

THE CORONAVIRUS CRISIS

Coronavirus: COVID-19 Is Now Officially A Pandemic, WHO Says

March 11, 2020 - 12:30 PM ET

BILL CHAPPELL



COVID-19 Update

James Steinberg, MD

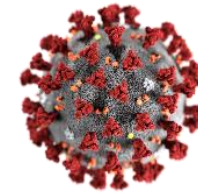
March 11, 2020

Learning Objectives

- Appreciate what is known and what is not known about COVID-19
- Understand how pandemics evolve
- Gain insight on what we as a society and you as individual can do to mitigate risk

COVID-19 coronaVirus Infectious Disease 2019

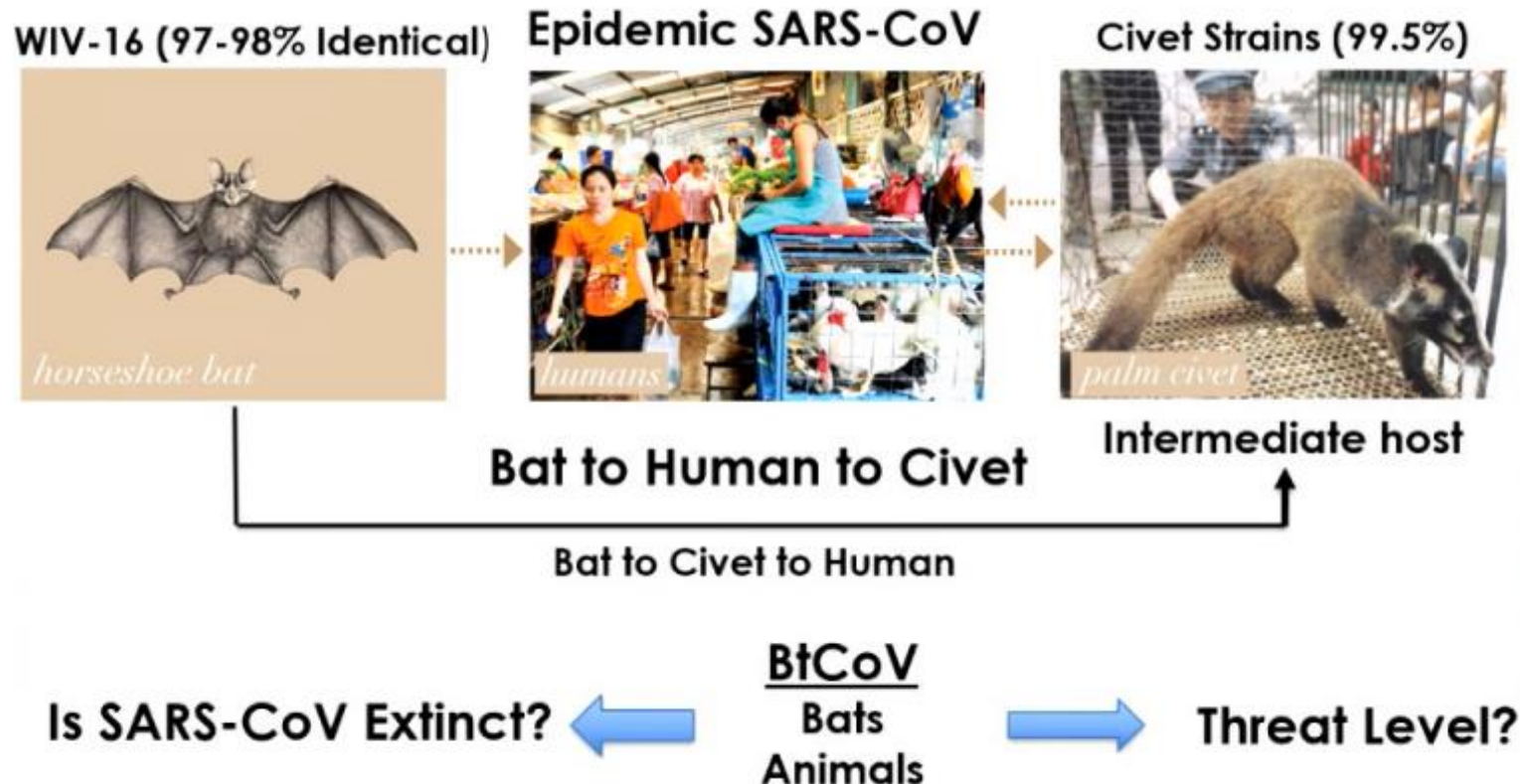
- Coronaviruses are a large family of viruses that can infect many animals
 - Named for the crown-like spikes on surface
- COVID-19 is a new coronavirus infection
 - Discovered in December 2019 in Wuhan, China
- Coronavirus family includes viruses that cause the common cold, as well as SARS and MERS
 - Although most COVID-19 infections are mild, severe pneumonia and even death can occur
- Natural host for many coronaviruses are bats
- Because COVID-19 is new, a lot is not known



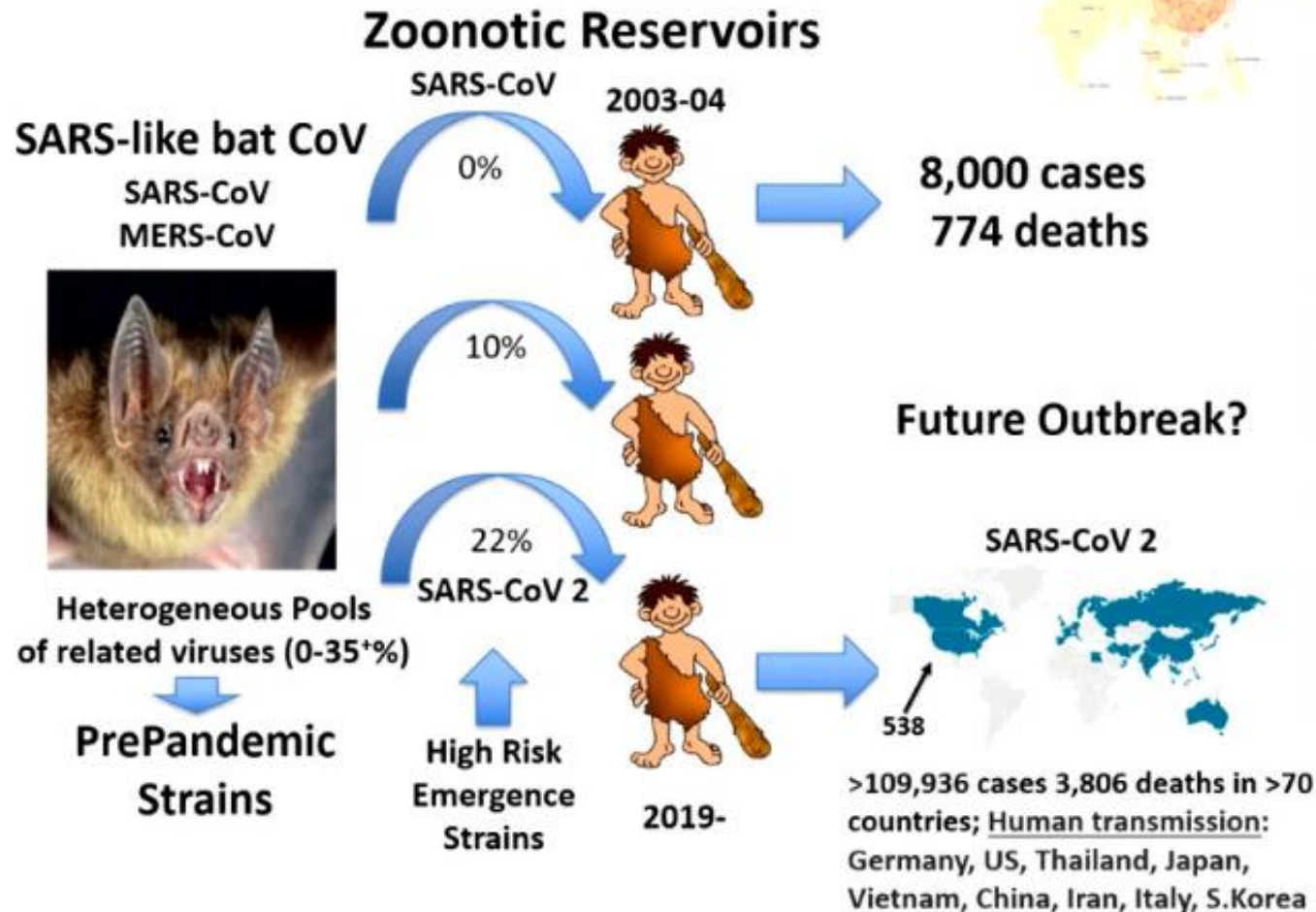
SARS-CoV Emergence in 2002 in China

8,096 cases, 774 deaths, in 32 countries, Nov 1 2002 - July 31 2003

Most Likely Model



Most Emerging Viruses

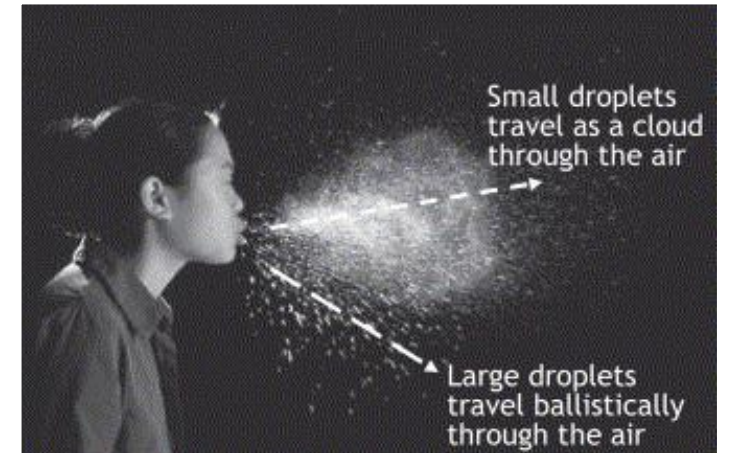


Z. Shi, Nature. 2013 Nov 28;503(7477):535-8.

Sheahan et al., JV 2008; Becker PNAS 2008; Menachery V et al., Nature Medicine 2015; Menachery PNAS 2016; Simon et al., mBIO 2017

COVID-19 Transmission

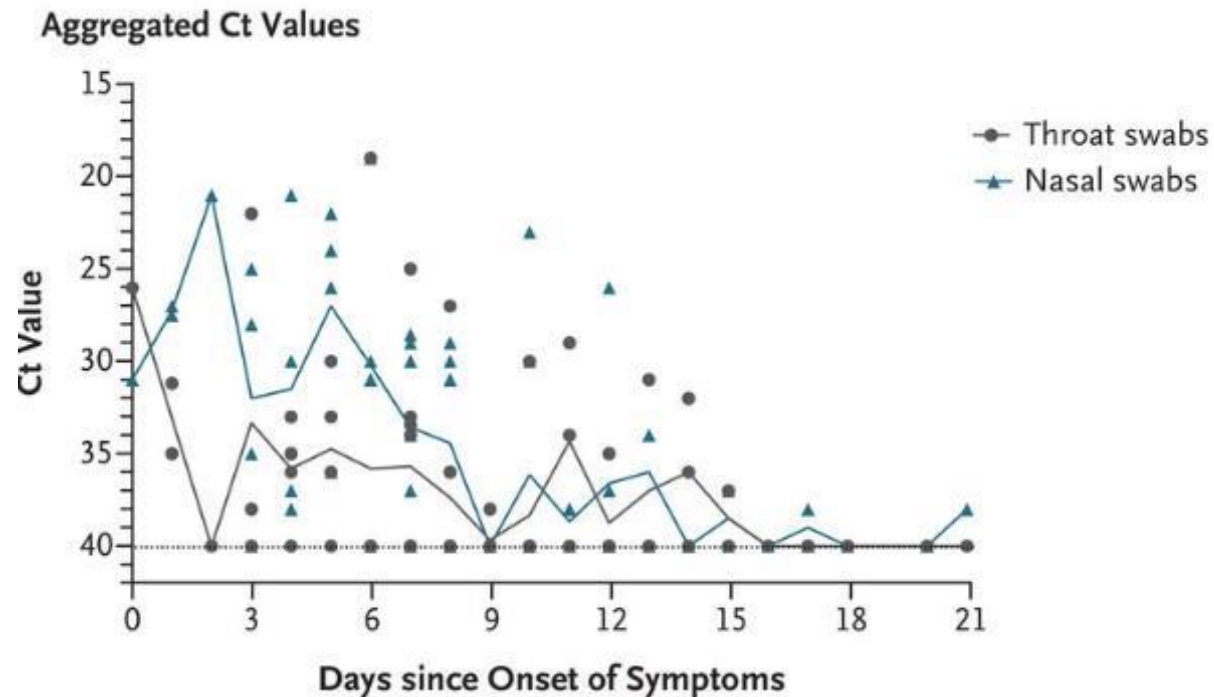
- Respiratory secretions - main mode of transmission
 - Spread through respiratory droplets in the air and that land on surfaces
 - Transmission from people before onset of symptoms or without symptoms possible but contribution of these infections appears to be small
- Stool – unlikely to be a source
- Perinatal – no transmission observed



Tang JW et al, *J Hosp Infect* 2006; 64:100-14.

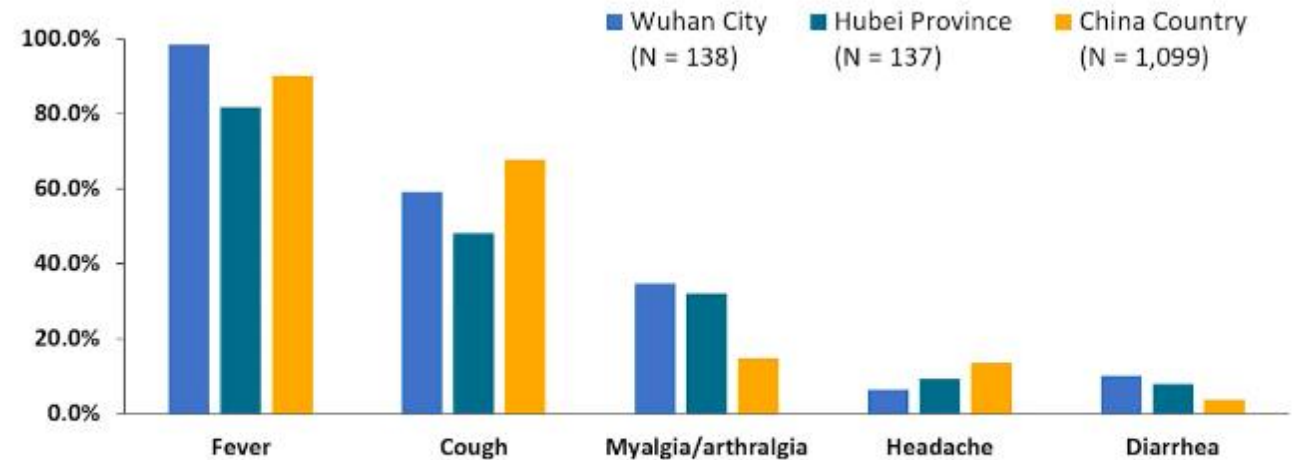
COVID-19 Viral RNA Shedding in Upper Respiratory Specimens of Infected Patients

- Shedding of RNA highest early in infection, tapering off over 1-2 weeks.
- No data on how long virus that can spread infection is shed in respiratory secretions



Signs and Symptoms of COVID-19

- No particular signs and symptoms can discriminate COVID-19 from other respiratory infections such as influenza



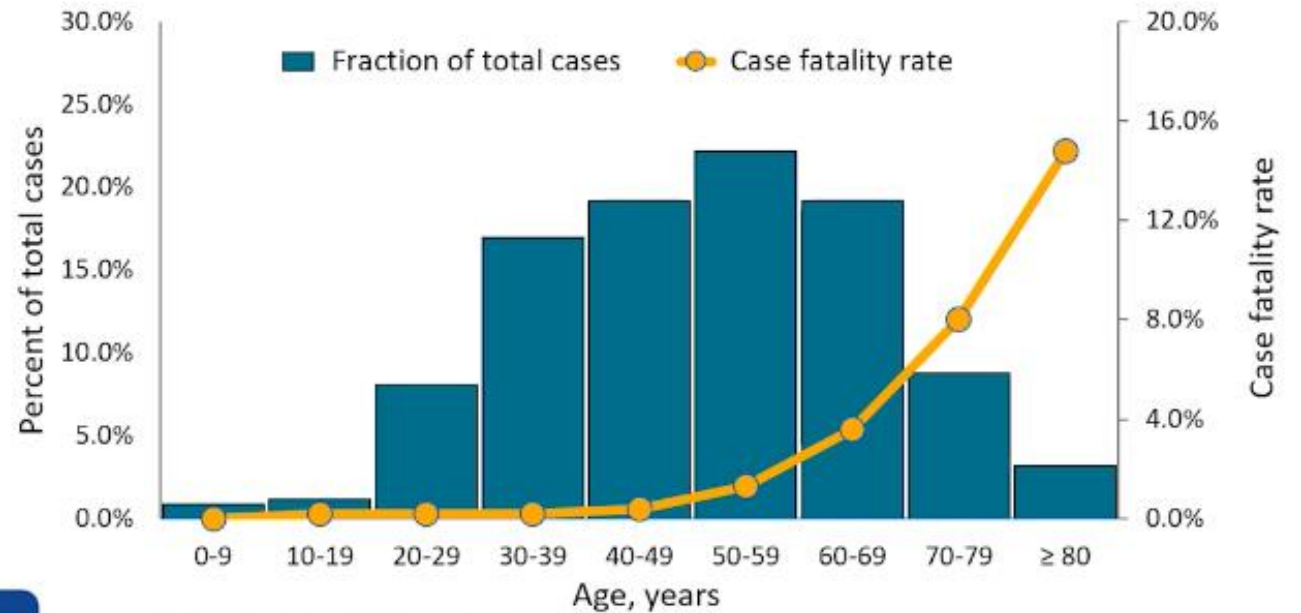
Liu 2020, [Chinese Med J](#); DOI: 10.1097/CM9.0000000000000744. Wang 2020, [JAMA](#); doi:10.1001/jama.2020.1585.
Guan 2020, [N Engl J Med](#); DOI: 10.1056/NEJMoa2002032.

Clinical Course of COVID-19

- Incubation period is ~5 days (range = 2 – 14 days)
- ~80 % have mild illness (~80%)
- ~ 30% of hospitalized patients required intensive care
 - 5-10% require mechanical ventilation
- No approved medication
 - NIH clinical trials have started
- Supportive care has been very successful for most patients



Age Distribution and Case Fatality Rate for COVID-19 in China (N=44,672 confirmed cases)

- Case fatality rate increases with age and underlying diseases
- Children have mild disease leading to under-diagnosis

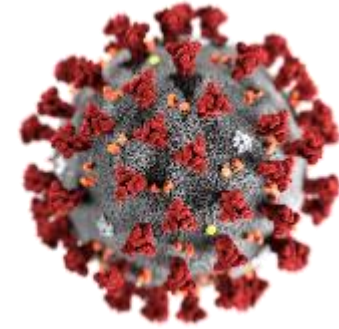


adapted from Zhang 2020, China CDC Weekly Rep; 2(8):113-122.

How does COVID-19 Compare to Influenza

	 Influenza	 COVID-19
Biology	Enveloped RNA virus Common in many bird/animal species	Enveloped RNA virus Common in many animal species
Symptoms	Fever, cough body aches Mild-severe	Fever cough, body aches Mild-severe, pneumonia more common
Transmission	Droplets/contact	Droplets/contact, maybe airborne
Incubation	2-5 days	Usually about 5 days, range 1-14
When does infection occur	Seasonal, fall-winter	Unknown
How contagious	Each case causes 1.3 others on average	Uncertain but likely more than flu
Who is most at risk	Elderly, chronically ill and pregnant women	Elderly and chronically ill, men in China
Treatment	Antivirals helpful if started early	No specific treatments
Vaccine	Yes! Moderately effective	No
Number of infections	About 1 billion annually worldwide 20-50 million in US each year	125,000 cases as of March 10, 2020
Deaths	300,000-600,000 annually worldwide 20,000-50,000 in US	4,600 so far worldwide

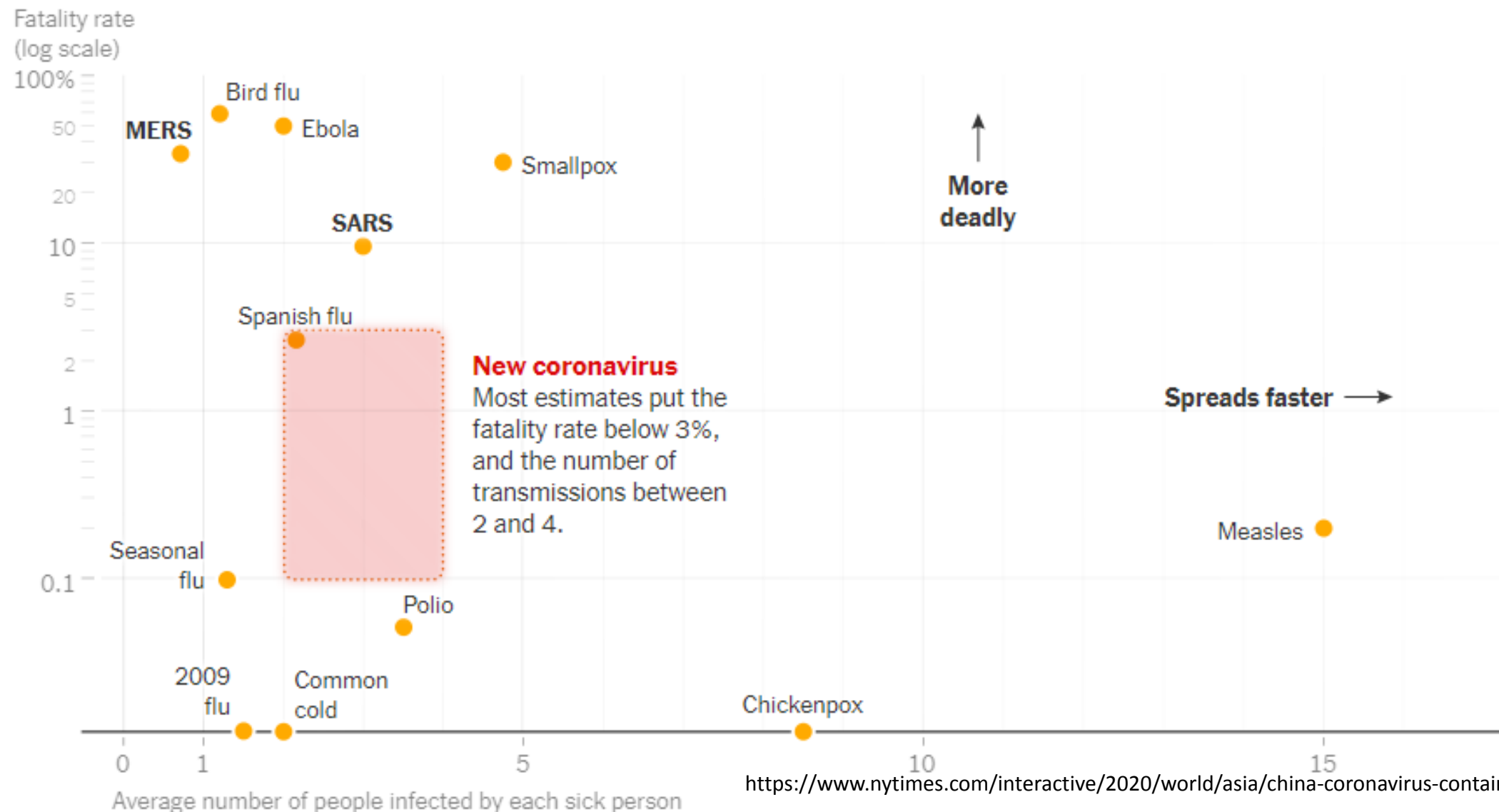
Unknowns about COVID-19



- How contagious is the virus and exactly how is it transmitted
- Optimal personal protective equipment
- How long will the pandemic last
- Effect treatments
- When a vaccine will be available
- One thing we can say for sure – expect recommendations to change as we learn more and as the situation evolves

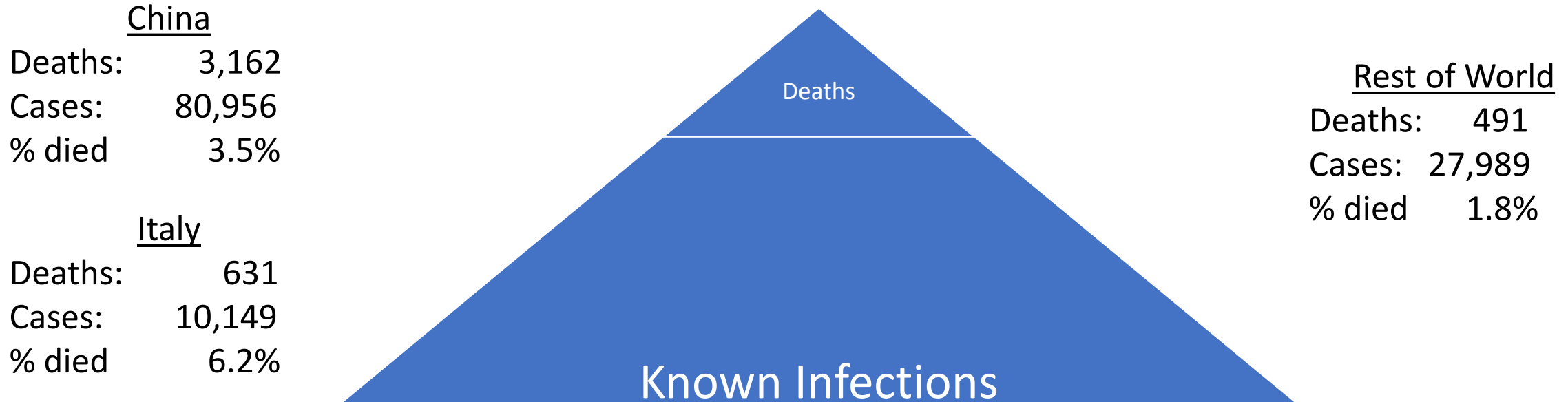
*worldwide spread of a new disease that affects large numbers of people

Current Estimates on Severity and Communicability of COVID-19



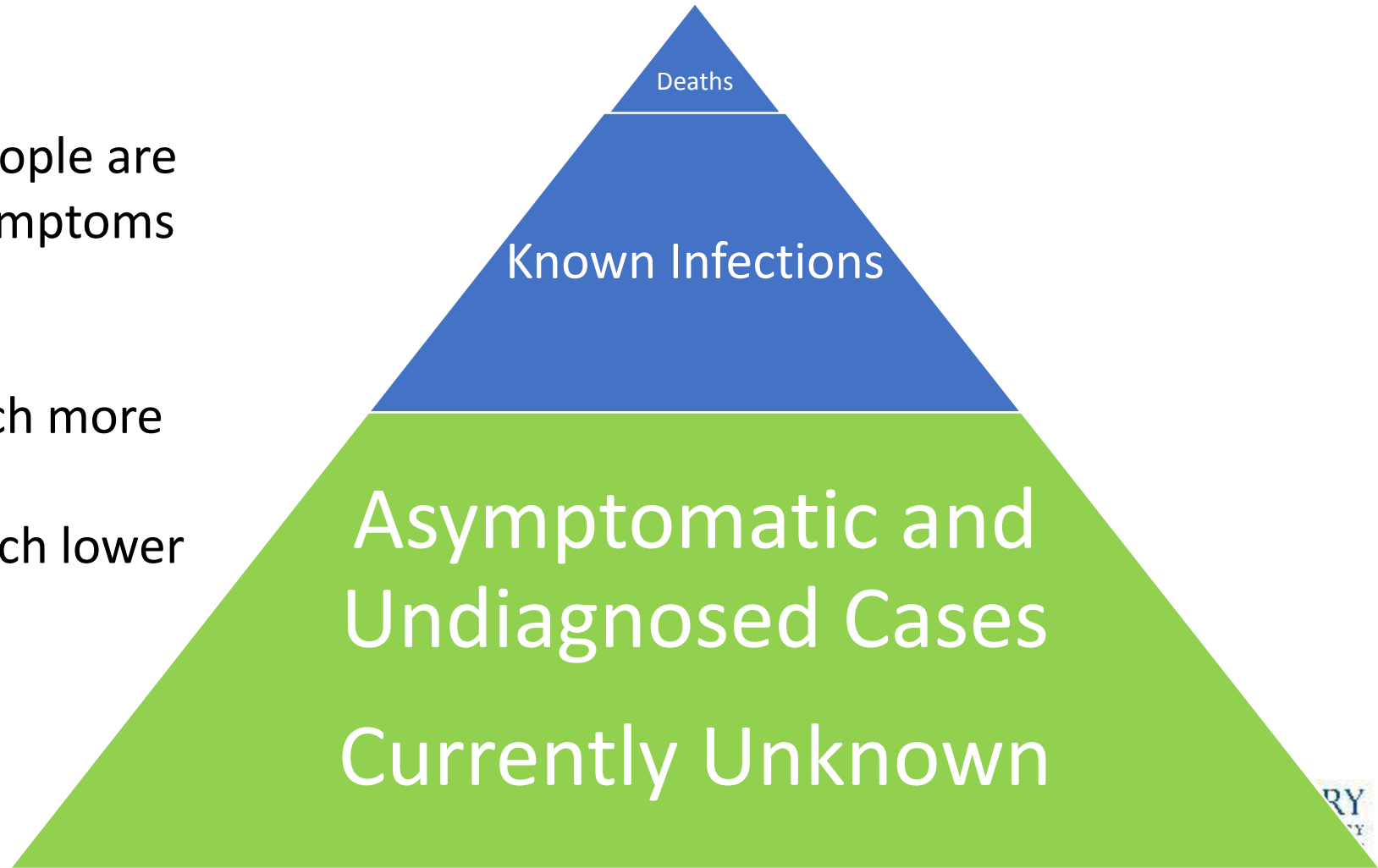
What we Know about Severity of COVID-19

March 10, 2020



True State Includes ALL Who are Infected

- We don't know how many people are asymptomatic or have had symptoms but haven't been tested
- If this group is large then
 - COVID-19 infection is much more widespread but
 - Mortality rate may be much lower and closer to seasonal flu



Diamond Princess Cruise Ship

- Covid-19 cases in passengers led to quarantine for 2 weeks
- 3,711 passengers and crew
- 696 diagnosed Covid-19 cases
- 6 have died
- $\% \text{ died} = 0.86$



COVID-19 Testing

- Current test is “PCR” of respiratory specimens
- Testing very limited so far in US limiting our ability to know how many people have been infected. Most testing has been at CDC only
- Georgia State lab begin testing 3/4/20
- Commercial tests this week
- Emory lab will have own test soon
- Expect case numbers to go up as testing expands
- Serologic test soon – will help determine what percent of population has been infected

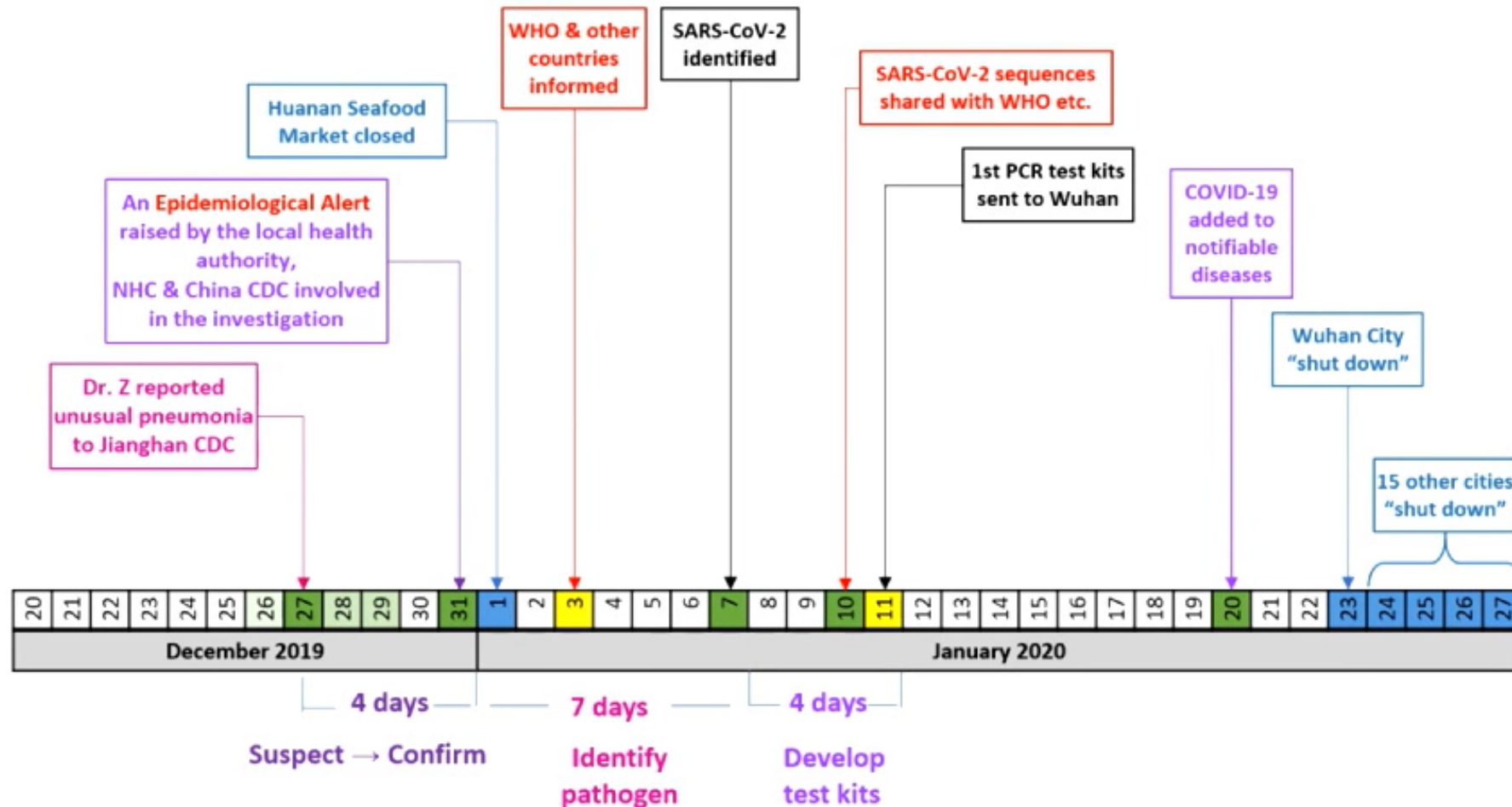


CDC test kit

What is going to happen?
Can we control COVID-19?

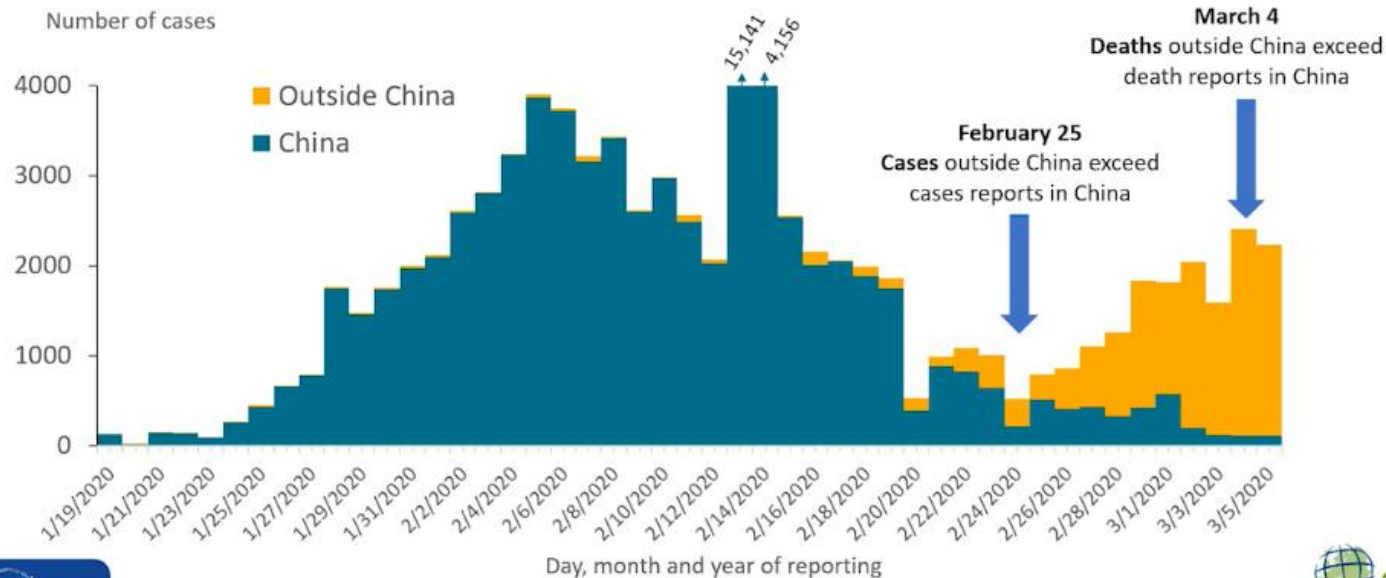
- Lessons from China and other countries
- Current state in US
- What to expect

China may have suppressed early evidence of a new outbreak, but once they acted, they moved quickly



Aggressive measures controlled COVID-19 in China

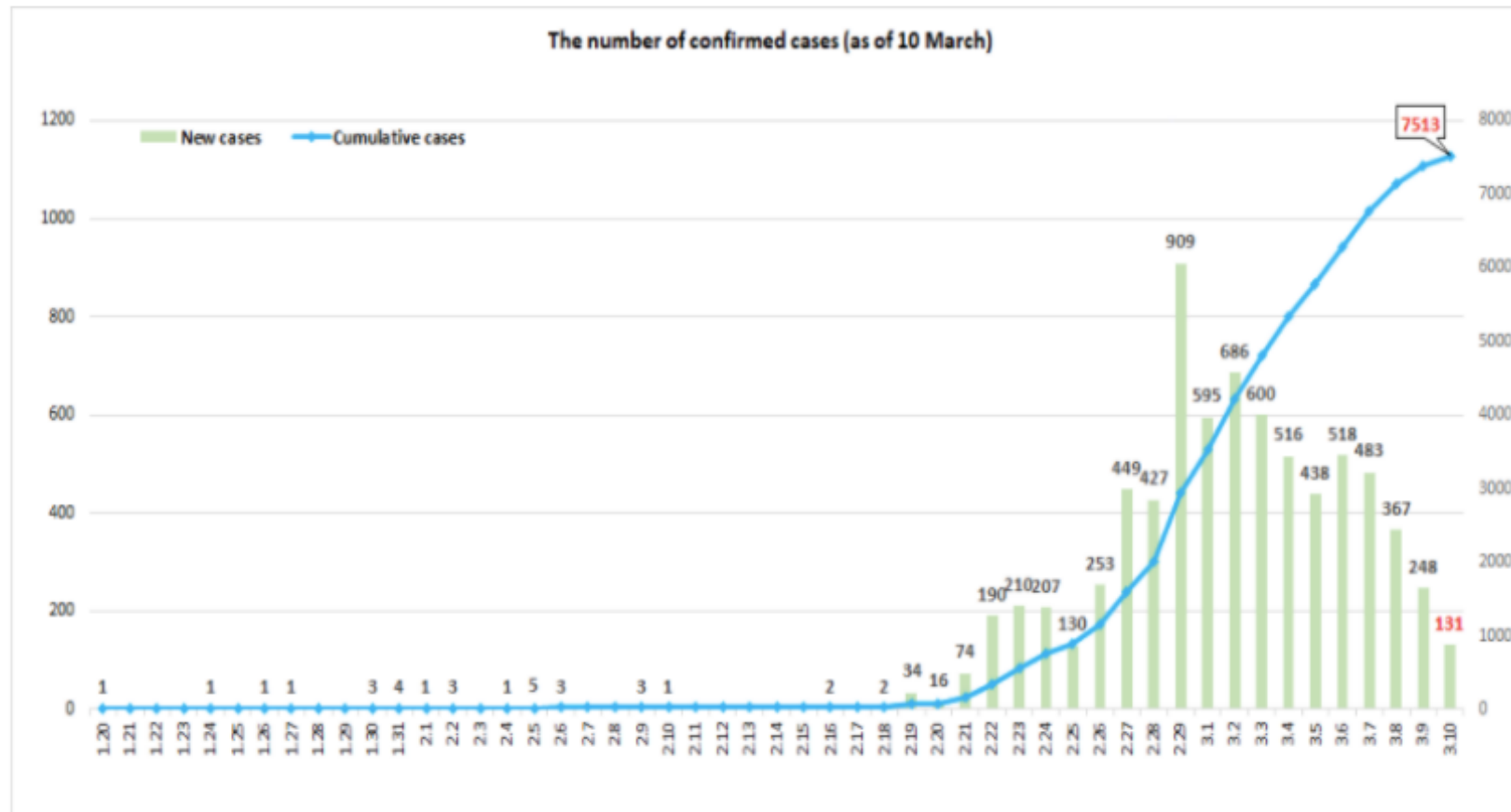
Distribution of COVID-19 cases in accordance with the applied case definitions in the affected countries, as of 05 March 2020



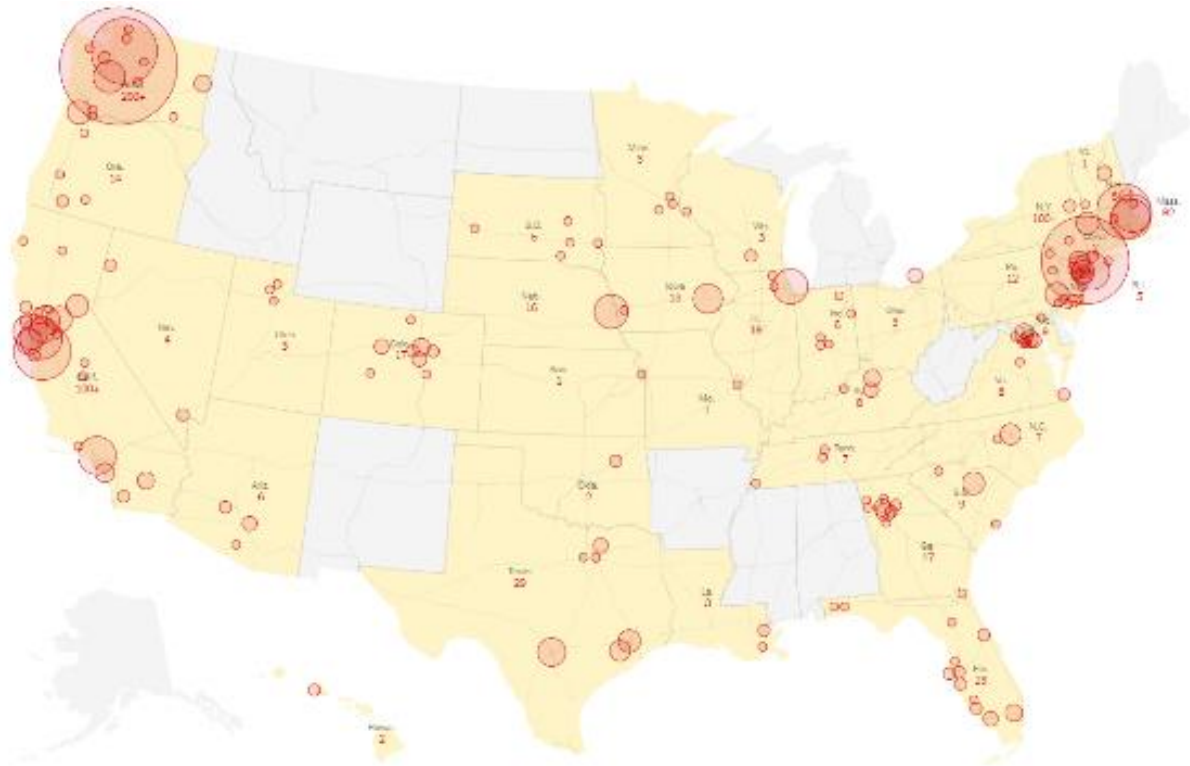
- 1.4 billion people underwent 10 days of at-home isolation
- 59 million restricted movement out of geographic area
- Opened 50,000 hospital beds
- >40,000 healthcare workers deployed to Hubei

South Korea

○ The confirmed cases by date, by region, by gender and age shown in the graph and tables as below;



COVID-19 Cases in US as of March 10, 2020



HOW VIRUS WAS CONTRACTED	CASES
Cluster connected to a community in New Rochelle, N.Y.	113
Nursing facility in Kirkland, Wash.	55
Personal contact in U.S.	50
Diamond Princess cruise ship	43
Travel in Egypt	37
Travel overseas	36
Travel in Italy	30
Business conference in Boston	29
Grand Princess cruise in March	21
Grand Princess cruise in February	20
Show more	

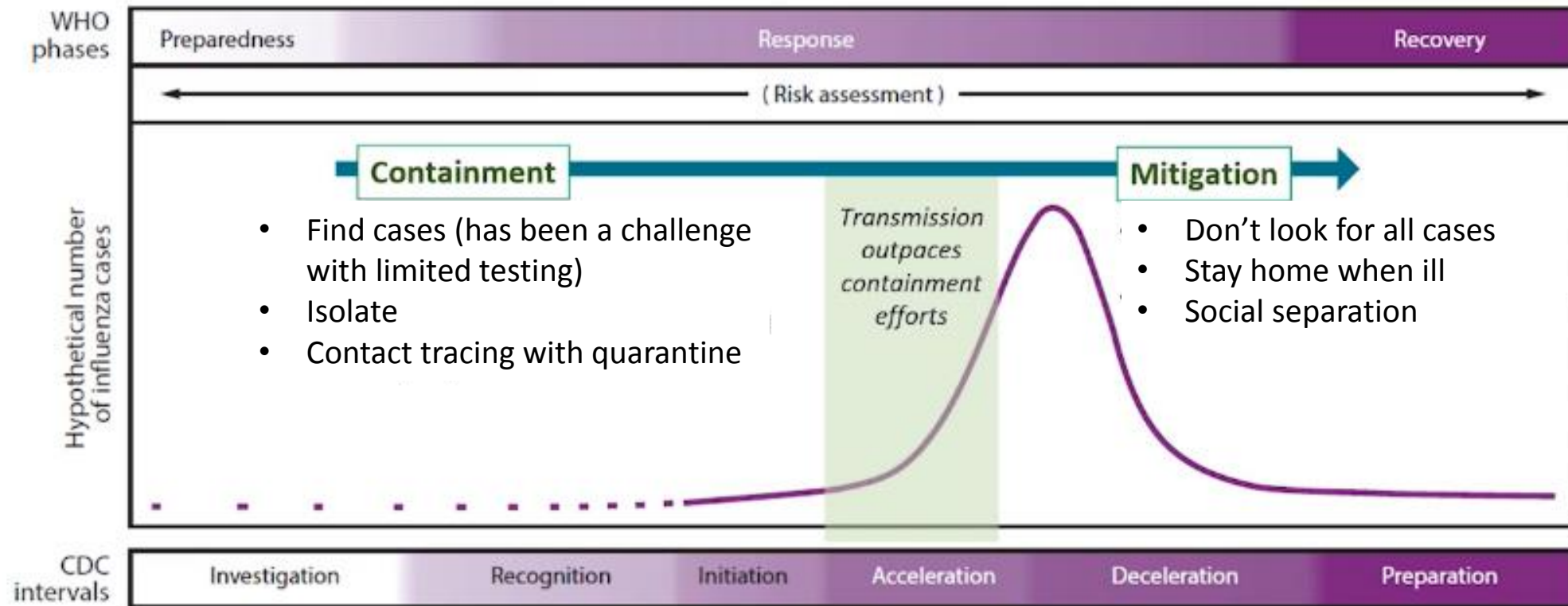
New coronavirus cases announced in the U.S. each day



Source: C.D.C., state and local health agencies, hospitals.

<https://www.nytimes.com/interactive/2020/us/coronavirus-us-cases.html>

Preparedness and Response Framework for Pandemics



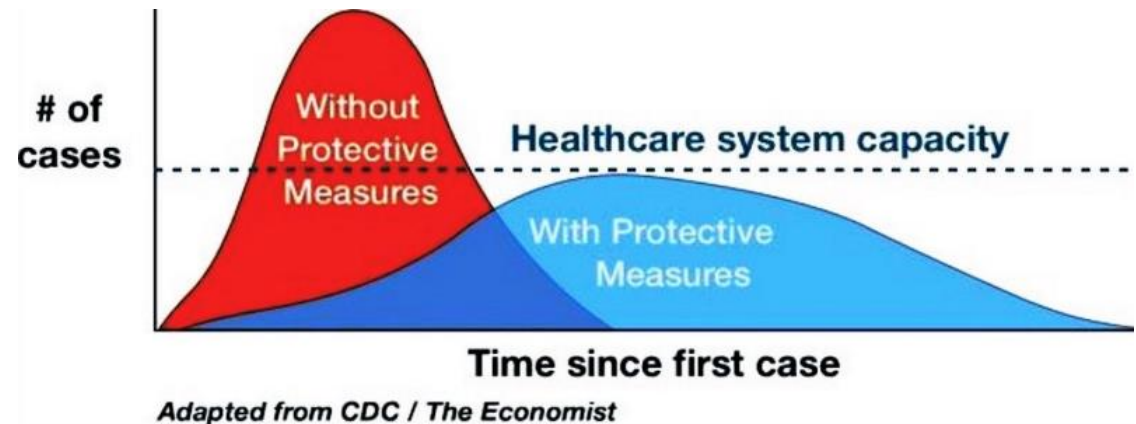
Adapted from: Holloway 2014, MMWR Recomm Rep;63(No. RR-6). Qualls 2017, MMWR Recomm Rep; 66(No. RR-1). Jernigan 2020, MMWR Early Release: February 25, 2020.



Division of Infectious Diseases

Goals of Mitigation Strategies

- Minimizing morbidity
- “Flattening” the epidemic curve to avoid overwhelming healthcare services
- Keeping impact on economy manageable
- Slowing progression of epidemic to allow for vaccine and other treatment development



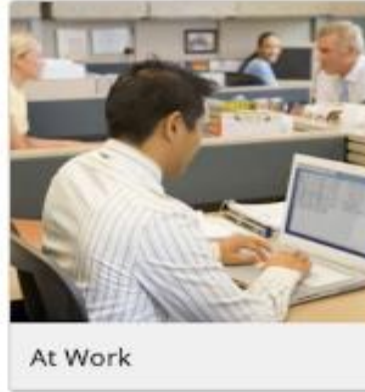
Social Distancing and Personal Hygiene



At Home



At School



At Work



At a Gathering

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

- | | | |
|---|--|---|
| <ul style="list-style-type: none"> • Stay home if sick • Notify MD office before visit • Limit movement • Limit visitors • At least 2 weeks supply of medications and food | <ul style="list-style-type: none"> • Early <ul style="list-style-type: none"> • Stay home if sick • Hand hygiene • Mild-moderate <ul style="list-style-type: none"> • Reduce large gatherings • Reduce mixing • Consider distance learning • Substantial <ul style="list-style-type: none"> • Distance learning • Closure | <ul style="list-style-type: none"> • Early <ul style="list-style-type: none"> • Stay home if sick • Hand hygiene • telework • Mild-moderate <ul style="list-style-type: none"> • Reduce meetings • Stagger schedules • Limit travel • Substantial <ul style="list-style-type: none"> • Telework • Cancel travel and conferences |
|---|--|---|



Mitigation Activities for Faith-based Organizations Based on Level of Community Transmission

None

- Knowledge
- Review emergency plans
- Encourage all to stay home when sick
- Stress hand hygiene/respiratory etiquette
- Available hand hygiene supplies
- Frequently clean surfaces

Minimal to Moderate

- Implement social distancing
 - Reduce group activities, especially for those at increased risk
 - Consider video/audio of events
- Determine ways to support those at increased risk
- Cancel large gatherings
- Cancel small gatherings for those at high risk

High

- Cancel gatherings of any size

<https://www.cdc.gov/coronavirus/2019-ncov/downloads/community-mitigation-strategy.pdf>

What is the difference
between isolation and
quarantine?

Should I wear a mask
to work? At home?

How long do
coronaviruses last on
surfaces?

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Coronavirus guide to public transit: Ride along with a microbiologist



Photo: The Atlanta Journal-Constitution

NEWS | 2 hours ago

By [Matt Kempner](#), The Atlanta Journal-Constitution

<https://www.ajc.com/news/local/coronavirus-guide-public-transit-ride-along-with-microbiologist/UYTyCSA0UPaD7oZFNS2sUL/>



Division of Infectious Diseases

Can our healthcare
system handle the
number of patients with
COVID-19?

Workforce Concerns

- Surge planning
- Concern about infection
- Absenteeism/presenteeism
- School closures

Thank You



Good websites for more information

www.CDC.gov

www.nytimes.com/2020/03/12/world/coronavirus-news.html

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>

<https://coronavirus.jhu.edu> (see interactive map)