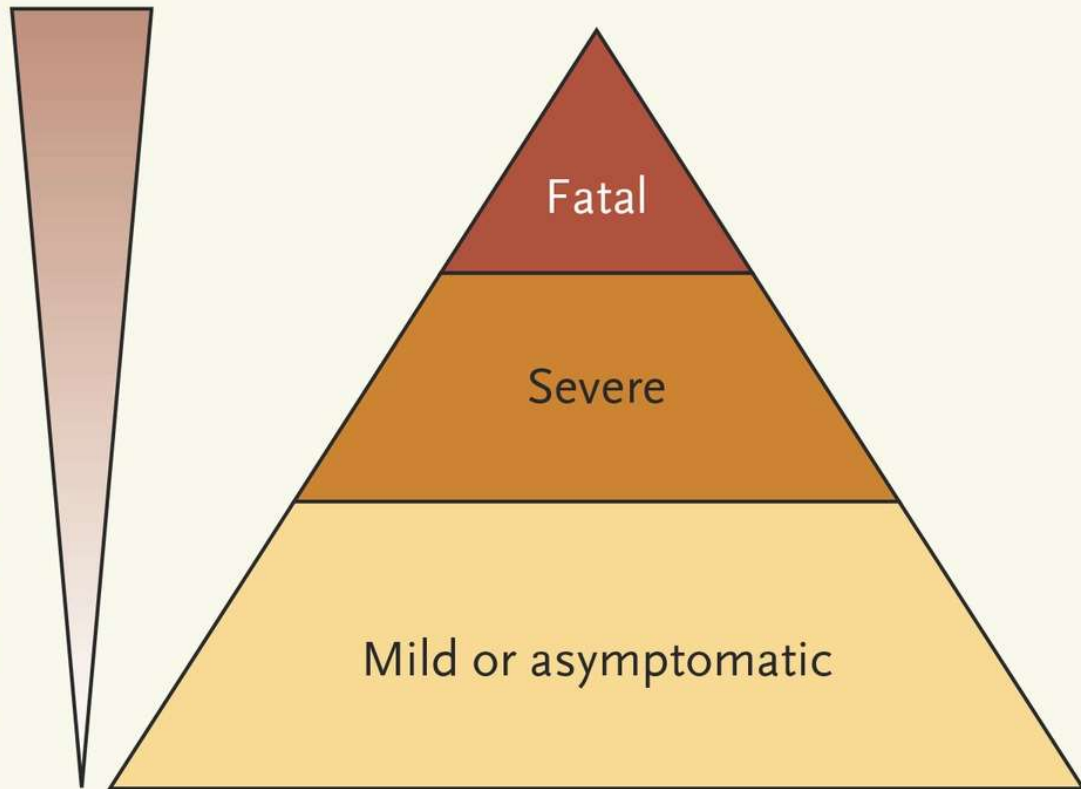For every 50 people that were infected,

MERS killed **17 people**

SARS killed **five people**

and the new coronavirus killed **one**

Ability to contain emerging virus in absence of countermeasures

Fatal

Severe

Mild or asymptomatic

Patients seek health care and can be diagnosed and isolated, and their contacts can be traced. A caveat is that coronaviruses have a propensity for noso-comial spread.

Patients do not seek health care, do not receive a diagnosis, and may spread the virus to contacts.

How to think about COVID-19?

- **Some of those exposed to the virus, acquire the virus**
- **Some will be asymptomatic**
- **There will be some who have mild symptoms**
- **There will be people who get (viral) pneumonia**
- **In severe cases, those who require ventilation - may require mechanical ventilation but will still recover**
- **People with co-morbidities die of the underlying disease or as a complication due to nosocomial infections**

Transmission of 2019-nCoV Infection from an Asymptomatic Contact in Germany
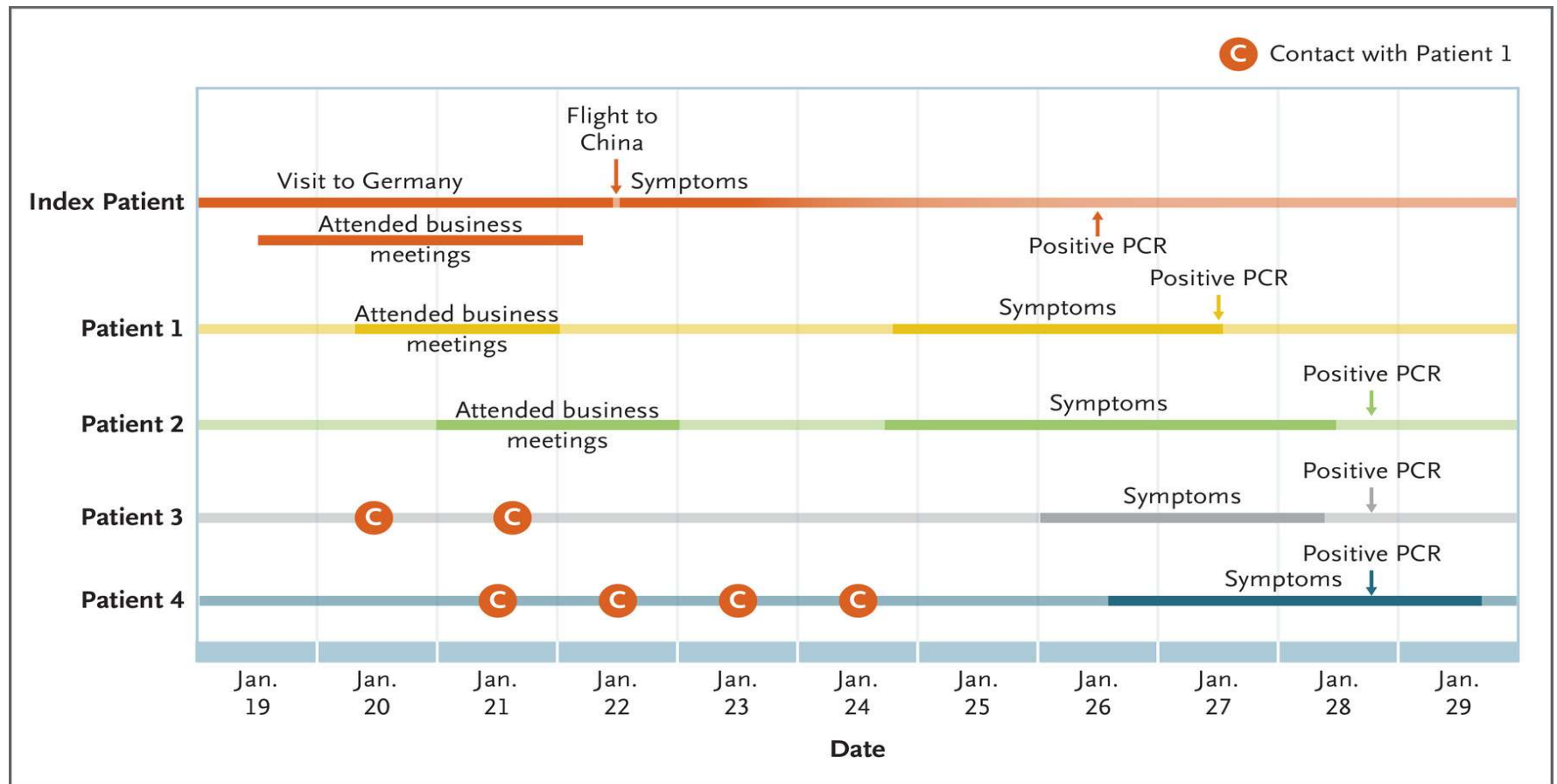
What lesson does the first German cluster teach us?

- **Contacts were found only after the PCR analysis of the index case**
- **The contacts might have transmitted the virus even before they had (or had very little of) the symptoms.**

Feasibility of controlling COVID-19 outbreaks by isolation of cases and contacts
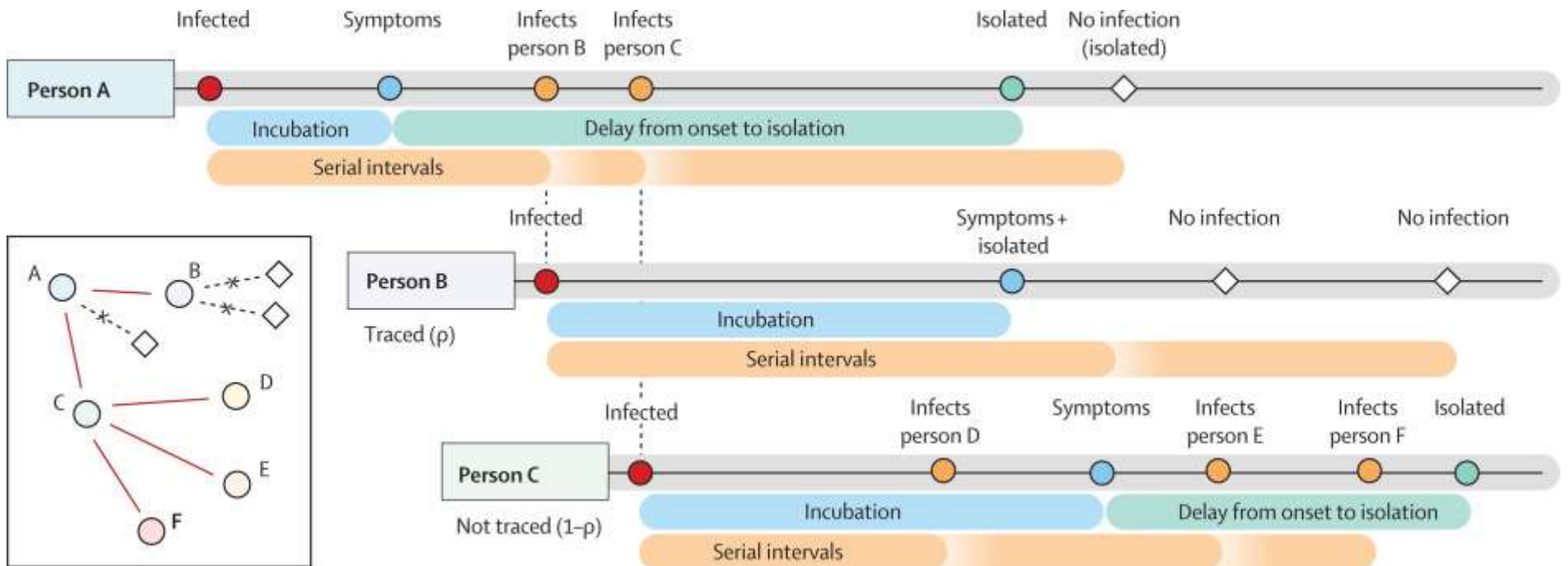
Importance of isolation / quarantine

- **Isolation / quarantine of the potentially infected patient could prevent the spreading of the virus**
- **When does an individual appear to be potentially infected?**
  - **He/She has been to Wuhan, he has been to Iran**
  - **He/She comes from an area where there is a documented accumulation**
  - **He/She got in contact with a COVID-19 infected patient**
  - **During his/her trip (on a plane, on a bus?) there was a patient (near?) showing respiratory symptoms**
  - **He/she has fever, respiratory symptoms, and the above factors can be detected during an epidemiological history taking**

Diagnosis

- **Epidemiological history**
- **According to the updated case definition (National Center for Public Health, WHO, ECDC, CDC) it is possible / necessary to initiate a respiratory sample PCR test**
- **A nasopharyngeal sample should be sent to the reference laboratory**
- **In severe cases, a chest CT may confirm a COVID-19 pneumonia**

What to watch out for when taking samples?

- **In case of doubt, the patient should be examined in a full protective equipment !!**

- **A surgical mask is not enough !!**

**The health worker should not only protect himself/herself !!!**

We know from the cases of SARS, MERSCo and now COVID-19 that unsuspecting healthcare workers were the vectors for the ones to spread the virus

(Italy, Washington State - USA, etc.)

**SARS-CoV-2 Viral Load in
Upper Respiratory Specimens
of Infected Patients**

February 19, 2020, and updated on February 20, 2020, at NEJM.org.
Ms. Zou, Mr. Ruan, and Dr. Huang

Conclusion:

From the respiratory samples, the highest number of virus was detected on day 3 after the onset of symptoms.
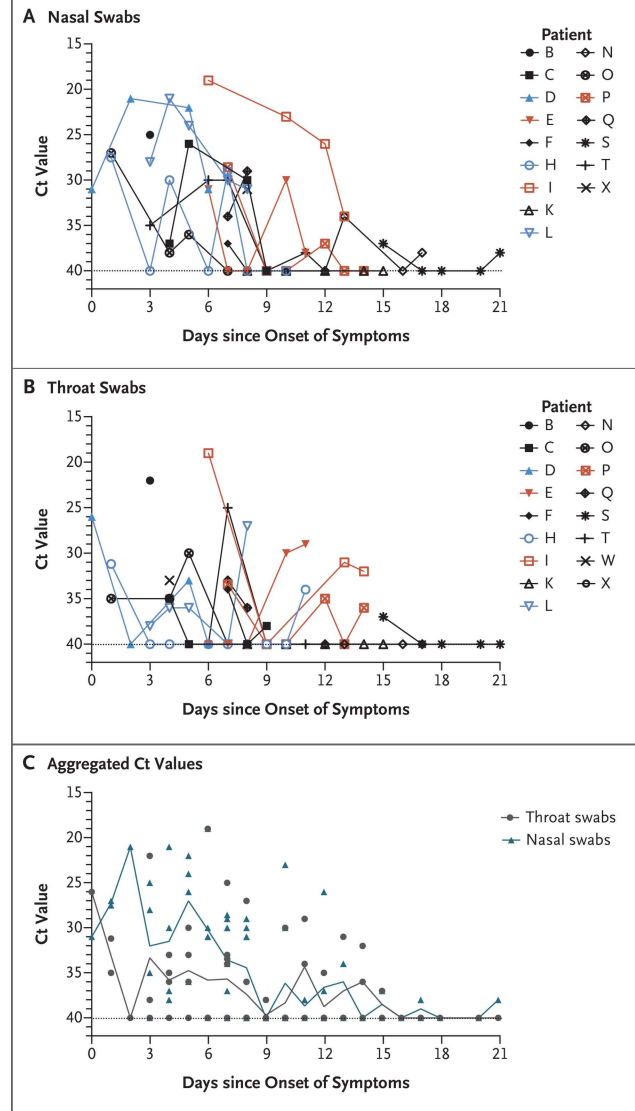
What to do now?

- **Persons with respiratory symptoms should preferably stay at home**
- **When their symptoms are mild, patients at risk based on their travel history should remain at home**
- **Wear a mask to protect your family members and vulnerable elderly people**
- **If there is a reasonable suspicion, contact the designated health care facilities**
- **In case of shortness of breath, fever, call a physician (emergency room, family doctor) for appropriate patient transport to the designated institution**

General rules of prevention

- **Avoid mass events held indoors**
- **Wash hands as often as possible, apply alcohol hand disinfectant after soapy hand wash**
- **Cough into a tissue, sneeze the used tissue into a sealed box.**
- **Do not touch your eyes, nose, mouth if you have not disinfected your hands when wearing a surgical face mask**
- **Disinfect objects and surfaces to which the virus can be transmitted (computer keyboard, mouse, mobile phone …)**