

Pandemic Assumptions and Reality

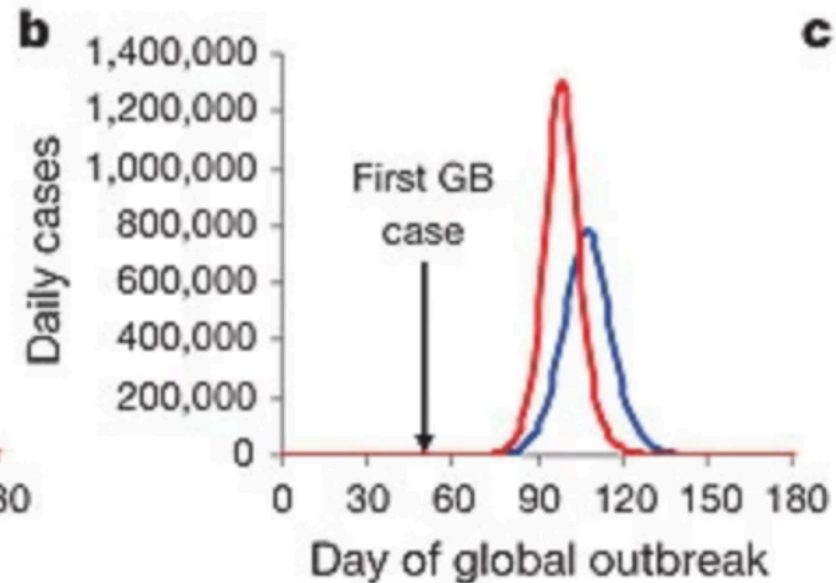
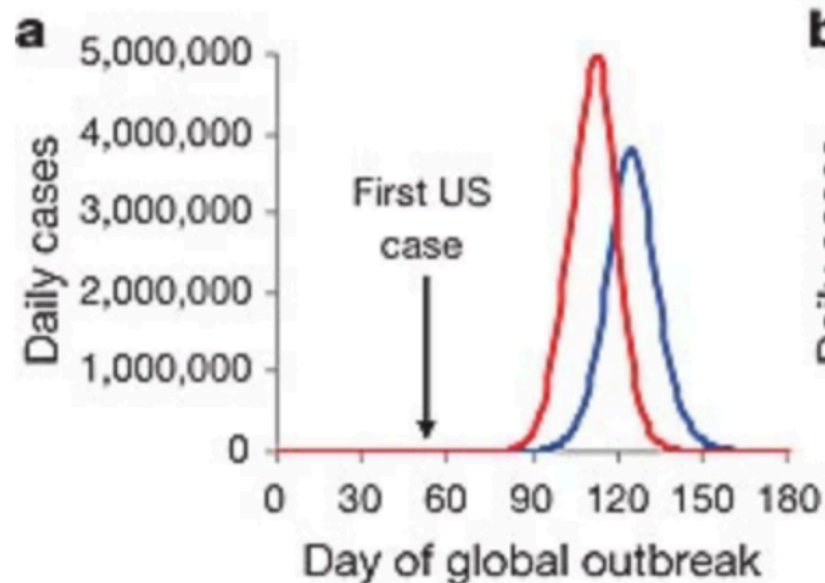
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ESRI Conference
December 2022

Outline

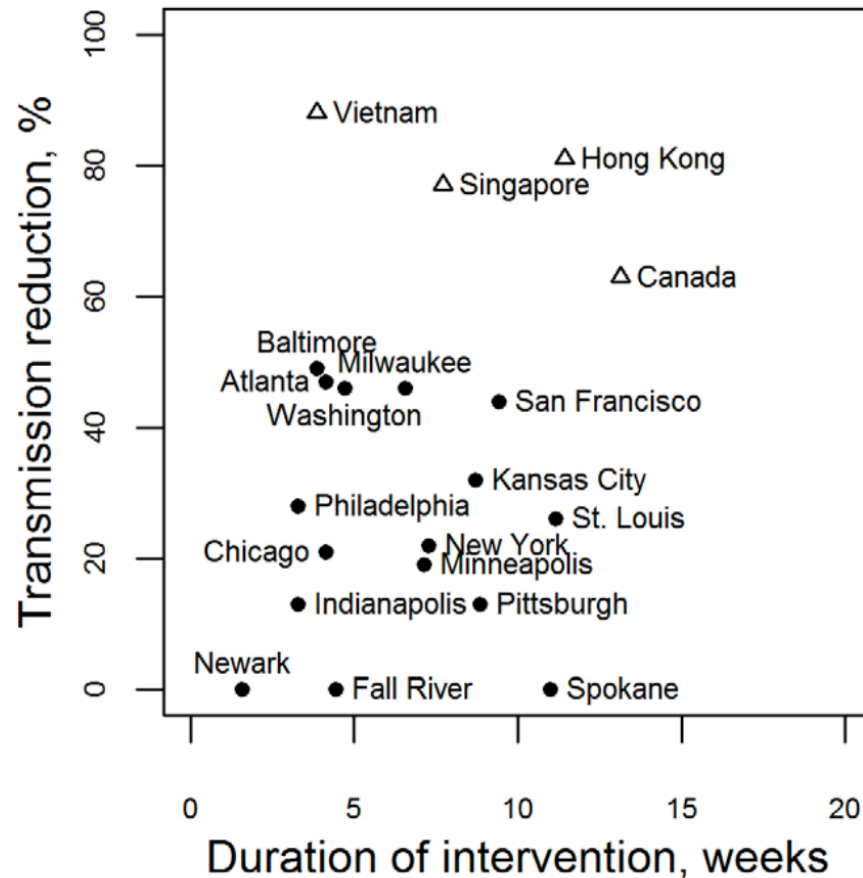
- March 2020 assumptions for COVID guided by prior planning for pandemic influenza (US)
 - Short
 - Antivirals and Vaccines would be available
 - No plan for long-term mitigation of epidemic
- Post COVID planning aims for vaccine development in 100 days
 - What if that effort fails?
 - What steps should we take to prepare for another long-term pandemic?

Pandemic Influenza Planning mid-2000's

- Ferguson et. al. Nature 2006 and others
- Over in a few months
- NPI's: School closures, travel bans, isolation and quarantine
- NPI's buy time to target anti virals and vaccines



Mitigation vs. Elimination



**1918 Influenza vs.
SARS 2003**

**Elimination not possible
for influenza**

**Longer and stricter
NPI's
to achieve
elimination of SARS**

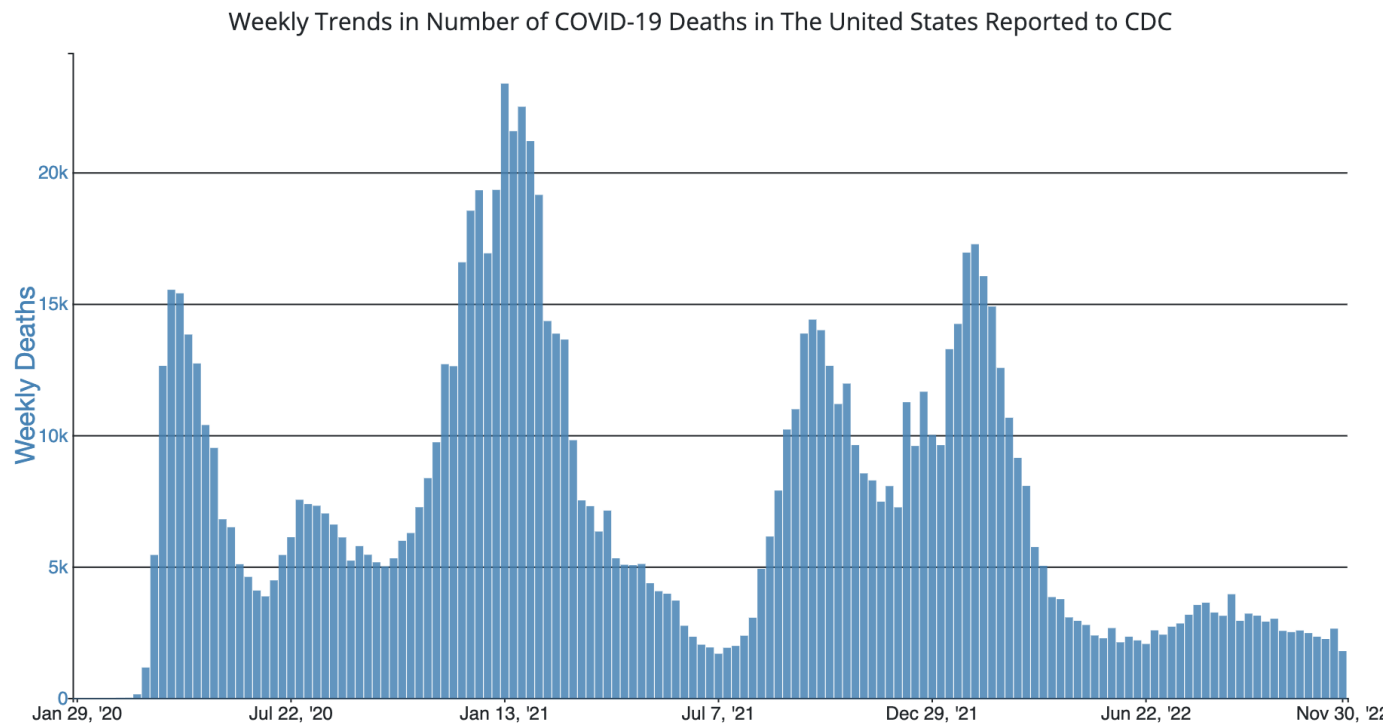
But duration of NPI's still short

Hollingsworth et. al. 2011

Figure 1. Magnitude and duration of responses to previous severe mortality outbreaks. Estimates of the reduction in the reproduction number and the duration of interventions during responses to the SARS outbreak in 2003 by country [18] (open triangles) and during the 1918 influenza pandemic in cities in the USA [22] (closed circles). A transmission reduction of 0% reflects an intervention which was estimated to have no effect on transmission. doi:10.1371/journal.pcbi.1001076.g001

Main Lesson From COVID

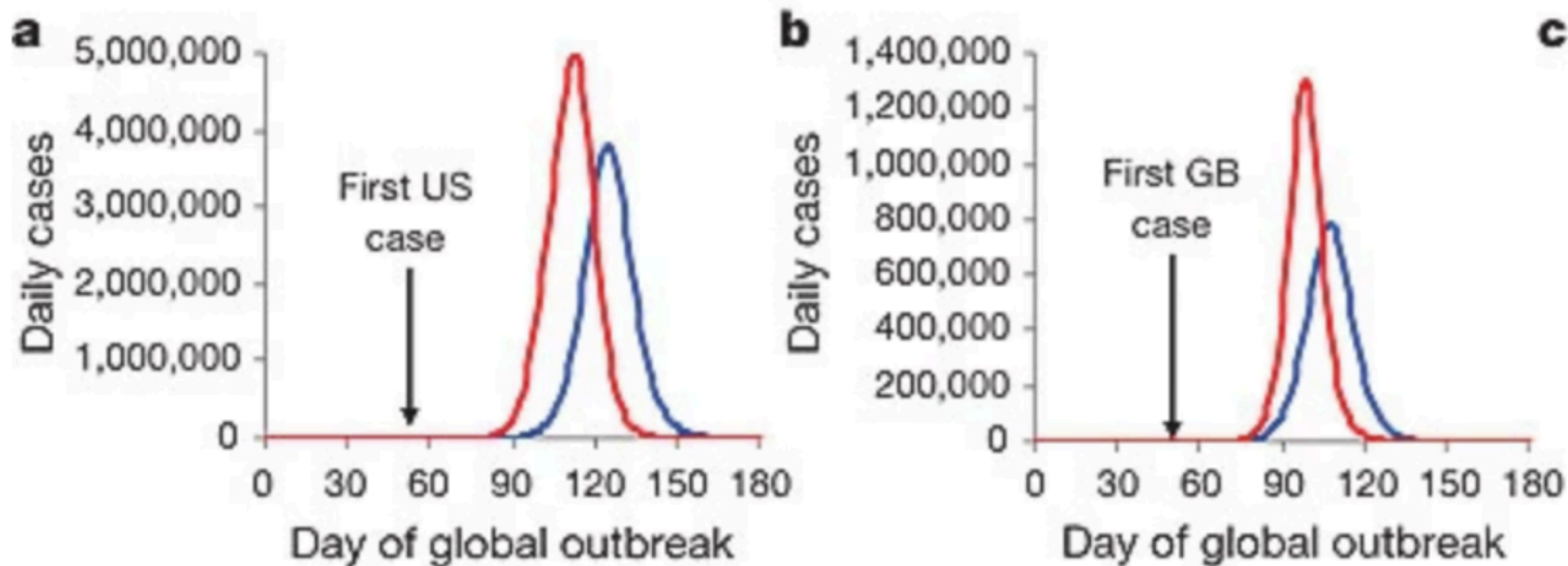
- Mandated NPI's and private behavioral responses turned the pandemic into a two year long ordeal
- Huge economic and social costs while waiting for vaccines and therapeutics



One Policy Response to COVID

- G7 “100 days mission”
- Plan to develop diagnostics, therapeutics, and vaccines within 100 days of identification of a new pandemic threat
 - Surveillance
 - Research on prototypes for critical viral families
 - Investment in capacity for rapid production and implementation
- Japan is investing in vaccine capacity as part of this effort (SCARDA)
- Only short period of NPI’s needed if this works

What does the first 100 days of an influenza pandemic look like?



Pandemic is peaking in US and UK 100 days after the first global case

But What if This “Technology” fails?

- When will we know that a pathogen has pandemic potential?
- “You may need to take a break from your normal daily routine for two weeks,” said Nancy Messonnier, the director of the National Center for Immunization and Respiratory Diseases at the Centers for Disease Control and Prevention, in a news conference Tuesday.”
Washington Post, [March 3, 2020](#)
- WHO Global Pandemic Declaration [March 11, 2020](#)
- And many reasons to expect research and implementation delays

What Policy Response is Missing?

- What investments can we make now to reduce the economic and social costs of future NPI's?
 - Improved indoor ventilation?
 - Public health infrastructure?
- Evaluation of what worked and what didn't
 - Japan's unique strategy
- What steps did we not even try?
 - Identifying transmission routes (school closures)
 - Targeted NPI's (testing and contact tracing)
- Huge economic and social returns to reducing the costs of mitigation

Ask an epidemiologist

- How would you invest \$50 billion to reduce the economic and social costs of pandemic mitigation through NPI's in the next pandemic?