

NCSL Health Innovations
Task Force - **October 2020**



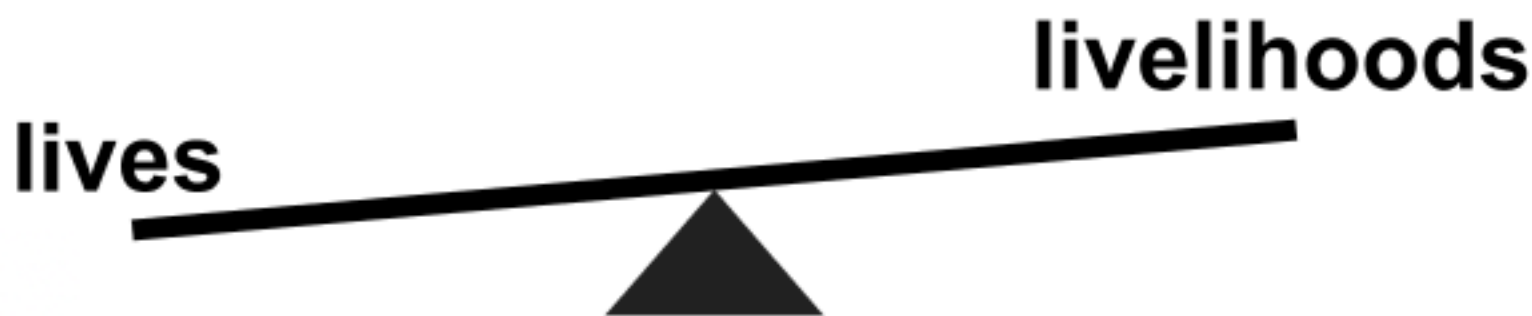
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Disclosures

- 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



New cases

PER 100K PEOPLE



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

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- D** • 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

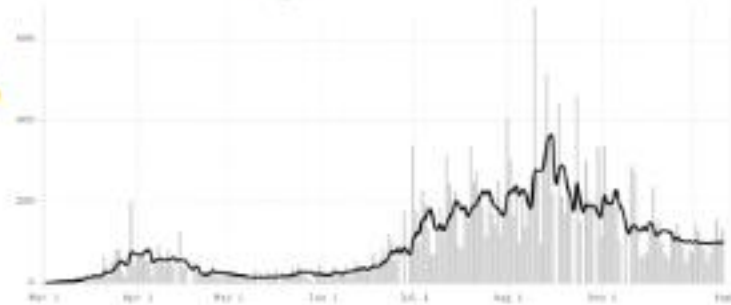
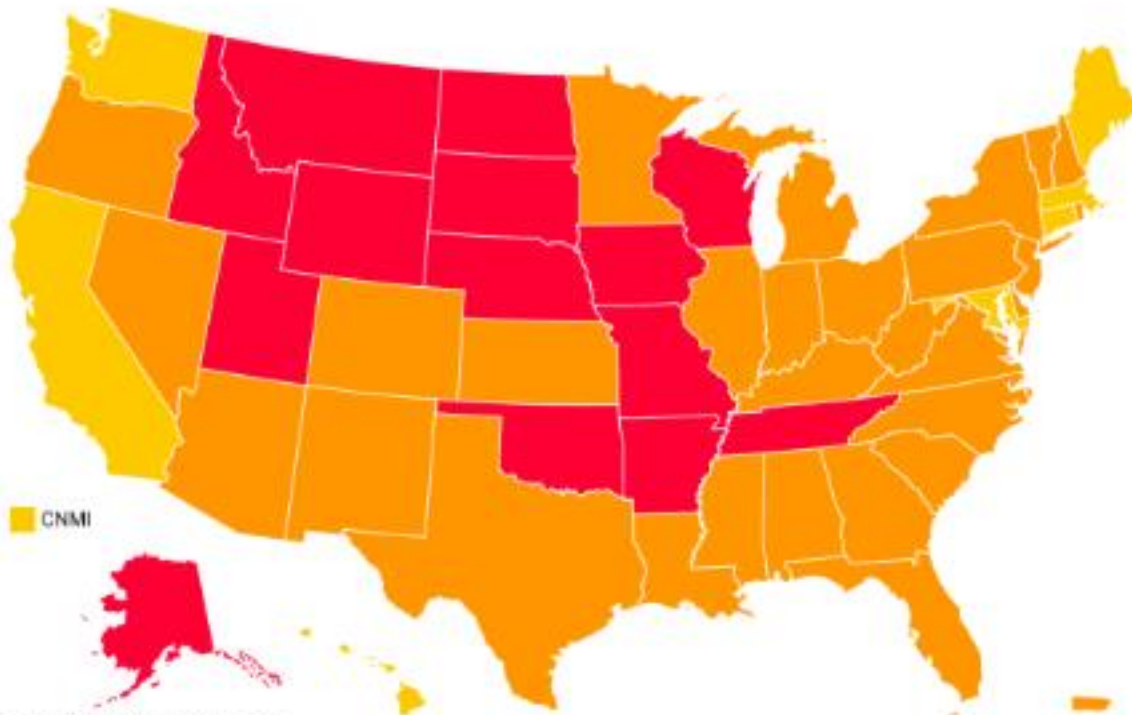
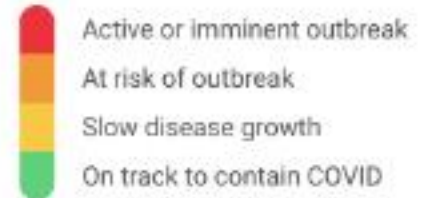
Do hospitals have capacity to treat a surge of COVID hospitalizations?

INDICATOR 5

TRACERS HIRED

Are we hiring enough contact tracers given the number of new cases?

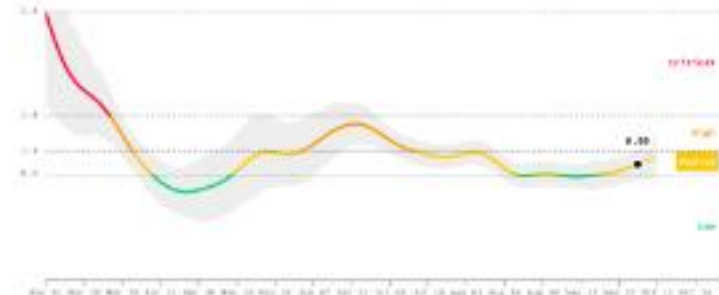
RISK LEVELS



Infection rate

Source: U.S. Census Bureau, COVID-19 Data

On average, each person in Santa Clara County, California with COVID is infecting 0.57 other people. Because this number is around 1.0, it means that COVID continues to spread, but in a slow and controlled fashion.



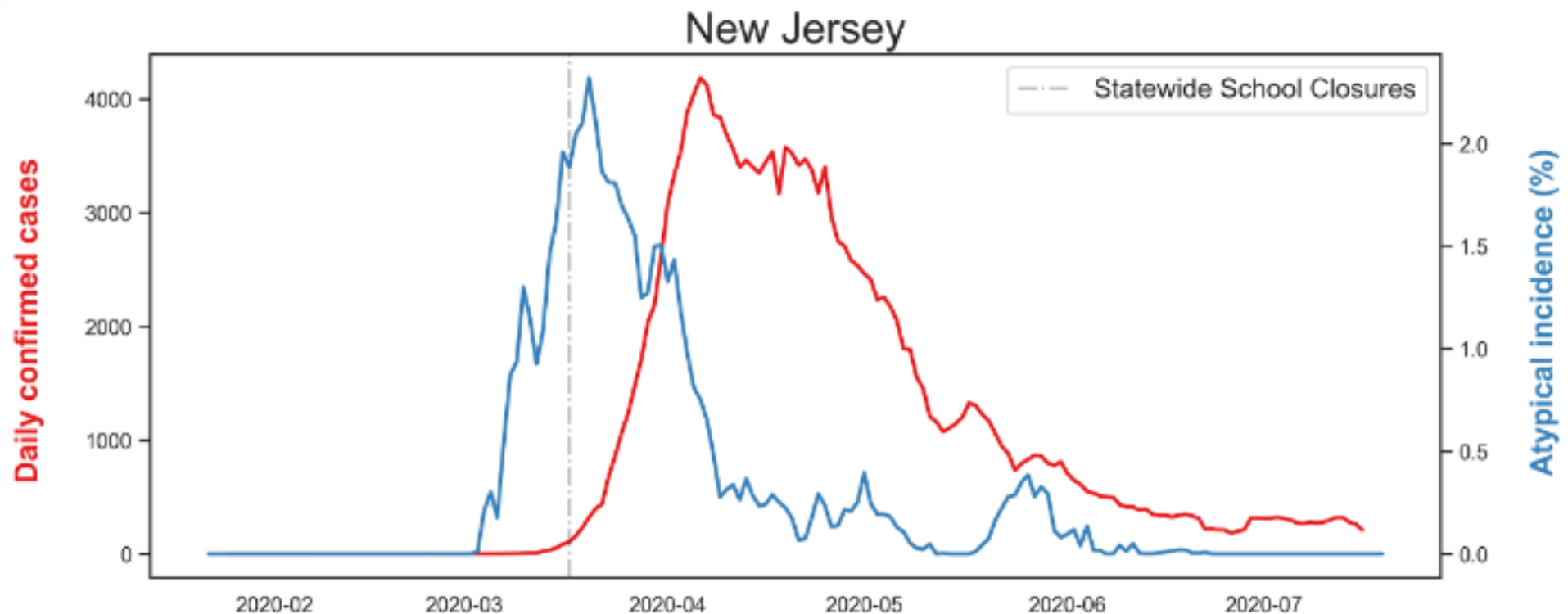
Early Warning System

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

PRE-HEALTH CARE SYSTEM COMMUNICATION



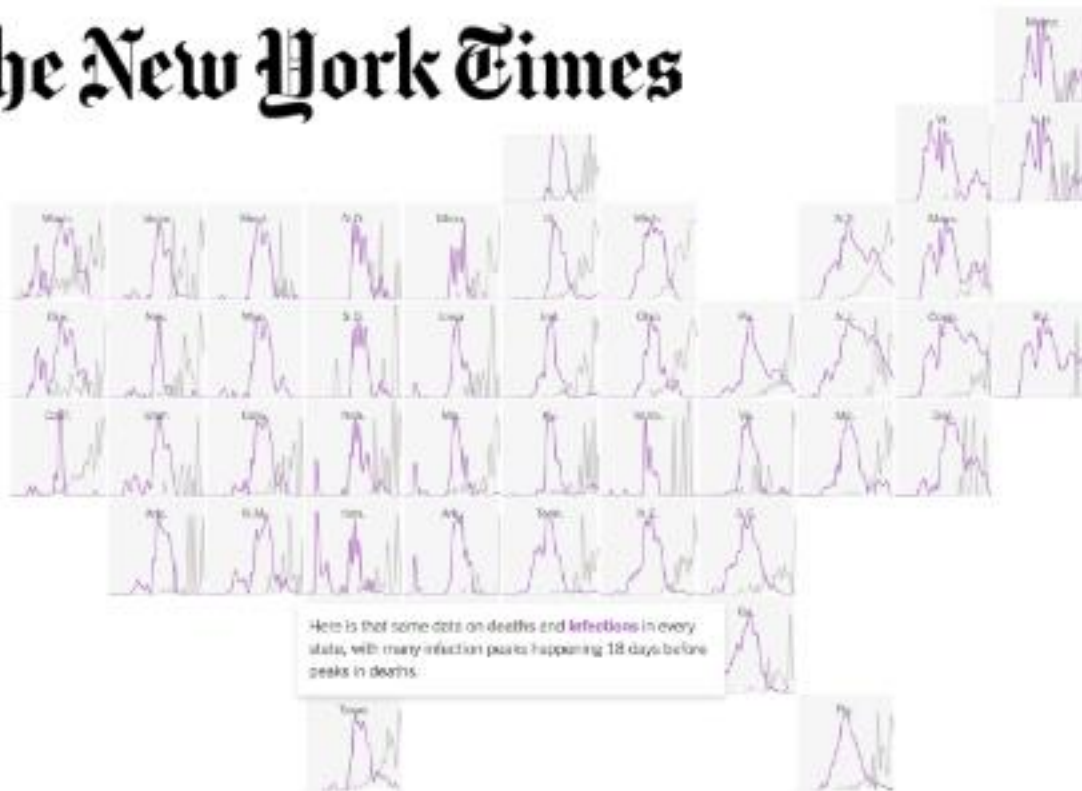
Kinsa Atypical Illness as a leading indicator of COVID-19 cases



Can This Thermometer Help America Reopen Safely?

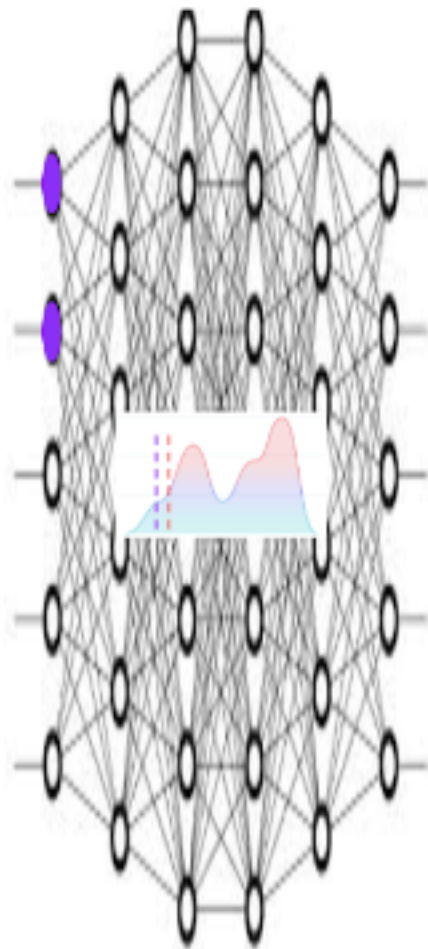
With no coronavirus cure or vaccine, early detection of outbreaks is crucial. This tool could help.

The New York Times



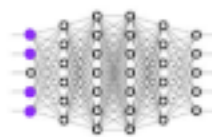
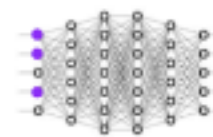
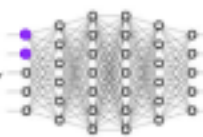
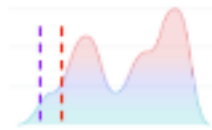
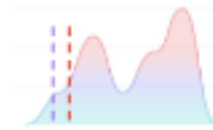
Artificial Intelligence for Public Health

Generalized Model

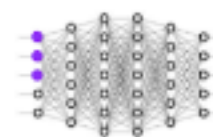
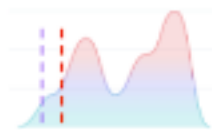
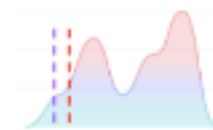
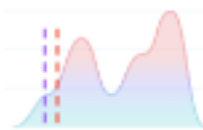


Personalized Model

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!

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