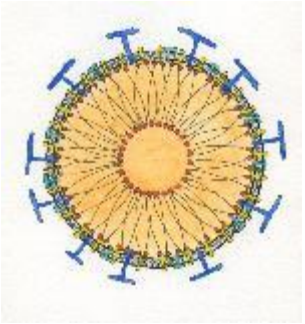
UCSF Benioff Children's Hospitals



COVID19: Community Safety, Schools, and SF

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University of California, San Francisco

12/11/2020

Drawing by Benjamin Briggs, MD

Disclosures and acknowledgments

- I am a physician, health policy researcher, pediatrician, and parent.
- Change is the only constant.
- This is a team sport requiring unprecedented levels of collaboration.

Framing the School Conversation

Our dashboards do not track the harms associated with closure

Chart last updated on August 11, 2020

		Elevated Disease Transmission		Increasing Hospitalization**	Limited Hospital Capacity**	
Threshold	<150	Case Rate >100 OR Case Rate >25 AND Positivity >8%		>10% Increase	<20% ICU Beds Available OR <25% Ventilators Available	
County	Avg # tests per day (per 100,000 population) (7 day average with a 7 day lag)	Case rate per 100,000 (14 days)	Testing positivity (%) (7 day average with a 7 day lag)	% Change in 3-day avg COVID+ hospitalized patients	% ICU beds currently available	% Ventilators currently available
Alameda*	---	---	---	✓	✓	✓

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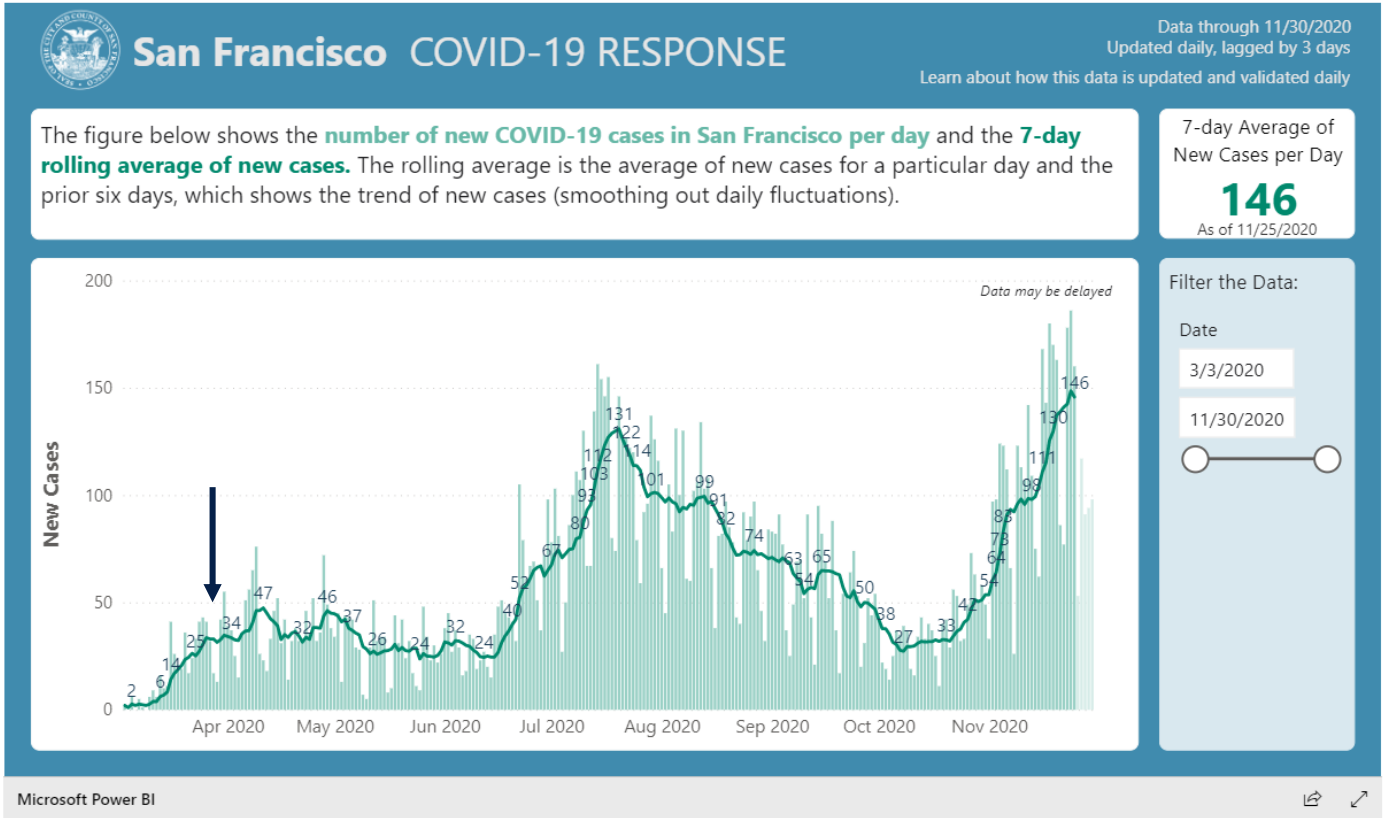
Framing the School Conversation

- A recent article estimates long lasting health effects for elementary school aged children due to loss of education
- Increases in child and youth mental health issues—increased suicidality, and suicides during Zoom school
- Important to balance the conversation

Fuchs-Schundlen et al. NBER pre-print Sept 2020
Christakis et al. JAMA Network Open Nov 2020

The COVID School Transmission Intellectual and Emotional Journey



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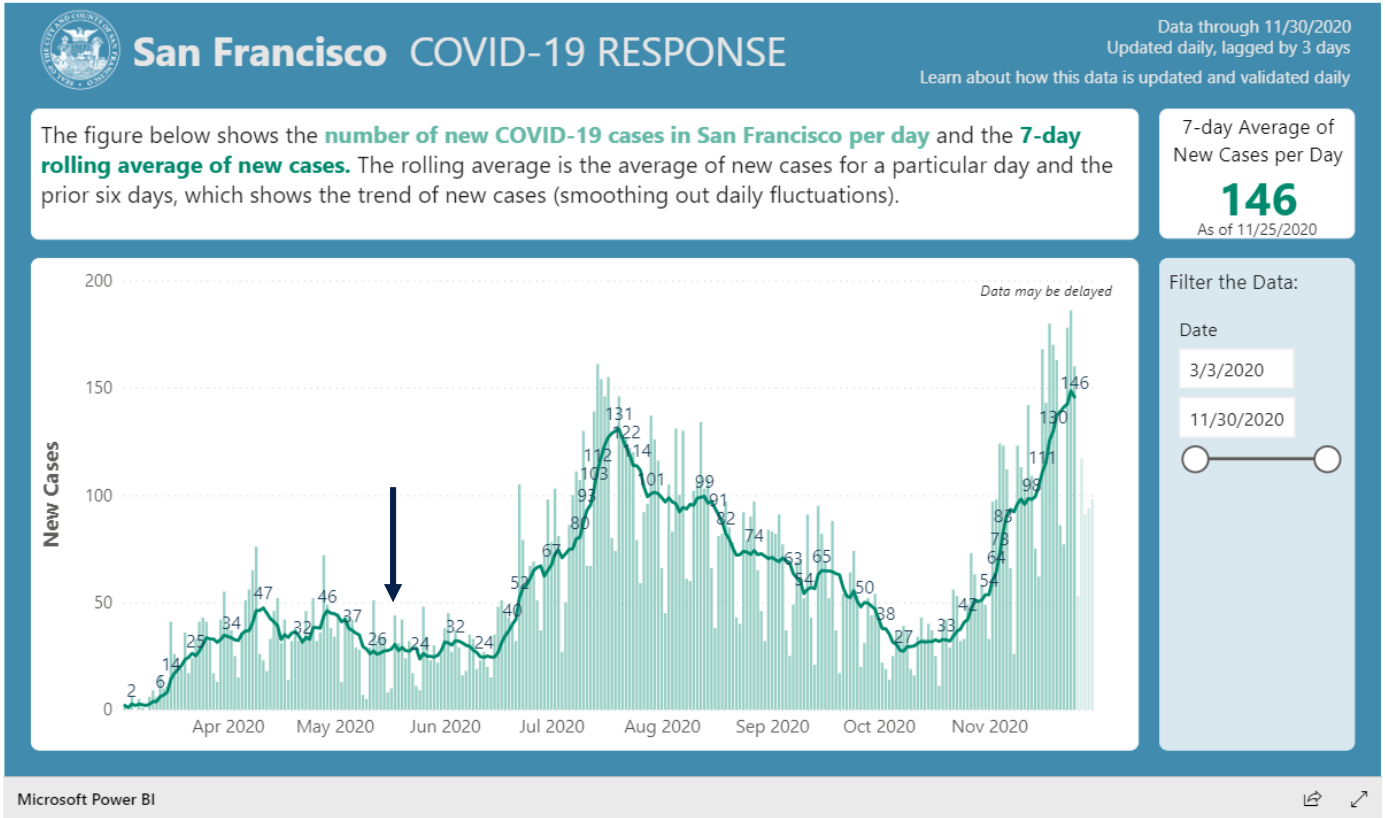

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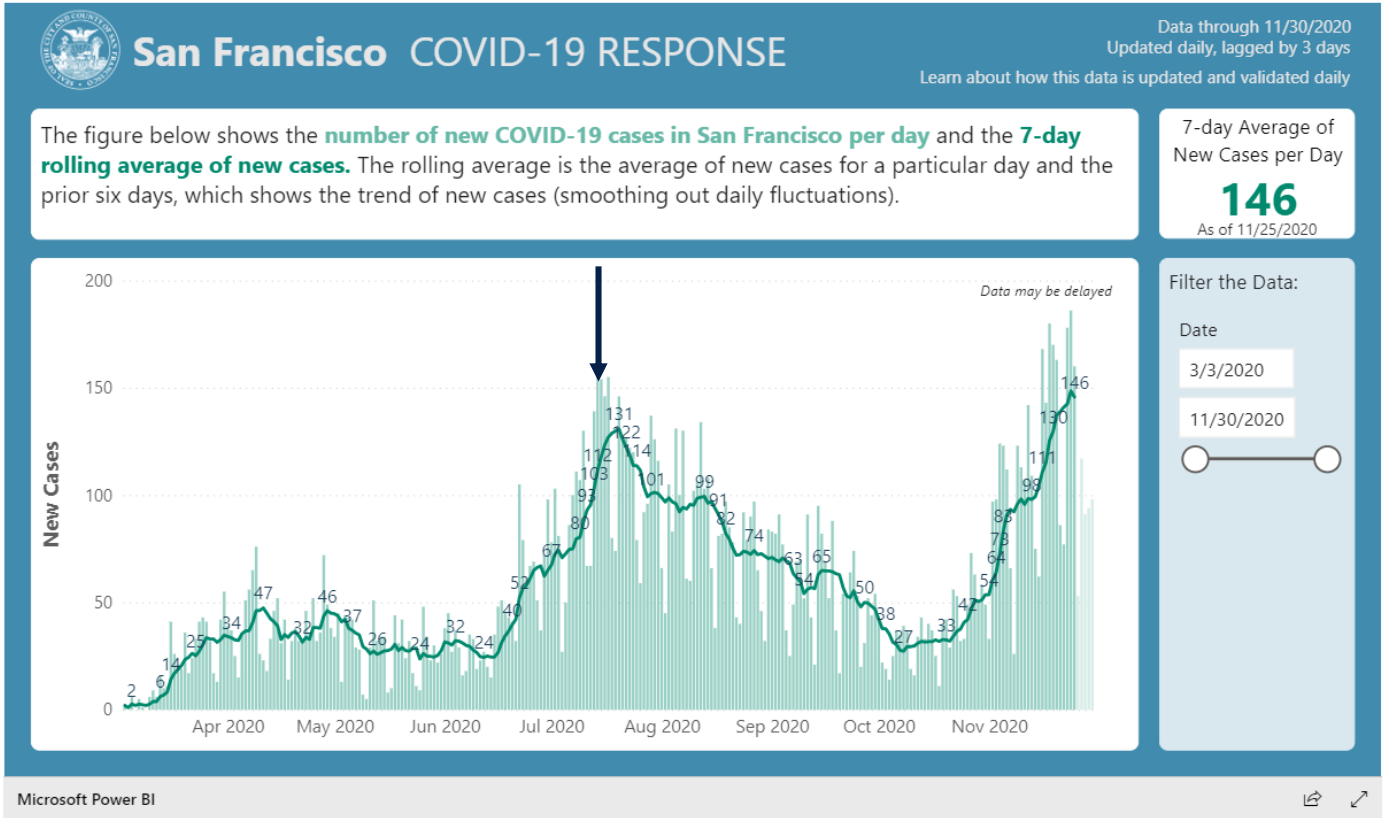

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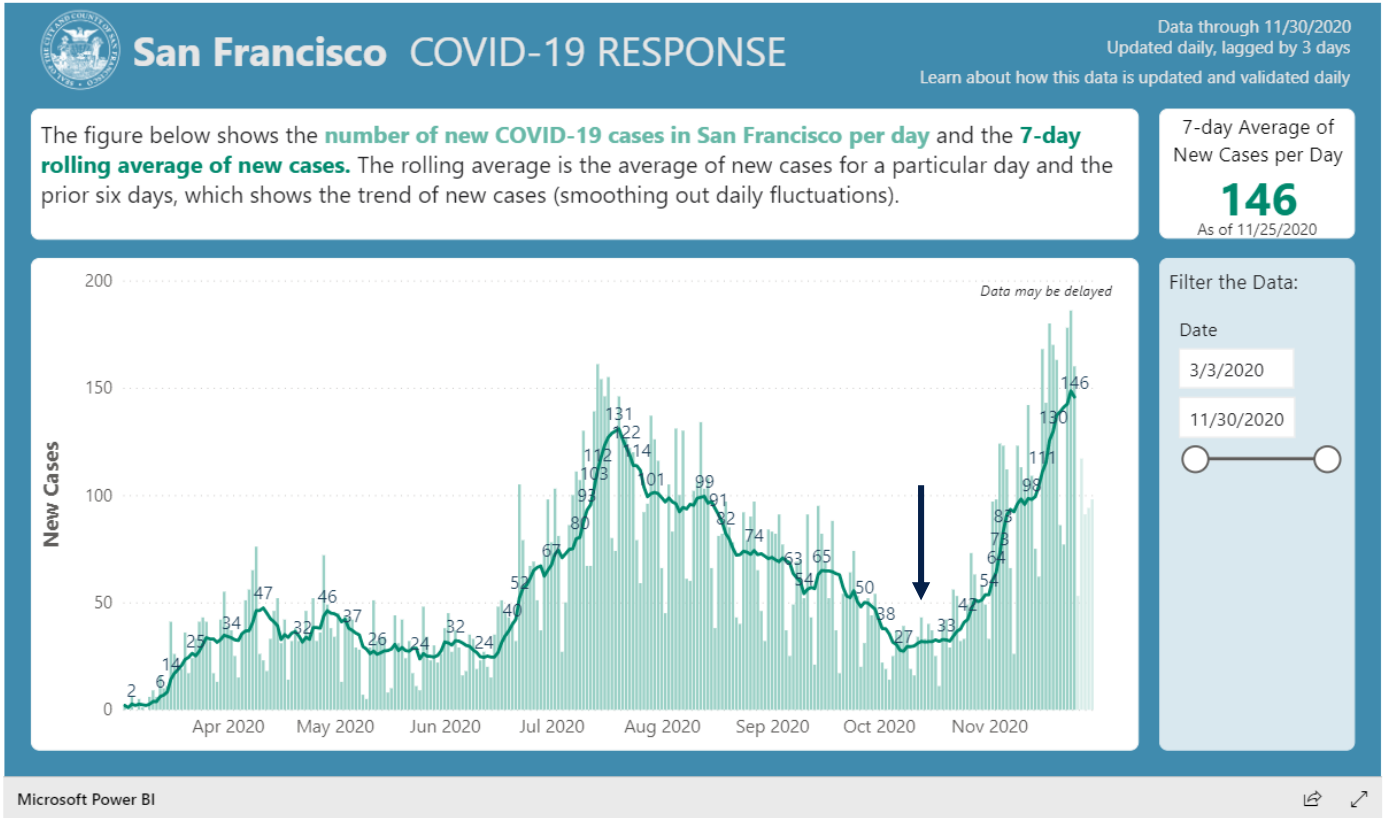

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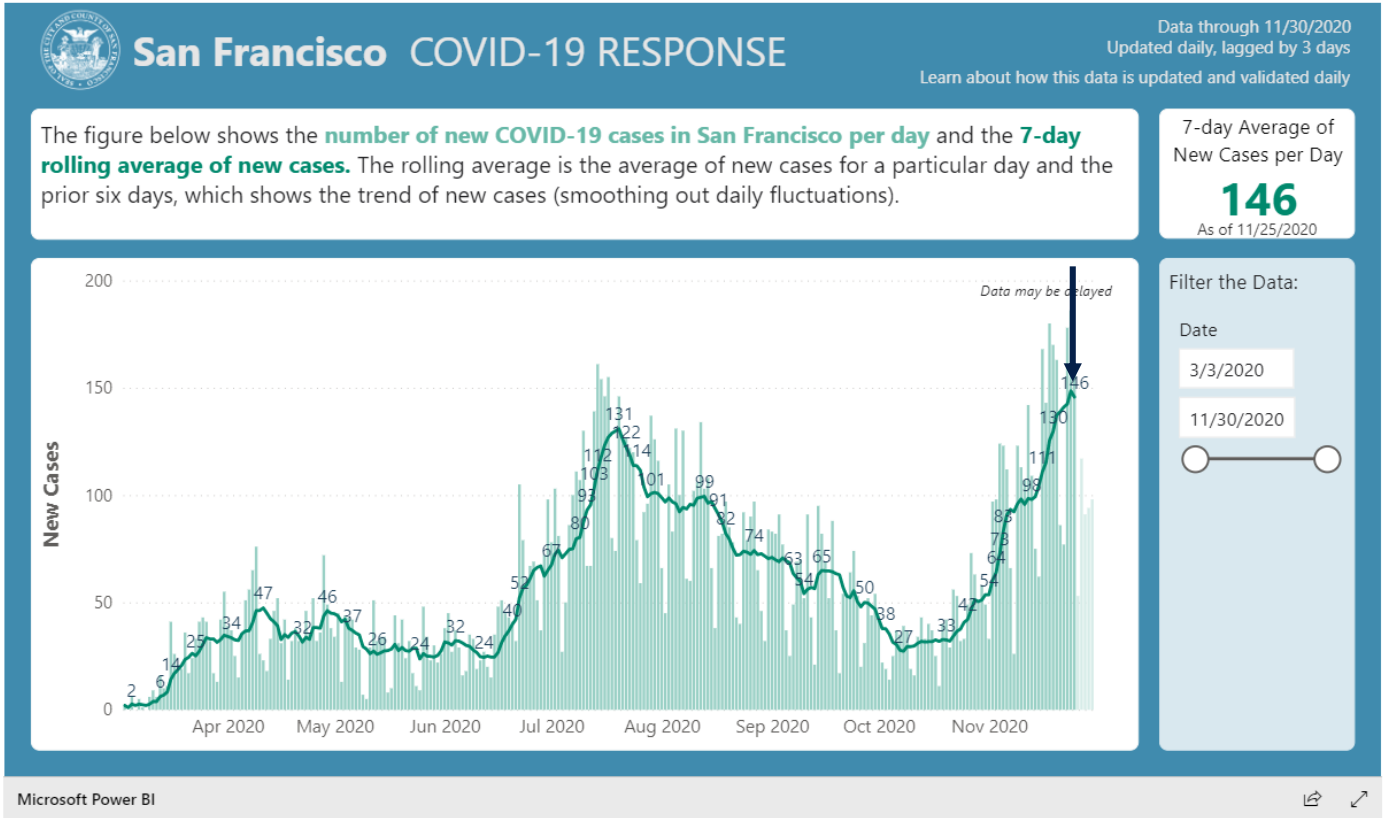

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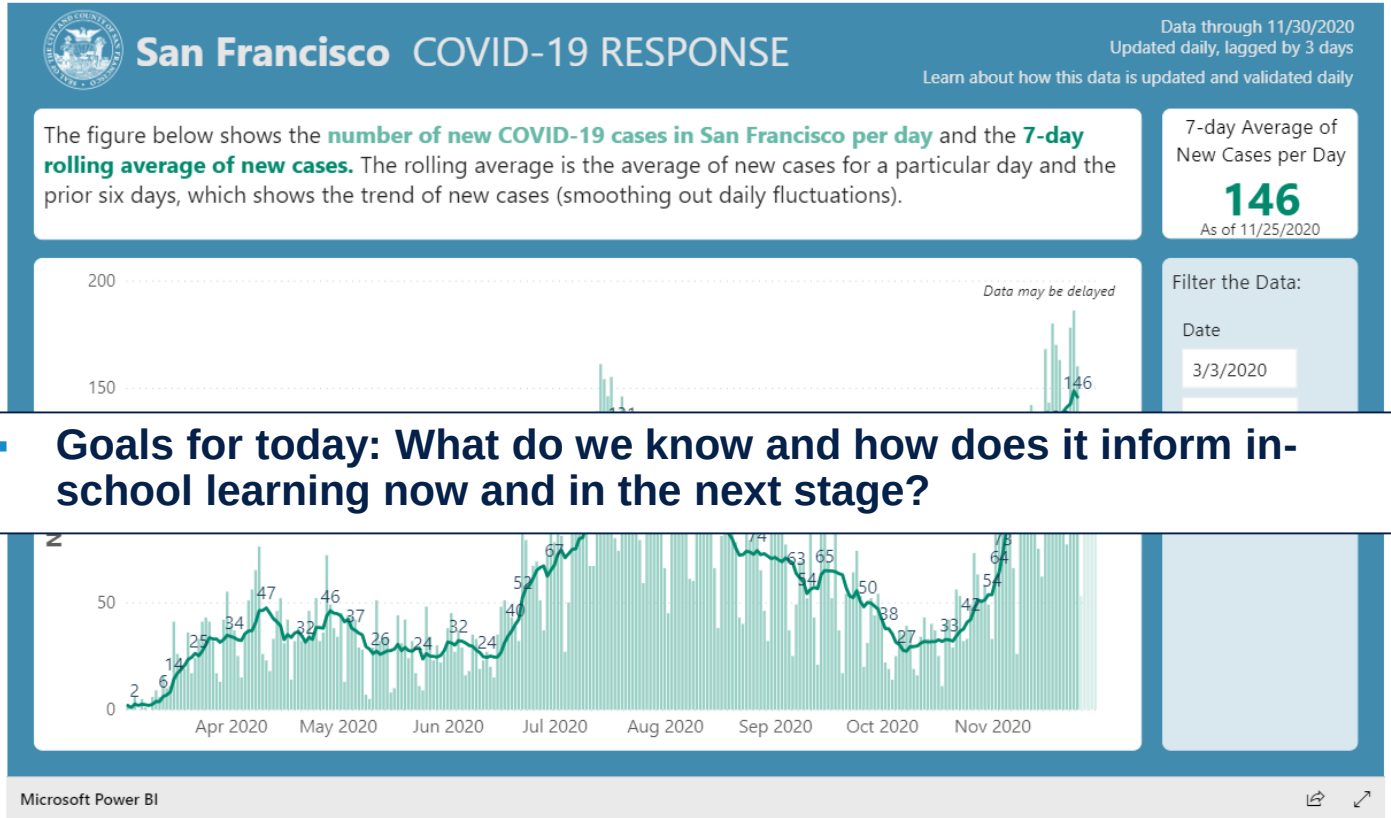
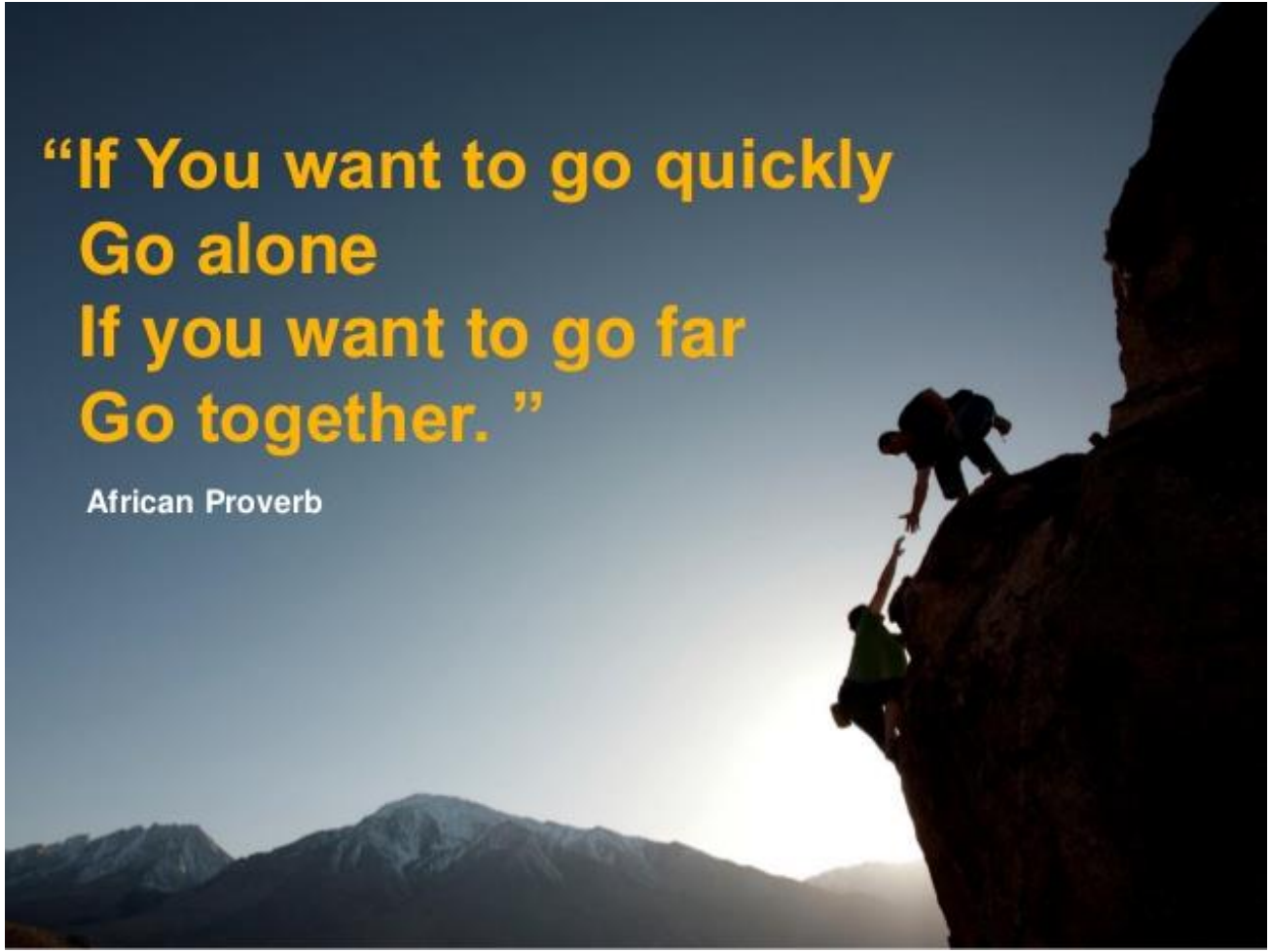


- **Goals for today: What do we know and how does it inform in-school learning now and in the next stage?**


"If You want to go quickly
Go alone
If you want to go far
Go together. "
African Proverb

Educators are Key Partners

- What is good for teachers, is good for students, is good for families

- School re-opening goals: Safe, Successful, Equitable

https://www.ny.gov/services/find-child-care-providers-new-york-state

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We know more than we did in March

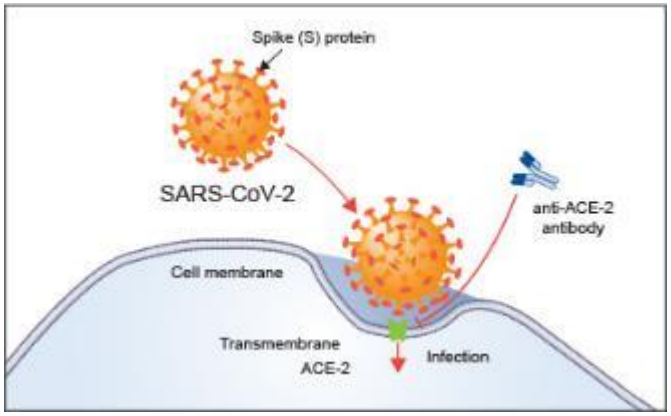
What do we know to inform us thus far?

- Summary of data on COVID in children and transmission
- Highlights themes and a few key articles and reports
  - Chosen for their rigor—imperative to get this right
  - Or chosen because they captured a lot of attention but are not well done, so it is helpful to explain and interpret them

Summary of findings

- Children get COVID19 less often and are less ill than adults.
- Children do not seem to be major sources of transmission to each other or to adults.
- Transmission in elementary schools differs from high schools.
- Adult to adult transmission is the most likely (and also where we may have more control).
- Community prevalence affects school-based cases but not necessarily in-school transmission.
- Key mitigation strategies: masking, cohorting, ventilation, hand hygiene, symptom screening and screening for contacts.

Why do children get COVID-19 infrequently and have less severe disease?



- ACE2 receptors are the entryway for COVID
- Ability to make ACE2 receptors varies with age
  - Elementary students < middle and high school students < adults

- **Implications: fewer doors → less disease and more mild disease**

Bunyavanich et al. JAMA 2020

Most school-aged children get COVID from a household contact

- Shown consistently in studies from Greece, Australia, China, Switzerland, Chicago.
- Close physical contact with family members, more than in schools
- When cases happen in schools, they are almost all from the community, in adults and students

Transmission among or from students is not common

- Case study of French 9 year old with co-occurring influenza and COVID 19. 3 schools, 80 contacts, 0 cases, but +influenza cases. (Danis, Clin Infect Dis 2020)

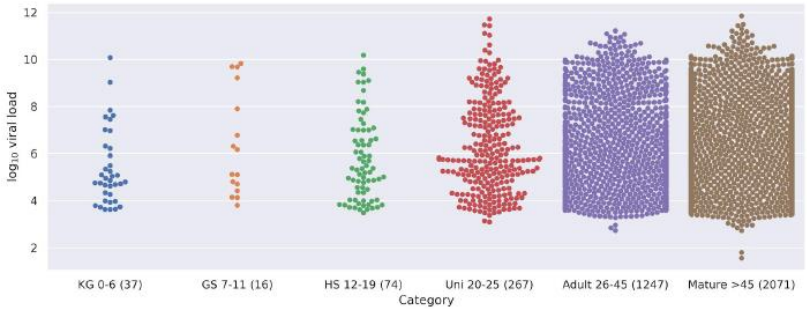
Australia study of 10 early childhood centers and 15 schools (>6000 people)

- Overall very low numbers: 1.2% of people got COVID19
- >90% got it from household contacts
- Transmission in school groups:
  - Child-to-child frequency: 0.3%
  - Child-to-staff frequency: 1%
  - Staff-to-child frequency: 1.5%
  - **Staff-to-staff frequency: 4.4%**

https://www.thelancet.com/action/showPdf?pii=S2352-4642%2820%2930251-0

But aren't children super spreaders? Are they equally infectious or more infectious than adults?

- Heald-Sargent et al. JAMA Peds July 2020. Patients with mild or moderate symptoms. Higher viral loads in children <5 compared to 5-17 and 18-65. BUT, only tested *symptomatic* children, and early in the pandemic.

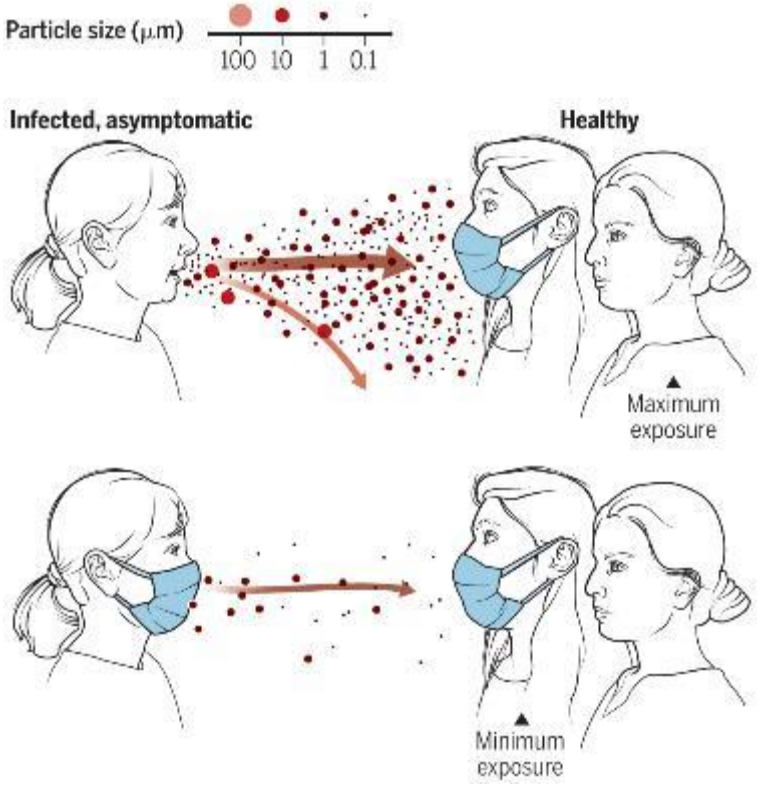


- Implications:
  - Likely reflecting more highly symptomatic children.
  - Even if all symptomatic pre-schoolers have higher viral loads→ follow symptom screening recommendations to break transmission

Similar to: Drosten et al. "Analysis of SARS-CoV-2 Viral Load by Patient Age". April, June pre-prints.

Why don't children transmit as efficiently?

- Practical considerations:
  - **Smaller lungs** → smaller clouds of viral particles
  - **Less severe disease** →less coughing → less spread
  - **Children are shorter than adults** → gravity pulls respiratory droplets down



High Schools are Different from Elementary Schools

- Community prevalence: 9%
- No precautions
- High school: 43% of teachers and 38% of students infected
- Elementary schools: 7% of teachers, 9% students infected
- Implications: Transmission can occur in high schools; community prevalence reflected in elementary school cases

Fontanet et al. MedRxiv April 2020—High School
Fontanet et al. Pasteur.fr June 2020—Elementary Schools

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What not to do: An Outbreak in a High School/Middle School in Israel

- Re-open in mid-May
- Outbreak in late May
- >150 infections
- Heat wave a few days after re-opening
- Stopped masking
- Index cases present & symptomatic
- + Air conditioning, closed windows

Stein-Zamir et al. Eurosurveillance Jul 2020

What not to do: A High School/Middle School in Israel

- Implications: masks, physical distancing, ventilation are all key. Symptom screening could have potentially helped.

Stein-Zamir et al. Eurosurveillance Jul 2020

Doing it right: Camps and hubs in SF

- Indoor camp pilot to test feasibility and acceptability of student self collection. K-8th grade.
- Also observed camps in action—successful masking, stable cohorts, physical distancing, hand hygiene, ventilation.
- Found no documented cases by PCR at the beginning or end of camp in campers, camp staff, up to two household contacts.
- Implications: It is possible to effectively follow public health principles. Need to gather lessons learned from eachother.

Tu et al. NEJM June 3, 2020.
Cooch and Bardach et al. Medrxiv. Submitted to Pediatrics

Implications: We Know More than We Did in March

Masks, masks, masks, masks

Physical Distancing

Stay Home when Sick/Screening

Ventilation

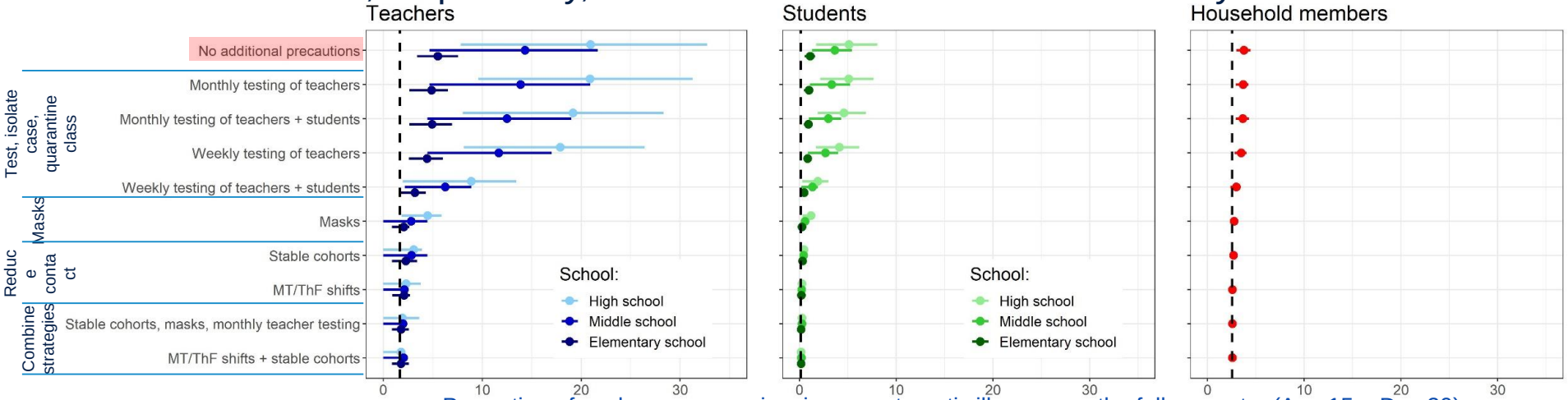
Symptomatic and asymptomatic testing

Small, Stable Cohorts

Masks and stable cohorts compared to testing

Berkeley
UNIVERSITY OF CALIFORNIA

1. Without strict interventions to reduce contact, teachers are at a high risk of infection over the course of the fall semester (Aug 15 – Dec 20)
2. Without precautions, the risk of infection among high school teachers and middle school teachers, respectively, is 4.9 and 3.3 times that of elementary school teachers



Proportion of each group experiencing symptomatic illness over the fall semester (Aug 15 – Dec 20)

Implications: Masks and stable cohorts alone are associated with decrease in infections more so than weekly testing of teachers and students

Jennifer R. Head, Kristin Andrejko, Joseph A. Lewnard, Justin V. Remais*
NIH: R01AI125842, R01TW010286

PUBLIC HEALTH 75 BERKELEY150

Hot topic: Testing

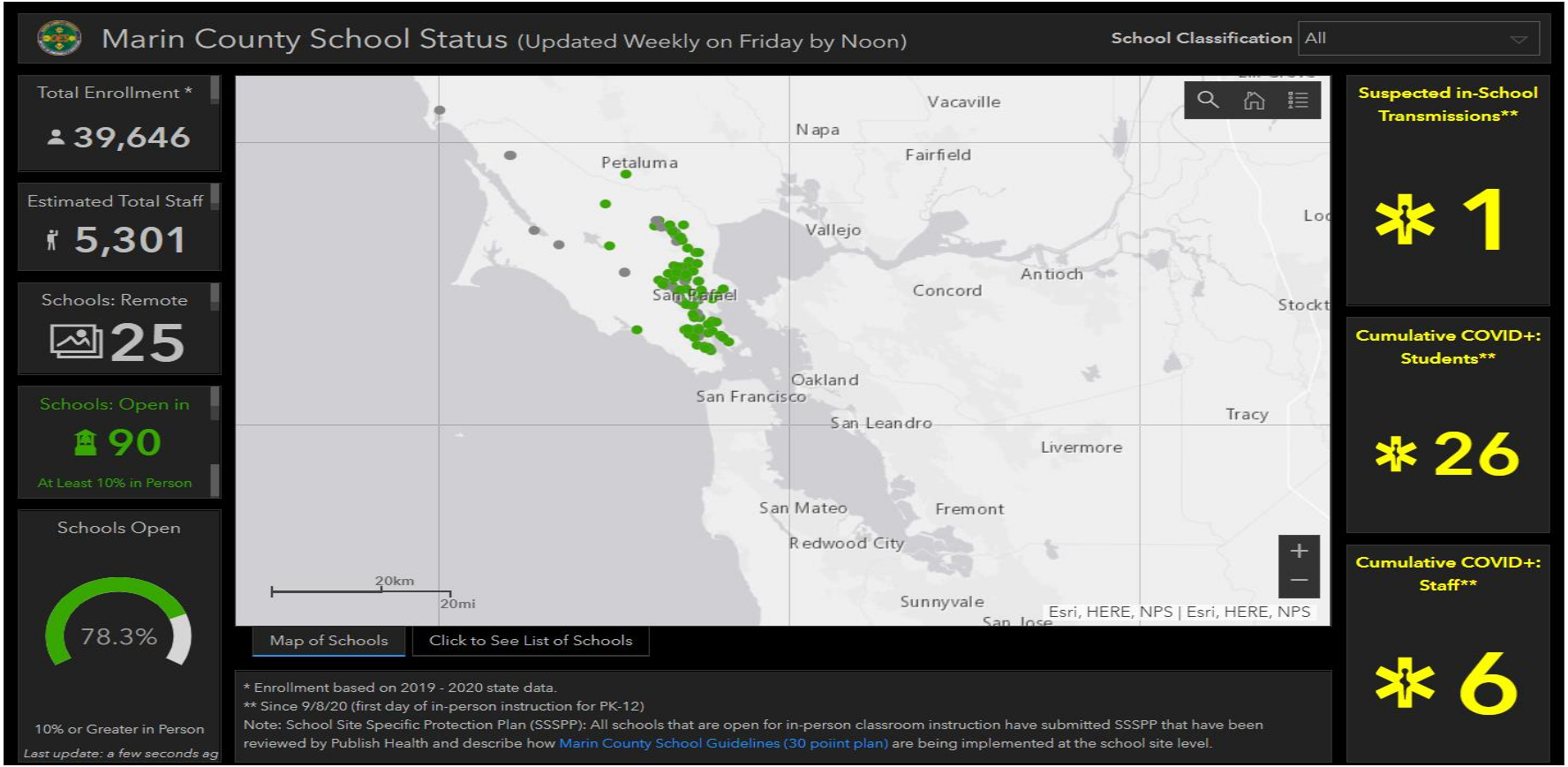
Symptom-based testing will lead to substantial testing

- COVID19 symptoms are similar to many other viral syndromes (coughs, colds)
- Current recommendations from SFDPH and CDPH are to do symptom screening and exclude symptomatic students or teachers from schools
- Elementary-aged students get 6-8 colds a year
- To return to school, will generally need a negative test
- →Lots of testing!

Testing for surveillance: NYC school experience

- 1800 public schools, ~50% students back, in hybrid learning
- Re-opened, then 120 shut due to community outbreaks
- Ongoing surveillance testing of staff and sample of students in every school (10-20%) every month
- 28 positives of 16,298 tests—20 staff, 8 students (0.17%)
- Implications: Very helpful to understand what is happening in schools, as rates shift in the community

Other county re-opening experiences



Testing Strategy

- Mitigation strategies still highly effective even without frequent testing
  - Masking, small stable cohorts, physical distancing, hand hygiene, ventilation, health screening.
  - Better not to direct resources to testing that could be better used elsewhere (other mitigation, PPE, direct education)
- Symptom screenings will lead to testing and catch cases
- Asymptomatic testing for school adults for surveillance and decision making

Upcoming testing challenges and opportunities

Increases in testing demand:

- Ongoing surge
- CDC guidance: It is possible to shorten quarantine to 14 days if testing is done at 7 days
- State requirement for weekly health care worker testing
- Above additional demands may limit access to symptom-based testing to return to school and contact tracing

Upcoming testing challenges and opportunities

- Opportunities: New tests getting released
  - Point of care tests for $5/test (Binax Now)
  - Self-administered home testing (Lucira)
- Caveat: tests are helpful, but only tell someone about one moment in time, are not preventative

The way forward? Keep our eyes on the prize

- Safe, successful, and equitable schooling
  - During surge, keep moving planning forward so we do not miss the opportunity when prevalence decreases.
  - Vaccines are on the horizon but should not be a reason to lose laser focus on safe and successful schooling.
  - Start planning now to make up for educational losses.
  - Opening cannot be done on the backs of the teachers and staff. Advocacy efforts should focus on ensuring adequate resources for schools to re-open safely.

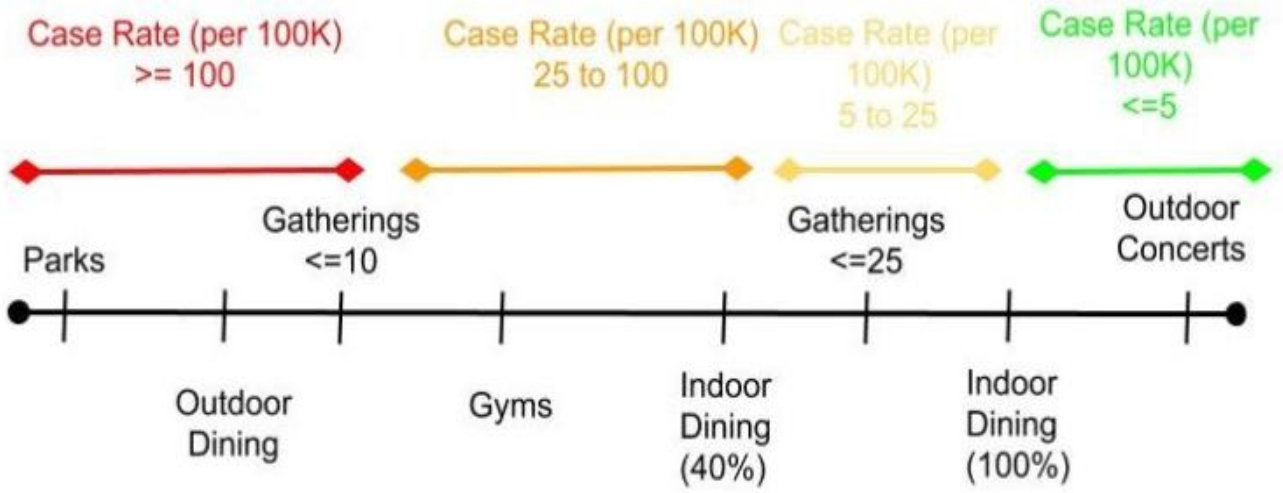
The way forward?

- Build flexibility into the system for families, teachers
- School community is really important—health pledge to community safety, positive messaging, care for each other, compassion not contention
  - Commitment to not come to school with symptoms (“just a cough”)
  - Minimizing higher risk behaviors (travel, indoor visits)
  - Support staff to not transmit by mistake when in break room
  - Positive reinforcement for masking and school rules
  - Sharing with each other about stresses and successes

Questions?

- Naomi.bardach@ucsf.edu
- We are all in this together and no one is smart enough or can process fast enough nor hold all perspectives at once to get this right on their own. Feel free to send notes or comments.

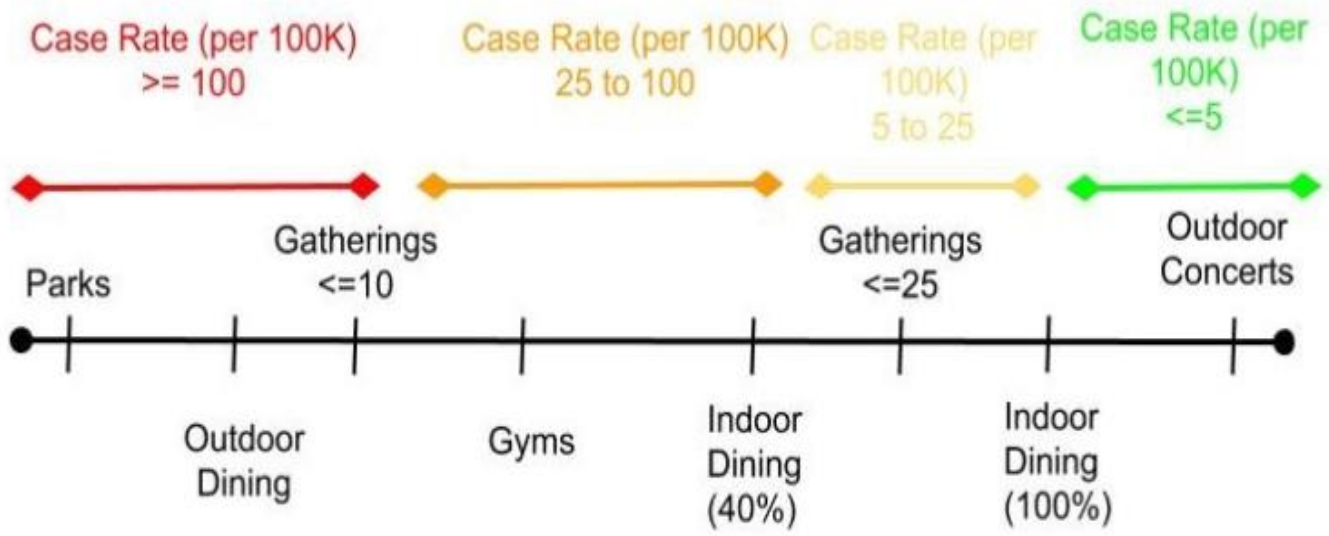
Approach to Thinking about Re-opening Activities



Lower Risk,
High Benefit

Higher Risk,
Lower Benefit

Courtesy Emily Oster, PhD



Valuable

Risky