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FROM THE AMERICAN PEOPLE

Pandemic *READY*?

(or *NOT* ?)

COVID-19: Epidemiology & Priorities for NGO Response

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READY Inter-Agency Outbreak Preparedness Planning (OPP) Workshops

Updated April 5, 2020
(https://www.savethechildren.org/us/about-us/resource-library/influenza-library)

JOHNS HOPKINS CENTER for HUMANITARIAN HEALTH
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mercy MALAYSIA
EcoHealth Alliance

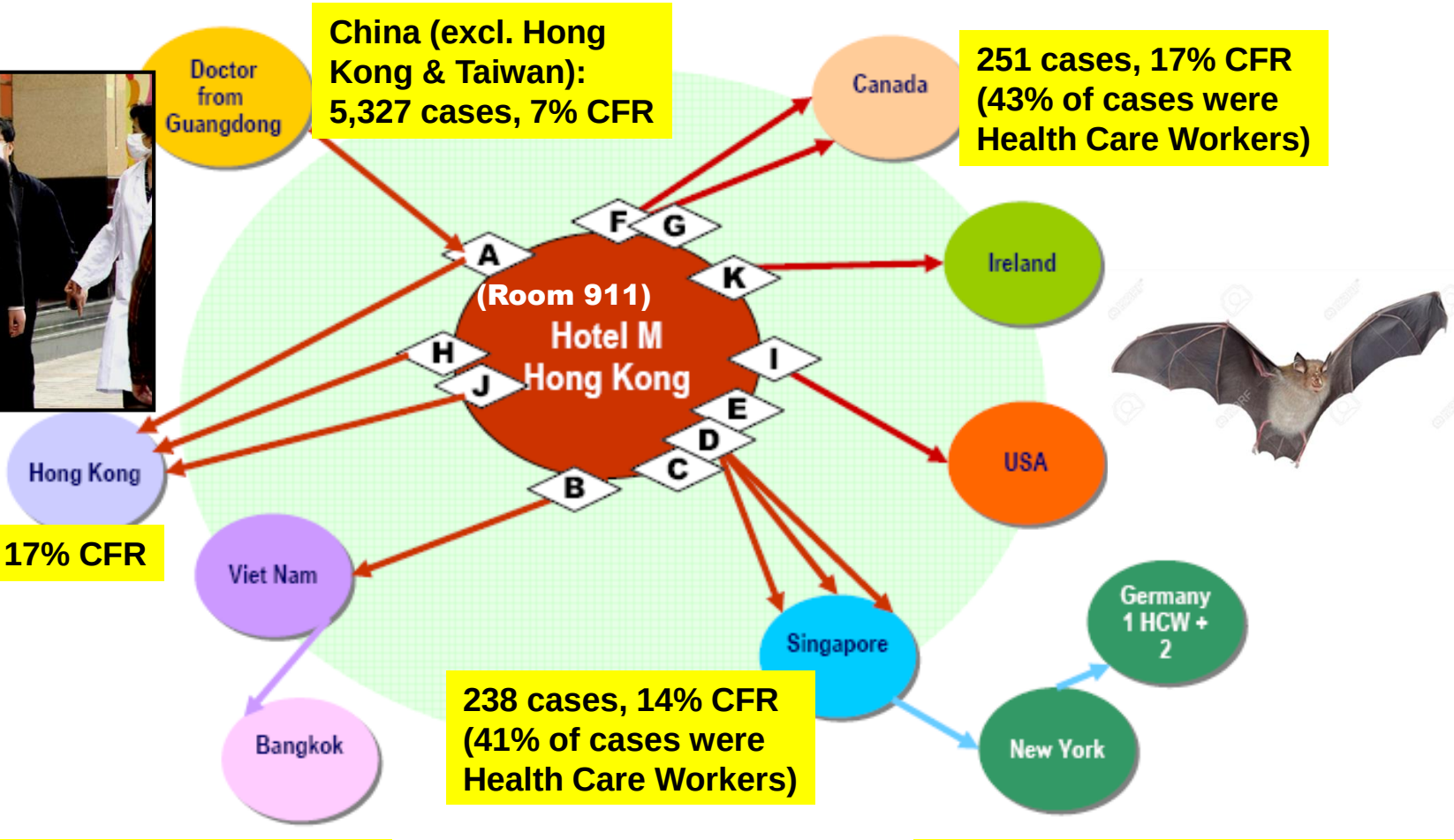
(This session is about COVID-19 & NGO preparedness for a severe respiratory pathogen pandemic.)

Philadelphia, USA, October 1918 (John Barry, *The Great Influenza*)

Question:

- Who has already worked on pandemic preparedness?

SARS: international spread from Hong Kong, 21 February – 12 March, 2003



Source: WHO/CDC

- Mutation for P2P respiratory transmission after jump from bats to palm civets in south China?
- Local transmission in Canada, China, Hong Kong, Mongolia, Philippines, Singapore, Taiwan, & Viet Nam
- 8,096 total cases in 26 countries + Hong Kong + Taiwan
- 1,706 of these cases (21%) were Health Care Workers
- 774 deaths - 10% case fatality

Lessons from SARS-CoV-1 (David Nabarro)

- Global action is critical
- Give priority to well-being of front line personnel
- Engage communities
- Involve media
- Don’t withhold information
- Encourage responsible, science-based & effective responses
- Harness energies of multiple actors
- Supportive leadership & building effective coalitions are vital

SARS Containment: Detect, Isolate, Quarantine

Some characteristics of SARS helped the world "dodge a bullet," but unfortunately, COVID-19 is looking different.

Avian Flu Diary

Covering Pandemic and Seasonal Influenza, H5N
community & Individual preparedness, and anyth

https://afludiary.blogspot.com/

Tuesday, December 31, 2019

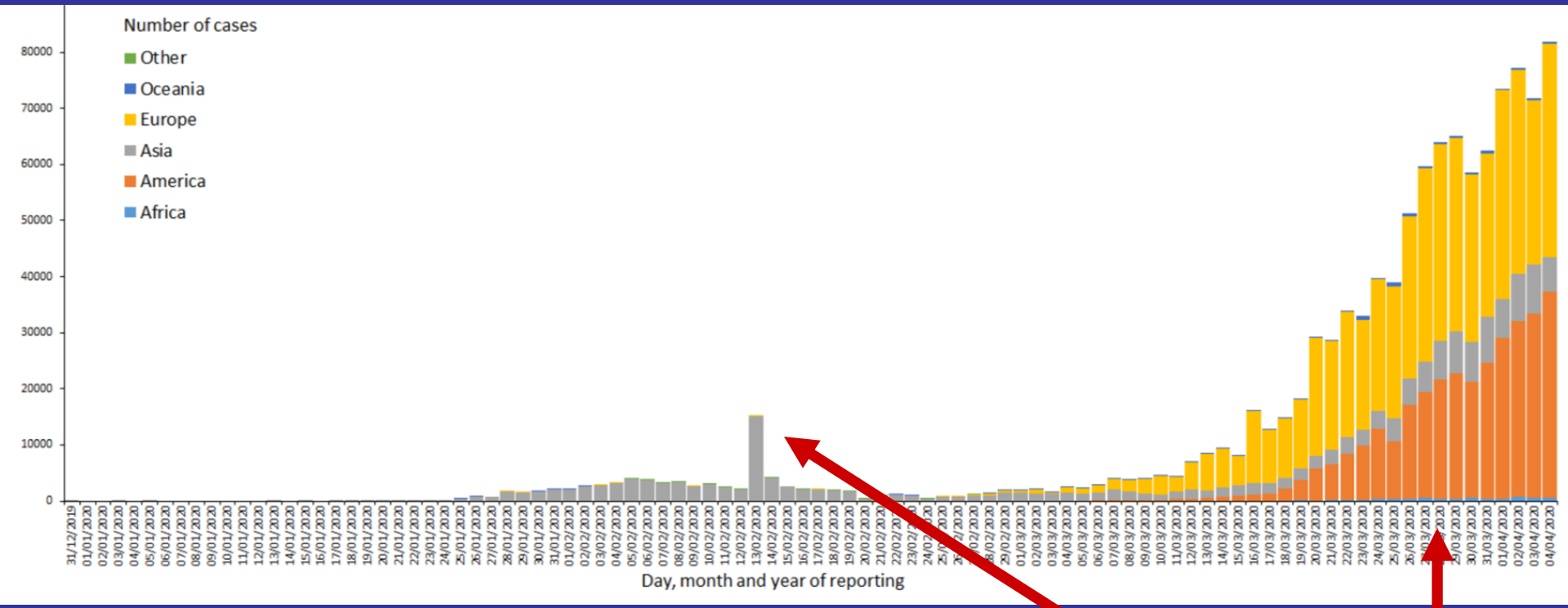
December 31: China notified WHO, & Eric woke up to this news (like something right out of the textbook), & notified his colleagues.

Posted by Michael Coston at 4:49 AM Links to this post

China: 27 Cases of `Atypical Viral Pneumonia' Reported In Wuhan, Hubei

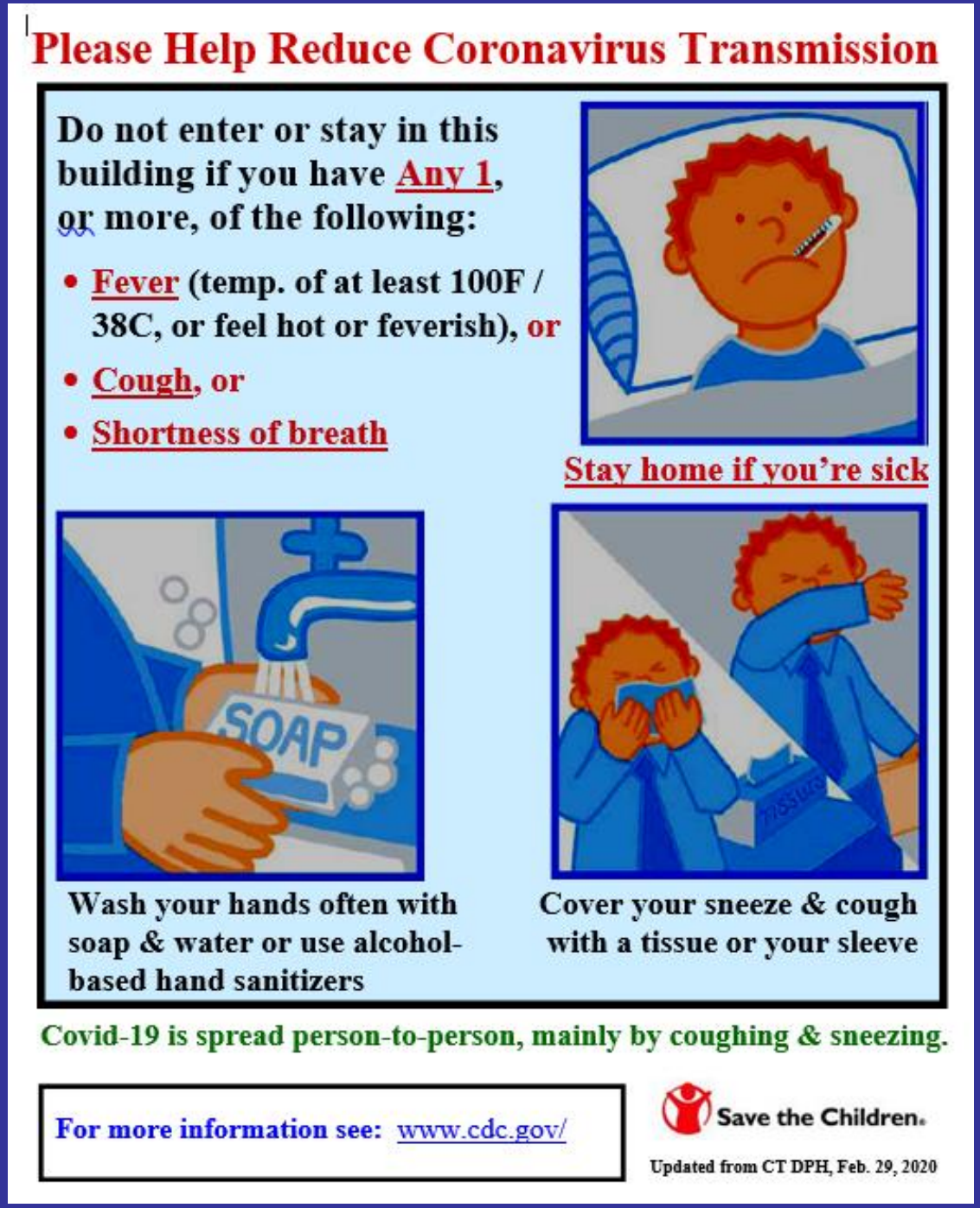
- **Cluster of 27 cases**
- **Tested negative for everything**
- **Linked to a "seafood" market (which also sold a variety of live wild animals)**

“Distribution of COVID-19 cases worldwide, as of 4 April 2020” (European CDC)



- **Now there is very little transmission reported in China.**
  (The Feb. 13 peak was due to a backlog of clinically confirmed cases in Hubei.)
- **& most cases are being reported by Western Europe & North America.**

- After onset of community transmission nearby, notices like this were posted in SC's Connecticut office in early March.
- These symptoms are similar to those of many acute respiratory infections now common in northern countries.
- Common symptoms:
  - Fever in 88%
  - Dry Cough in 68%
  - Shortness of breath / difficult breathing: 19%
- No symptom algorithm can accurately diagnose COVID-19.



Flu & COVID-19 too (?):

Person-to-Person Respiratory Transmission:
Close Exposure (1 - 2 meters / 3 - 6 feet):

1. **Large droplets from coughing, sneezing, & talking, to other's nose & mouth (& eyes);**
2. **Contact: direct (hand-to-hand) & indirect (hand-to-surface-to-hand – less common?);**
3. **Airborne / aerosol / droplet nuclei: By aerosol-generating medical procedures & in shared air spaces with poor air circulation? Can remain suspended in air for longer, but NOT long distance or in ventilation systems?**

(Not about the birds, pigs, or bats !)

(WHO: www.cdc.gov/ncidod/EID/vol12no01/05-1370.htm
www.cidrap.umn.edu/cidrap/content/influenza/panflu/biofacts/panflu.html)

COVID-19: We are thinking in terms of 3 scenario dimensions:

1. **Global spread:** Of substantial outbreaks / epidemics
2. **Severity:** Attributable mortality = attack rate X case fatality
3. **Time:** Growth, seasonality, & duration of outbreaks

Severity is very complex (social, economic, health system, etc.), but can be simplified here as attributable mortality (nCoV-attributable deaths per 100,000 total population), which depends on the attack rate (AR) X case fatality ratio (CFR, requiring an appropriate denominator, or maybe fancy modelling?). The following are illustrative examples only (not meant to imply positive correlation between AR & CFR – they are actually, probably, somewhat negatively correlated):

a. Low: 10% AR X 0.01% CFR = 1 death per 100,000 total population (1 / 100,000)
b. Medium: 30% AR X 0.1% CFR = 3 deaths per 10,000 total population (30 / 100,000)
c. High: 50% AR X 2% CFR = 1 death per 100 total population (1,000 / 100,000 = 1%)

The above lends itself to a 3 X 3 table, with 9 scenario cells:

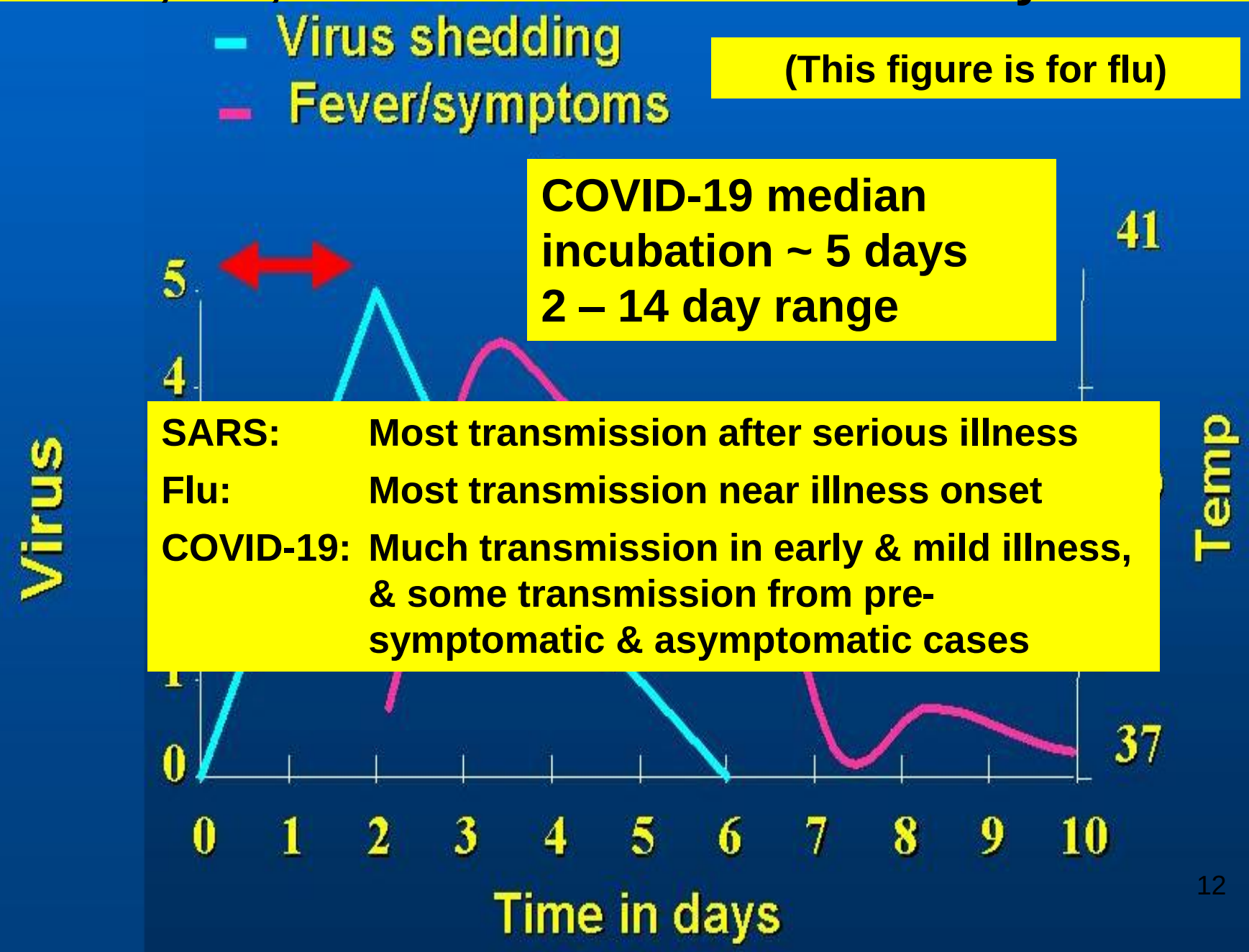
Severity (deaths / total population)	**Global Spread** (epidemics in countries, not just imported cases)		
	Little outside China	China + high risk countries	Pandemic
High	1	2	3
Medium	4	5	6
Low	7	8	9

(Cell numbers, above, have no meaning. Scenario content may be drafted for several of these cells.)

1. The global spread of COVID-19 reminds us of 2009 pH1N1

Travel screening & restrictions, & isolation & quarantine, may delay spread of the virus, but are unlikely to stop it.

SARS, Flu, & COVID-19 Transmission Dynamics



(This figure is for flu)

COVID-19 median incubation ~ 5 days
2 – 14 day range

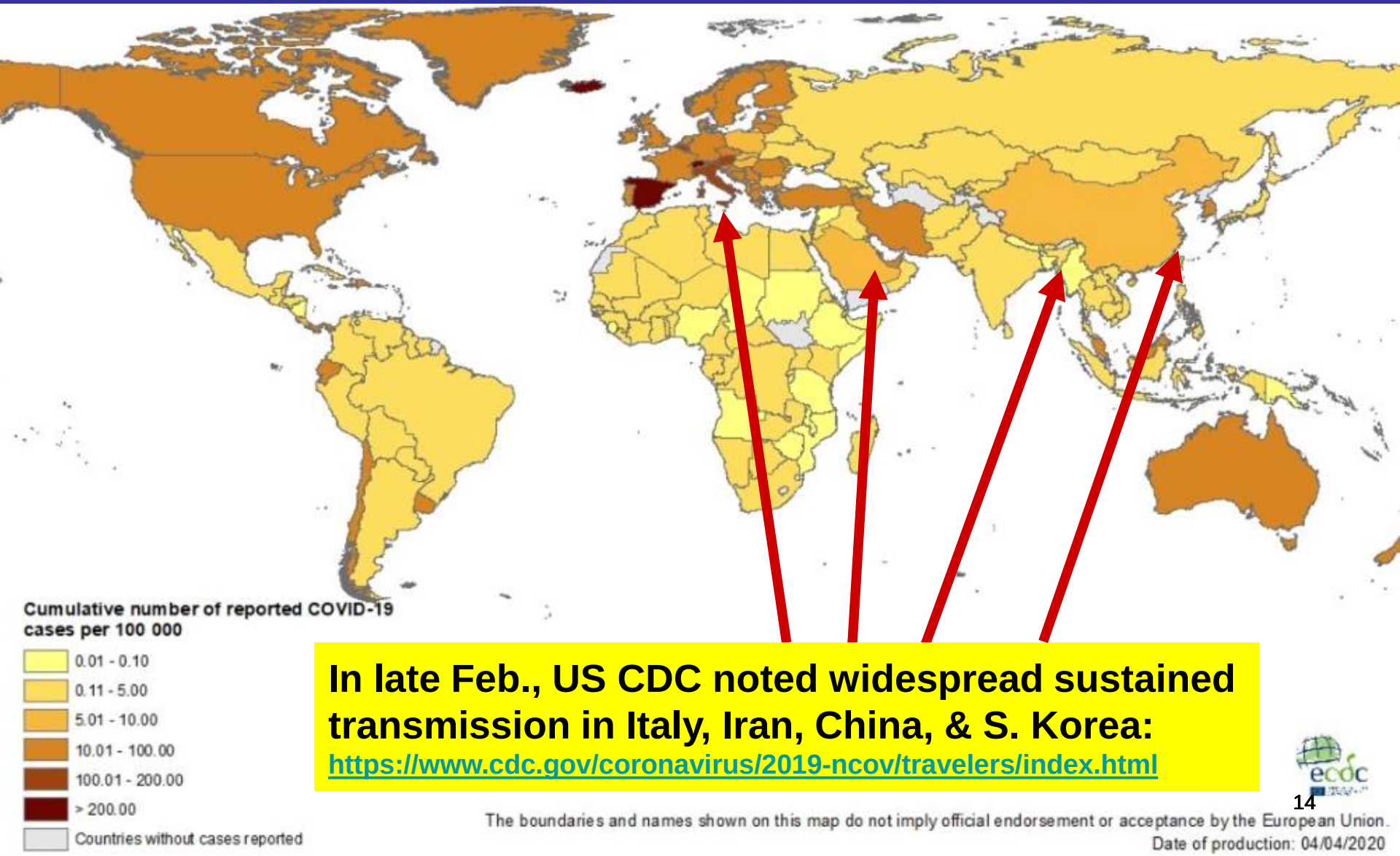
SARS:	**Most transmission after serious illness**
Flu:	**Most transmission near illness onset**
COVID-19:	**Much transmission in early & mild illness, & some transmission from pre-symptomatic & asymptomatic cases**

Evaluations of fever scanning have shown that it is not effective at identifying a high % of people with flu.

(It has both low sensitivity & low specificity.)

- **Some people infected with flu will not exhibit fever because of:**
  - **Those incubating the virus, who become symptomatic later;**
  - **Those with symptoms other than fever;**
  - **Those taking antipyretics to ease symptoms or evade detection; &**
  - **Asymptomatic carriers of flu.**
- **Consumption of hot beverages or alcohol can increase external skin temperature & cause a false positive.**
- **Intense perspiration or heavy face make-up can have a cooling effect on skin temperature, & cause a false negative.**

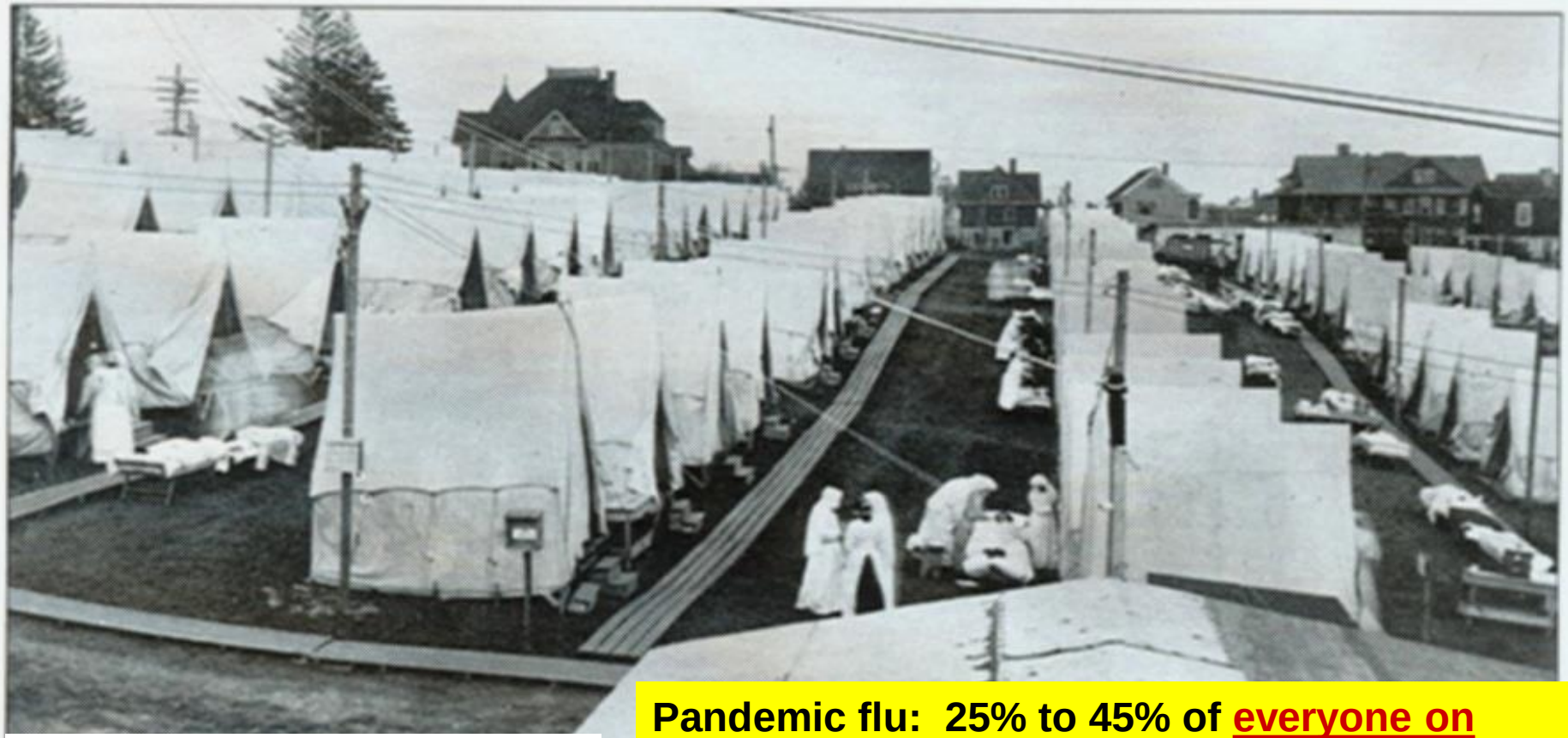
Sustained community spread detected in 3 WHO regions on February 21, with cases in most countries on April 4



In late Feb., US CDC noted widespread sustained transmission in Italy, Iran, China, & S. Korea:
https://www.cdc.gov/coronavirus/2019-ncov/travelers/index.html

2. Severity: A high attack rate, as in pandemic flu, could be bad news: "Few" countries have the staff, facilities, equipment, & hospital beds needed to cope **…. (in a severe flu pandemic - WHO, Oct. 2005)**

9. Massachusetts was the first state to suffer huge numbers of civilian deaths. This is a hospital in Lawrence.



(John Barry. *The Great Influenza*.)

Pandemic flu: 25% to 45% of <u>everyone on earth</u> gets sick with the flu. COVID-19???

2. Severity

- ….. "comparable lethality to H1N1 influenza in 1918."
- "Overall IFR (infection fatality ratio) of 0.9% (95% credible interval 0.4 - 1.4)."

Without any control measures or changes in individual behavior:

- ….. "81% of the GB & US populations would be infected" …..
- …. "approximately 510,000 deaths in GB & 2.2 million in the US, not accounting for the potential negative effects of health systems being overwhelmed" ….
- ….. "an eventual peak in ICU or critical care bed demand that is over 30 times greater than the maximum supply in both countries."

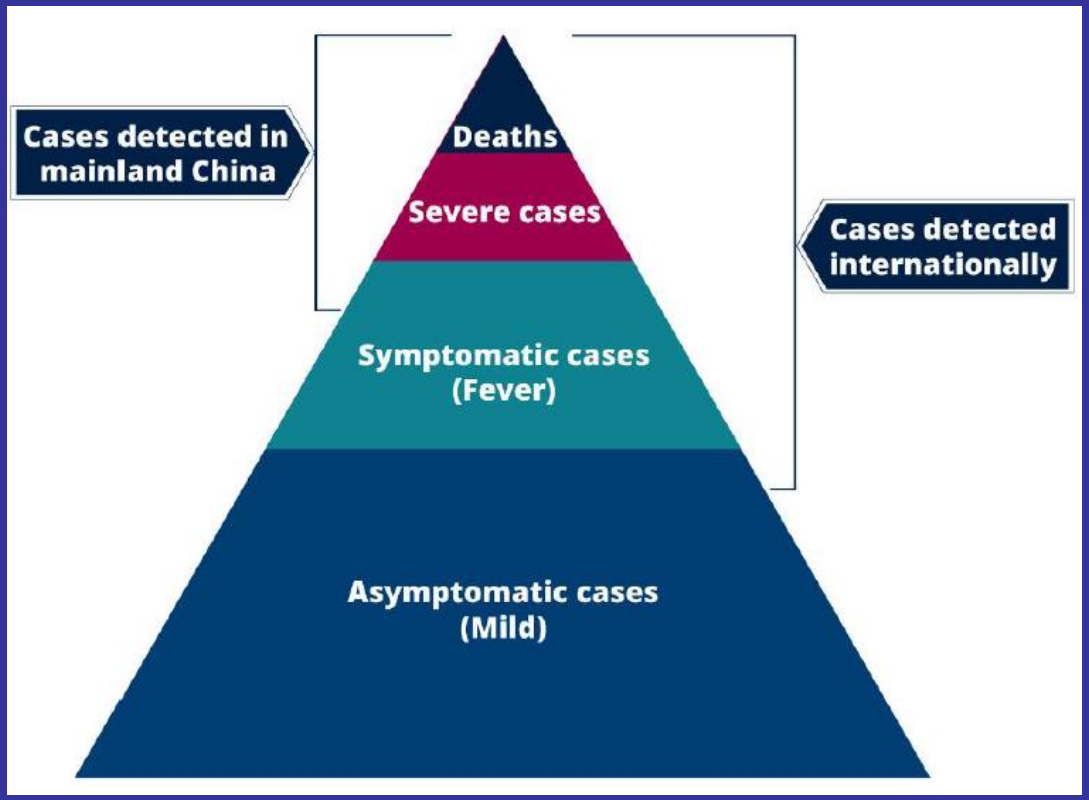
Imperial College London

https://www.imperial.ac.uk/

Paper 9. Impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality & healthcare demand

Neil M Ferguson, et. al.

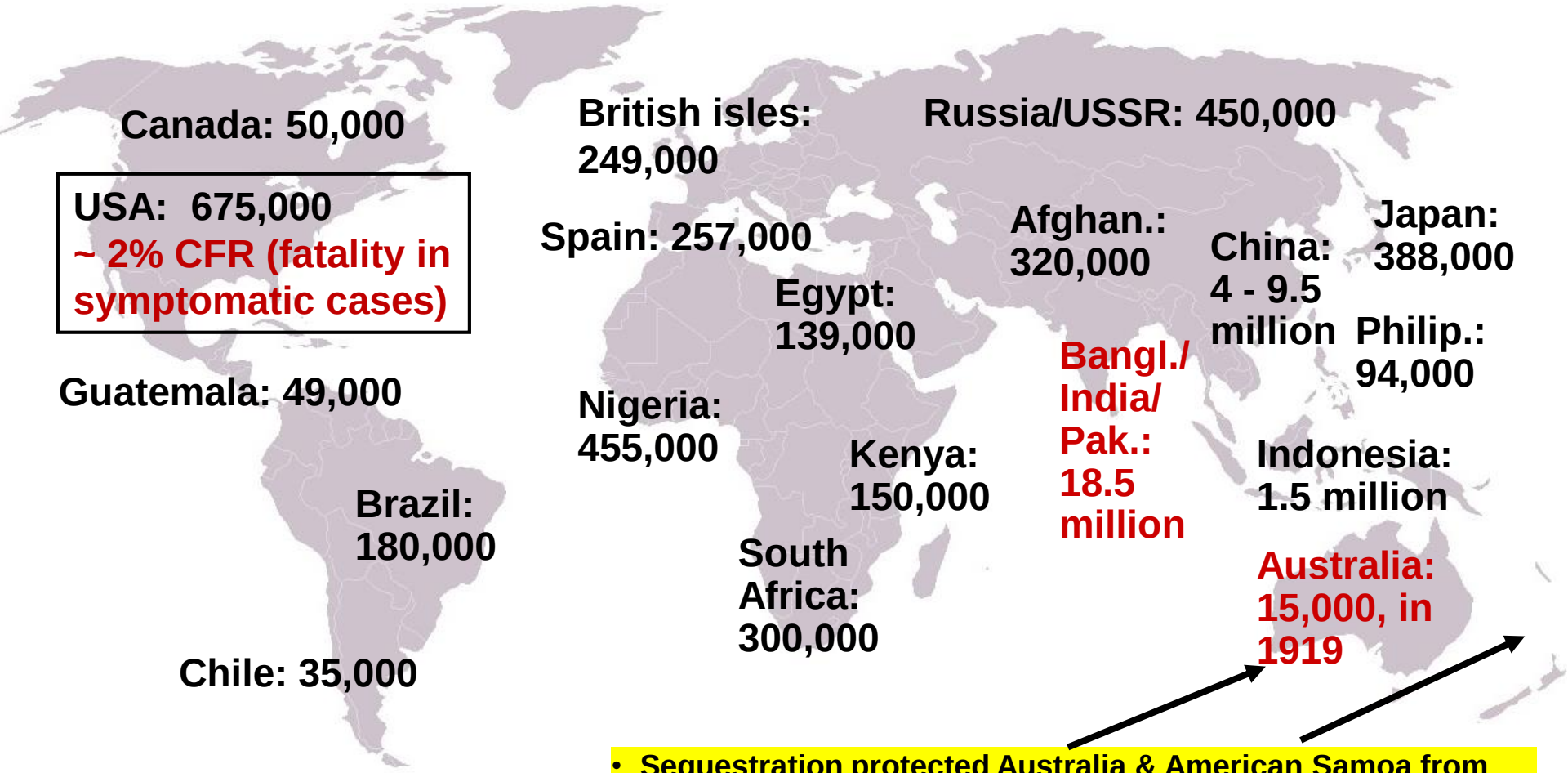
March 16, 2020



1918 is our Reference for Severity: Published Mortality Estimates

(Johnson NPAS & Mueller J. Bulletin of the History of Medicine (2002) 76:105-15)

(**1918: ¼ of 2020 global population**. www.birdflubook.org/resources/NIALL105.pdf)



Global Total:
50 – 100 million

- Sequestration protected Australia & American Samoa from the 2nd wave, while Western Samoa lost 24% of its population
- **Mortality varied over 30-fold across countries**
- **Income differences contributed to this variation**

(Murray CJL, Lopez AD, et al, Lancet 2006;368: 2211-18)

2. Severity (cont.)

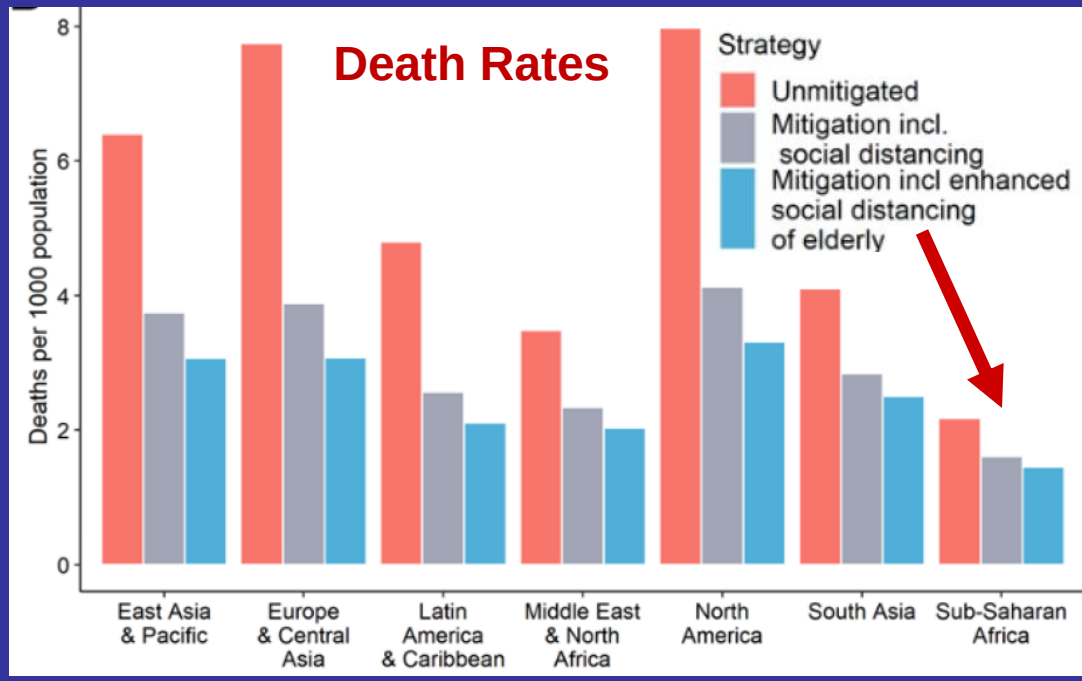
- ….. "in the absence of interventions, COVID-19 would lead to 7.0 billion infections & 40 million deaths globally in the coming year.
- "Aggressive mitigation strategies focusing on shielding the elderly & slowing transmission overall might reduce this burden by half …. but ……. even in this scenario, health systems in all countries will be quickly overwhelmed.
- "This effect is likely to be most severe in lower income settings where capacity is lowest: our mitigated scenarios lead to peak demand for critical care beds in a typical low-income setting outstripping supply by a factor of 25," ….

Imperial College London https://www.imperial.ac.uk/

Paper 12.

The Global Impact of COVID-19 & Strategies for Mitigation & Suppression

March 26, 2020



Estimates of the severity of coronavirus disease 2019: a model-based analysis

Robert Verity*, Lucy C Okell*, Ilaria Dorigatti*, Peter Winskill*, Charles Whittaker*, Natsuko Imai, Gina Cuomo-Dannenburg, Hayley Thompson, Patrick G T Walker, Han Fu, Amy Dighe, Jamie T Griffin, Marc Baguelin, Sangeeta Bhatia, Adhiratha Boonyasiri, Anne Cori, Zulma Cucunubá, Rich FitzJohn, Katy Gaythorpe, Will Green, Arran Hamlet, Wes Hinsley, Daniel Laydon, Gemma Nedjati-Gilani, Steven Riley, Sabine van Elsland, Erik Volz, Haowei Wang, Yuanrong Wang, Xiaoyue Xi, Christl A Donnelly, Azra C Ghani, Neil M Ferguson*

Lancet Infect Dis 2020
Published Online
March 30, 2020
https://doi.org/10.1016

Summary

Background In the face of rapidly changing data, a range of case fatality ratio estimates for coronavirus disease 2019 (COVID-19) have been produced that differ substantially in magnitude. We aimed to provide robust estimates, accounting for censoring and ascertainment biases.

Findings Using data on 24 deaths that occurred in mainland China and 165 recoveries outside of China, we estimated the mean duration from onset of symptoms to death to be 17·8 days (95% credible interval [CrI] 16·9–19·2) and to hospital discharge to be 24·7 days (22·9–28·1). In all laboratory confirmed and clinically diagnosed cases from mainland China (n=70 117), we estimated a crude case fatality ratio (adjusted for censoring) of 3·67% (95% CrI 3·56–3·80). However, after further adjusting for demography and under-ascertainment, we obtained a best estimate of the case fatality ratio in China of 1·38% (1·23–1·53), with substantially higher ratios in older age groups (0·32% [0·27–0·38] in those aged <60 years *vs* 6·4% [5·7–7·2] in those aged ≥60 years), up to 13·4% (11·2–15·9) in those aged 80 years or older. Estimates of case fatality ratio from international cases stratified by age were consistent with those from China (parametric estimate 1·4% [0·4–3·5] in those aged <60 years [n=360] and 4·5% [1·8–11·1] in those aged ≥60 years [n=151]). Our estimated overall infection fatality ratio for China was 0·66% (0·39–1·33), with an increasing profile with age. Similarly, estimates of the proportion of infected individuals likely to be hospitalised increased with age up to a maximum of 18·4% (11·0–7·6) in those aged 80 years or older.

Interpretation These early estimates give an indication of the fatality ratio across the spectrum of COVID-19 disease and show a strong age gradient in risk of death.

In China's 'war' on coronavirus, hospitals turn away other patients — with dire results

(Washington Post, Feb. 21)

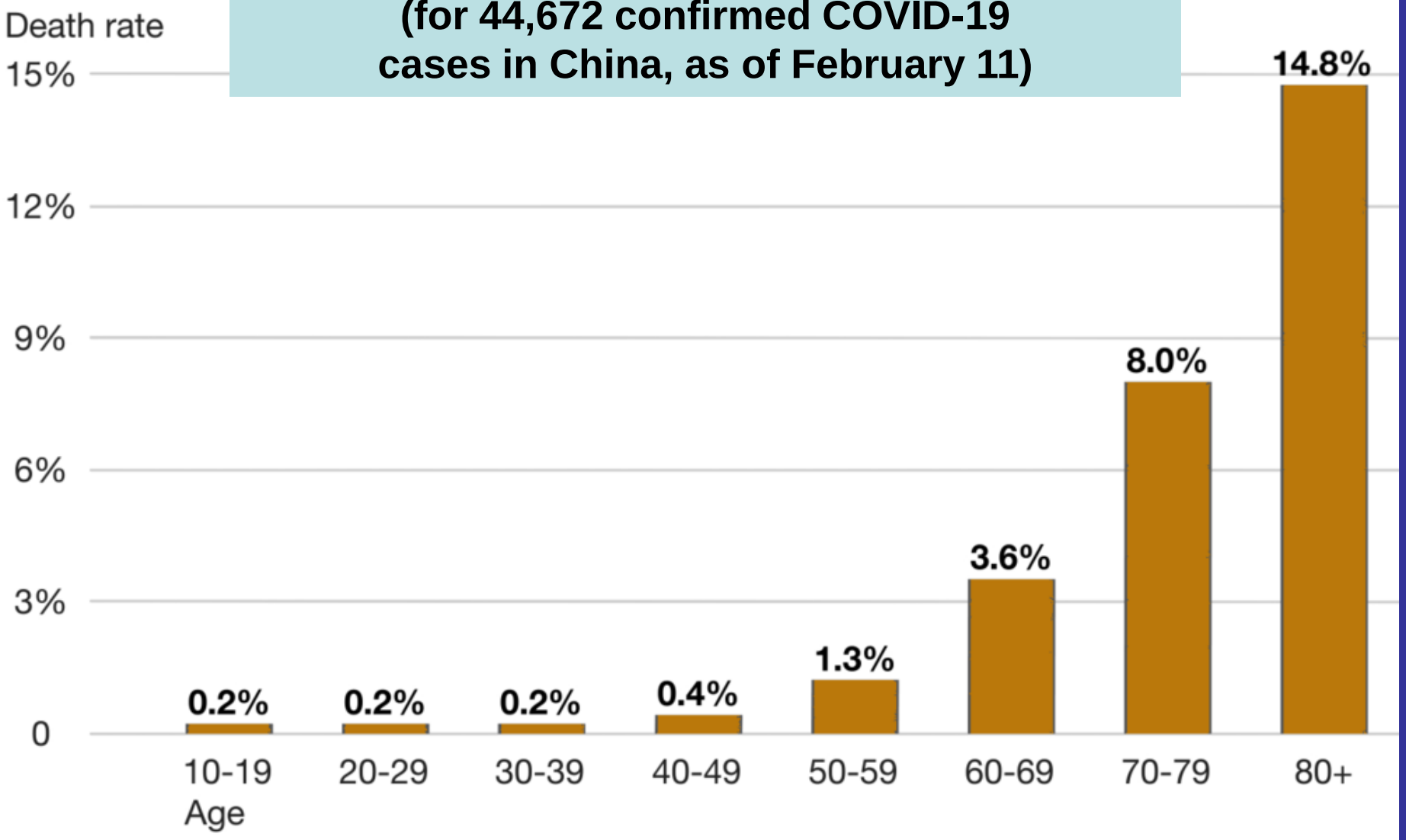
(COVID-19 can devastate strong healthcare systems.)

The country's wider health system is breaking down, leading to the sacrifice of some to save others.

- **By Feb. 16, Wuhan had 11 temporary hospitals equipped with 20,461 beds.**
- **Over 3,000 medics in Hubei have contracted COVID-19 (SC/China, Mar. 6)**

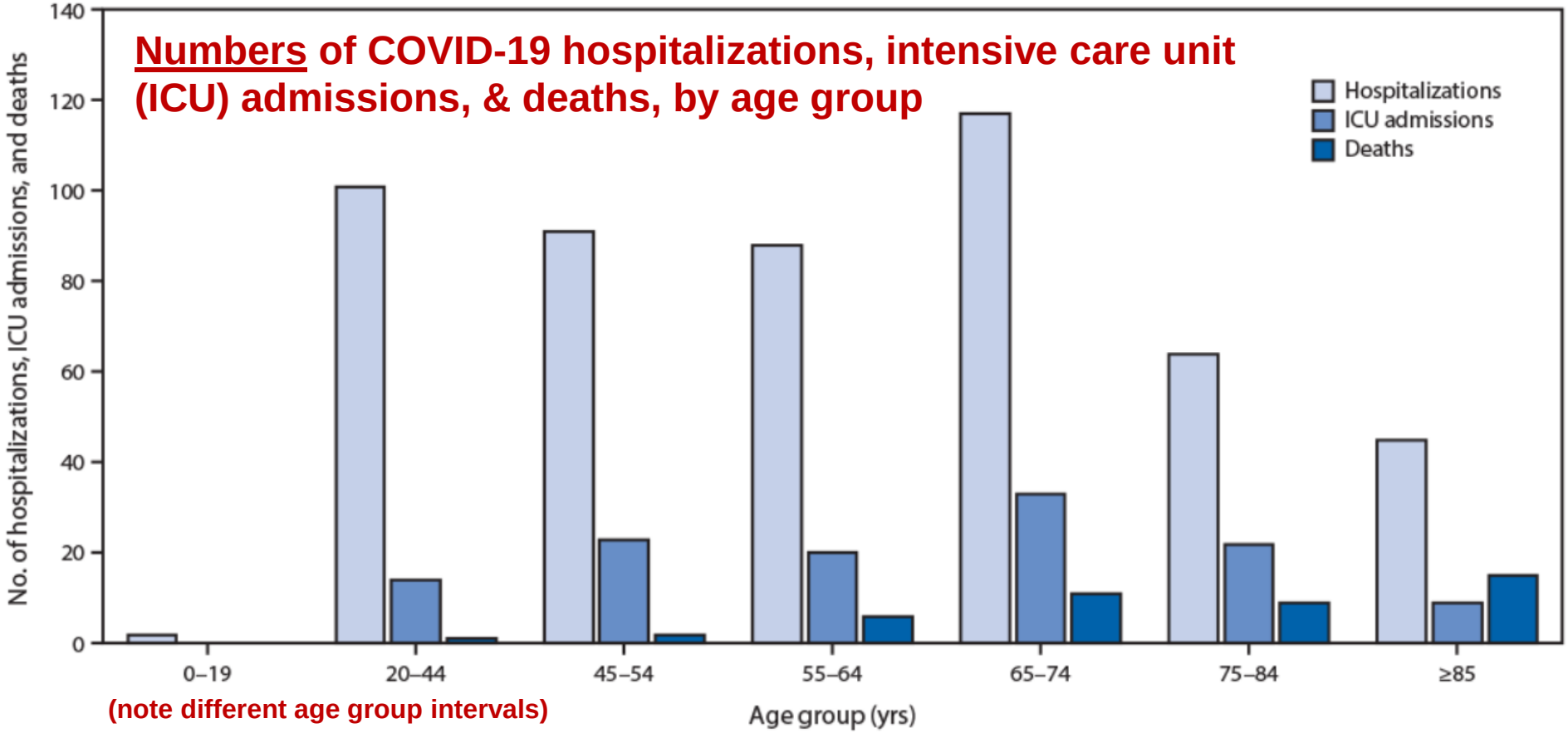
A temporary hospital converted from an exhibition center in Wuhan, China, during operations on Feb. 18. The hospital, one of a dozen of its kind in Wuhan, hosts covid-19 patients with mild symptoms. (AP)

COVID-19 Case Fatality Ratios by Age
(for 44,672 confirmed COVID-19 cases in China, as of February 11)



The Novel Coronavirus Pneumonia Emergency Response Epidemiology Team. The Epidemiological Characteristics of an Outbreak of 2019 Novel Coronavirus Diseases (COVID-19) — China, 2020[J]. China CDC Weekly, 2020, 2(8): 113-122

Severe Outcomes Among Patients with Coronavirus Disease 2019 (COVID-19) — United States, February 12 – March 16, 2020



(note different age group intervals)

On March 18, 2020, this report was posted online as an MMWR Early Release
https://www.cdc.gov/mmwr/volumes/69/wr/mm6912e2.htm?s_cid=mm6912e2_w

Groups at Higher Risk for Severe Illness

US CDC, April 2, 2020:
https://www.cdc.gov/coronavirus/2019-ncov/specific-groups/people-at-higher-risk.html

Based on what we know now, those at high-risk for severe illness from COVID-19 are:

- People 65 years and older
- **People who live in a nursing home or long-term care facility**

People of all ages with underlying medical conditions are at higher risk for severe illness, particularly if the underlying medical conditions are not well controlled. This includes people with:

- **Chronic lung disease or moderate to severe asthma**
- **Serious heart conditions**
- **Conditions that can cause a person to be immunocompromised**, including cancer treatment, smoking, bone marrow or organ transplantation, immune deficiencies, poorly controlled HIV or AIDS, and prolonged use of corticosteroids and other immune weakening medications.
- **Severe obesity** (body mass index [BMI] of 40 or higher)
- **Diabetes**
- **Chronic kidney disease and who are undergoing dialysis**
- **Liver disease**

Learn how you can help protect yourself if you are at higher risk of severe

Imperial College London

3. Time

https://www.imperial.ac.uk/mrc-global-infectious-disease-analysis/news--wuhan-coronavirus/

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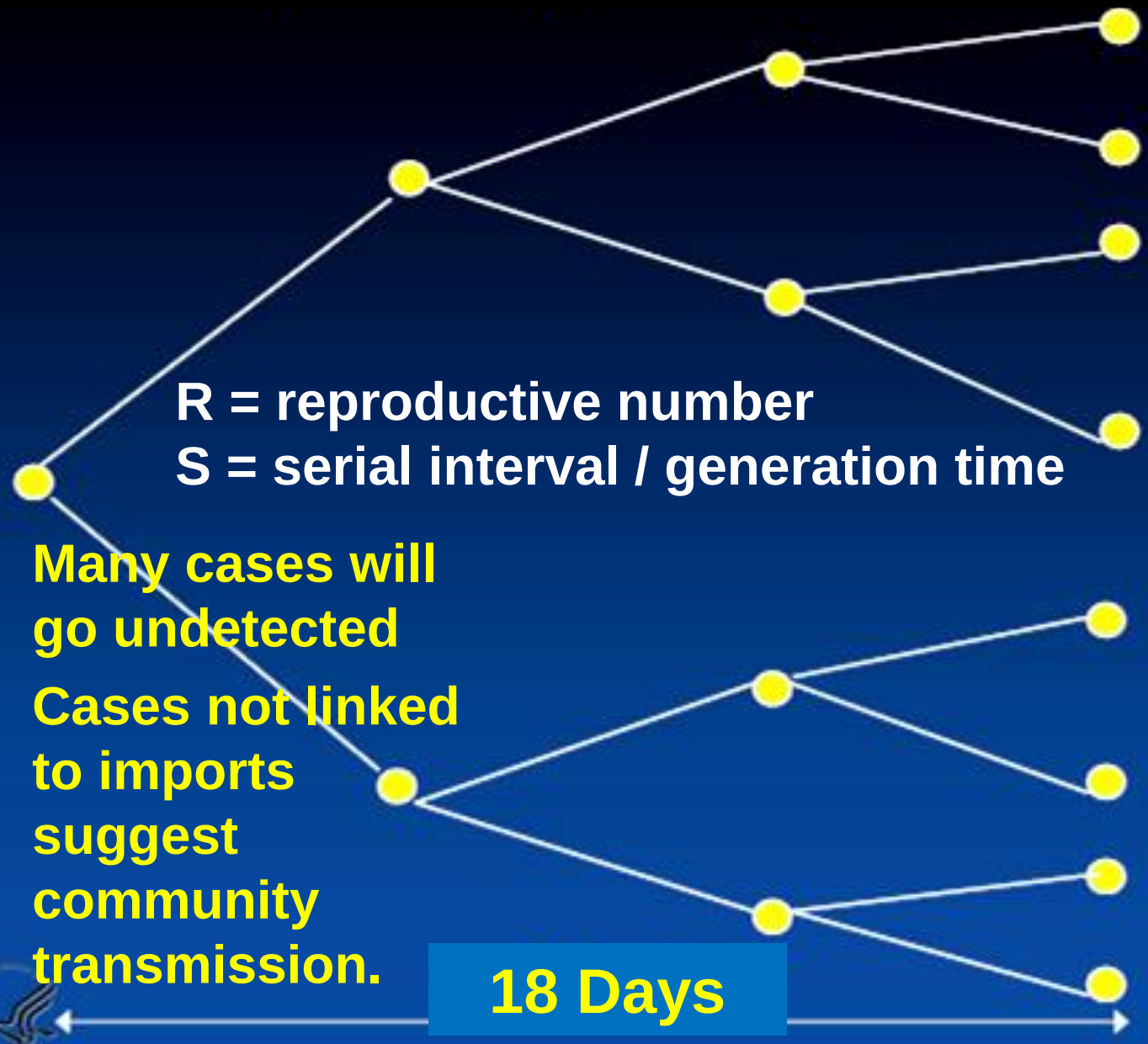
Report 5, February 15, 2020: "Bayesian and maximum likelihood phylogenetic methods indicate that the virus was introduced into the human population in early December and has an epidemic doubling time of approximately seven days."

COVID-19: If R = 2 (?) & S = 6 days (?)



Flu: R = 2 & S = 3 days: From 1 to 2,047 cases by Day 30 !

R = reproductive number
S = serial interval / generation time

COVID-19: From 1 to 63 cases by Day 30, & 2,047 by Day 60 (?)

- Many cases will go undetected
- Cases not linked to imports suggest community transmission.

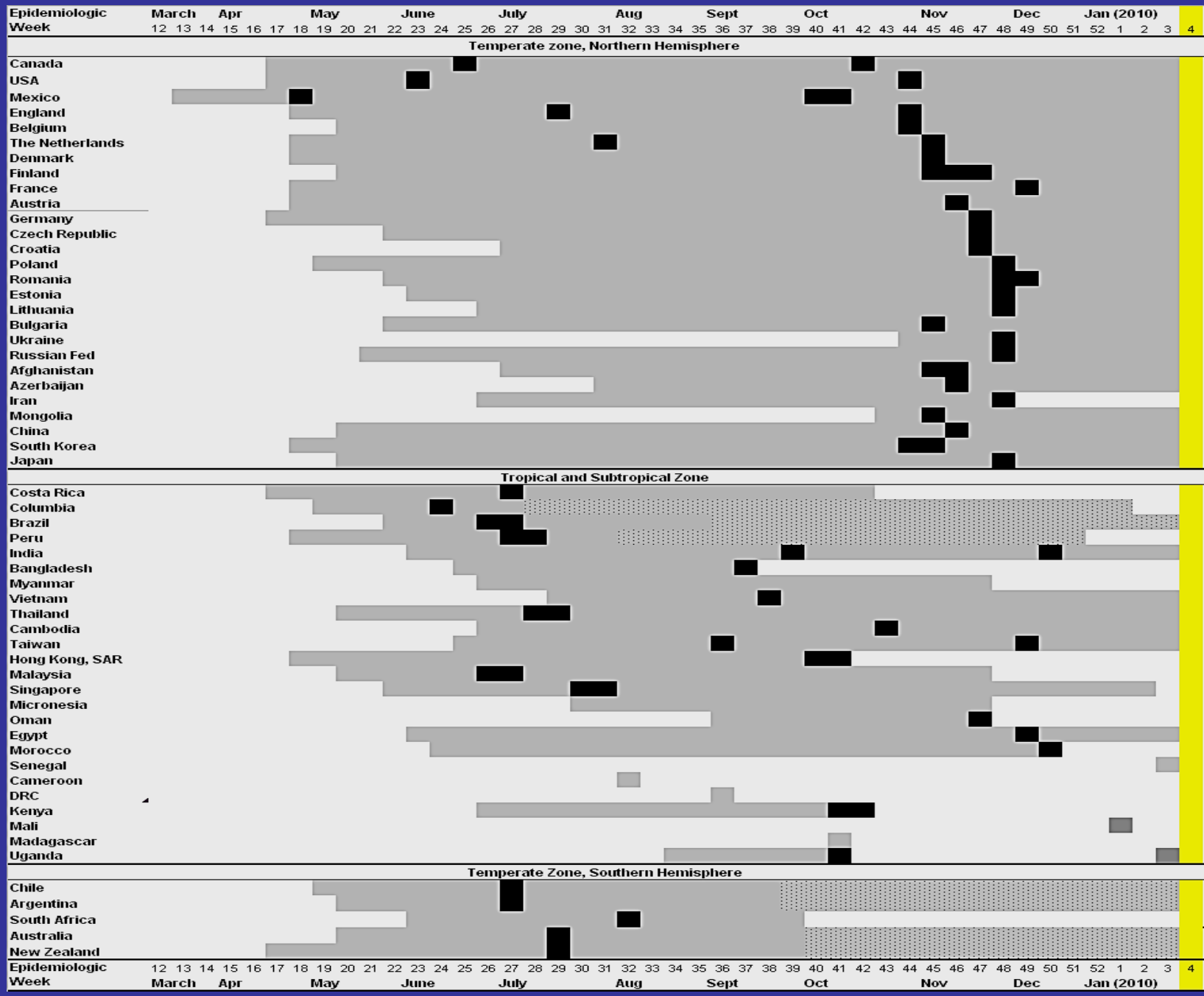
(**SARS**: R_o = 3, v = 9 days: 40 cases by Day 30)

Time Course & Seasonality of the 2009 H1N1 Pandemic.

Peak(s) (N.B. Not all countries have detected a "peak" in activity)

Cases detected

Sporadic Cases Detected



Many countries saw periods of several weeks or months between first introduction of the virus & their first wave / big outbreak.

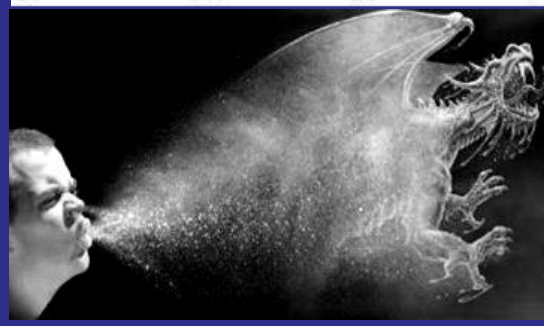
COVID-19?

*Table developed by: Maria Van Kerkove PhD, MRC Centre for Outbreak Analysis and Modeling, Imperial College London

Differences: COVID-19 vs. Pandemic Flu

1. No proven **antiviral** medication for COVID-19 - studies started on existing antivirals.
2. Somewhat different **risk factors** for severe illness (not pregnancy??)
3. COVID-19: longer **incubation** period & serial interval – so outbreaks may grow & move around the world somewhat slower?
4. More difficulty with COVID-19 **lab testing**, including false negatives.
5. ????????

- So, plan for a **severe flu-like pandemic**, taking differences & uncertainties into account, &
- **Expect the unexpected**, from the virus, & from our response to it.



Slide adapted from:

UNSIC

Categories of Risk: Pandemic Flu & COVID-19 too?

Livelihoods

- Food & income loss from decreased economic activity

Human Health

- High illness & potentially high death rates
- Overstretched health facilities
- Disproportionate impact on vulnerable

Governance & Security

- Increased demand for governance & security
- Higher public anxiety
- Reduced capacity due to illness & death

Social & Humanitarian Needs

- Deterioration of coping & support mechanisms
- Interruption in public services

Economic Systems

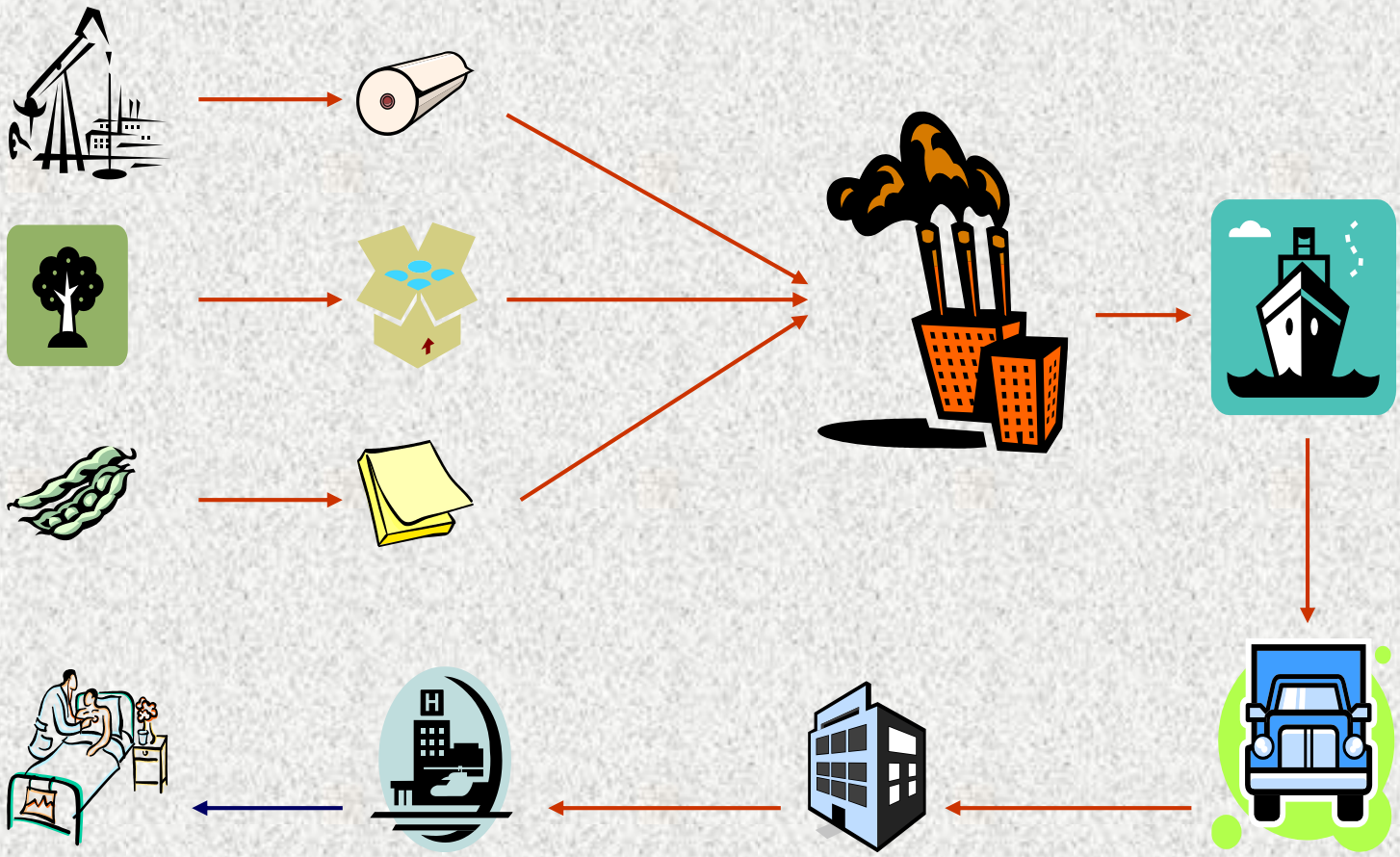
- Trade & commerce disruptions
- Degraded labour force (up to 50% ??)
- Interruption of regular supply systems

In the 21st Century (in a severe pandemic wave):

Pandemic Wave Peak Worker-Absenteeism ~50% (?)

+ Long Supply Lines & Just-In-Time Delivery of Goods

= Big Impact on Availability of Goods & Services?



(www.cidrap.umn.edu/index.html)

In 2006 - 2008, then US Health Secretary Mike Leavitt noted at pandemic flu state planning summits around the US that:

"Any community that fails to prepare with the expectation that the federal government will at the last moment be able to come to the rescue will be tragically wrong, …… because there is no way in which 5,000 different communities can be responded to simultaneously," ……

(In a severe pandemic, many districts may receive little or no outside help for months.)

WHO: Critical preparedness, readiness & response actions for COVID-19 - 7 March 2020

Table 1. Critical preparedness, readiness and response actions for each transmission scenario for COVID-19

	No Cases	Sporadic Cases	Clusters of Cases	Community Transmission
Transmission scenario	No reported cases	One or more cases, imported or locally acquired	Most cases of local transmission linked to chains of transmission	Outbreaks with the inability to relate confirmed cases through chains of transmission for a large number of cases, or by increasing positive tests through sentinel samples (routine systematic testing of respiratory samples from established laboratories
Aim	Stop transmission and prevent spread	Stop transmission and prevent spread	Stop transmission and prevent spread	Slow transmission, reduce case numbers, end community outbreaks
Priority areas of work				
Emergency response mechanisms	Activate emergency response mechanisms	Enhance emergency response mechanisms	Scale up emergency response mechanism	Scale up emergency response mechanism
Risk communication and public engagement	Educate and actively communicate with the public through risk communication and community engagement	Educate and actively communicate with the public through risk communication and community engagement	Educate and actively communicate with the public through risk communication and community engagement	Educate and actively communicate with the public through risk communication and community engagement
Case finding, contact tracing and management	Conduct active case finding, contact tracing and monitoring; quarantine of contacts and isolation of cases	Enhance active case finding, contact tracing and monitoring; quarantine of contacts and isolation of cases	Intensify case finding, contact tracing, monitoring, quarantine of contacts, and isolation of cases;	Continue contact tracing where possible, especially in newly infected areas, quarantine of contacts, & isolation of cases; apply self-initiated isolation for symptomatic individuals
Surveillance	Consider testing for COVID-19 using existing respiratory disease surveillance systems and hospital-based surveillance.	Implement COVID-19 surveillance using existing respiratory disease surveillance systems and hospital-based surveillance	Expand COVID-19 surveillance using existing respiratory disease surveillance systems and hospital-based surveillance	Adapt existing surveillance systems to monitor disease activity (e.g. through sentinel sites)
Public health measures	Hand hygiene, respiratory etiquette, practice social distancing	Hand hygiene, respiratory etiquette, practice social distancing	Hand hygiene, respiratory etiquette, practice social distancing	Hand hygiene, respiratory etiquette, practice social distancing
Laboratory testing	Test suspect cases per WHO case definition, contacts of confirmed	Test suspect cases per WHO case definition, contacts of confirmed	Test suspect cases per WHO case definition, contacts of confirmed	Test suspect cases per WHO case definition and symptomatic contacts of
Case management	Prepare to treat patients, Ready hospitals for potential surge	Treat patients and ready hospitals for surge; develop triage procedures	Treat patients and ready hospitals for surge; enhance triage procedures; activate surge plans for health facilities	Prioritize care and activate triage procedures. Scale up surge plans for health facilities (designate referral hospitals, defer elective procedures)
	Promote self-initiated isolation of people with mild respiratory symptoms to reduce the burden on health systems	Promote self-initiated isolation of people with mild respiratory symptoms to reduce the burden on health system	Activate surge plans for health facilities (designate referral hospitals, defer elective procedures)	Implement self-initiated isolation of people with mild respiratory symptoms to reduce the burden on health systems
IPC	Train staff in IPC and clinical management specifically for COVID-19	Train staff in IPC and clinical management specifically for COVID-19	Train staff in IPC and clinical management specifically for COVID-19	Retrain staff in IPC and clinical management specifically for COVID-19
	Prepare for surge in health care facility needs, including respiratory support and PPE	Prepare for surge in health care facility needs, including respiratory support and PP	Advocate for home care for mild cases, if health care systems are overwhelmed, and identify referral systems for high risk groups	Implement health facilities surge plans
Societal response	Develop all-of-society and business continuity plans	Implement all-of-society, repurpose government and ready business continuity plans	Implement all-of-society resilience, repurpose government, business continuity, and community services plans	Implement all-of-society resilience, repurpose government, business continuity, and community services plans

https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/critical-preparedness-readiness-and-response-actions-for-covid-19

Tools in Our Toolbox

(Health Sector)

- Pandemic Vaccine (after 1 year + ?)
  (+ vaccine for 2^0 bacterial pneumonia)
- Antiviral medications (soon ?)
  (+ antibiotics for 2^0 bacterial pneumonia)
- Infection control measures
- Community Mitigation measures

- **Medical masks (surgical / procedure) help protect against droplets**
- **Better on cases than on uninfected?**
- **Respirators protect against aerosols (for suctioning, nebulizer treatment, etc.), but should be fit-tested**
- **Neither protect eyes or prevent contact transmission**
- **Warns others to stay away? But:**
- **Must discard after dirty or moist**
- **Already in short supply**
- **Gives false sense of protection?**
- **Woven cloth masks: Little data**

https://afludiary.blogspot.com/2020/01/the-man-in-ironed-mask-revisited.html

US CDC: "COVID-19 is a respiratory disease that seems to be spreading much like flu. Guidance developed for influenza pandemic preparedness would be appropriate in the event the current COVID-19 outbreak triggers a pandemic."

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

https://www.cdc.gov/coronavirus/2019-ncov/php/pandemic-preparedness-resources.html

Coronavirus Disease 2019 (COVID-19)

CDC > Coronavirus Disease 2019 (COVID-19) > Public Health Professionals

- Coronavirus Disease 2019 (COVID-19)
- COVID-19 Situation Summary +
- About COVID-19 +
- Information for Travel +
- Information for Specific Groups +
- Healthcare Professionals +
- **Public Health Professionals** −
  - Reporting a PUI for COVID-19
  - Lab Confirmed Case Report Form
  - Risk Assessment and Management

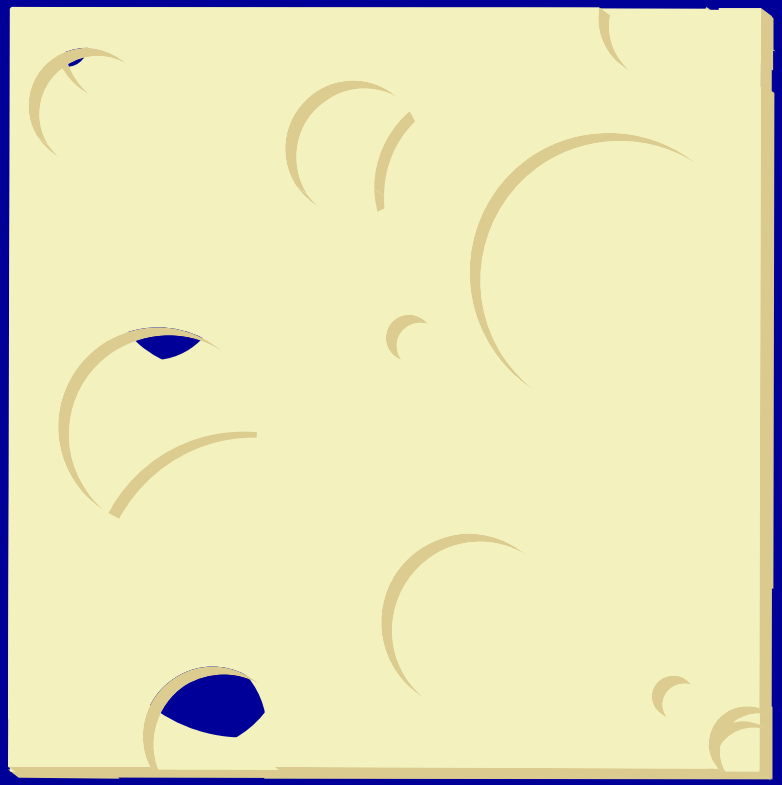
On February 11, 2020 the World Health Organization announced an official name for the disease that is causing the current outbreak of coronavirus disease, COVID-19. CDC will be updating our website and other CDC materials to reflect the updated name.

Pandemic Preparedness Resources

While the content at the links provided below was developed to prepare for, or respond to, an influenza ("flu") pandemic, the newly emerged coronavirus disease 2019 (COVID-19) is a respiratory disease that seems to be spreading much like flu. Guidance developed for influenza pandemic preparedness would be appropriate in the event the current COVID-19 outbreak triggers a pandemic.

- Pandemic Planning and Preparedness Resources
- Pandemic Influenza Plan (UPDATED 2017) [1 MB, 52 pages]
- Community Mitigation Guidelines to Prevent Pandemic Influenza — United States, 2017
- Nonpharmaceutical Interventions (NPIs)
- NPI 101: An Introduction to Nonpharmaceutical Interventions (NPIs) for Pandemic Influenza CDC TRAIN course

Community Mitigation: Multiple "Layered" Non-Pharmaceutical Interventions (NPIs)



(Because No Single NPI is Effective Enough)

Table 1. Recommendations on the use of NPIs by severity level

SEVERITY	PANDEMIC[a]
Any	Hand hygiene Respiratory etiquette Face masks for symptomatic individuals Surface and object cleaning Increased ventilation Isolation of sick individuals Travel advice
Moderate	*As above, plus* Avoiding crowding
High	*As above, plus* Face masks for public School measures and closures
Extraordinary	*As above, plus* Workplace measures and closures Internal travel restrictions
Not recommended in any circumstances	UV light Modifying humidity Contact tracing Quarantine of exposed individuals Entry and exit screening Border closure

(Right column of Table 1. "Epidemic" is omitted here.)

Countries are using most of above now.

GLOBAL INFLUENZA PROGRAMME

Non-pharmaceutical public health measures for mitigating the risk and impact of epidemic and pandemic influenza

Containment measures being used to delay spread of COVID-19.

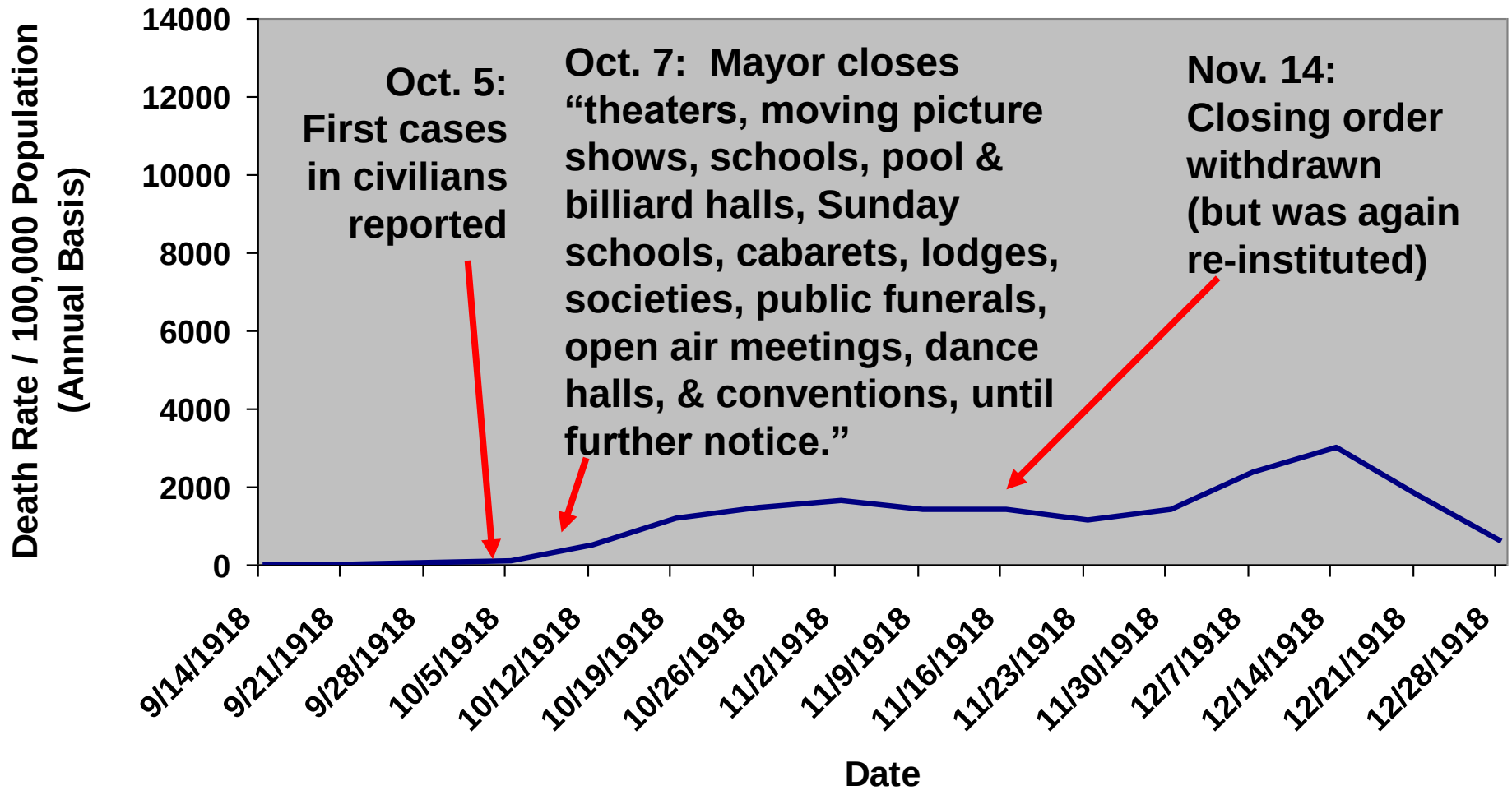
- This focusses on the evidence for each NPI.
- It does not include guidance on how countries should adapt & prepare to implement these.

https://www.who.int/influenza/publications/public_health_measures/publication/en/

(October 2019)

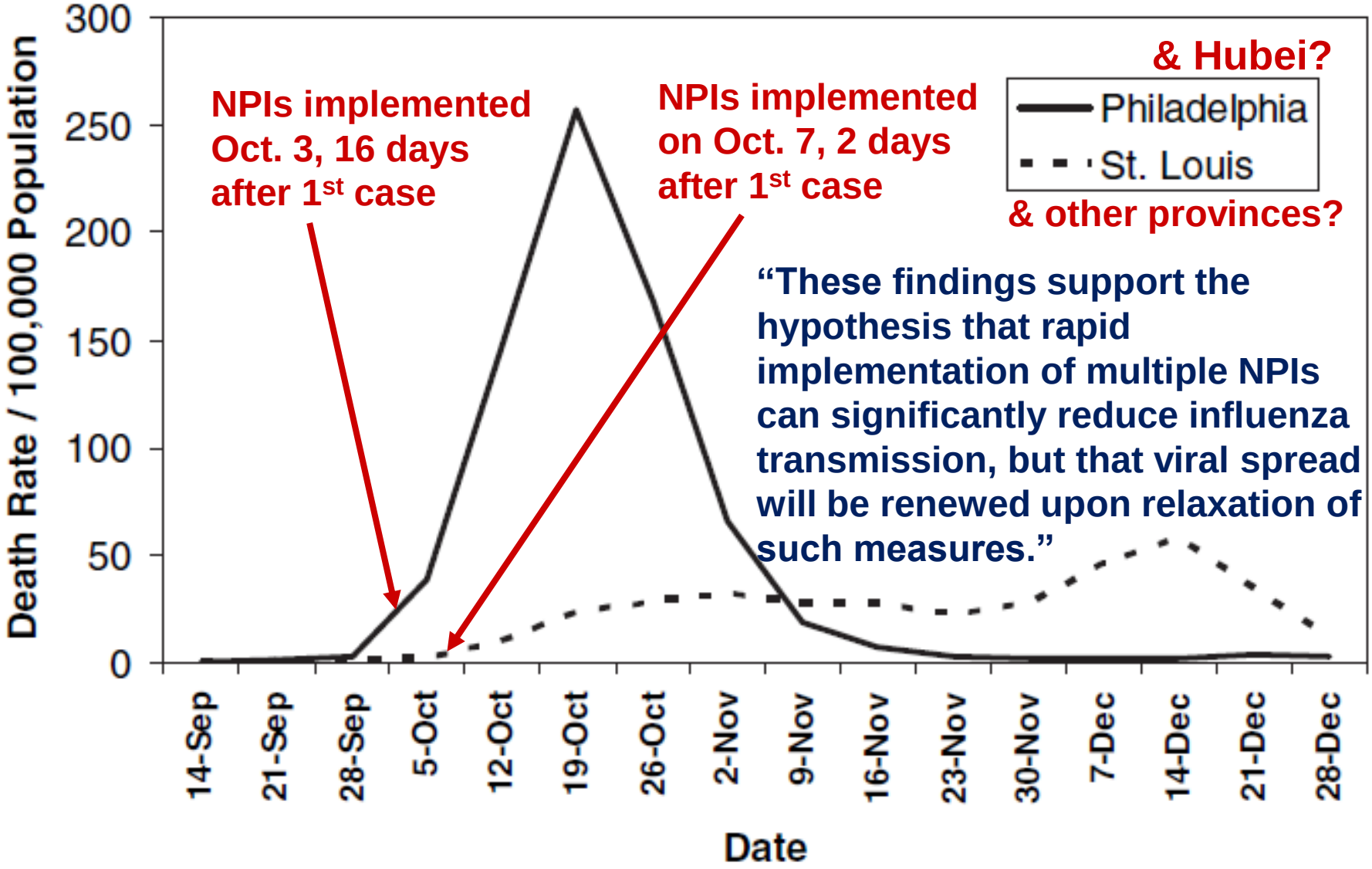
World Health Organization

3 studies have examined relationships between NPI implementation & mortality in US cities in 1918. This is St. Louis, Sep. 14 – Dec. 28.



- Markel H, Lipman HB, Navarro JA, et al. Nonpharmaceutical interventions implemented by US cities during the 1918-1919 influenza pandemic. JAMA 2007, Aug 8; 298(6): 644-54: http://jama.ama-assn.org/cgi/reprint/298/6/644.pdf **(43 cities)**
- **Hatchett RJ**, Mecher CE, Lipsitch M. Public health interventions and epidemic intensity during the 1918 influenza pandemic. Proc Natl Acad Sci 2007, May 1; 104(18): 7582-7: www.pnas.org/content/104/18/7582.full.pdf **(17 cities)**
- Bootsma CJ, **Ferguson NM**. The effect of public health measures on the 1918 influenza pandemic in US cities. Proc Natl Acad Sci 2007 May 1;104(18):7588-93: www.pnas.org/content/104/18/7588.full.pdf **(23 cities)**

Excess pneumonia & flu mortality over 1913 – 1917 baseline in Philadelphia & St. Louis, Sep. 8 – Dec. 28, 1918



(Hatchett RJ, Mecher CE, Lipsitch M. *Public health interventions & epidemic intensity during the 1918 influenza pandemic.* PNAS 2007: http://www.pnas.org/cgi/content/abstract/0610941104v1)

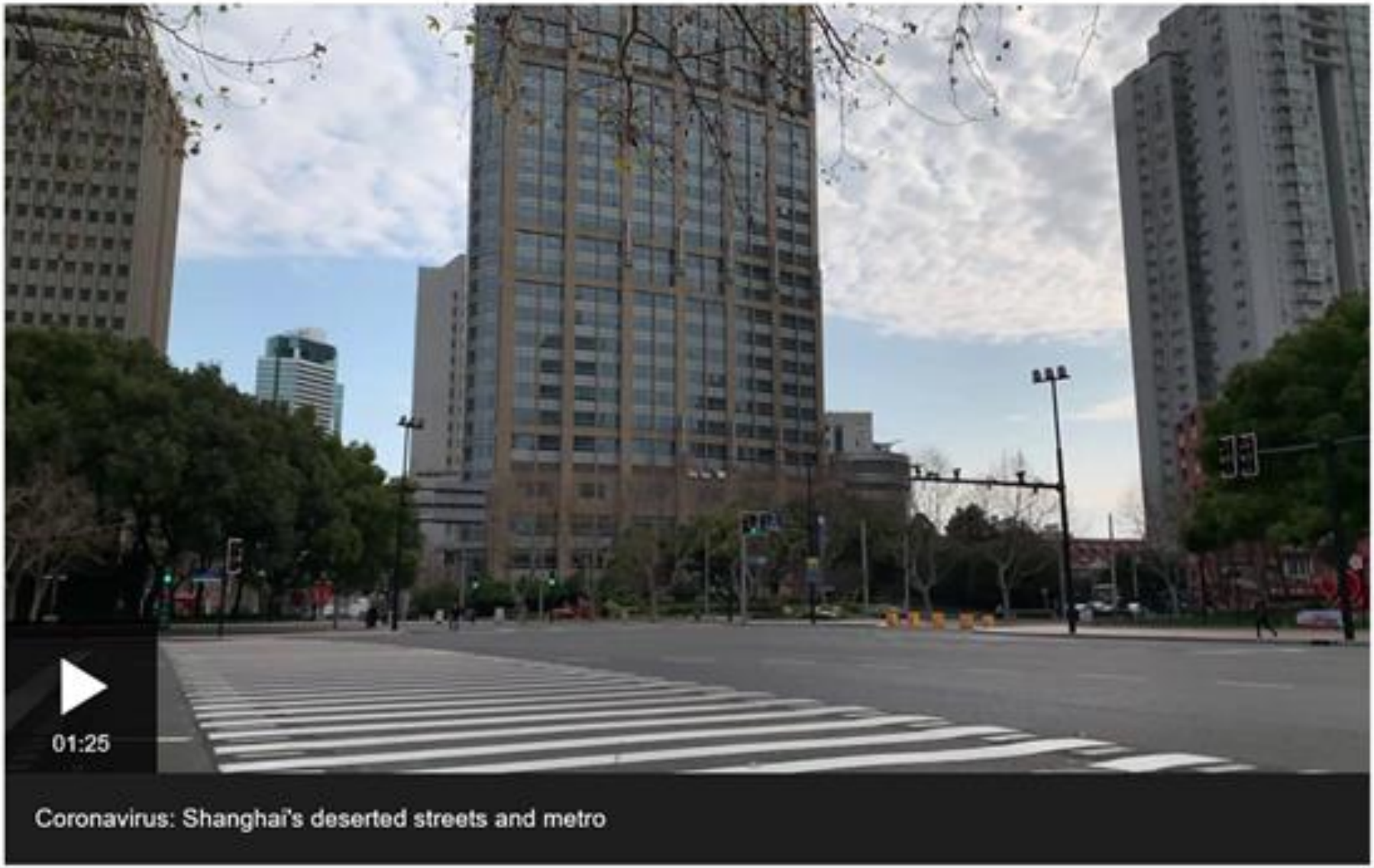
1918
Social Distancing in the US

14. All New York City workers wore masks. Note the absence of traffic on the street and pedestrians on the sidewalk. The same silent streets were seen everywhere. In Philadelphia a doctor said, "The life of the city had almost stopped."

(John Barry,
***The Great Influenza*)**

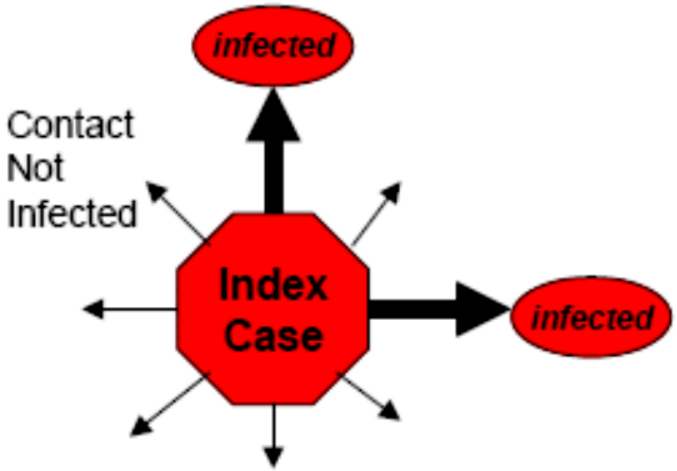
2020 Social Distancing in Shanghai (BBC, February 6)

Coronavirus: Shanghai's deserted streets and metro

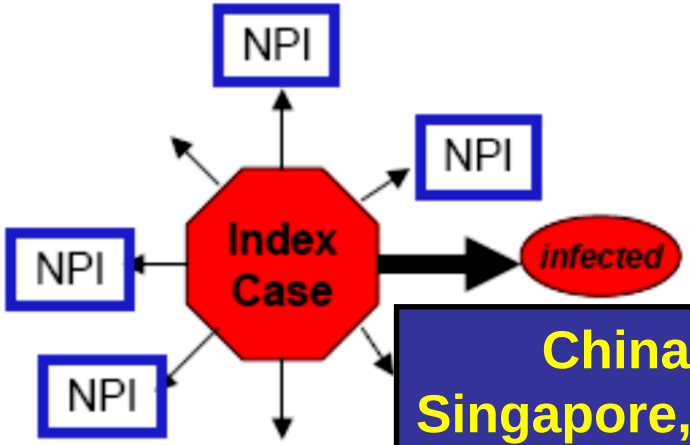


NPIs Can Reduce R by Reducing the Number of Contacts Between Infectious & Susceptible Persons

If less than 1.0, virus cannot effectively spread, and will burn out



Ro = 2



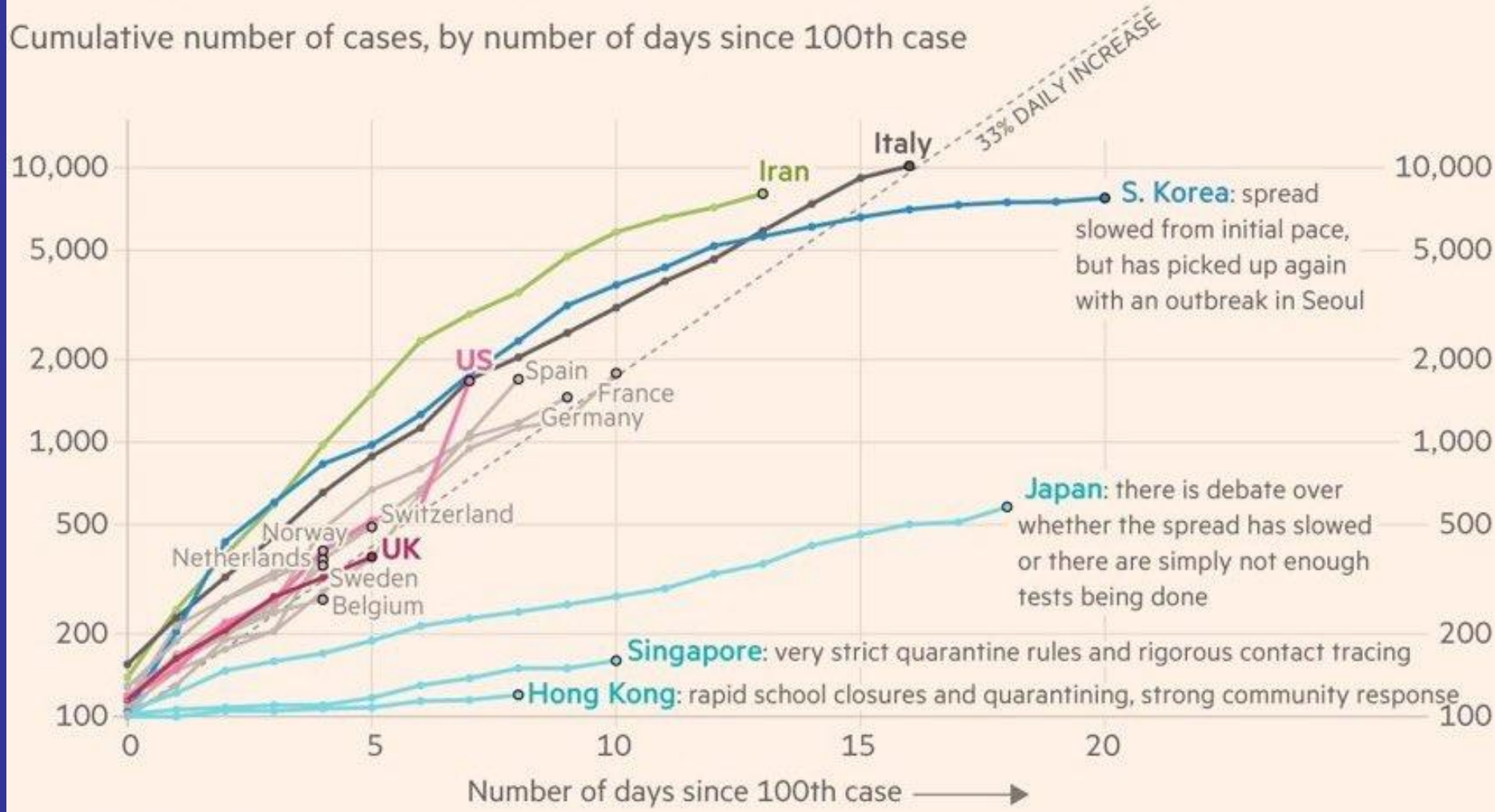
Ro = 1

China, HK, Singapore, S. Korea, & Taiwan now appear to be doing better than this, but can others do too ?

(In both scenarios, above, ¼ of contacts become ill.)

Most western countries are on the same coronavirus trajectory. Hong Kong and Singapore have managed to slow the spread

Cumulative number of cases, by number of days since 100th case



Source: FT analysis of Johns Hopkins University, CSSE
FT graphic: John Burn-Murdoch / @jburnmurdoch

Centers for Disease Control and Prevention
MMWR
Morbidity and Mortality Weekly Report
Recommendations and Reports / Vol. 66 / No. 1
April 21, 2017

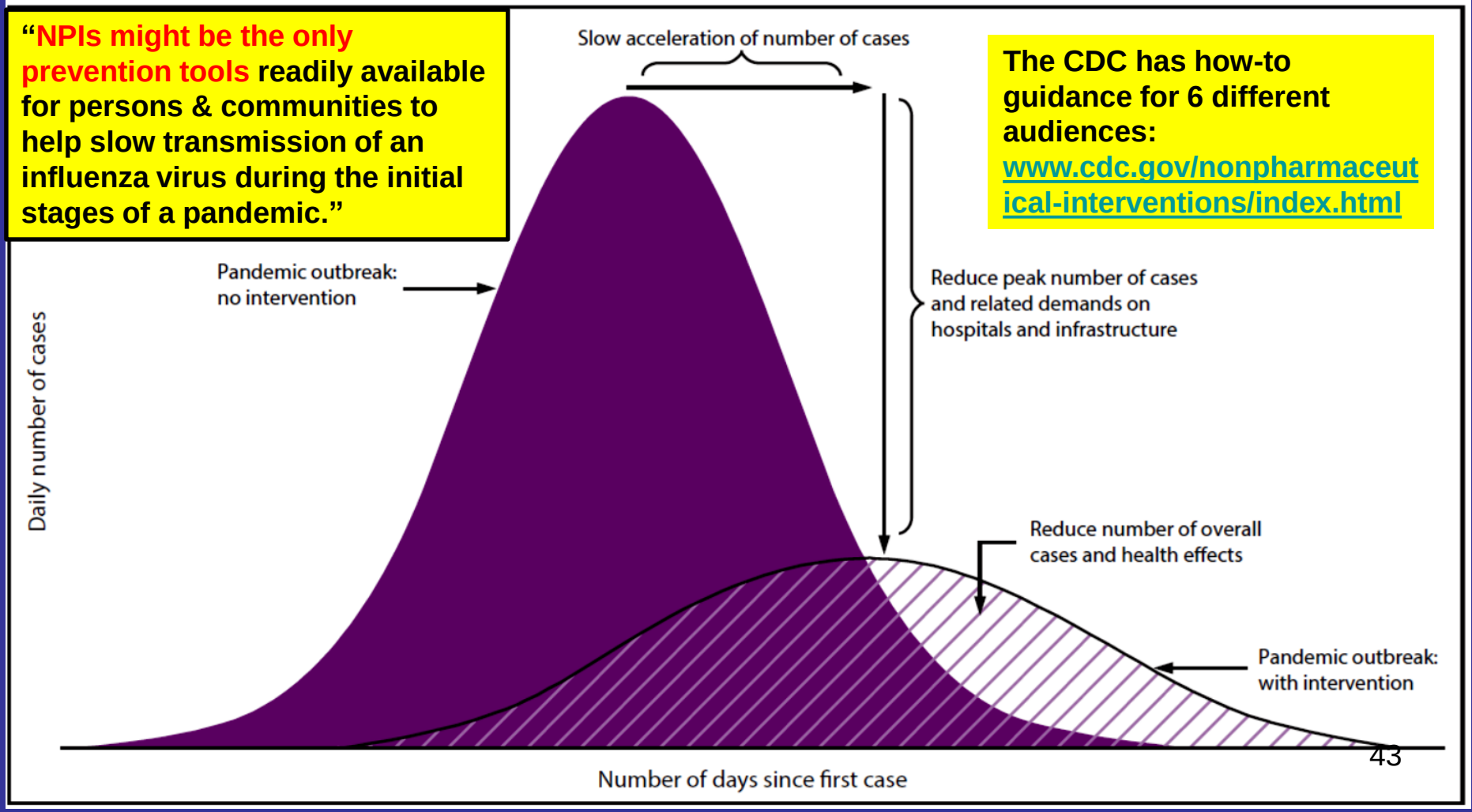
Community Mitigation Guidelines to Prevent Pandemic Influenza — United States, 2017

"this 2017 update affirms the importance of pre-pandemic planning & preparedness for use of NPIs during a pandemic response & recommends the early, targeted, & simultaneous implementation of multiple NPIs to decrease influenza virus transmission."

FIGURE 1. Goals of community mitigation for pandemic influenza

"NPIs might be the only prevention tools readily available for persons & communities to help slow transmission of an influenza virus during the initial stages of a pandemic."

The CDC has how-to guidance for 6 different audiences: www.cdc.gov/nonpharmaceutical-interventions/index.html



Centers for Disease Control and Prevention
MMWR
Morbidity and Mortality Weekly Report
Recommendations and Reports / Vol. 66 / No. 1
April 21, 2017

www.cdc.gov/nonpharmaceutical-interventions/index.html

Community Mitigation Guidelines to Prevent Pandemic Influenza — United States, 2017

TABLE 10. Recommended nonpharmaceutical interventions for influenza pandemics, by setting and pandemic severity*

	Pandemic severity		("Similar to the 1918 pandemic")
Setting	Low to moderate severity (mild to moderate pandemic)	High severity (severe pandemic)	Very high severity (very severe to extreme pandemic†)
All	CDC recommends voluntary home isolation of ill persons, respiratory etiquette, hand hygiene, and routine cleaning of frequently touched surfaces and objects.§	CDC recommends voluntary home isolation of ill persons, respiratory etiquette hand hygiene, and routine cleaning of frequently touched surfaces and objects.	CDC recommends voluntary home isolation of ill persons, respiratory etiquette, hand hygiene, and routine cleaning of frequently touched surfaces and objects.
Residences	CDC generally does not recommend voluntary home quarantine of exposed household members.	CDC might recommend voluntary home quarantine of exposed household members in areas where novel influenza virus circulates.	CDC might recommend voluntary home quarantine of exposed household members in areas where novel influenza virus circulates.
	CDC generally does not recommend use of face masks by ill persons.	CDC might recommend use of face masks by ill persons when crowded community settings cannot be avoided.	CDC might recommend use of face masks by ill persons when crowded community settings cannot be avoided.
Child care facilities, schools for grades K–12, and colleges and universities	CDC might recommend selective school dismissals in facilities serving children at high risk for severe influenza complications.	CDC might recommend temporary preemptive, coordinated dismissals of child care facilities and schools.¶	CDC might recommend temporary preemptive, coordinated dismissals of child care facilities and schools. (until vaccine is available)
		If schools remain open, CDC might recommend social distancing measures.**	If schools remain open, CDC might recommend social distancing measures.
Workplaces	CDC generally does not recommend social distancing measures.	CDC might recommend social distancing measures.††	CDC might recommend social distancing measures.
Mass gatherings§§	CDC generally does not recommend modifications, postponements, or cancellations.	CDC might recommend modifications, postponements, or cancellations.	CDC might recommend modifications, postponements, or cancellations.

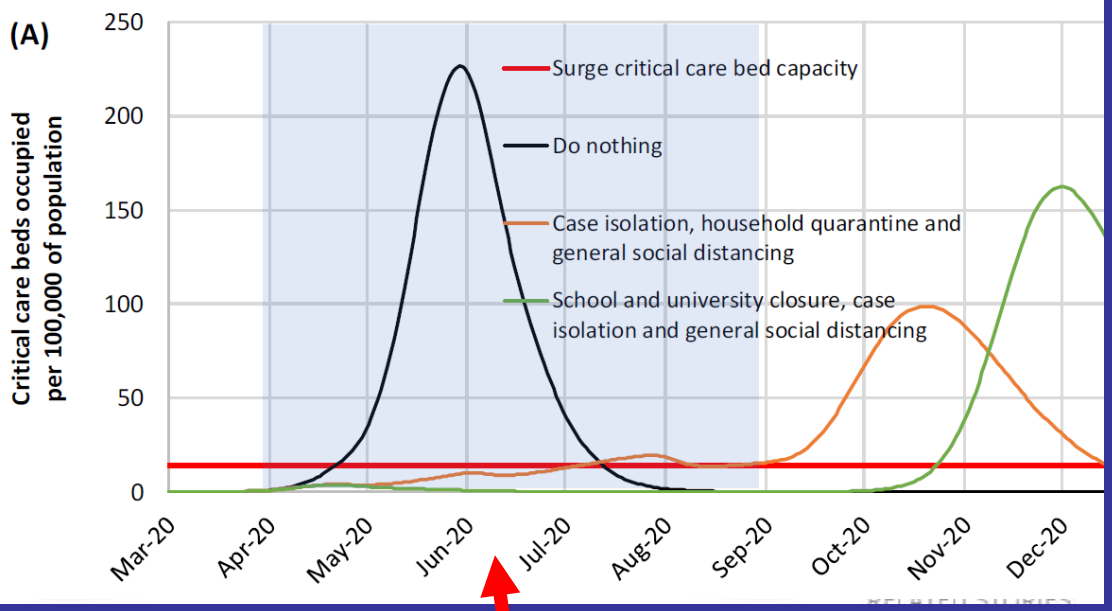
- …. “social distancing applied to the population as a whole would have the largest impact; & in combination with other interventions – notably home isolation of cases & school & university closure – has the potential to suppress transmission below the threshold of R = 1 required to rapidly reduce case incidence.”
- …. “interventions need to be in place well before healthcare capacity is overwhelmed.”
- ….. “these policies will need to be maintained until large stocks of vaccine are available to immunize the population” ...
- …… “intermittent social distancing – triggered by trends in disease surveillance – may allow interventions to be relaxed temporarily” ….

Imperial College London https://www.imperial.ac.uk/

Paper 9. Impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality & healthcare demand

Neil M Ferguson, et. al.

March 16, 2020



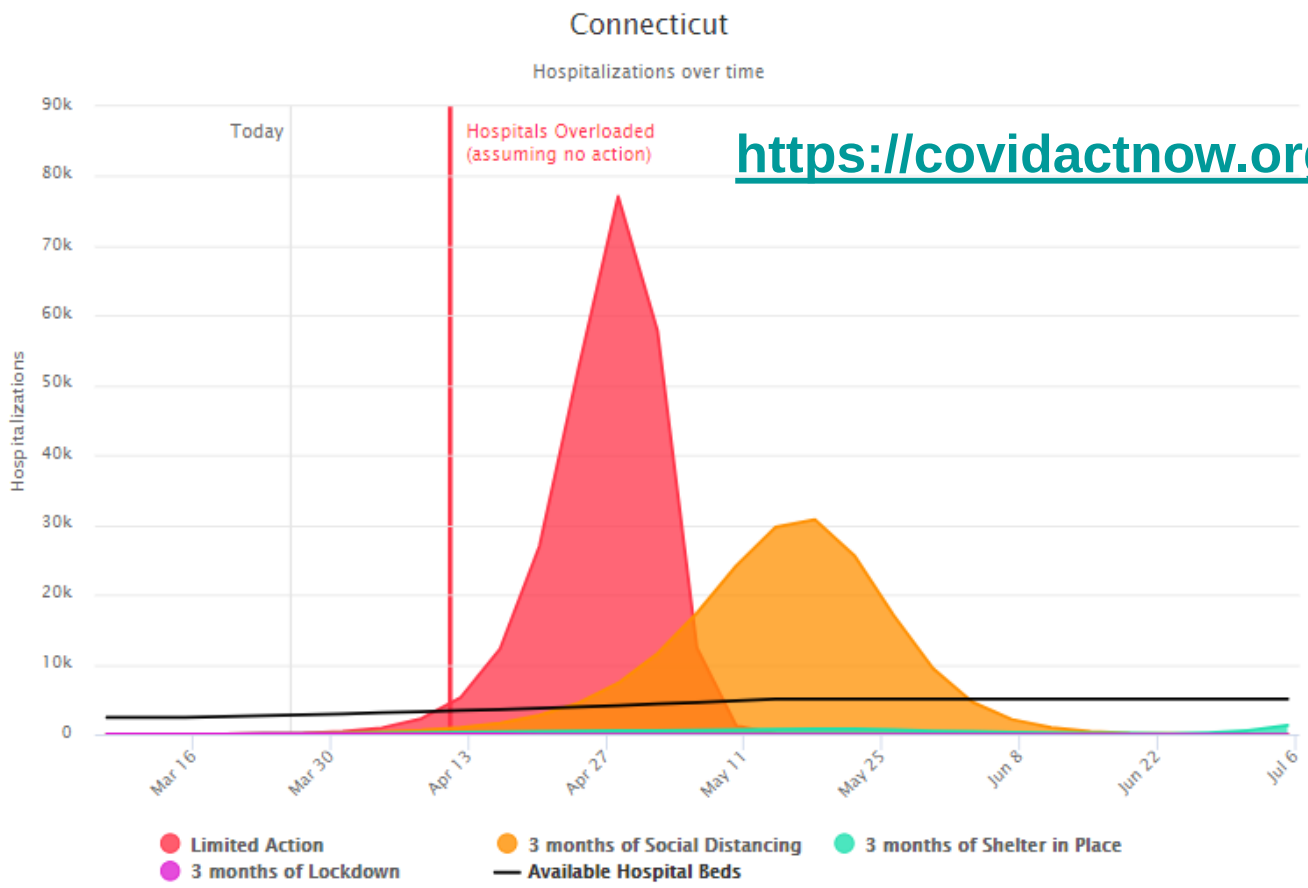
(Interventions for 5 months)

Why you must act now: Connecticut

Status: Shelter in Place

Public leaders & health officials:
The only thing that matters right now is the speed of your response

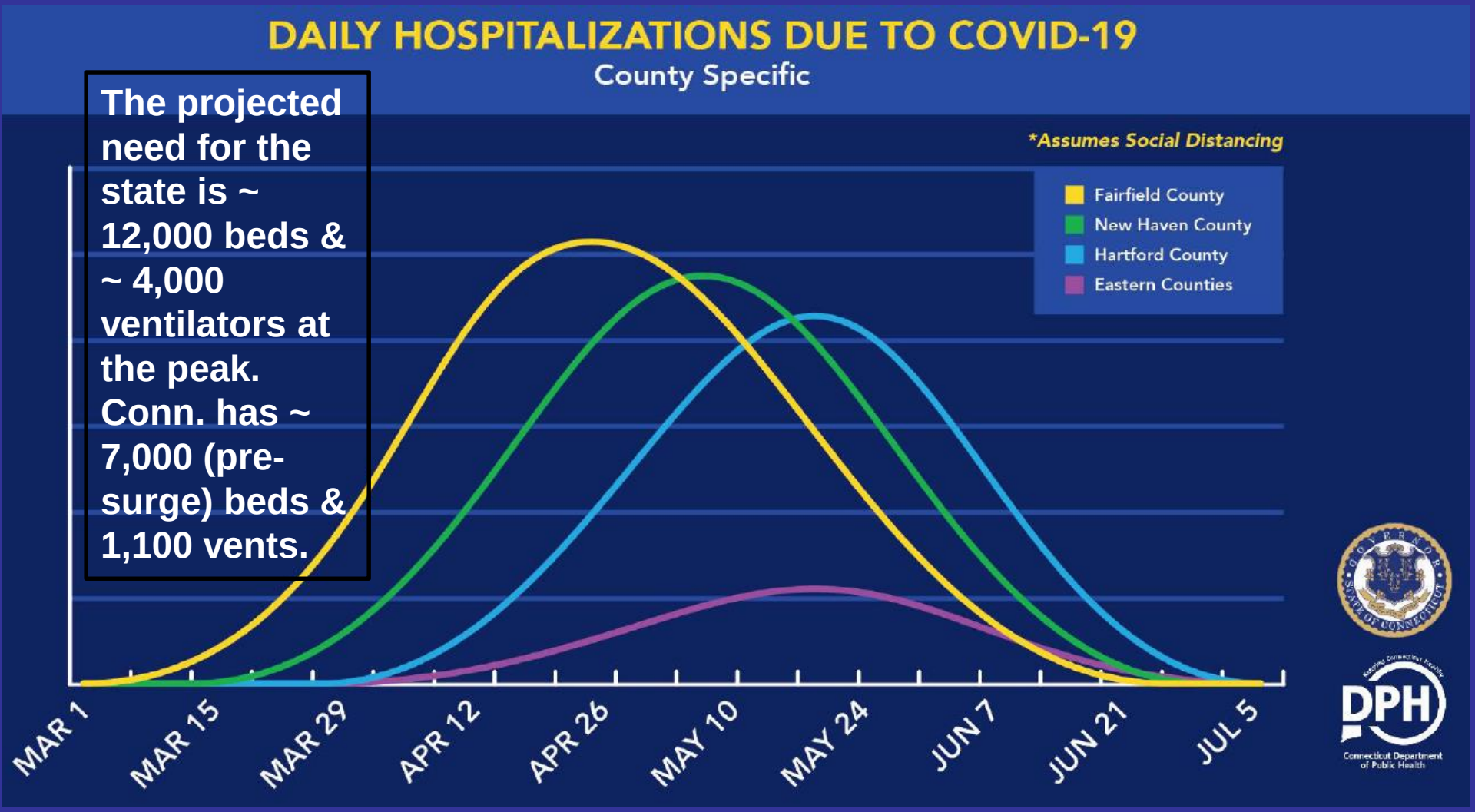
This model is intended to help make fast decisions, not predict the future



https://covidactnow.org/state/CT

Connecticut Responds: Preparing for the Surge

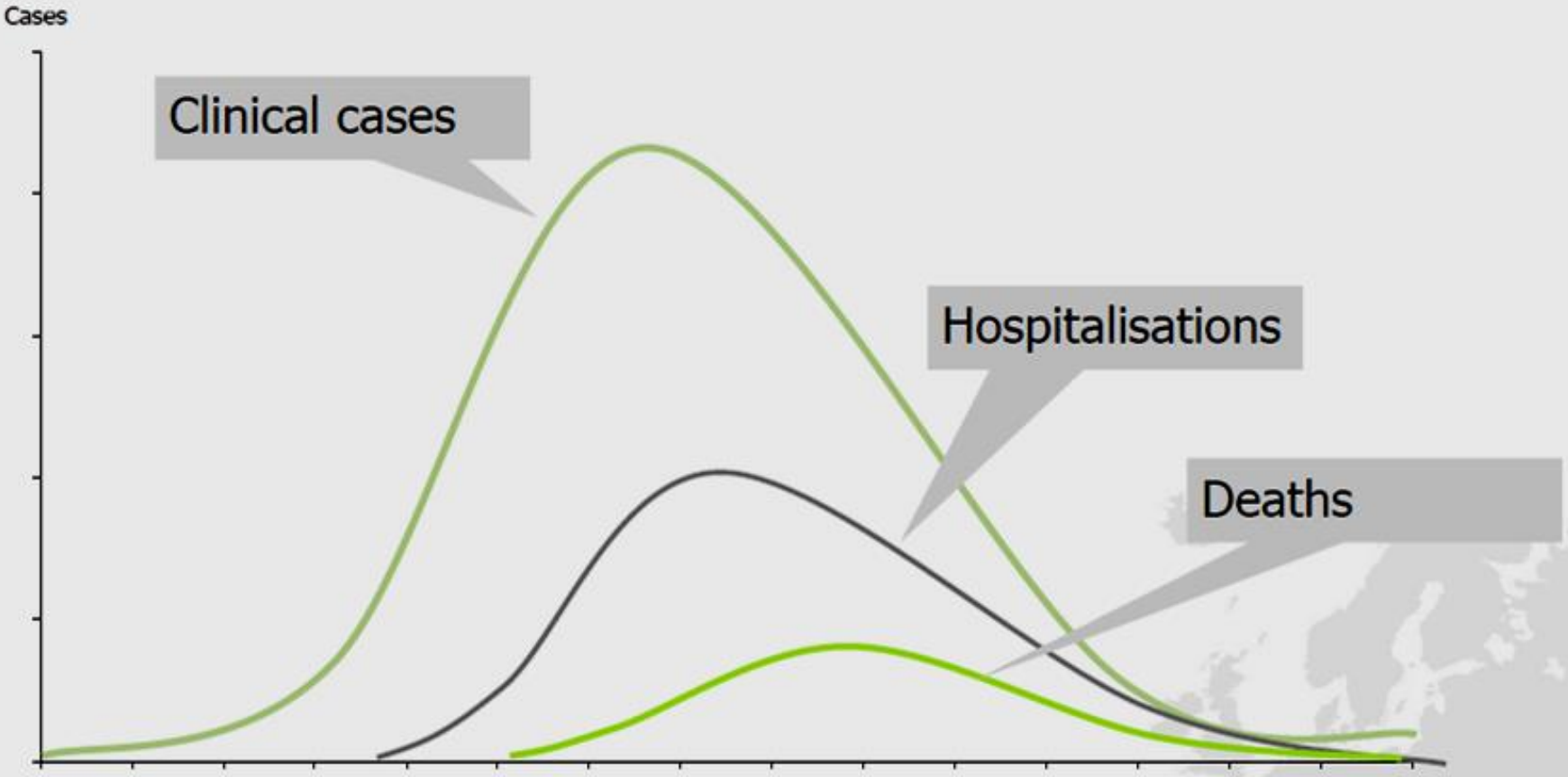
(From the Governor's press conference, April 3, 2020)



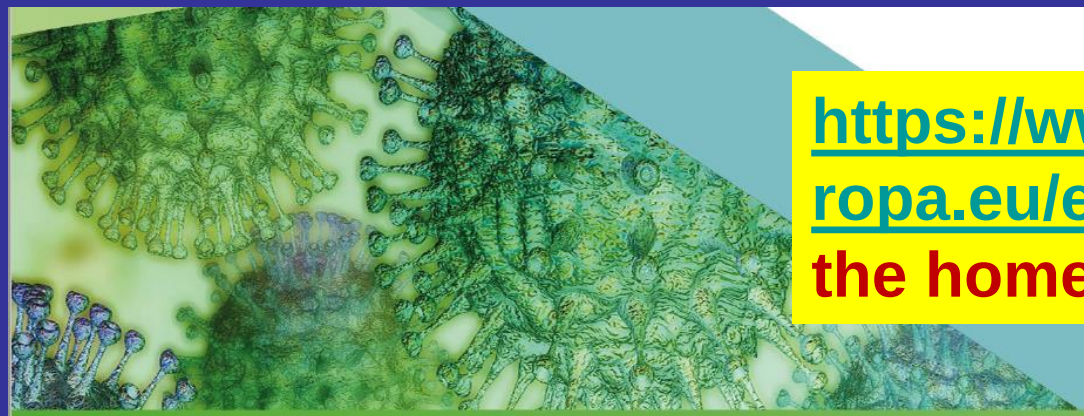
The projected need for the state is ~ 12,000 beds & ~ 4,000 ventilators at the peak. Conn. has ~ 7,000 (pre-surge) beds & 1,100 vents.

Connecticut's COVID-19 plan includes strong social distancing early, building surge capacity before needed, & load balancing across the state.

Three curves – more hospitalisations and deaths <u>after</u> the peak



Not drawn to scale



https://www.ecdc.europa.eu/en (Right on the home page !)

ecdc
EUROPEAN CENTRE FOR DISEASE PREVENTION AND CONTROL

March 2020

Considerations relating to social distancing measures in response to the COVID-19 epidemic

Individual social distancing:

- Isolation of cases
- Quarantine of contacts
- Stay-at-home recommendations

Social distancing of multiple persons:

- Closure of educational institutions
- Workplace closures
- Measures for confined settings
- Mass gathering cancellations
- *Cordon sanitaire*

Schools: Difficult Decisions

COVID-19: Kids infected with little severe illness – so what is their role in transmission??

- **Proactive or reactive dismissal.**
- **Immediate community-wide impact from a single policy decision?**
- **If kids stay away from other kids.**
- **But this will cause substantial adverse socio-economic impacts:**
  - **How many health workers will stay home with their kids?**
  - **Parents' lost income & jobs;**
  - **Child nutrition?**
- **These consequences must be considered & planned for.**

"Better Off in School": School Medical Inspection as a Public Health Strategy During the 1918–1919 Influenza Pandemic in the United States

Public Health Reports / 2010 Supplement 3 / Volume 125
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2862335/pdf/phr125s30063.pdf

Alexandra Minna Stern, PhD[a]
Mary Beth Reilly, BA[a]
Martin S. Cetron, MD[b]
Howard Markel, MD, PhD[a]

SYNOPSIS

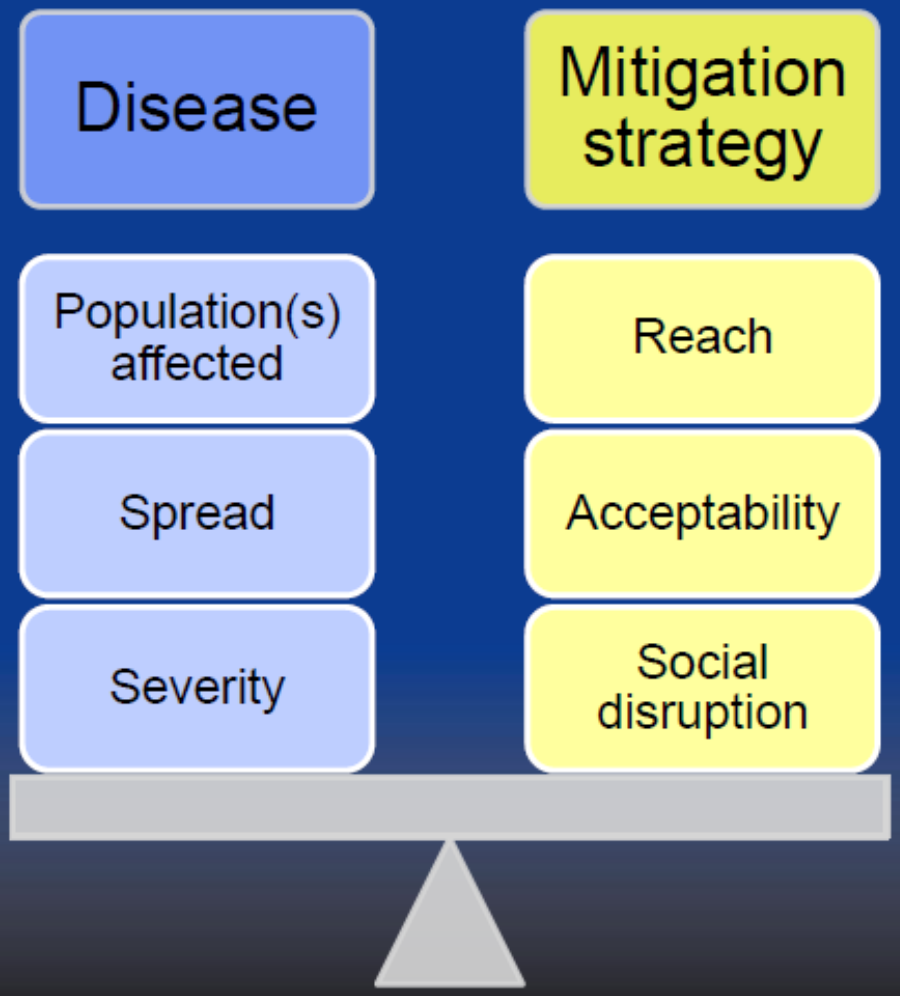
During the 1918–1919 influenza pandemic in the United States, most cities responded by implementing community mitigation strategies, such as school closure. However, three cities—New York City, Chicago, and New Haven, Connecticut—diverged from the dominant pattern by keeping their public schools open while the pandemic raged. This article situates the experiences of these three cities in the broader context of the Progressive era, when officials and experts put great faith in expanding public programs in health and education. It adds an important dimension to the historical understanding of the 1918–1919 influenza pandemic and offers lessons for public health practitioners and policymakers today who might face difficult decisions about how to respond to the 2009 H1N1 influenza pandemic.

Keeping kids learning during a coronavirus outbreak

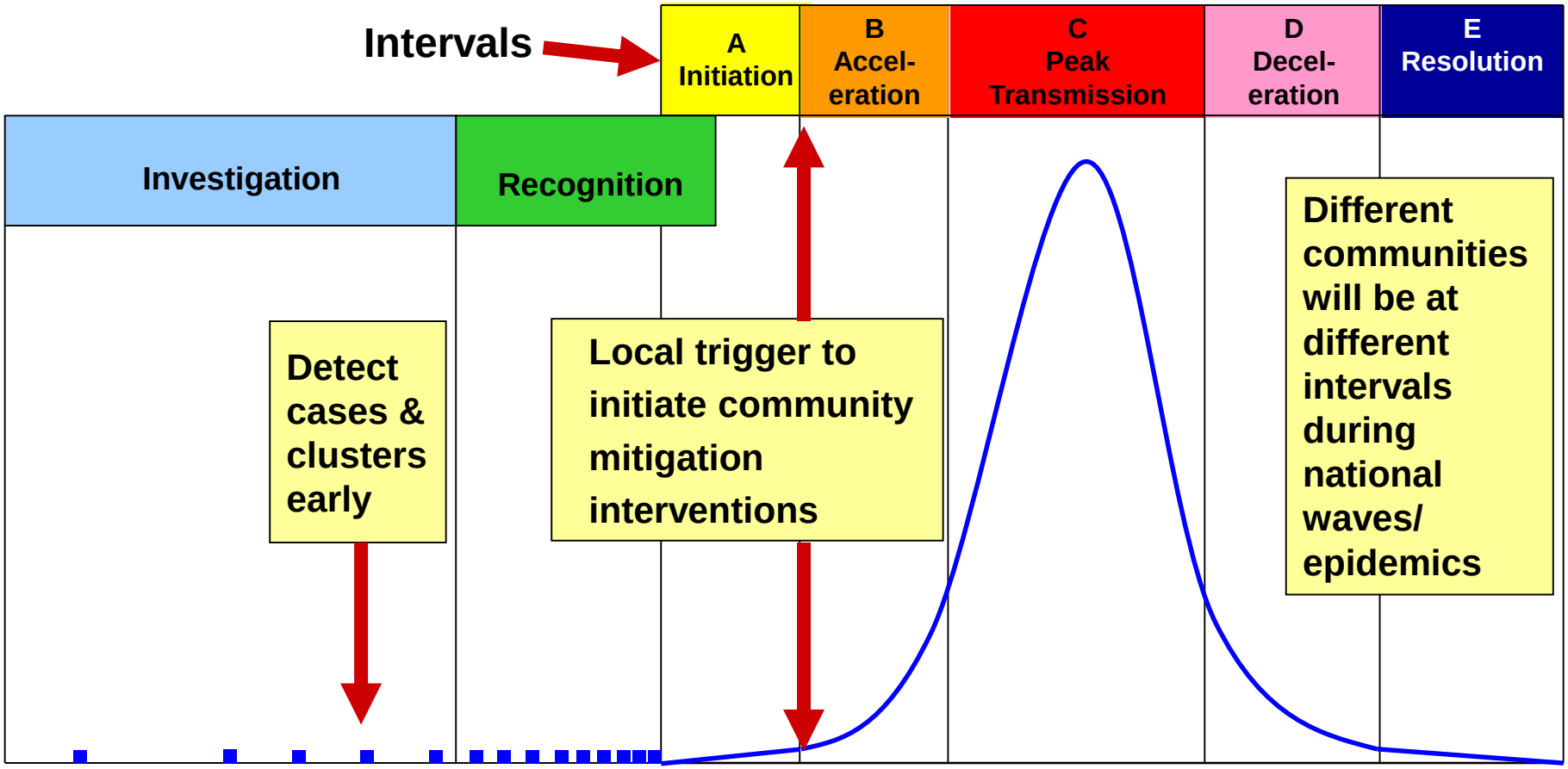
As Hong Kong's schools close, six-year-old Amelia shows us around her new 'classroom'

https://www.bbc.com/news/topics/cyz0z8w0ydwt/coronavirus-outbreak

Pandemic decision makers must find the right balance between disease- and mitigation strategy-related factors



Intervals in Local Epidemic Curves & Triggers for Community Mitigation

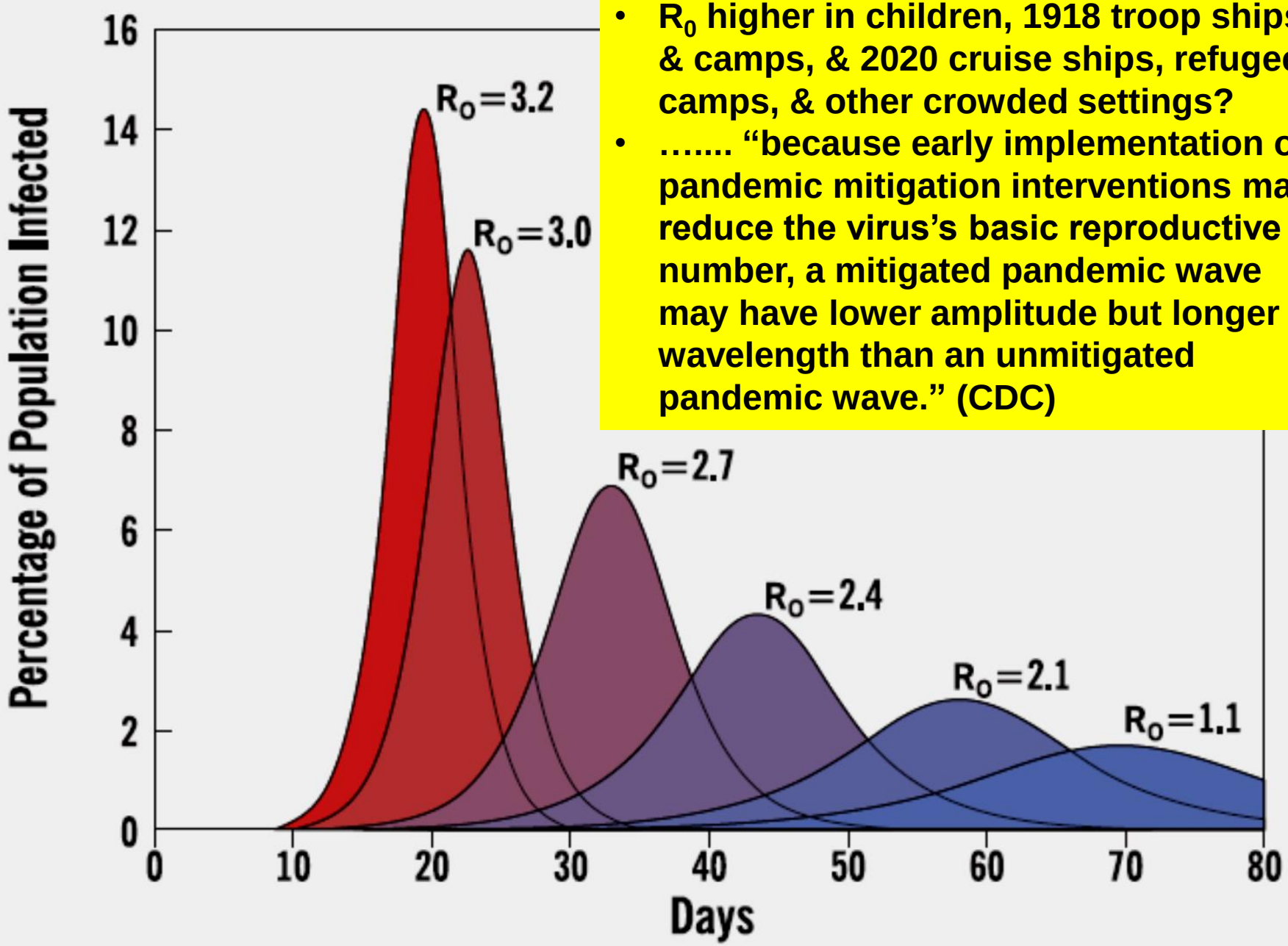


- **Implementing interventions before the local outbreak will likely result in economic & social hardship, & intervention compliance fatigue.**
- **Implementing after extensive local spread will likely limit the public health benefits.**
- **The geopolitical trigger should be defined as a cluster of cases occurring within a U.S. State or proximate epidemiological region (e.g., a metropolitan area that spans more than one State).** **(US HHS/CDC, Feb. 2007. Consistent with 2017 CDC guidance.)**

(Adapted from US CDC slide)

Figure 2.

Effect of R_0 on Epidemic Curves

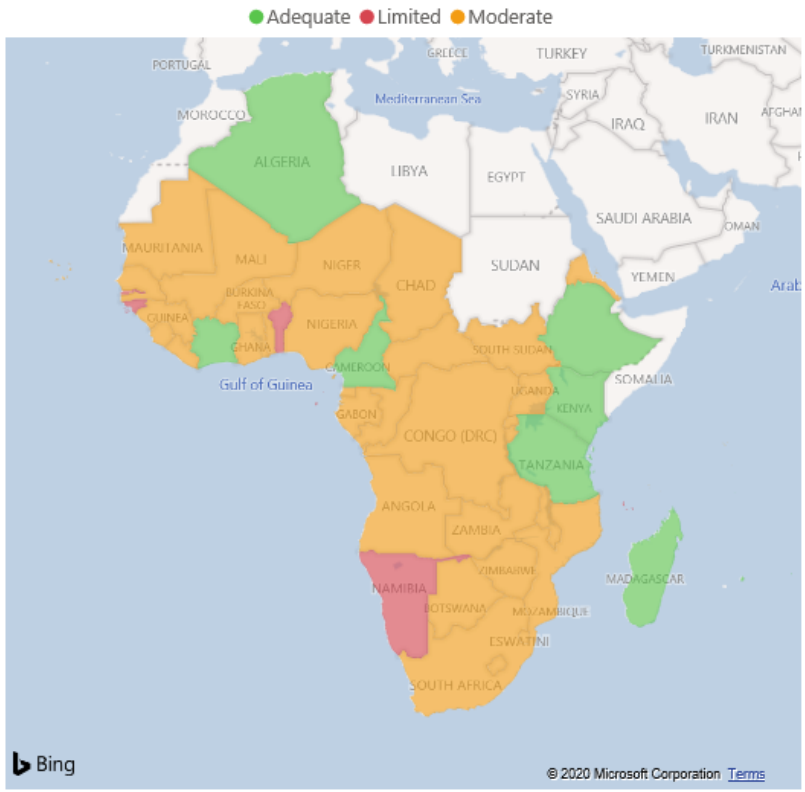


- R_0 higher in children, 1918 troop ships & camps, & 2020 cruise ships, refugee camps, & other crowded settings?
- ……. "because early implementation of pandemic mitigation interventions may reduce the virus's basic reproductive number, a mitigated pandemic wave may have lower amplitude but longer wavelength than an unmitigated pandemic wave." (CDC)

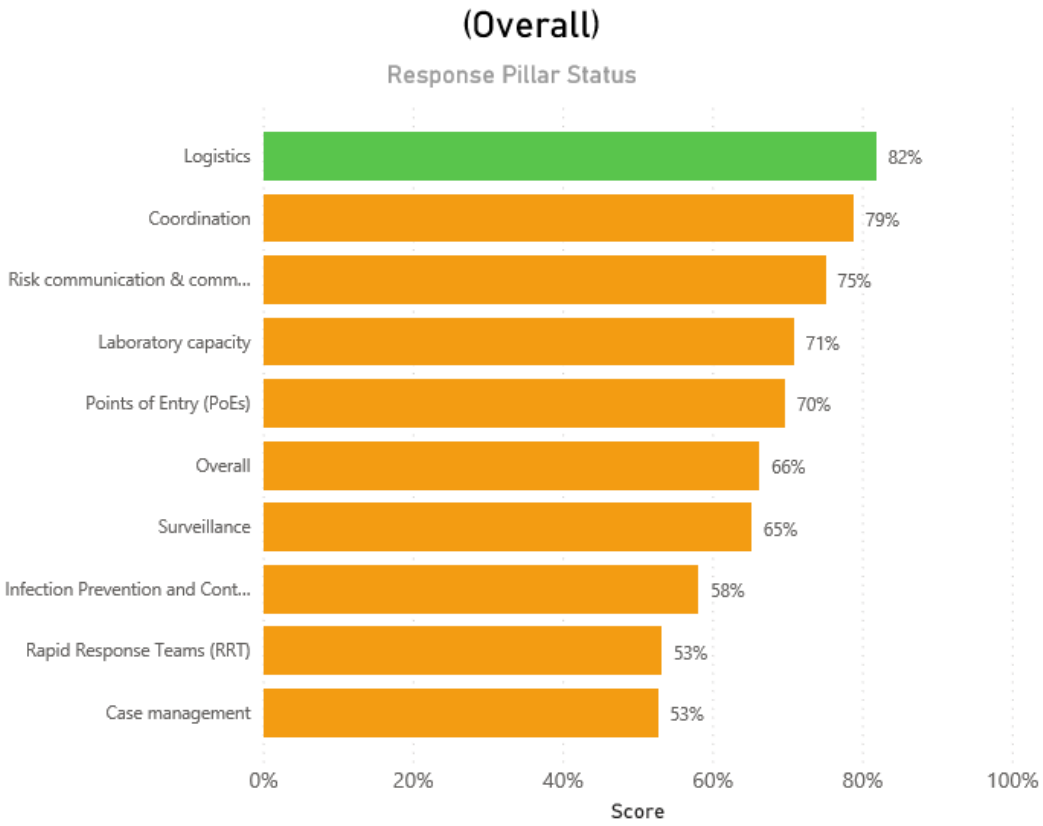
WHO COVID-19 Readiness Dashboard, African Region, 4/4/2020

WHO African Region COVID-19 Readiness Status by Country

World Health Organization



(select country on map to view the responses in the table below)



Is any content on community mitigation, social distancing, or NPIs hiding in any of these "response pillars"? (It hasn't been a WHO priority.)

https://app.powerbi.com/view?r=eyJrIjoiNWY4NTQyNWMtZjllYS00MjA0LTg0MjYtMjRkNGE0ZmZiYmI5IiwidCI6ImY2MTBjMGI3LWJkMjQtNGIzOS04MTBiLTNkYzI4MGFmYjU5MCIsImMiOjh9

WHO: Country & Technical Guidance - Coronavirus Disease (COVID-19), 4/4/2020

World Health Organization | Health Topics | Countries | Newsroom | Emergencies | About Us

- Coronavirus disease 2019
- Technical guidance
- Situation reports
- Media resources
- Advice for public
- Travel advice
- Donors and partners
- Training & Exercises
- COVID-19 Response Fund

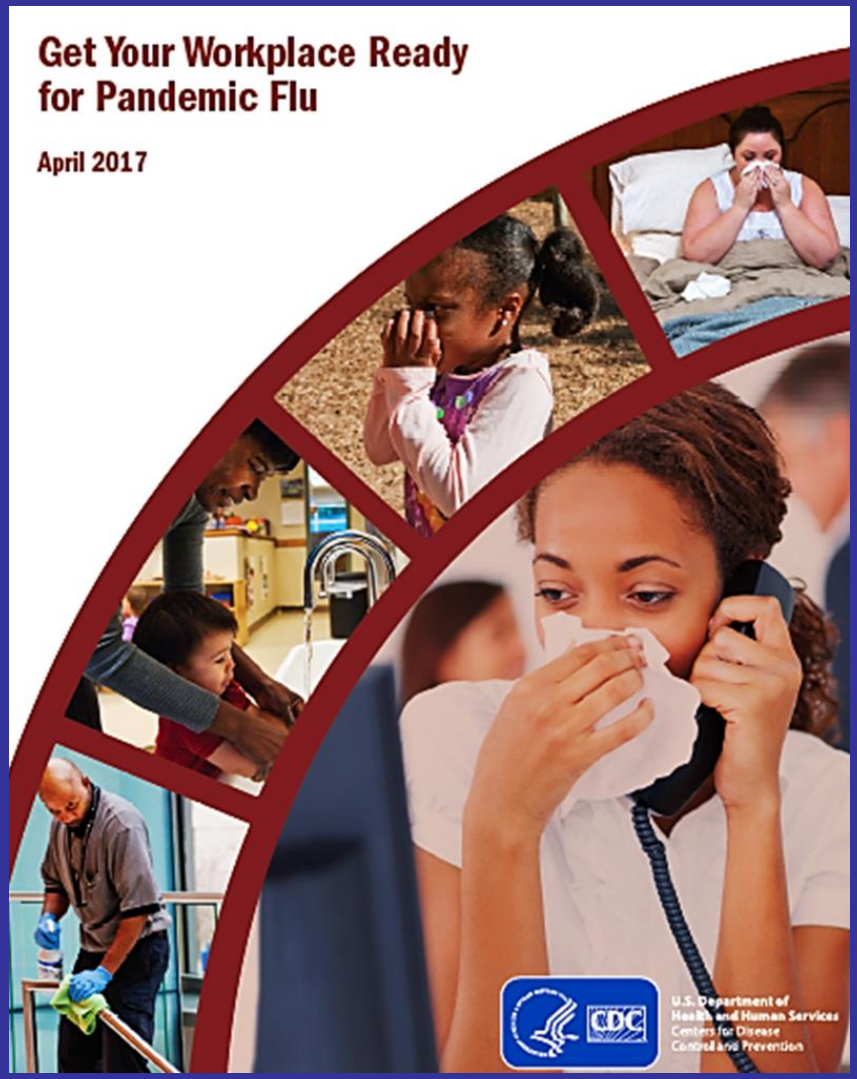
All technical guidance by topic

Critical preparedness, readiness and response actions for COVID-19	Country-level coordination, planning, and monitoring	Surveillance, rapid response teams, and case investigation
National laboratories	Clinical care	Infection protection and control / WASH
Risk communication and community engagement	Operational support and logistics	Guidance for schools, workplaces & institutions
Early investigation protocols	Virus origin/Reducing animal-human transmission	Points of entry / mass gatherings
Naming the coronavirus disease (COVID-19)	Humanitarian operations, camps and other fragile settings	Health workers
Maintaining Essential Health Services and Systems		

Is some content on community mitigation / social distancing / NPIs hiding in all of this somewhere?

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

NGO READYness priorities for a severe respiratory pandemic include:



1. Health & safety of our staff & their families.
2. Continuity of key NGO business & services.
3. Helping mitigate the effects of a severe pandemic in the communities in which we work.

Save the Children.

Enter search term

Who We Are › | What We Do › | Get Involved › | Ways to Give › | Sponsor a Child › | Dona

About Us › Reports and Publications › Influenza and Pandemic Threats

Influenza & Pandemic Threats (including Novel Coronavirus)

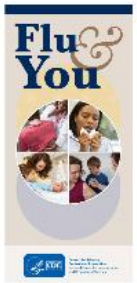
The information provided here has been developed to help inform Save the Children staff and offices about Influenza and Pandemic Threats, and is posted here to make this information more accessible to them. We make no representation about the suitability of these materials for other individuals or organizations, and accept no responsibility related to their use other than by Save the Children staff and offices.

Much of the information on this page was originally posted in 2006 to address the Avian Influenza H5N1 pandemic threat. Two additional concerning pandemic threats emerged in late 2012 and early 2013: Avian Influenza H7N9, and Novel Coronavirus (MERS-CoV, not an influenza virus, but related to the virus that caused SARS and to Coronaviruses in bats). All three of these, H5N1, H7N9, and MERS, are RNA viruses with high rates of mutation. The concern has been that any of these could evolve into a virus capable of sustained person-to-person respiratory transmission, and potentially cause a severe pandemic. We have expanded some content on this page to address the newer threats. We also believe that much of the information here is relevant to pandemic threats from respiratory viruses beyond the H5N1 virus. Some of these documents also apply to seasonal influenza (as noted).

2019 Novel Coronavirus (2019-nCoV) – Information & Guidance

- WHO: Coronavirus
- US CDC: Novel Coronavirus 2019
- European CDC: Novel Coronavirus - China
- Univ. of Minn.: Center for Infectious Disease Research and Policy (for late afternoon/early evening US eastern time summaries)

As of Jan. 28, 2020, we believe that the information below is relevant to 2019-nCoV. Difference between flu and 2019-nCoV which we know about include the following: antiviral medications for flu, like Tamiflu, don't work for 2019-nCoV, and 2019-nCov has a longer incubation period, the time between infection and when symptoms appear, than does flu.



Key Information for All Staff

- Seasonal Flu, Pandemic Flu, and You - What SC Staff Should Know and Be Prepared For (Aug. 2018)
- Pandemic Threats: Summary Travel Guidance for SC Staff (Aug. 2018)
- Get Your Household Ready for Pandemic Flu (16 pages. US CDC, 2017)
- Flu & You (CDC)
- People at High Risk for Developing Flu-Related Complications
- Caring for Someone Sick at Home (20 pages). US CDC
- Influenza Self-Care (metric measures, Gov. of Alberta, 2009)
- Flu Symptoms, Transmission & Prevention (Sep. 2009)
- Home Stockpiling of Food & Essential Items (Feb. 2019)
- Staff Repatriation and Relocation (Feb. 2019)
- Voice & Data Connections from Home (Mar. 2006)
- Westport/Washington Guidance on Staff Absence (Sep. 2009)

Recommended Internet Sites for All Staff

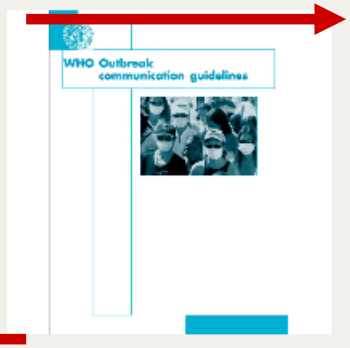
- World Health Organization
- European CDC
- International Government Pandemic Flu Resources
- US CDC

www.savethechildren.org/us/about-us/resource-library/influenza-library

& https://resourcecentre.savethechildren.net/node/16747 (same content)

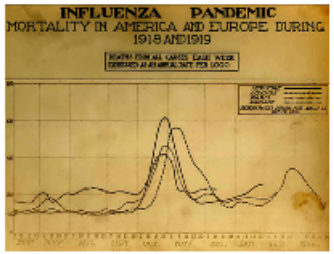
Additional Information for Health Professionals & Outbreak Responders

- Covid-19 Scenario Dimensions (SC, 11 Feb. 2020)
- Covid-19: Guidance for Businesses & Employers, US CDC (Feb. 2020)
- Pandemic Threats: News & Guidance Links (August 2018)
- Top 10 Resources on Pandemic Preparedness & Response (January 2020)
- Pandemic Preparedness Summary Checklist for SC Country & Field Offices (August 2018)
- Severe Pandemic Flu: Challenges for Preparedness & Response (1 page) (Sep. 2011)
- Pandemic Influenza Planning Assumptions (March 2015)
- Influenza Point Persons Roles and Responsibilities (May 2006)
- Tamiflu: To Stockpile or Not to Stockpile (Mar. 2009)
- Covid-19 office notice for local adaption (SC, 11 Feb. 2020)
- Covid-19: 7 office notices for local adaption (SC, 11 Feb. 2020)
- Influenza Procedures & Supplies for the Westport & DC Offices (July 2006)
- Guidance on Preparing Workplaces for an Influenza Pandemic, US Dep. of Labor, 2009 (2009)
- Business Continuity Planning Guide, Gov. of New Zealand (Dec. 2009)
- Potential Pandemic Severity - Appraisals by Authoritative Sources (Sep. 2019)
- Pandemic Threat & NGO Preparedness (Dec. 2019 presentation)
- Summary of the Threat, & SC Activities & Priorities (Feb. 2017)
- WHO Outbreak Communications Guidelines (2005)



Pandemic Flu Program Response

- Non-pharmaceutical public health measures for mitigating the risk and impact of epidemic and pandemic influenza (WHO, Oct. 2019, evidence review on NPIs, but lacks guidance on how to adapt & implement these measures)
- US CDC Pages on Nonpharmaceutical Interventions (includes guidance on how to implement NPIs)
- Leadership During A Pandemic: What Your Municipality Can Do (USAID, 2011, goes well beyond the health sector)
- Basic Pandemic Influenza Community Health Response in Developing Countries (2X2 table, H2P, updated Aug. 2019)
- H2P Community Planning & Response Curriculum (CORE Group, 2009)
- Community Case Management during an Influenza Outbreak: A Training Package for CHWs (WHO, 2011)
- WHO Guidelines for Humanitarian Agencies (Updated 5/08, for Refugee/IDP Populations but more broadly applicable)
- ECDC Menu of Public Health Measures (June 2009, 1.9 MB)
- Guidance & Template for Country Planning (H2P) (Feb. 2019)
- Pandemic Flu & Kids (Feb. 2019)
- HIV/AIDS Program Guidance (July 2006)



Advocacy

- Are We Prepared to Help Low-Resource Communities Cope with a Severe Influenza Pandemic? Influenza & Other Respiratory Viruses Editor's Choice paper, Nov. 2012 (authored by SC staff).

The 1918 Pandemic

- 1918 Influenza: The Mother of All Pandemics (Taubenberger & Morens, Emerg. Infect. Dis. (Jan. 2006)
- Global mortality (Johnson & Mueller, Bull. Hist. Med. (2002)
- The Great Pandemic in the US: CDC & Univ. of Mich.
- 1918 in Bethel & Danbury Connecticut (near Westport)

Save the Children/US staff may access these and a few other documents, with use of a password, on the Travel Safety and Security pages of SaveNet: Avian & Pandemic Flu Updates & Guidelines

Last Updated: 11 February 2020

Pandemic Preparedness Summary Checklist For Save the Children Country & Field Offices

Updated August 2, 2018[1]

www.savethechildren.org/us/about-us/resource-library/influenza-library

Action	Comments / Resources	Persons Responsible & Current Status
I. Overarching actions		
1. Influenza Point Persons (IPPs) in each office	Trusted health professionals (& back-ups in case primary IPPs are out of office) appointed & oriented to advise staff, SMT, etc. See Influenza Point Persons Roles and Responsibilities on SaveNet & SC/US external site.	(SMT / CODs)
2. Pandemic Preparedness Plans (PPPs) updated	Pandemic Prep. Plans should address a range of severity (case fatality) scenarios, & should be an annex of the Emergency Preparedness Plan.	Influenza Point Persons (IPPs)
3. Coordination of plans & actions with local partners	Coordination of planning & response with local government, UN agencies, Red Cross/ Red Crescent, NGO partners, etc.	(IPPs)
II. Health of SC staff & their families		
4. Staff orientation & Q&A sessions	Incl.: High risk groups, transmission, prevention, symptoms, home care, care seeking, & preparedness at home (based on WHO, CDC, ECDC, & documents for all staff on SC sites)	(IPPs)
5. Written guidance for staff & their families	As above, & promotion of healthy practices in the office, incl. ill staff staying home, hand washing, & respiratory etiquette.	(IPPs)
6. Plans for further guidance & action in a severe wave	Including actions to help protect high risk staff, active screening of staff arriving at work, reducing office crowding/ meetings, office layout to reduce exposure, risk of using public transport for commuting to/from work, working from home, office closure, travel & relocation guidance, etc.	(IPPs, SMT, Global Safety & Security, IT, Facilities & Services)
7. Travel guidance	See guidance on SC Influenza and Pandemic Threats sites	(Global Safety & Security, IPPs)
8. Staff relocation / stay in place	See guidance on SC Influenza and Pandemic Threats sites	(SMT)
9. Arrangements with local health care providers	Services for staff/ families, including seasonal & pandemic flu immunization (if/ when available)	(HR, IPPs)
10. Flu-related supplies for SC offices / staff	PPE for SC staff who are health care providers & supplies for offices, incl. supplies for hand washing. (See guidance on SC flu sites)	(Facilities & Services, IPPs)
11. Staff at higher risk of severe illness (those pregnant or with underlying health conditions)	Consider specific guidance to encourage pandemic & seasonal flu immunization, prompt care seeking for illness with flu-like symptoms, & (particularly in a severe wave) other measures to reduce risk of infection.	(IPPs)
12. Staff with special needs	Incl. guidance for those who speak other languages.	(IPPs)
III. Mitigate the consequences of a severe pandemic in the communities in which we work		
13. Health-related programming with partners, incl. reducing transmission at family level & home care.	See section on program response on SC/US external & SaveNet Influenza and Pandemic Threats pages.	(IPPs)
14. Work with local partners to address needs of children.	See section on program response on SC/US external & SaveNet Influenza and Pandemic Threats pages.	(IPPs, Education Sector)
IV. Continue key SC business & services		
15. Departmental / office Business Continuity Plans updated	Incl. plans for increased staff absence (due to illness, care of ill family members, & children home from school/ child care), staff working from home, & office closure in a severe wave.	(SMT, CODs)
16. IT guidance on working from home	See guidance on SC flu sites from IT	(IT)
17. Guidance & benefits related to absenteeism	See guidance on SC flu sites from Human Resources	(HR)

(Basic checklist **for the few weeks before being struck**, with less content than WHO checklist for countries, but more similar to CDC checklists at: https://www.cdc.gov/nonpharmaceutical-interventions/tools-resources/planning-guidance-checklists.html)

1. Health & safety of our staff & their families

Key Information for All Staff

https://www.savethechildren.org/us/about-us/resource-library/influenza-library

- Community Mitigation Guidance for COVID-19 Response (US CDC, Feb. 2020)
- COVID-19 Symptoms, Transmission, & Prevention (SC, March 2020)
- Seasonal Flu, Pandemic Flu, and You - What SC Staff Should Know and Be Prepared For (Aug. 2018)
- Pandemic Threats: Summary Travel Guidance for SC Staff (Aug. 2018)
- Get Your Household Ready for Pandemic Flu (16 pages. US CDC, 2017)
- Flu & You (CDC)
- People at Higher Risk for COVID-19 Complications (CDC)
- Caring for Someone Sick at Home (20 pages), US CDC
- Influenza Self-Care (metric measures, Gov. of Alberta, 2009)
- Flu Symptoms, Transmission & Prevention (Sep. 2009)
- Home Stockpiling of Food & Essential Items (Feb. 2019)
- Staff Repatriation and Relocation (Feb. 2019)
- Voice & Data Connections from Home (Mar. 2006)
- Westport/Washington Guidance on Staff Absence (Sep. 2009)
- Masks (Feb. 2020)

2. Continuity of key NGO business & services

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Search

Coronavirus Disease 2019 (COVID-19)

CDC > Coronavirus Disease 2019 (COVID-19) > Preventing COVID-19 Spread in Communities > Work

Coronavirus Disease 2019 (COVID-19)

COVID-19 Situation Summary +

Interim Guidance for Businesses and Employers

Plan, Prepare and Respond to Coronavirus Disease 2019

https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html

INFLUENZA PANDEMIC PLANNING

BUSINESS CONTINUITY PLANNING GUIDE

December 2009

www.savethechildren.org/us/about-us/resource-library/influenza-library

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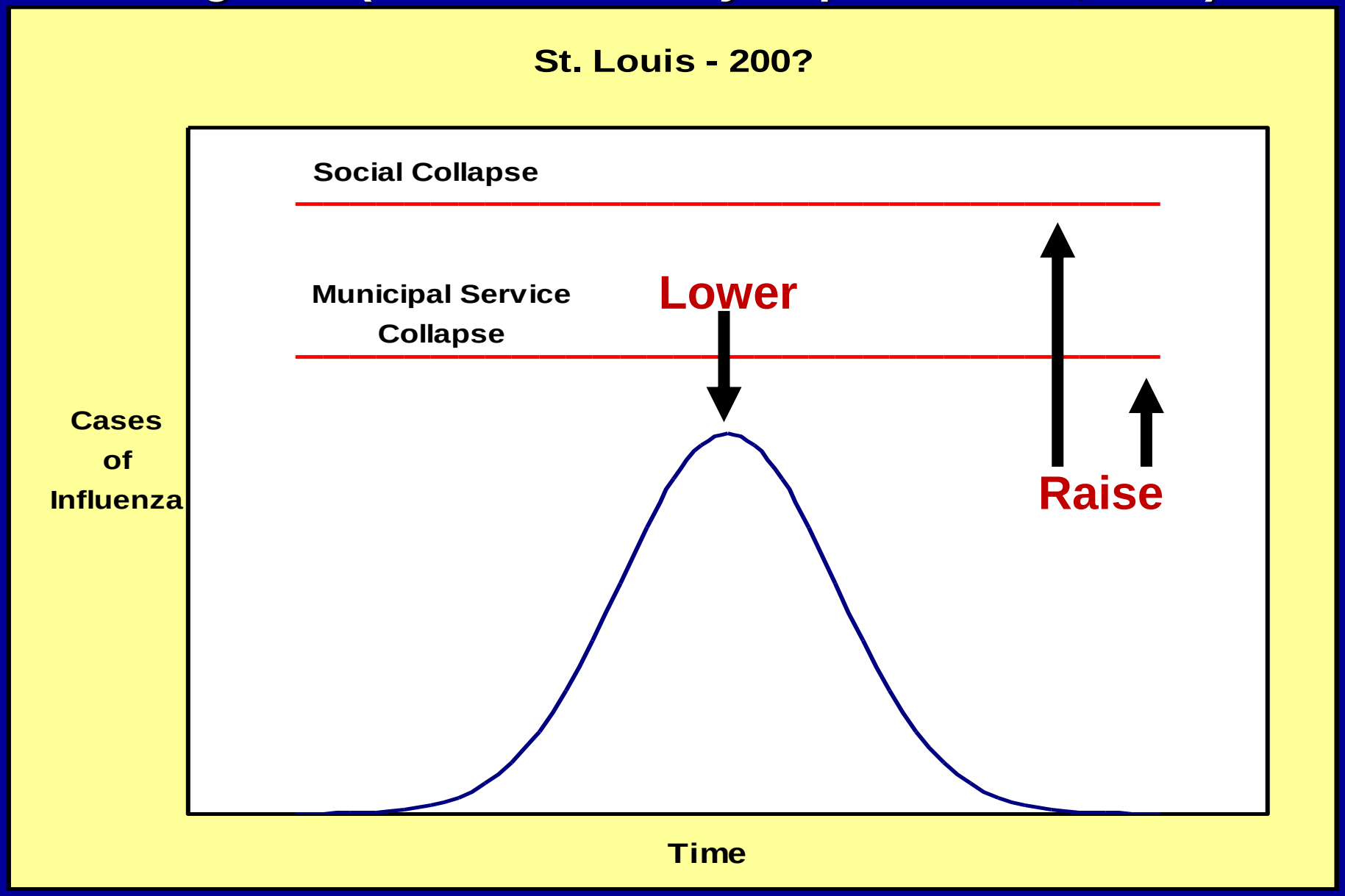
Goals of Service Continuity Planning & Community Mitigation (St. Louis County Dep. of Health, 2006)



Continuity of key business & services

SC/US: Departmental all-hazard plans: We are updating these now, trying to address the COVID-19 threat (but these plans aren't on our pandemic threats web pages.)

Save the Children

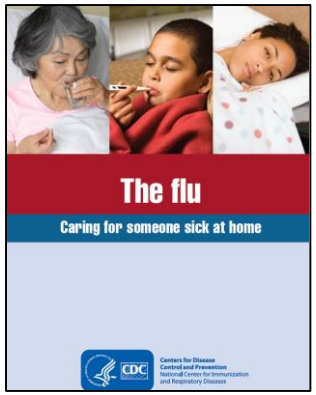
Business Continuity Plan (BCP)

Finance

Table of Contents

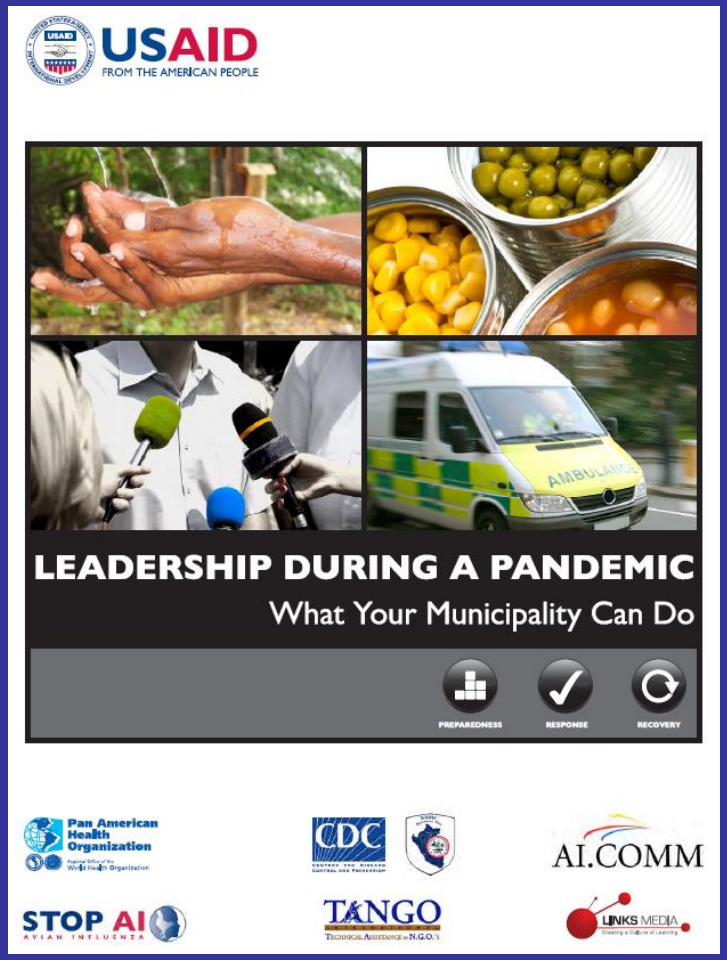
August 2018

3. Community Mitigation: Basic Community Health Response

	Family / Household Level:	Community & Facility Levels: (Depending on pandemic severity)
Prevention: 	**N**on-**P**harmaceutical **I**nterventions**s**: ▪ Keep your distance. ▪ Wash your hands. ▪ Cover your coughs & sneezes. ▪ Isolate the ill (incl. ventilation, cleaning, masks, etc.).	▪ Educating families on prevention. ▪ Social distancing / **NPIs** to limit public crowding, gathering, & contacts, like: ▪ Closing schools & child care centers. ▪ Cancelling selected public events, etc. ▪ Pandemic vaccination, if available.
Care: 	Care for those ill with symptoms of COVID-19: ▪ Fluids ▪ Fever ▪ Rest ▪ Nutrition ▪ Medications ▪ Care seeking	▪ Educating families on home care. ▪ Assisting the most vulnerable households (incl. care, food, water). ▪ Facility & community case managem. (including antibiotics for pneumonia & antivirals for COVID-19, if available). ▪ Continuity of other selected health services (such as childbirth, & HIV & TB medications), if feasible.
Surveillance & Community Engagement: ▪ What is COVID-19? / Symptoms / Transmission. ▪ Numbers, location, & severity of cases. ▪ Best sources of information & guidance. ▪ Addressing community perceptions & concerns.		**NGOs & Other Organizations:** ▪ Health & safety of staff & their families. ▪ Continuity of key business & services. ▪ Supporting local pandemic response.

(2008 H2P table, updated February 2020, for in-country adaptation.)

This is an example of guidance which we contributed to.



www.paho.org/disasters/index.php?option=com_content&view=article&id=1053:leadership-during-a-pandemic-what-your-municipality-can-do&Itemid=937&lang=en

INTRODUCTION

Tool 1: Priority Actions to Lead Your Municipality through a Pandemic

Tool 2: Presentation on the Threat of a Severe Influenza Pandemic (PowerPoint Slides and Presenter Guide)

HEALTH

Tool 3: Pandemic Health Impact Projection Tool (User Guide and Excel Workbook)

Tool 4: Non-Pharmaceutical Interventions (NPIs): Actions to Limit the Spread of the Pandemic in Your Municipality

Tool 5: Triage: Prioritizing Care to Reduce Deaths

Tool 6: Training for Community Health Responders

FOOD SECURITY AND LIVELIHOODS

Tool 7: Food Security in a Pandemic

Tool 8: Classification of Food Security Risk Locations (User Guide and Excel Workbook)

Tool 9: Identification of People Most at Risk of Food Insecurity

Tool 10: Household Food Security Preparedness

Tool 11: Distribution of Emergency Food During an Influenza Pandemic

CRISIS AND EMERGENCY RISK COMMUNICATIONS

Tool 12: Fundamentals of Communication During Crises and Emergencies

Tool 13: Communications Plan Implementation for a Severe Pandemic

Tool 14: News Media Communication

DISASTER MANAGEMENT

Tool 15: Disaster Management in a Pandemic

Tool 16: Maintenance of Essential Services

Tool 17: Volunteer Coordination

Tool 18: Management of Dead Bodies

Tool 19: Recovery and Resilience

Influenza

Community case management during an influenza outbreak

A training package for community health workers

Authors:
WHO

This is an example of guidance which we contributed to.

Publication details

Publication date: 2011
ISBN: 9789241501842

This focusses on household-level NPIs & care for the ill.

Downloads

- Trainer's guide - English
  pdf, 2.96Mb
- Participant's handout - English
  pdf, 2.26Mb
- Flipbook - English
  pdf, 2.14Mb
- Assessment and treatment in the community during an influenza outbreak
  pdf, 108kb

World Health Organization

Assessment and treatment in the community during an influenza outbreak

General danger signs for infants less than 2 months	General danger signs for sick children (2 months up to 5 years old)	Danger signs for adults and children (5 years and older)
1. Not able to feed since birth, or stopped feeding well 2. Convulsed or fitted since birth 3. Fast breathing: Two counts of 60 breaths or more in one minute 4. Chest indrawing 5. High temperature: 37.5 °C or more 6. Very low temperature: 35.4 °C or less 7. Infant only moves when stimulated 8. Yellow palms and soles 9. Signs of local infection: umbilicus red or draining pus, skin boils, or eyes draining pus	1. Cough for 21 days or more 2. Diarrhoea for 14 days or more 3. Blood in stool 4. Fever for 7 days or more[a] 5. Convulsions 6. Not able to drink or feed 7. Vomits everything 8. Chest indrawing 9. Unusually sleepy or unconscious 10. Red on MUAC strap 11. Swelling of both feet	1. Shortness of breath/difficulty in breathing[a] 2. Lips or skin turning blue 3. Chest pain 4. Coughing up blood or coloured sputum 5. Low blood pressure 6. Confusion/disorientation 7. Convulsions 8. Loss of consciousness 9. Signs of severe dehydration 10. Persistent high fever beyond 3 days[a]

IF NO DANGER SIGN PRESENT DOES THE PATIENT HAVE?

- COUGH OR DIFFICULTY IN BREATHING → IF YES
- FEVER (Body temperature above 37.5 °C from armpit or 38 °C rectal, hot to touch, history of fever in the last 48 hours) → IF YES
- DIARRHOEA (3 or more loose stools in 24 hours) → IF YES

IF ANY DANGER SIGNS, REFER
Before referral, if able to eat and drink, give a first dose of antibiotics and antimalarial medication, continue to give ORS, breastfeed frequently and keep infant warm

Count the breaths in one minute

Age	Fast breathing
0 up to 2 months	60 breaths/min or more
2 up to 12 months	50 breaths/min or more
12 months up to 5 years	40 breaths/min or more
5 to 12 years	30 breaths/min or more
13 years or more	20 breaths/min or more

Malaria-endemic region: Test and treat for malaria according to national protocol

Non malaria-endemic region: Treat for fever

Give ORS and extra fluid (zinc for children less than 5 years of age)

If fast breathing: Give antibiotic for pneumonia according to national protocol

Follow-up care
- Explain to the patient and family that they must take the medication as prescribed
- Follow up the patient to evaluate any improvement, worsening symptoms, or danger signs
- Provide key messages 1 to 10 to the sick person and family

Key messages

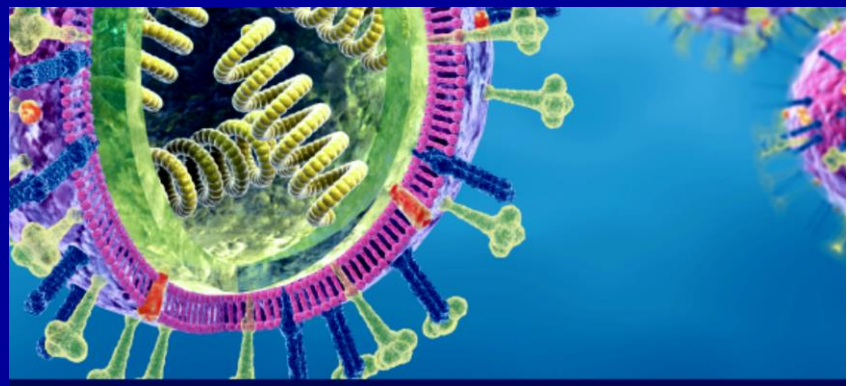
1. Know the disease
2. Keep your distance from someone who is coughing and sneezing
3. Cover your cough or sneeze
4. Wash hands to prevent spread of germs
5. Separate the sick person from other people
6. Ventilate closed spaces
7. Assign a single caregiver to a sick person
8. Provide hydration and nutrition for the sick
9. Learn how to care for a sick person who needs advanced treatment at home
10. Recognize the danger signs and seek prompt care

https://www.who.int/influenza/resources/documents/community_case_management_flipbook/en/

- "The IHR core capacities are unlikely in their current formulation to adequately prepare countries and the international community for high-impact respiratory events" (pages 7 & 30).
- "We expect that, were such a pathogen to emerge, either naturally, or as the result of accidental or deliberate release, many countries would be affected at once, which would require different international approaches than typically occur in geographically limited events" (page 15).
- "The potential for an epidemic or pandemic caused by a high-impact respiratory pathogen is increasing" (page 18).
- "Guidelines from public health authorities such as WHO exist regarding the use of NPIs, but they do not provide sufficient information to guide the appropriate use of these measures" (page 72).

Figure 3: Global Map Identifying Countries with National Influenza Preparedness Plans

*Data extracted from WHO Strategic Partnership Portal



Johns Hopkins Center for Health Security

Preparedness for a High-Impact Respiratory Pathogen Pandemic

September 2019

www.centerforhealthsecurity.org/newsroom/center-news/2019-09-18-GPMBreport.html

Johns Hopkins Bloomberg School of Public Health | Center for Health Security

What do you think the answer is to this question?

Influenza and other respiratory viruses
Open Access
isirv International Society for Influenza and other Respiratory Virus Diseases

Are we prepared to help low-resource communities cope with a severe influenza pandemic?

Eric S. Starbuck, Rudolph von Bernuth, Kathryn Bolles, Jeanne Koepsell

Department of Health and Nutrition, Save the Children, Westport, CT, USA.
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E-mail: estarbuck@savechildren.org

Accepted 25 September 2012. Published Online 12 November 2012. https://onlinelibrary.wiley.com/doi/epdf/10.1111/irv.12040

Recent research involving lab-modified H5N1 influenza viruses with increased transmissibility and the ongoing evolution of the virus in nature should remind us of the continuing importance of preparedness for a severe influenza pandemic. Current vaccine technology and antiviral supply remain inadequate, and in a severe pandemic, most low-resource communities will fail to receive adequate medical supplies. However, with suitable guidance, these communities can take appropriate actions without substantial outside resources to reduce influenza transmission and care for the ill. Such guidance should be completed, and support provided to developing countries to adapt it for their settings and prepare for implementation.

Keywords Developing countries, influenza, nonpharmaceutical interventions, pandemic, preparedness, public health.

Please cite this paper as: Starbuck *et al.* (2013) Are we prepared to help low-resource communities cope with a severe influenza pandemic? Influenza Other Respiratory Viruses 7(6), 909–913.

There is increasing focus on approaches to protect high risk groups after containment efforts fail.

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

March 17, 2020

Search | Coronavirus

Coronavirus Disease 2019 (COVID-19)

CDC > Coronavirus Disease 2019 (COVID-19) > People Who Need Extra Precautions

- Coronavirus Disease 2019 (COVID-19)
- Symptoms & Testing +
- Prevent Getting Sick +
- Daily Life & Coping +
- If You Are Sick +
- **People Who Need Extra Precautions** −
  - People Who Are At Higher Risk +
  - Others At Risk +
  - **Steps to Prevent Getting Sick**

Take Steps to Prevent Getting Sick

Take actions to reduce your risk of getting sick

If you are at higher risk for serious illness from COVID-19 because of your age or because you have a serious long-term health problem, it is extra important for you to take actions to reduce your risk of getting sick with the disease.

- Stock up on supplies.
- **Take everyday precautions** to keep space between yourself and others.
- When you go out in public, keep away from others who are sick, limit close contact and wash your hands often.
- **Avoid crowds** as much as possible.
- **Avoid cruise travel** and non-essential air travel.
- **During a COVID-19 outbreak in your community, stay home** as much as possible to further reduce your risk of being exposed.

https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/get-ready.html

COVID-19 control in low-income settings & displaced populations: what can realistically be done?

Table 1. Options for housing high-risk persons into designated 'green zones'.

Option	Description	Applicability	Notes
Household-level shielding	Each household demarcates a room or shelter for high-risk members. If necessary, a carer from the household is isolated with them.	Settings with multi-shelter compounds or multi-room houses.	Likely preferable to families with space available but also more likely to be 'leaky' if isolation is not strictly enforced.
Street- or extended family-level shielding	Neighbouring households (e.g. 5-10) or members of an extended family within a defined geographic locale (neighbourhood, district) voluntarily 'house-swap' and group their high-risk members into dedicated houses / shelters.	All, but especially urban settings.	Infection control and social distancing measures would also have to be strictly observed within each green zone.
Neighbourhood - or sector-level isolation	Sections of the settlement are put aside for groups of high-risk people (e.g. 50-100).	Displaced persons' / refugee camps, where humanitarian actors can provide supportive services and smaller scale isolation is not possible.	Ideally located at the periphery of camps to facilitate such measures. Infection control and social distancing measures would also have to be strictly observed within each green zone.

M Dahab, K van Zandvoort, S Flasche, A Warsame, PB Spiegel, RJ Waldman, & F Checchi

The Challenge: Transmission must be substantially reduced by effectively implementing an array of appropriate measures (including social distancing), at the right time, while limiting their harmful consequences, & protecting the most vulnerable groups.

India's poorest 'fear hunger may kill us before coronavirus'

25 March 2020

(because social distancing can be deadly)

Coronavirus pandemic

https://www.bbc.com/news/world-asia-india-52002734

Ali Hasan has no money to buy food after the shop he worked in closed