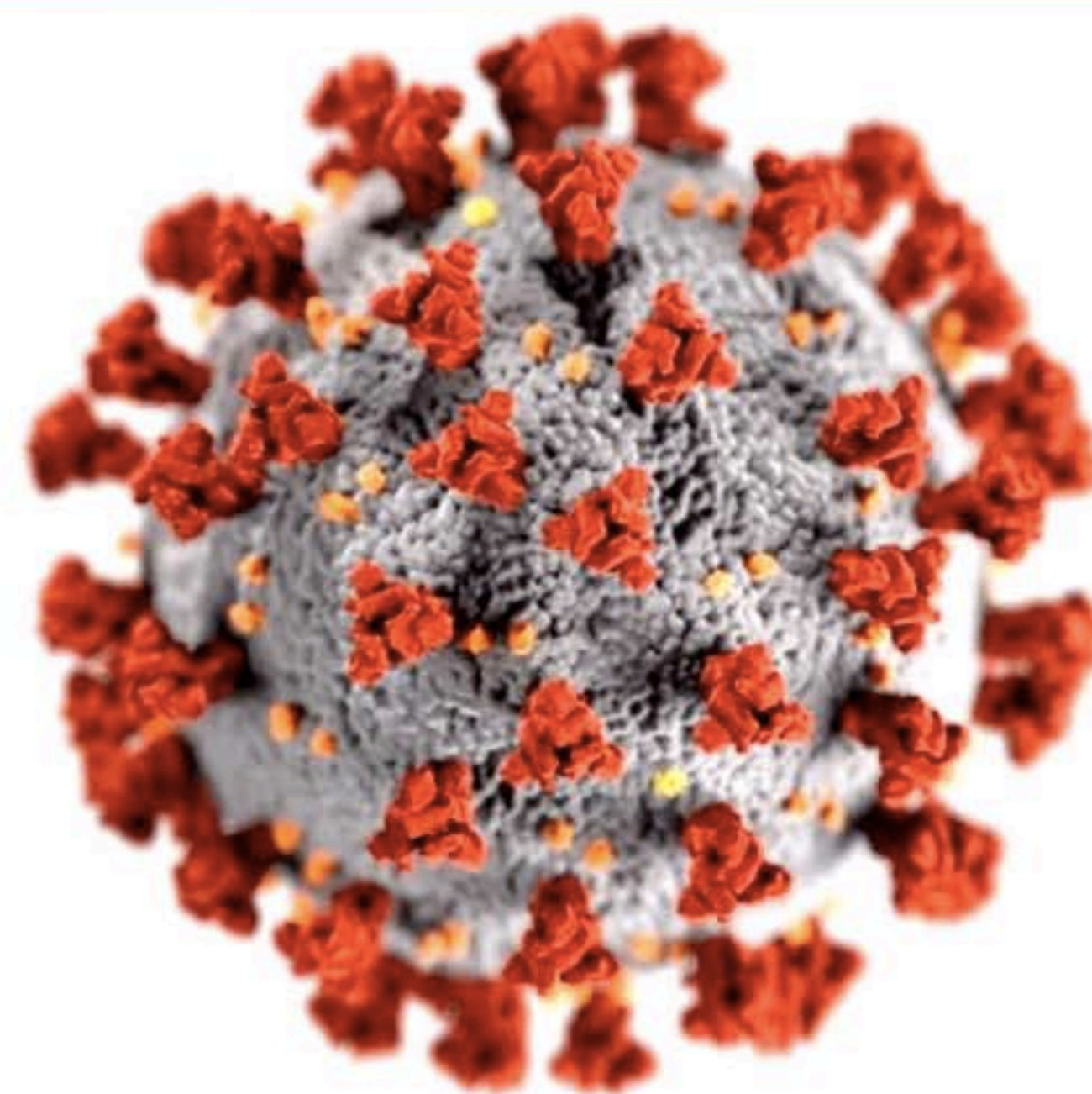




**Dr. Brooks has no relevant  
financial affiliations to disclose**



For more information: [www.cdc.gov/COVID19](https://www.cdc.gov/COVID19)



# Seven Human Coronaviruses (HCoVs)

- Common HCoVs (lower pathogenicity):

- HCoV-229E (alpha)
- HCoV-NL63 (alpha)
- HCoV-OC43 (beta)
- HCoV-HKU1 (beta)

- Other HCoVs (higher pathogenicity):

- SARS-CoV (beta)
- MERS-CoV (beta)
- **SARS-CoV-2\*** (beta)

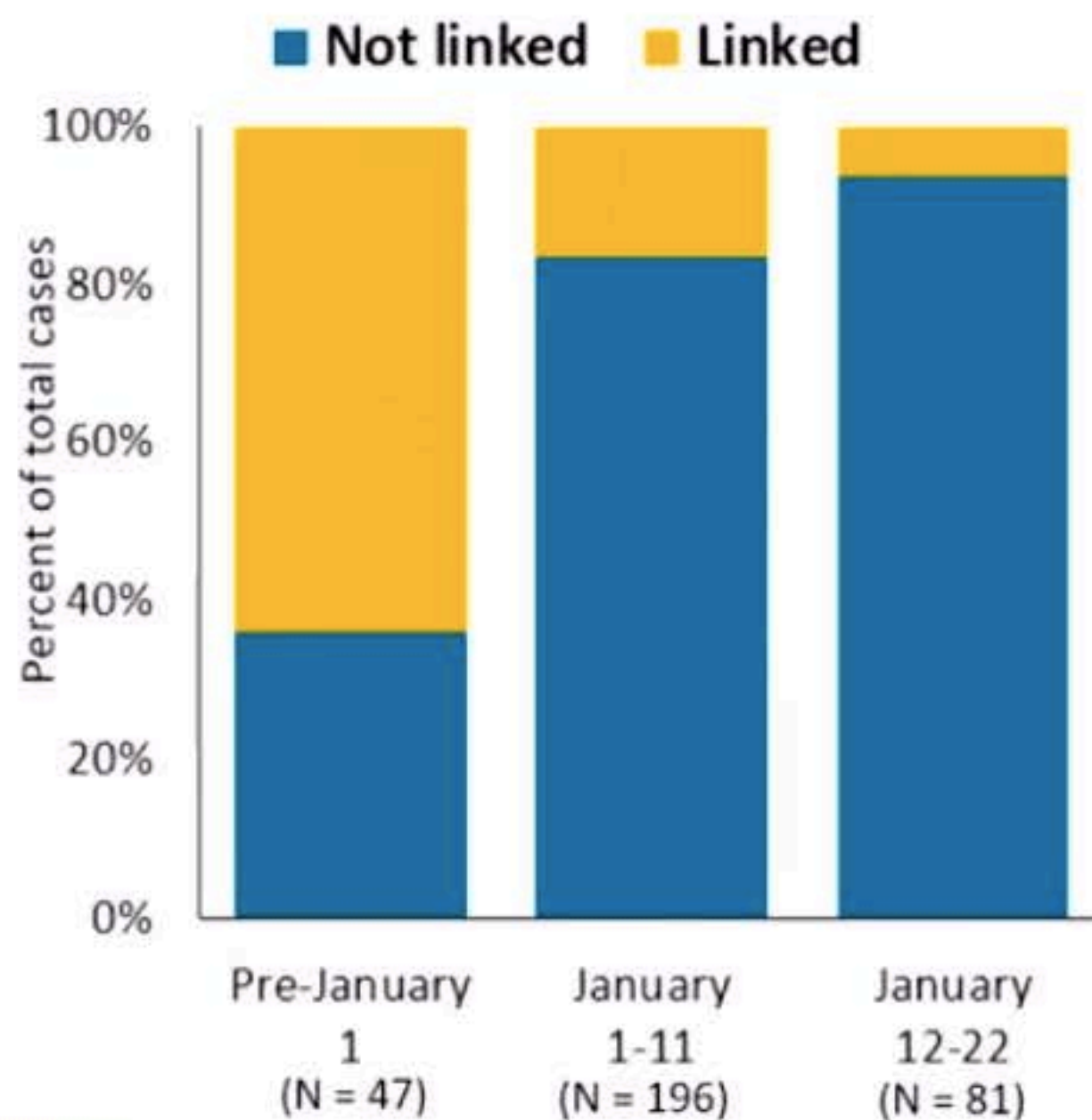
**The illness COVID-19 is caused by SARS-CoV-2, which is more like SARS-CoV than MERS-CoV**



[https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-\(covid-2019\)-and-the-virus-that-causes-it](https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-(covid-2019)-and-the-virus-that-causes-it)



# Linkage of Early COVID-19 Cases\* to Huanan Seafood Wholesale Market – Wuhan, China



<https://www.healthpolicy-watch.org/>



Adapted from Li 2020, *N Engl J Med*; DOI: 10.1056/NEJMoa2001316.

\* Total N=324 persons with complete exposure histories among 425 total cases



**Early  
Distribution  
of Cases:  
China as of  
20-Jan-2020**

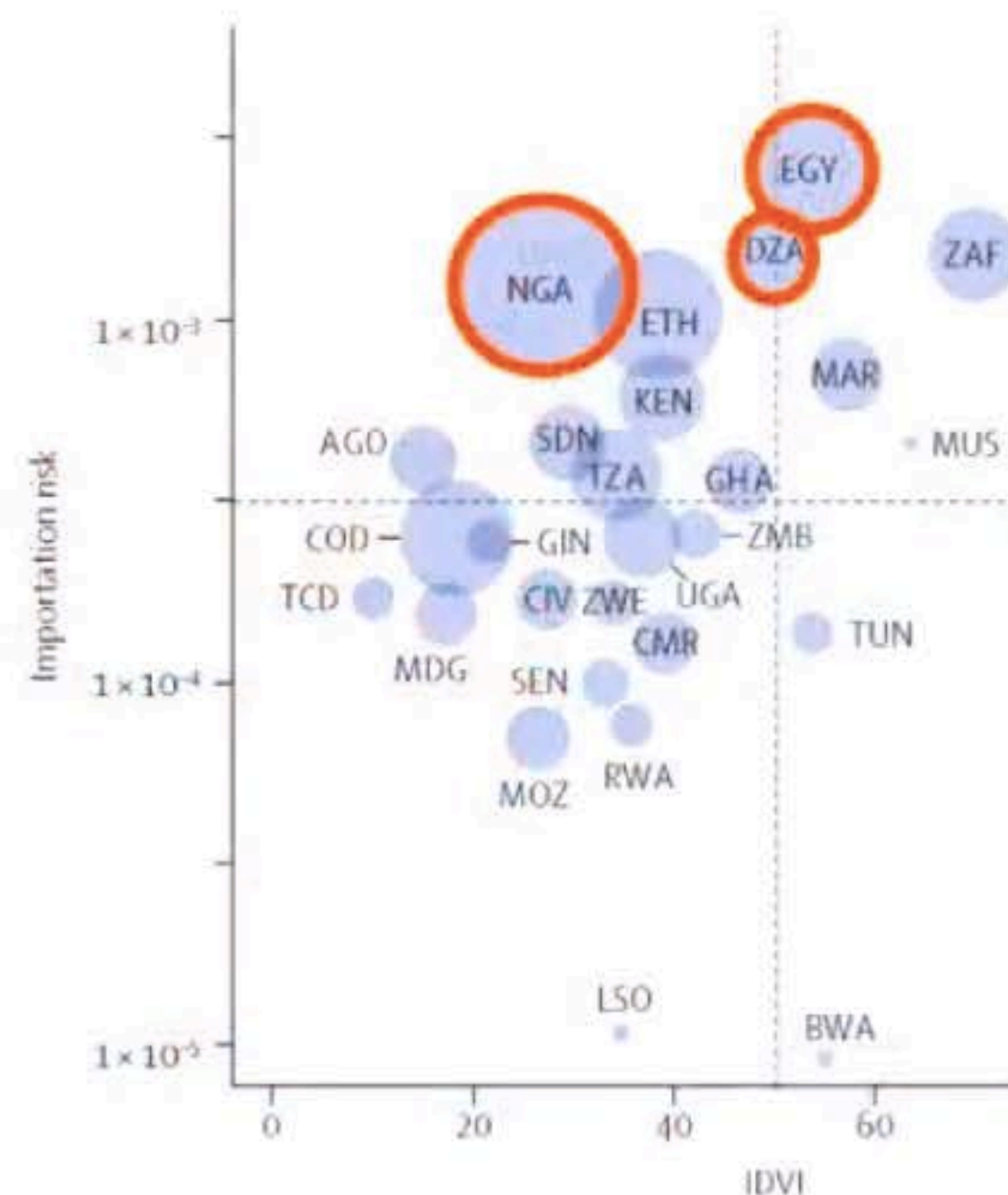
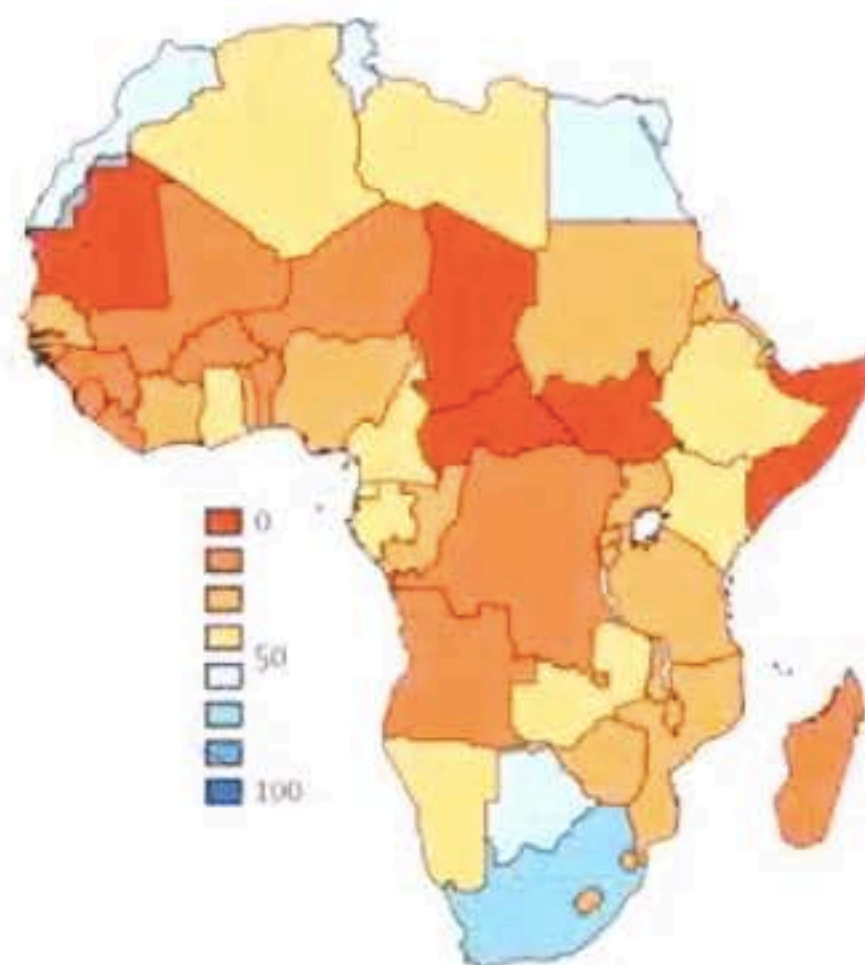


Source: National Health Commission of the PRC. Data correct as of January 26, 00:00 P.M. ET.  
Graphic: Natalie Leung and Henrik Pettersson, CNN.





### Air travel volume inbound From China provinces



Gilbert 2020, *Lancet*, [https://doi.org/10.1016/S0140-6736\(20\)30411-6](https://doi.org/10.1016/S0140-6736(20)30411-6)

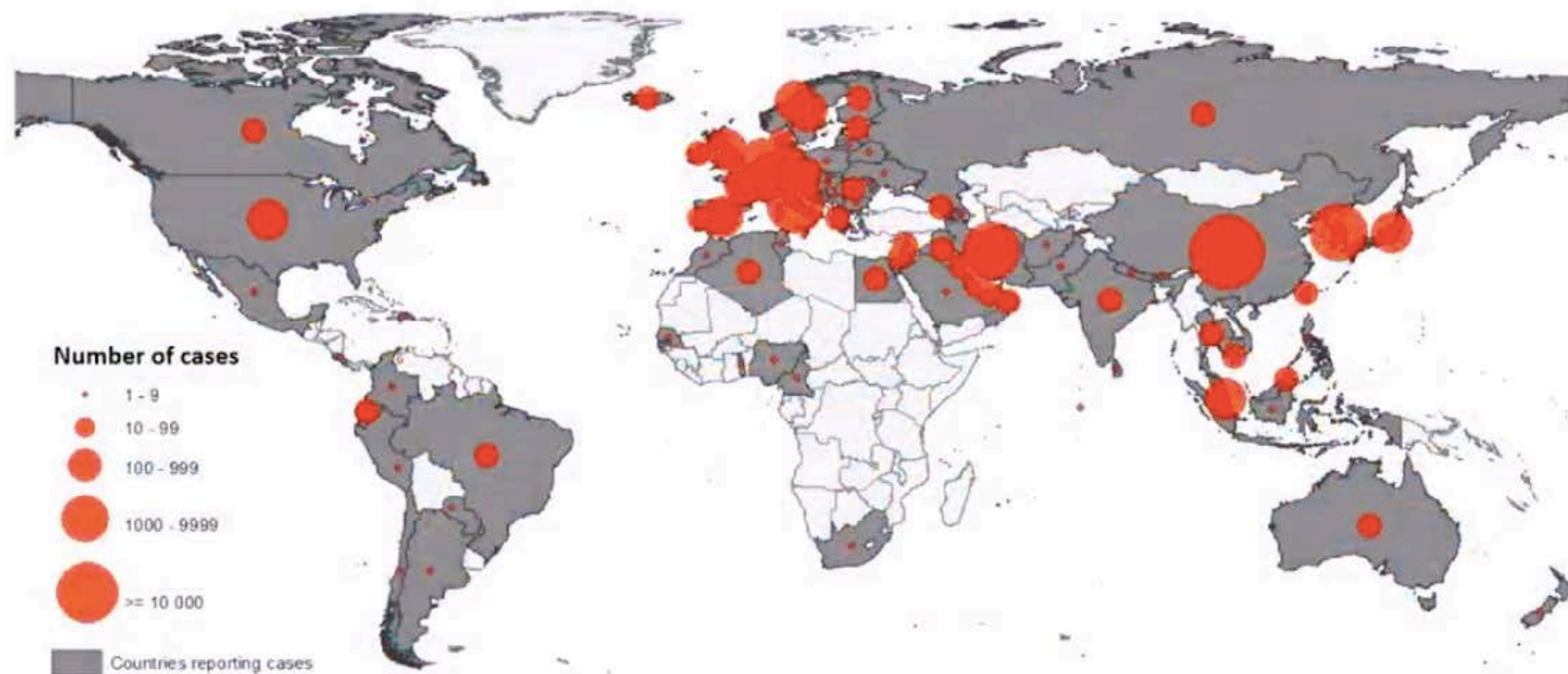


# Widespread rapid dissemination in our hyper-connected world creates real-time challenges to prediction analyses





# Worldwide cases as of March 4, 2020



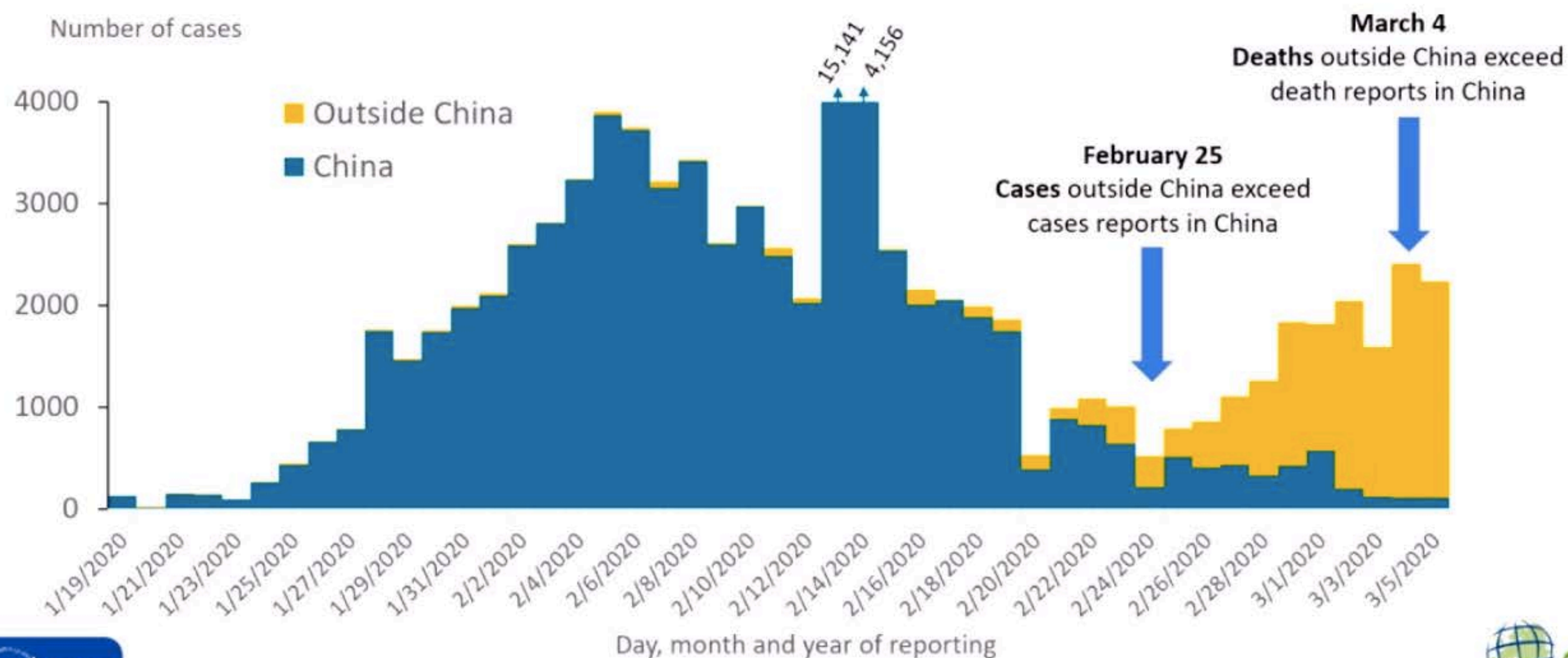
Date of production: 08/03/2020

The boundaries and names shown on this map do not imply official endorsement or acceptance by the European Union





## Distribution of COVID-19 cases in accordance with the applied case definitions in the affected countries, as of 05 March 2020





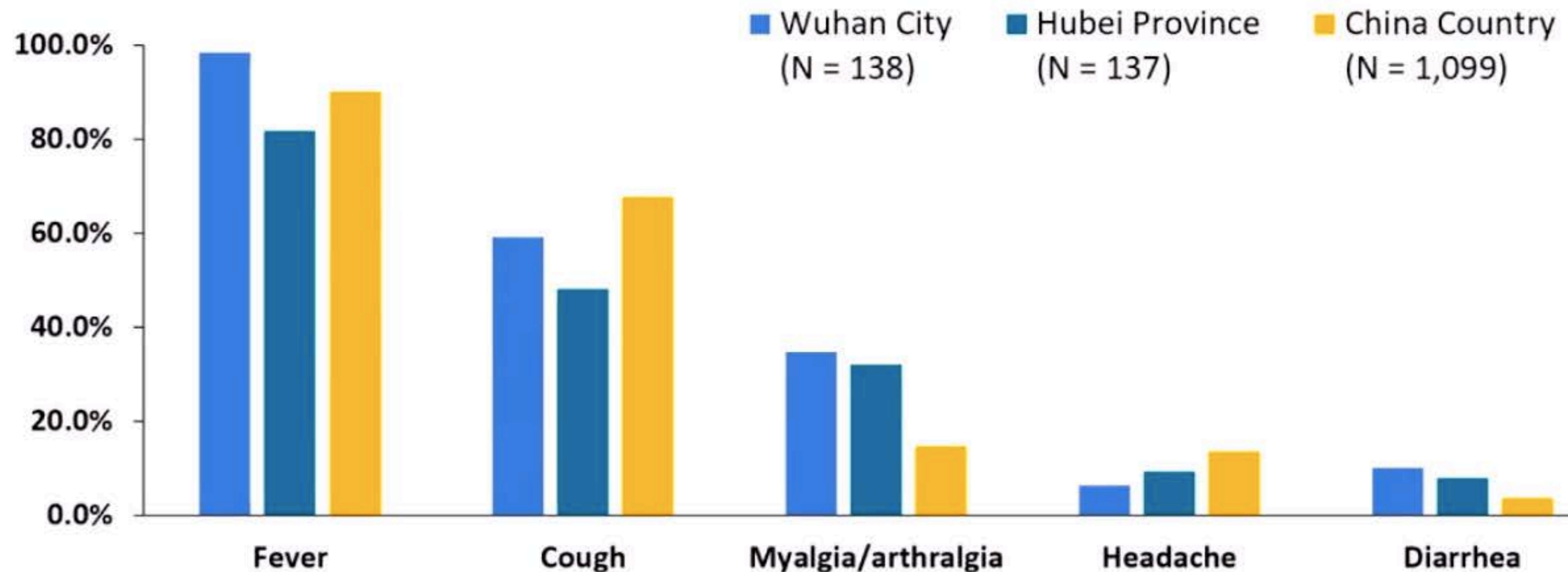
# COVID-19

## Clinical Epidemiology and Transmission





# Signs/Symptoms of COVID-19



Liu 2020, *Chinese Med J*; DOI: 10.1097/CM9.0000000000000744. Wang 2020, *JAMA*; doi:10.1001/jama.2020.1585.  
Guan 2020, *N Engl J Med*; DOI: 10.1056/NEJMoa2002032.



# Signs/Symptoms of COVID-19

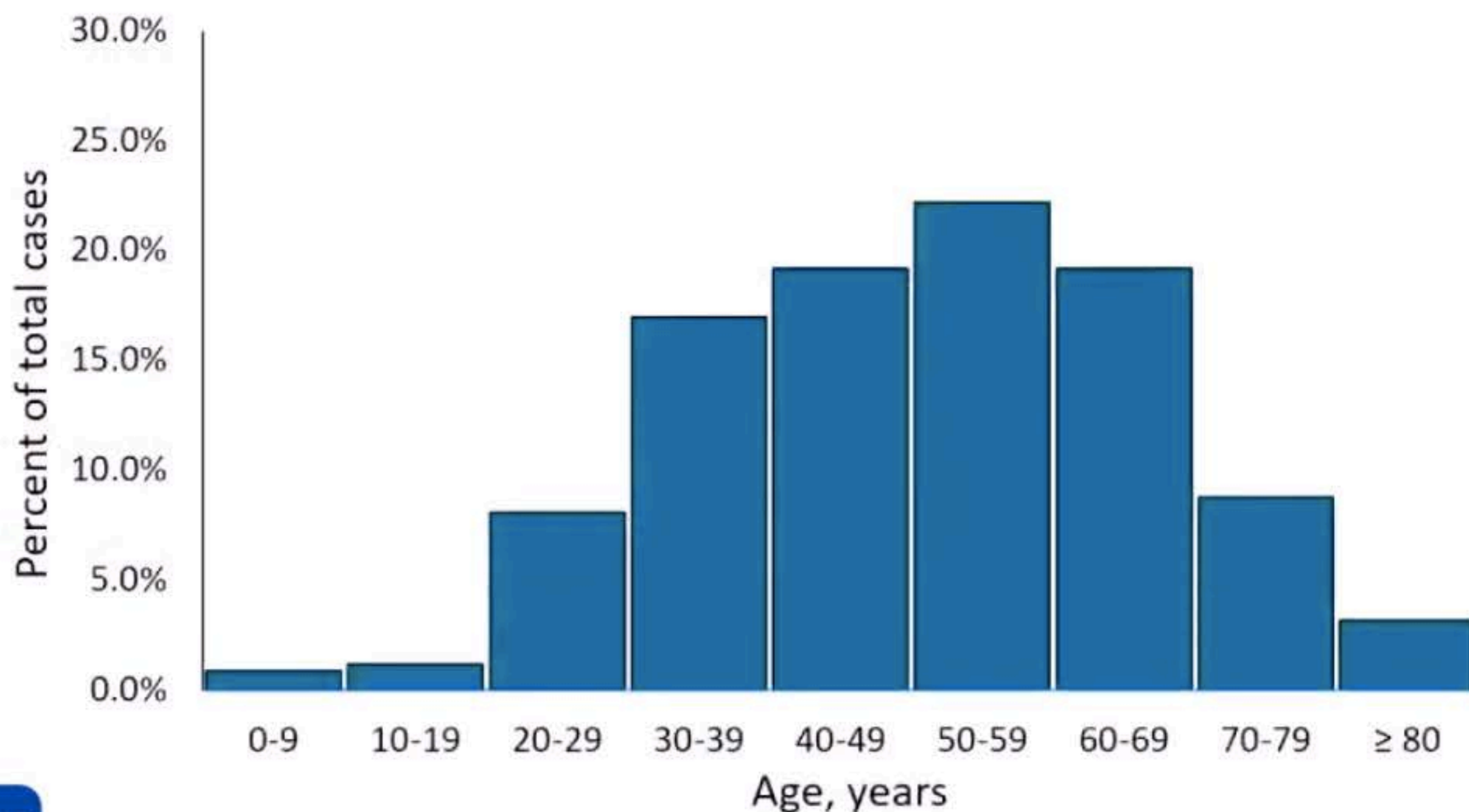
- No particular set of signs or symptoms can reliably discriminate COVID-19 from other respiratory viral illnesses such as influenza
  - Subacute to acute onset
  - Non-productive cough
  - Fever or “feverish” (often low-grade or not initially measurable)
  - Some reports of isolated diarrhea alone preceding cough and fever
- Median incubation period estimated to be 4-6 days (range 2-14 days)
- Most people will recover spontaneously with supportive care
- Complications include pneumonia, respiratory failure, multiorgan system failure



Liu 2020, *Chinese Med J*; DOI: 10.1097/CM9.0000000000000744. Wang 2020, *JAMA*; doi:10.1001/jama.2020.1585.  
Guan 2020, *N Engl J Med*; DOI: 10.1056/NEJMoa2002032. Chen 2020, *Lancet*; [https://doi.org/10.1016/S0140-6736\(20\)30211-7](https://doi.org/10.1016/S0140-6736(20)30211-7)



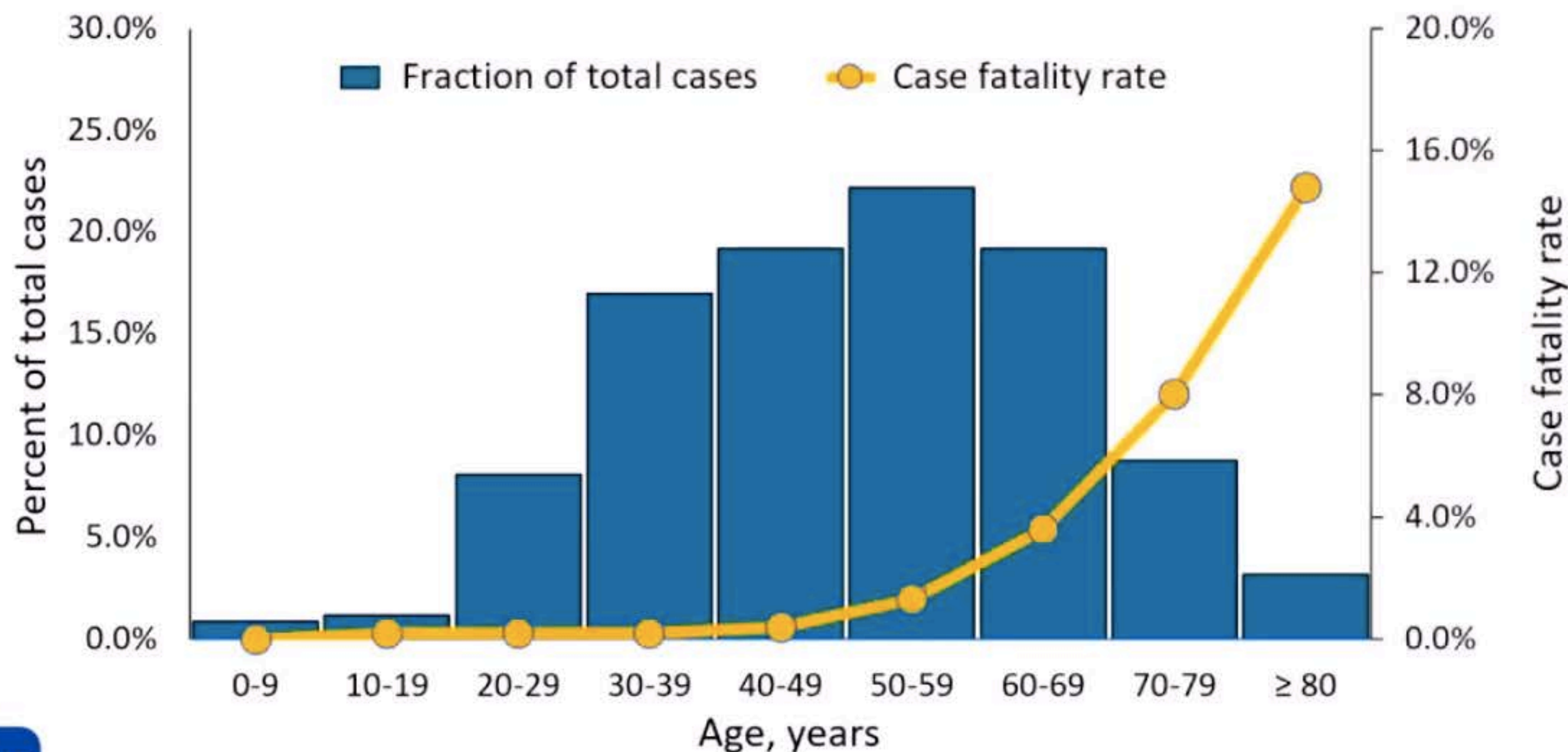
# Age Distribution and Case Fatality Rate COVID-19 China through 11-Feb-2020 (N = 44,672 confirmed cases)



adapted from Zhang 2020; *China CDC Weekly Rep*; 2(8):113-122.



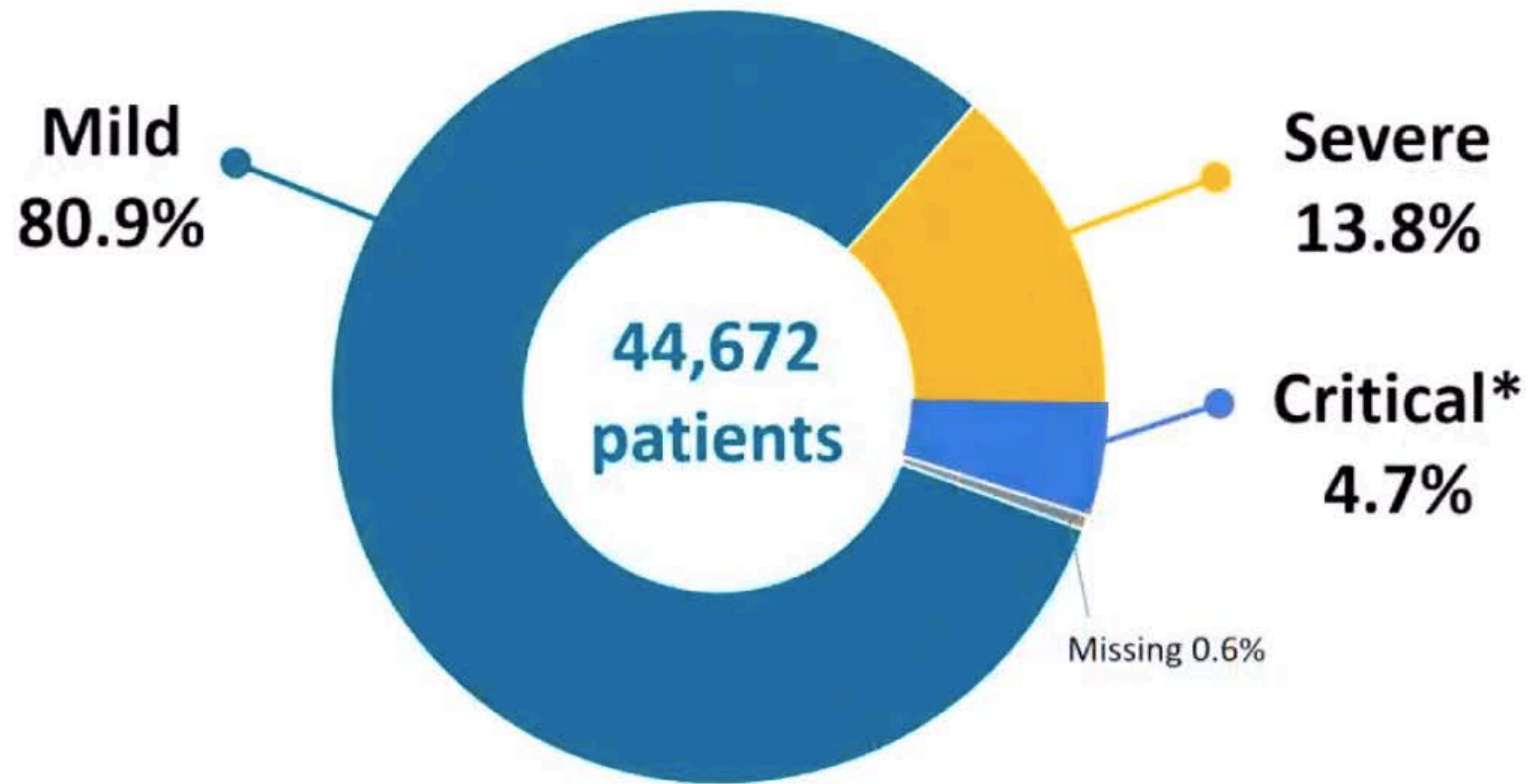
# Age Distribution and Case Fatality Rate COVID-19 China through 11-Feb-2020 (N = 44,672 confirmed cases)



adapted from Zhang 2020, *China CDC Weekly Rep*; 2(8):113-122.



# Illness Severity COVID-19 - China through 11-Feb-2020



adapted from Zhang 2020, *China CDC Weekly Report* 2(8):113-122.

\* 1,023 (49%) deaths among 2,087 critically ill patients



# SARS-CoV-2 in Human Samples and Transmission

- **Respiratory secretions – main mode of transmission**
  - Infection spread through respiratory droplets in the air and that land on surfaces
  - Transmission from persons who are pre-symptomatic or who may have asymptomatic infection is possible but the contribution of these infections to overall numbers of illness appears to be small at this time
- **Stool – unlikely at this time**
  - Readily detectable by RT-PCR but only one report of replication-competent virus cultured
- **Perinatal – no transmission yet observed**
  - Not detected by RT-PCR in amniotic fluid, cord blood, neonatal throat swab, breast milk

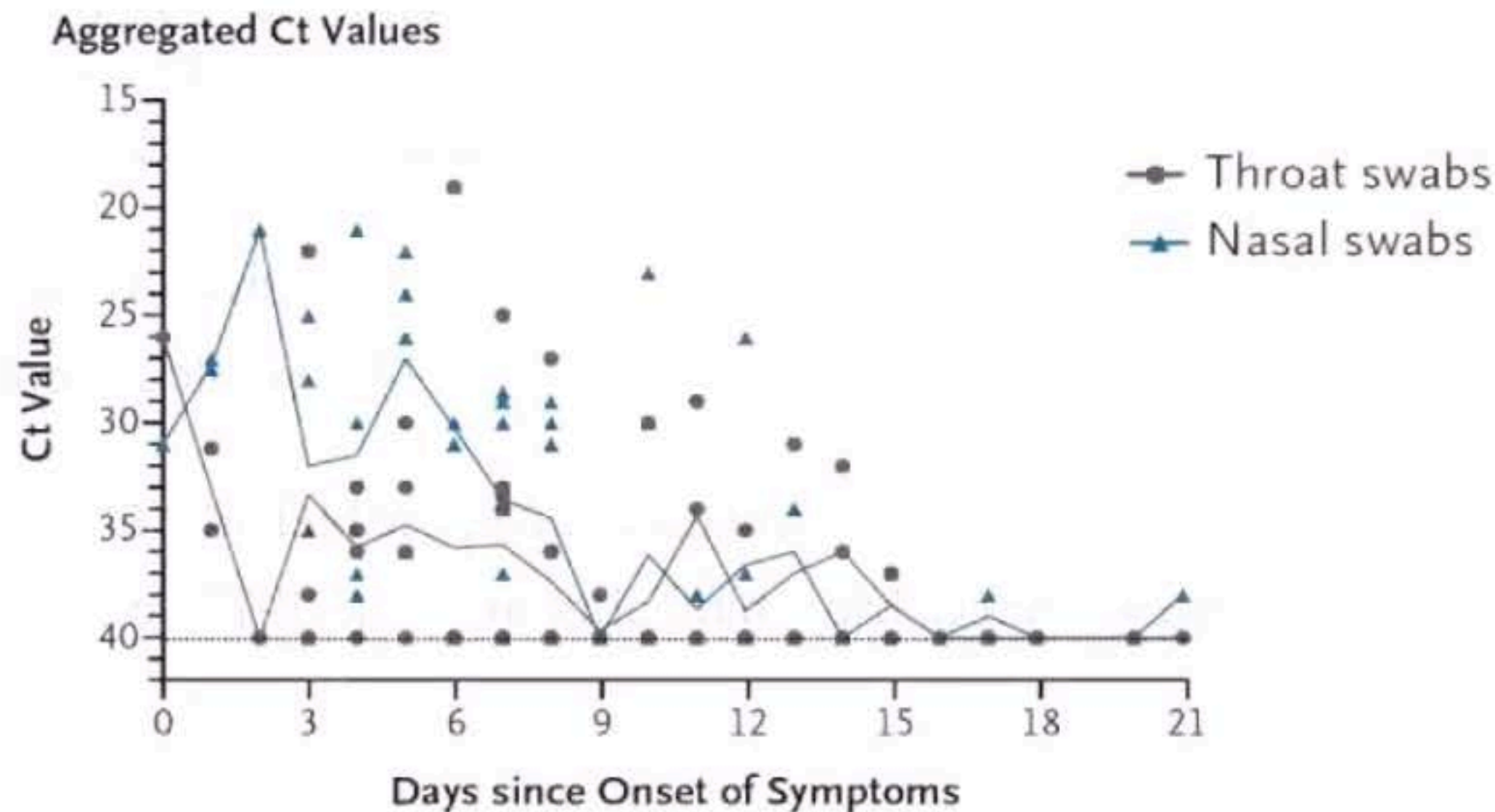


Zou 2020; N Engl J Med; DOI: 10.1056/NEJMc2001737. Pan 2020; Lancet Infect Dis; [https://doi.org/10.1016/S1473-3099\(20\)30113-4](https://doi.org/10.1016/S1473-3099(20)30113-4).  
Zhang 2020; China CDC Weekly; <http://weekly.chinacdc.cn/en/article/id/ffa97a96-db2a-4715-9dfb-ef662660e89d>. Chen 2020; Lancet; [https://doi.org/10.1016/S0140-6736\(20\)30360-3](https://doi.org/10.1016/S0140-6736(20)30360-3).  
Zhu 2020; Transl Pediatr; <http://dx.doi.org/10.21037/tp.2020.02.06>



# Viral Shedding Greatest At Time Symptoms Start

- SARS-CoV-2 viral loads in 17 symptomatic patients
- No data regarding duration of replication-competent virus shedding (e.g., culture)



Zou 2020, N Engl J Med, DOI: 10.1056/NEJMc2001737



# COVID-19 in High-Risk Groups

- **Comorbidity and advanced age increase risk for severe illness and death**
  - Cardiovascular disease, diabetes, chronic respiratory disease (CFR >5%)
- **Immunocompromised (medical, acquired) – no data at present**
  - For persons with HIV, risk likely greatest at low CD4 cell counts or if not virally suppressed
  - Nonetheless all should take precautions given this is a new virus
  - CDC estimates that  $\geq 50\%$  of people with HIV are more than 50 years old
- **Pregnancy**
  - Current observational data only exist for women infected in third trimester
  - Maternal morbidity similar to that of uninfected women without COVID-19
  - No definitive evidence infection transmitted perinatally



Zhang 2020, [China CDC Weekly Report](#); 2(8):113-122 Rasmussen 2020, [Am J Obstet Gynecol](#). <https://doi.org/10.1016/j.ajog.2020.02.017>

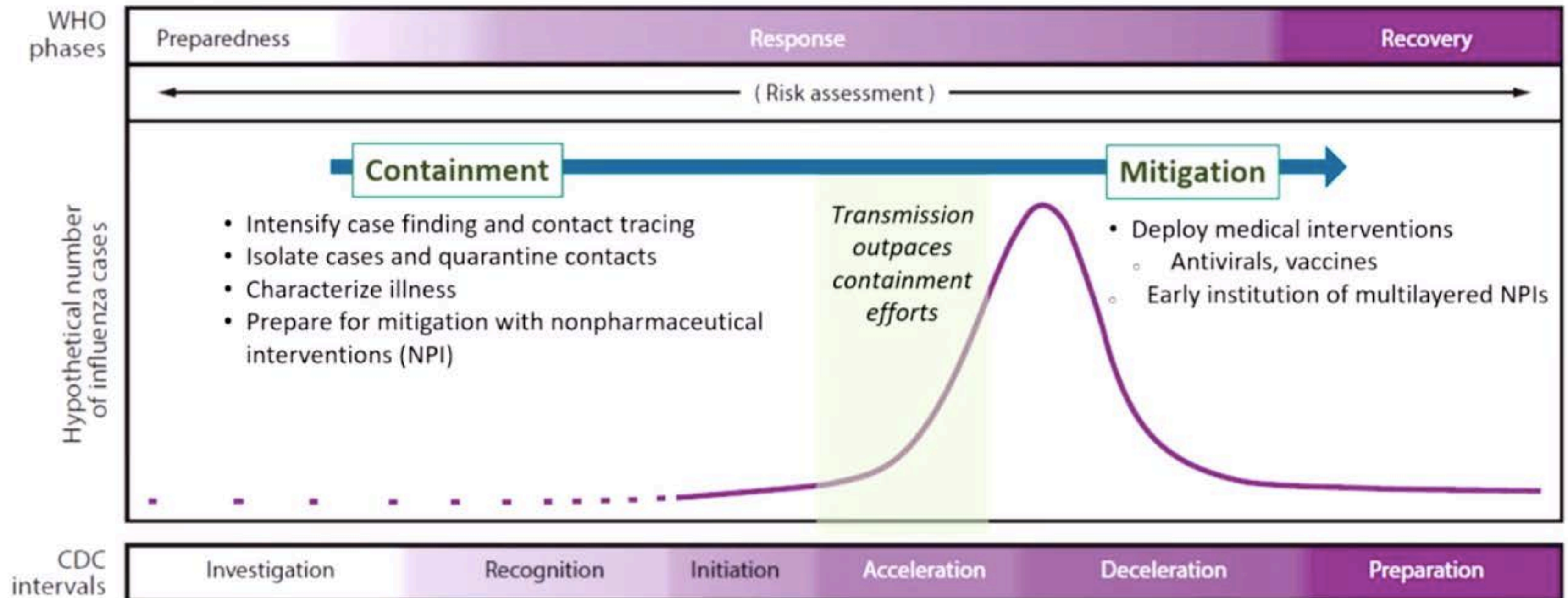


# COVID-19 Preparedness and Prevention





# Preparedness and Response Framework for Pandemics



Adapted from: Holloway 2014, [MMWR Recomm Rep;63\(No. RR-6\)](#). Qualls 2017, [MMWR Recomm Rep; 66\(No. RR-1\)](#). Jernigan 2020, [MMWR Early Release](#): February 25, 2020.



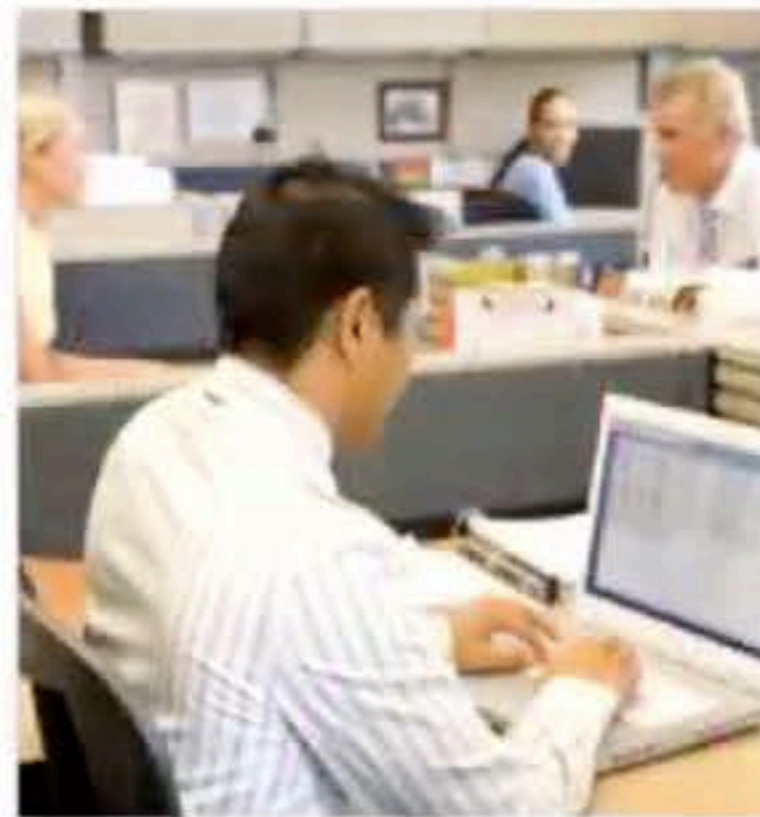
# Nonpharmaceutical Interventions (NPIs): “Social Distancing”



At Home



At School



At Work



At a Gathering

<https://www.cdc.gov/nonpharmaceutical-interventions/index.html>





# Nonpharmaceutical Interventions (NPIs): “Personal Action”

**COVID 19**  
CORONAVIRUS DISEASE  
2019 (COVID-19)

**You can help prevent the spread of respiratory illnesses with these actions:**

- Avoid close contact with people who are sick.
- Avoid touching your eyes, nose & mouth.
- Wash hands often with soap & water for at least 20 seconds.

[www.cdc.gov/COVID19](http://www.cdc.gov/COVID19)

**Your hands carry germs you can't see**

**Wash your hands**

[www.cdc.gov/handwashing](http://www.cdc.gov/handwashing)



[www.cdc.gov/handwashing](http://www.cdc.gov/handwashing)



# Stigma is the Enemy of Public Health



<https://www.scmp.com/comment/opinion/article/3051744/west-unleashes-new-strain-racism-name-coronavirus-prevention>



# Stigma is the Enemy of Public Health



<https://www.scmp.com/comment/opinion/article/3051744/west-unleashes-new-strain-racism-name-coronavirus-prevention>



# Recommendations for People with HIV

- Ensure ample medication supply
  - 30-days supply at all times
- Keep vaccinations up to date
  - influenza, pneumococcal
- Establish plan for clinical care if isolated/quarantined
  - telemedicine options
  - physician on-line portals
- Maintain a social network but remotely
  - Social contact helps us stay mentally healthy and fights boredom

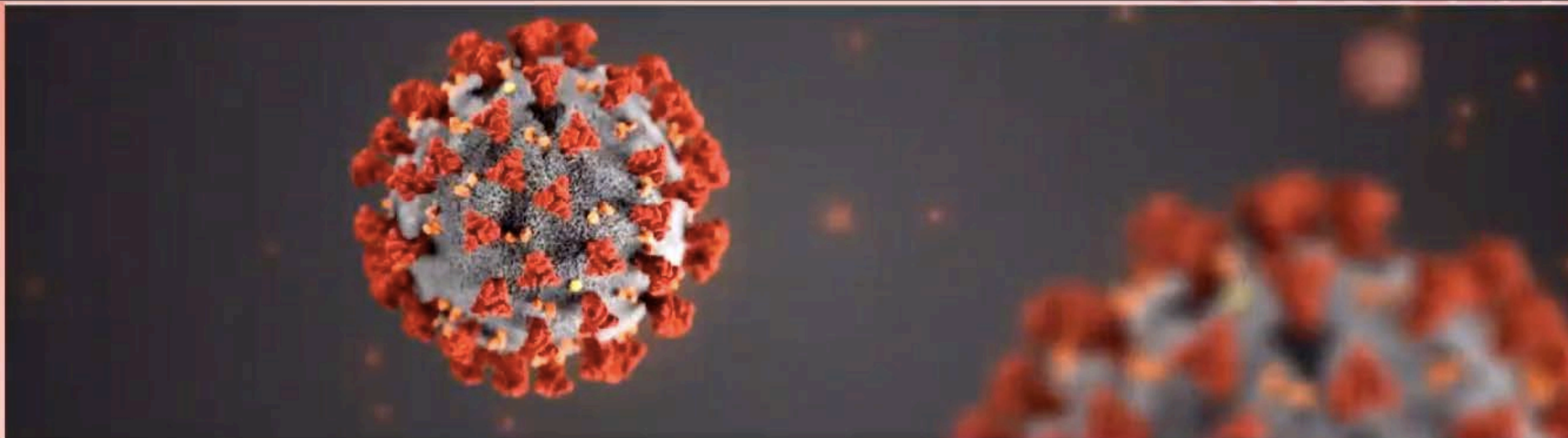




# Don't Panic, There's Plenty of Soap!







For more information, contact CDC  
1-800-CDC-INFO (232-4636)  
TTY: 1-888-232-6348 [www.cdc.gov](http://www.cdc.gov)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

