COVID-19 Conversations

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The Science of Social Distancing

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For more information: www.cdc.gov/COVID19
Linkage of Early COVID-19 Cases* to Huanan Seafood Wholesale Market – Wuhan, China

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

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

https://www.healthpolicy-watch.org/
Early Distribution of Cases: China as of 20-Jan-2020
Widespread rapid dissemination in our hyper-connected world creates real-time challenges to prediction analyses
Modeling Likelihood of Infection Outside Mainland China

Air travel volume inbound From China provinces

Infectious disease vulnerability index (IDVI)

Contextualized risk

Gilbert 2020, *Lancet*; https://doi.org/10.1016/S0140-6736(20)30411-6
Worldwide Cases as of March 24, 2020

375,498 confirmed cases
16,362 deaths
195 countries, areas or territories with cases

Source: https://experience.arcgis.com/experience/685d0aca521648f8a5beeee6b9125cd
SARS-CoV-2 in Human Samples and Transmission

- **Respiratory secretions – main mode of transmission**
  - Infection is 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 is not fully known 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

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Zhu 2020, *Transl Pedtr*: 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)

Intensify case finding and contact tracing
Isolate cases and quarantine contacts
Characterize illness
Prepare for mitigation with nonpharmaceutical interventions (NPI)

Deploy medical interventions
- Antivirals, vaccines
- Early institution of multilayered NPIs

Transmission outpaces containment efforts

Nonpharmaceutical Interventions (NPIs) = “Social Distancing”

https://www.cdc.gov/nonpharmaceutical-interventions/index.html
Worldwide Sentiment That Travel Restrictions and Self-isolation May Not Stop COVID-19

Nonpharmaceutical Interventions (NPIs): “Personal Action”

www.cdc.gov/handwashing
Schools, Pandemics, and School Closures

- School reopening often heralds increased influenza activity
  - Host factors: age-specific susceptibility, viral shedding, behaviors
  - Environmental factors: very high social density in an age-assorted setting

- Timing of influenza-related school closures relative to influenza spread*
  - Reactive: after flu is widespread
  - Pre-emptive: before disease becomes widespread within school

- Only pre-emptive coordinated closures are considered an NPI*
  - Evidence on effectiveness: historic, modeling, & observational studies*¹

*Per 2017 Community Mitigation Guidelines: [https://www.cdc.gov/mmwr/volumes/66/rr/pdfs/rr6601.pdf](https://www.cdc.gov/mmwr/volumes/66/rr/pdfs/rr6601.pdf).

¹See additional information in Technical Report 2, Appendix 5, NPI Body of Evidence Summary Table: [https://stacks.cdc.gov/view/cdc/44314](https://stacks.cdc.gov/view/cdc/44314)
State Board of Education OKs distance learning for remainder of 2019-20 because of COVID-19
Epidemiological and Modeling Studies Support Social Distancing in Workplaces

- Effect is more pronounced when workplace social distancing is combined with other NPIs
- Effectiveness declines with delayed triggering of workplace social distancing or lower compliance
- Results are mainly based on modeling; more empirically parametrized models and epidemiological studies needed
General Public is Heading Mass Gathering and Travel Messages

Mass Gathering in Densely Populated Area Gave Rise to 2009 H1N1 Outbreaks in Mexico

Social Distancing Works

- Experience is based on influenza pandemics, but data shows that community interventions do work.
- Communities are interconnected systems.
- Actions taken in one sector may have a domino effect.
- Critical that community plans account for interconnection when the country begins a staged return to normal activity.
For more information, contact CDC
1-800-CDC-INFO (232-4636)

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.