Disclosures

- Senior Scholar at Stanford University
- Board Member of CovidActNow.org
- Advisor to Kinsa Health
- Chief Medical Officer of doc.ai
- All views expressed are my own
Mitigation strategies

- Total containment with eventual elimination (e.g. New Zealand)
- Control with masks (Japan), test (S. Korea), quarantine (Taiwan)
- Herd immunity (e.g. Sweden, Brazil)
- Something else
What’s needed for controlling COVID-19

- Broad and efficient testing
- Contact tracing
- Effective quarantine / isolation
- Adequate treatment capacity, including hospital beds and therapeutics
- Actionable data dashboards for the above
- Widespread safe vaccines
What’s needed for controlling COVID-19

- Broad and efficient testing
- Contact tracing
- Effective quarantine / isolation
  - Adequate treatment capacity, including hospital beds and therapeutics
- Actionable data dashboards for the above
  - Widespread safe vaccines?
What we don’t need for Public Health

- Incremental funding to turn fax-based reporting into google forms
- Marginal, time-limited and reactive funding “band-aids” for Flint and other disasters
- 1,000 local or 50 state-based solutions like immunization registries
- Condition-specific disaster declarations, i.e. A flavor of the month approach: “We have an epidemic of… obesity, opioids, gun violence, racism, etc.”
- Large pots of $ that are easy targets for raiding like the Prevention and Public Health Fund
- An abdication of our responsibility and a fully privatized approach
What we need for Public Health

- A standards organization like IEEE
- EIS officers trained in tech: federated learning / zero trust / edge and A.I., big data analytics
- An Open Data strategy and a new approach to Ethics / privacy-aware / autonomy / civil liberties / consent-based
- Standard (PHI-stripped) data outputs in standard data formats (OHDSI.org, for example)
- Coefficient-stripped model descriptions in standard constructs, with performance reporting if developer benefits from the public purse (tax advantages, federally funded research programs)
America’s COVID Warning System

We use 5 key indicators to determine risk levels for 50 states and 3,000+ counties.

- **INDICATOR 1: DAILY NEW CASES**
  How many new cases are confirmed daily?

- **INDICATOR 2: INFECTION RATE**
  Is the number of infections going down?

- **INDICATOR 3: TEST POSITIVITY**
  Is COVID testing widespread enough to identify new cases?

- **INDICATOR 4: ICU HEADROOM**
  Do hospitals have capacity to treat a surge of COVID hospitalizations?

- **INDICATOR 5: TRACERS HIRED**
  Are we hiring enough contact tracers given the number of new cases?

**RISK LEVELS**
- Active or imminent outbreak
- At risk of outbreak
- Slow disease growth
- On track to contain COVID

---

CovidActNow.org
Early Warning System

Thesis: Real-time biometric data from a network of millions of households will enable early warning of outbreaks

PRE-HEALTH CARE SYSTEM COMMUNICATION

https://www.kinsahealth.co/
Kinsa Atypical Illness as a leading indicator of COVID-19 cases

New Jersey

Statewide School Closures

Daily confirmed cases

Atypical incidence (%)

0 1.0 2.0

2020-02 2020-03 2020-04 2020-05 2020-06 2020-07
Can This Thermometer Help America Reopen Safely?

With no coronavirus cure or vaccine, early detection of outbreaks is crucial. This tool could help.

The New York Times
Artificial Intelligence for Public Health

Generalized Model

Personalized Model

Patient #1: Joe

Patient #2: Sally
What we need for Public Health

A New framework

- Focus on data protection, not just data collection
- Focus on public good, not just private benefits
- Focus on right to information, not just right to privacy
Thank you!

@niravrshah
nirav.shah@stanford.edu