



Is there an off-ramp for that?: K-12 schools and COVID 19

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Disclosures and acknowledgments

- No commercial interests to disclose
- This is a team effort across multiple sectors

Overview

- Theme 1: Pursuing the goal of policy-relevant evidence
- Theme 2: Making evidence-based policy decisions
- Theme 3: Reflecting on lessons learned for COVID19 public health and cross-agency leadership in creating, sharing, and supporting implementation of K-12 schools guidance
- Looking forward and lessons learned

Impetus for the work: personal and professional



Original hypothesis—April 2020

- Everyone already has been infected. Just need to measure antibodies for kids and teachers and get everyone with antibodies back in the classroom!
- Initiated conversations with George Rutherford, SF DPH partners to see if we could start testing in the city-run learning hubs

Original hypothesis—April 2020

- Then...
- Unidos en Salud late April testing in the Mission—very few children infected (2.3% of 259 4-17 year olds)
- Random sample in Iceland April 2020: Zero cases <10yo. High-risk sample: (symptomatic, travel or +contact) case rate kids was half those in adults (7% vs. 14%)
- Antibody prevalence in Spain community April-May 2020: 3.1% of children <10 vs 5% overall

Summer 2020: Mounting evidence that schools could be safe and that school closures are harmful

- International experiences of how to do it right and how to do it wrong
- Limited illness burden in children, but families with children bear a large brunt of the economic devastation, mediated through school closures
 - Starkly deepening existing disparities for low SES students
 - Increased anxiety and depression for students and adults
 - Signs of increased child abuse, domestic and intimate partner violence (and data from prior recessions have shown this)
- Twin goals: Safe AND Successful Schools

Implications: Several safe practices emerged

Masks, masks, masks, masks

Physical Distancing

Stay Home when Sick/Screening

Ventilation

Symptomatic and asymptomatic testing

Small, Stable Cohorts

Importance of each? MAJOR Barriers to “Success” Goal

Masks, masks, masks, masks

Physical Distancing

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Symptomatic and asymptomatic testing

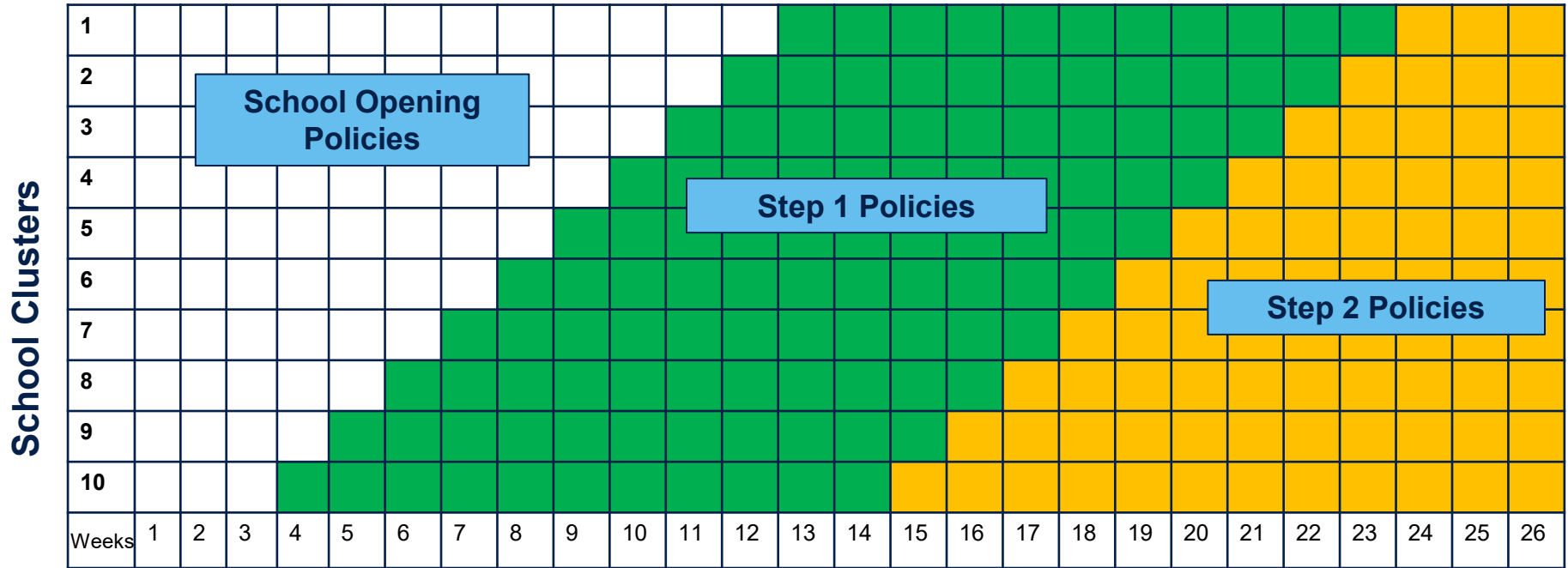
Small, Stable Cohorts

How to create policy-relevant evidence?

- Key step 1: Defining a policy-relevant question
- Key step 2: Involving stakeholders in refining the question and designing the study (thinking about the potential changes in policy that might result)
- Key step 3: Timeliness
- Key step 4: Sharing the results, interpreting them in context, and sharing policy and implementation implications (“the last mile”)

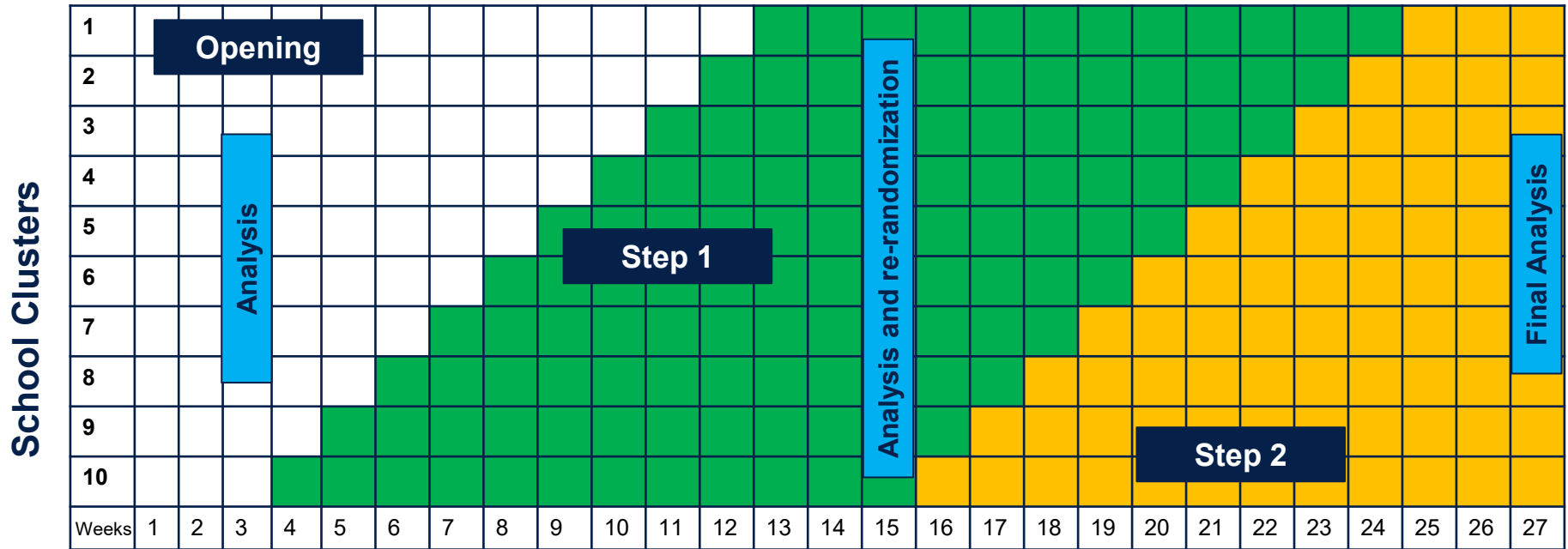
Assessment of safe and successful practices

Stepped Wedge Design



Assessment of safe and successful practices

Stepped Wedge Design



Creating policy-relevant evidence

Stakeholders and collaborators

- Key question to inform research: What should the stages be? What are the pain points? What is feasible (logistically, emotionally, public health risk tolerance)?
- Key stakeholders: SFDPH partners, school administrators, teachers, families
- Key scientific collaborators: virology, infectious disease, implementation science, primary care pediatrics, preventive medicine

Unprecedented collaboration

- Virology and testing
 - Joe Derisi
 - Bryan Greenhouse
 - Diane Havlir
 - Gabe Chamie
 - Carina Marquez
 - CZ Biohub
- Pediatrics and preventive medicine
 - George Rutherford
 - Ted Ruel
 - Raphael Hirsch
 - Elizabeth Rogers (CARES)
 - Lee Atkinson-McEvoy (CARES)
 - Roberta Keller
 - Robert Harrison (Occupational Health)
- SFDPH
 - Tomas Aragon
 - Jeanne Lee
 - Curtis Chan
 - Wayne Enanoria
 - Ana Validzic
 - Shannon Wirth
 - Darpun Sachdev
 - Lillian Brown

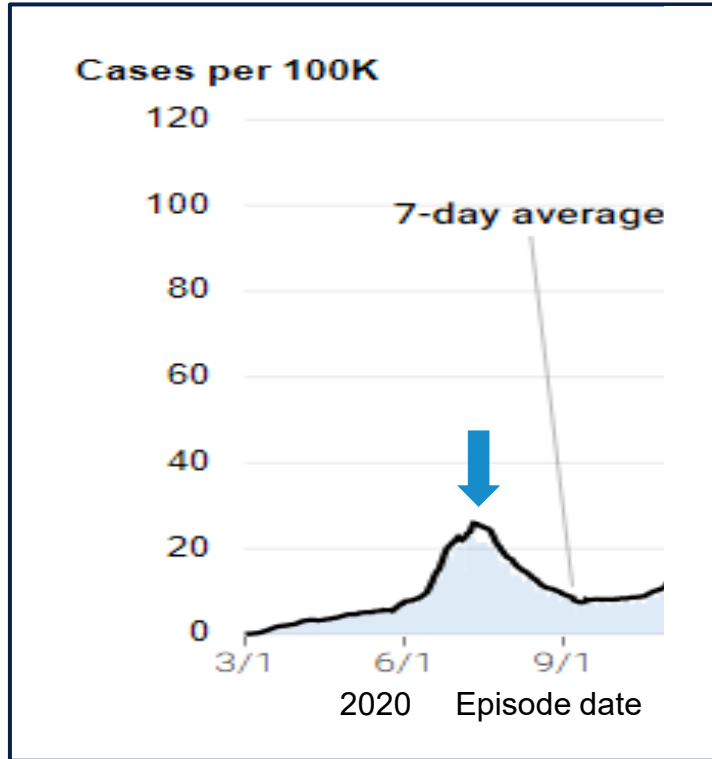
Unprecedented collaboration

- School Administrators
 - Oakland USD
 - SF USD
 - San Mateo County superintendent
 - Alameda County superintendent
 - DCYF leadership
- Teachers
 - CTA
 - UESF
 - Individual teachers (Emily Frank, MD)
- Families
 - Decrease the distance
 - CAREs webinar participants and attendees

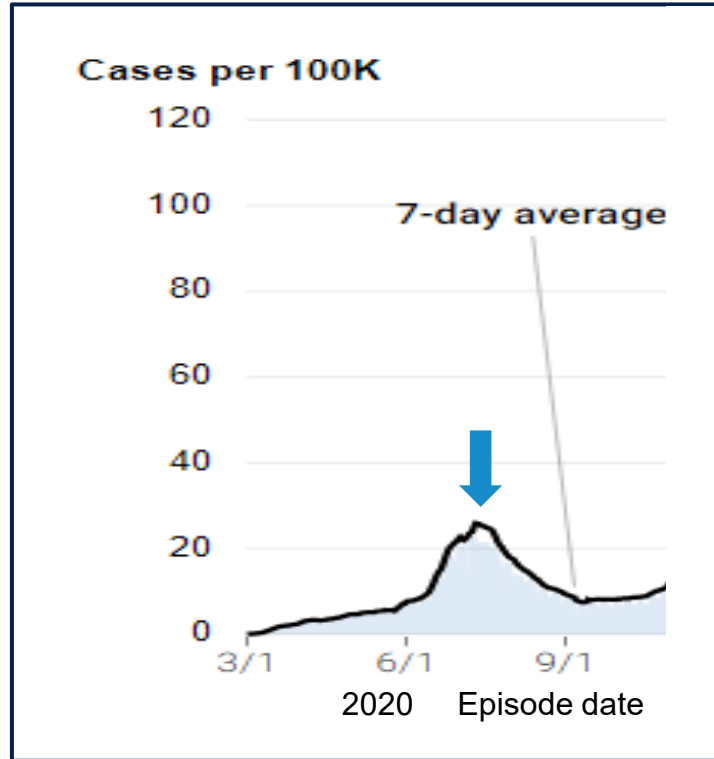
Unprecedented collaboration

- Funding
 - Department of Pediatrics
Development office
 - Chancellor's COVID fund
 - FluLab
 - SilverGiving

Summer surge decreased confidence



Summer surge decreased confidence



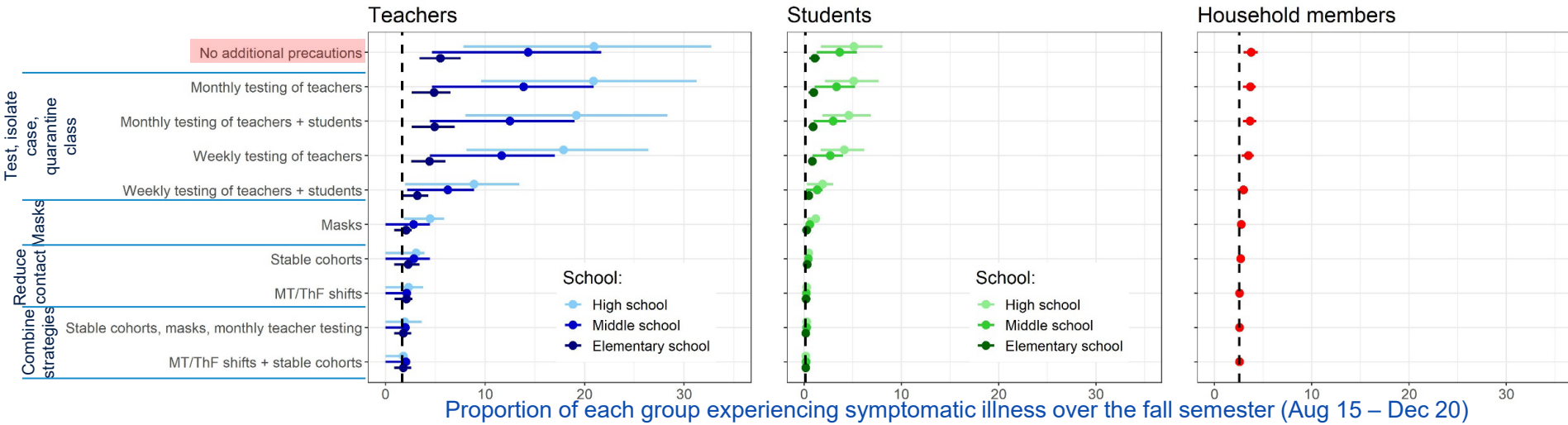
Build on momentum: SF Summer camps study 2020

- 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 follow public health principles. Student self-collected PCR tests highly feasible and acceptable for students as young as kindergarten



Modeling study: Masks and stable cohorts compared to testing

- 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)
- 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



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

Observing practices and transmission in learning hubs

- 57 learning hubs in SF
- On-site visits Nov 2020-Feb 2021 (high community incidence)
- Mixed methods: observing practices and gathering qualitative data on barriers and facilitators
- Variable practices—higher in adults than students
- 36 cases, 1 transmission (adult-to-adult)
- Implications: implementing layers feasible in higher risk settings, associated with no student transmissions

Utility of illness symptoms for predicting COVID-19 infections in children

- COVID-19 symptoms are non-specific and overlap substantially with other childhood viruses
- Can we inform national and state recommendations for symptom screening, to limit missed school days for testing?
- Reviewed symptom screening results and test results from BCH-Oakland, Mt Zion, and PAMFRI April 2020-Nov 2021 for children 0-4 and 5-18 years

Utility of illness symptoms for predicting COVID-19 infections in children

- Highest positive likelihood ratios for prior exposure (5.26) and loss of taste or smell (3.57)
- Nasal congestion/rhinorrhea, sore throat were very common (43-44%) and likelihood ratios of ~ 1 , indicating no associated change to chance of testing positive

Utility of illness symptoms for predicting COVID-19 infections in children

- High numbers of missed school days associated with exclusion and testing to find one case of COVID 19
- Implications: exclusion and testing for common non-specific symptoms may lead to excessive missed school days

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Utility of illness symptoms for predicting COVID-19 infections in children

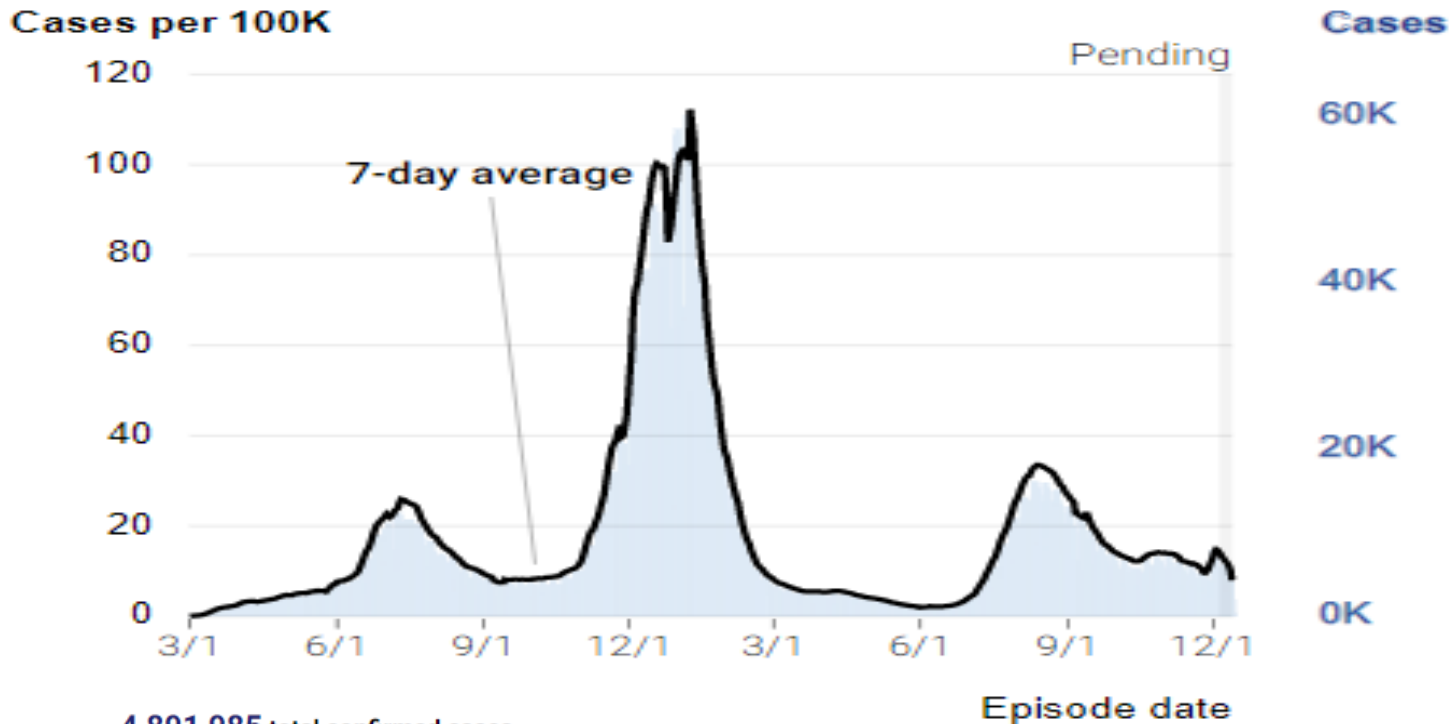
- Limitation: original strain and potentially some alpha variant
- As we move to endemic stage, it will be helpful to have a system to update these analyses (e.g., with Omicron infections)
- Option to consider now based on findings: allow for rapid tests to clear symptomatic students if with non-specific symptoms; consider not excluding for very common non-specific symptoms



Public Health Leadership Stories and Lessons Learned

Part 2: Making evidence-based policy decisions

- How do we put what we know into practice?
 - “The Last Mile Problem”
- Sharing and interpreting the science--thought leadership
 - Medicine Grand Rounds in July 2020
 - CARES UCSF webinars, listserve
 - Media collaboration: NYT op-ed solicitation
 - Chicago public schools testing consultation
- Service
 - SF DPH deployment to support design of school testing strategy for schools
 - CA DPH deployment to lead multi-agency Safe Schools Team



4,891,985 total confirmed cases
 5,476 new cases (0.1% increase)
 13.6 cases per 100K (7-day average)

Cases per 100K

Cases

120

Pending

60K

100

40K

80

60

3/4: State of
Emergency

20K

40

20

0K

0

3/1

6/1

9/1

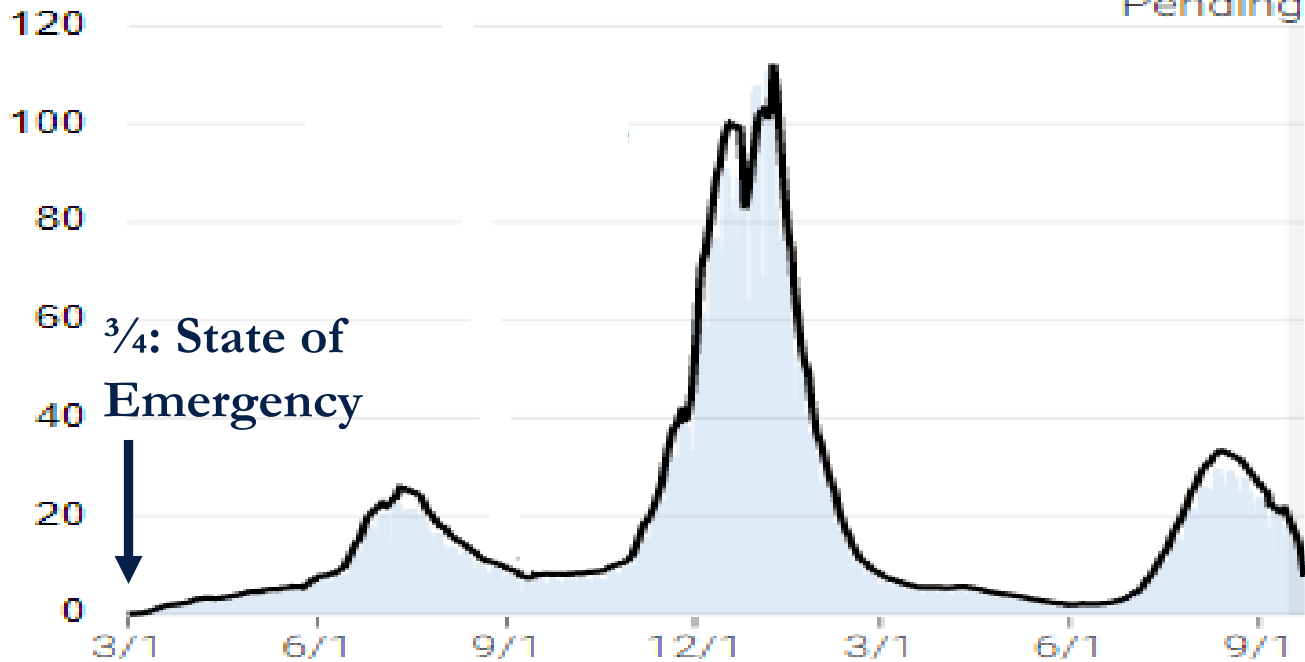
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Episode date



Cases per 100K

120

100

80

60

40

20

0



3/7: Schools shut

3/1

6/1

9/1

12/1

3/1

6/1

9/1

Episode date

Pending

Cases

60K

40K

20K

0K

Cases per 100K

Cases

120
100
80
60
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20
0

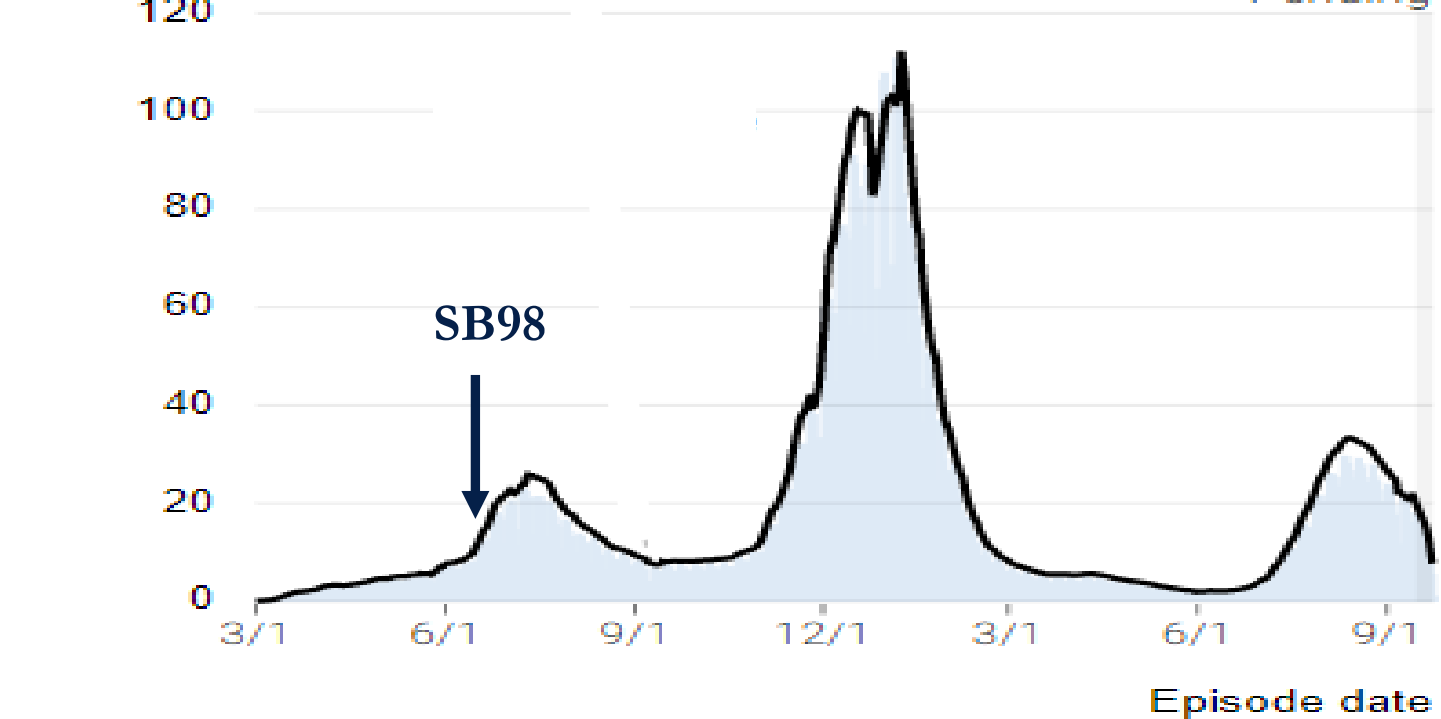
Pending

60K
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SB98

3/1 6/1 9/1 12/1 3/1 6/1 9/1

Episode date



Cases per 100K

120
100
80
60
40
20
0



Pending

Cases

60K
40K
20K
0K

3/1 6/1 9/1 12/1 3/1 6/1 9/1

Episode date

Cases per 100K

Cases

120

Pending

60K

100

San Bernadino
announced not
reopening

40K

80

60

40

20K

20

0

0K

3/1

6/1

9/1

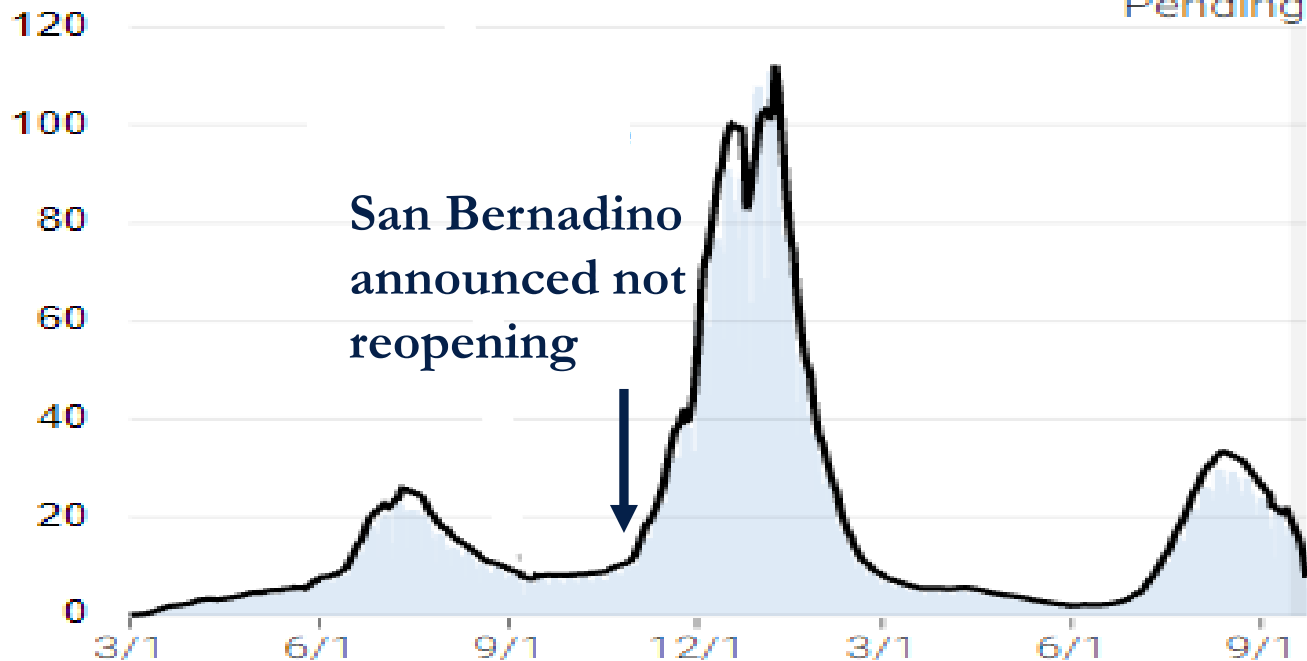
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Cases per 100K

Cases

120
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Pending

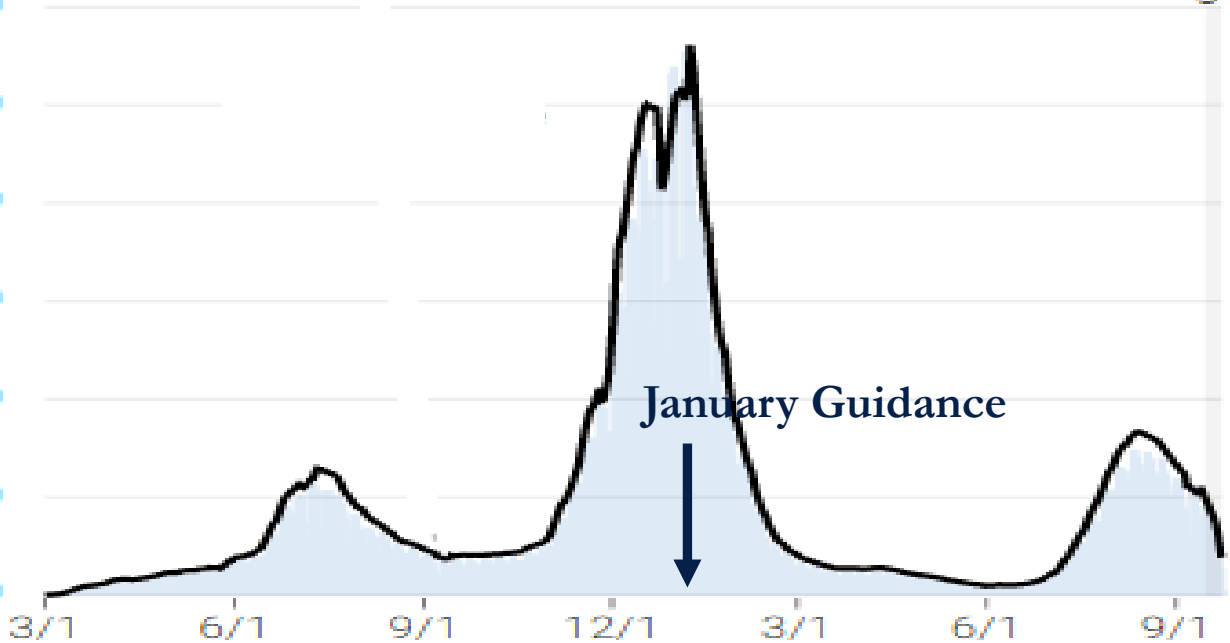
60K
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January Guidance



3/1 6/1 9/1 12/1 3/1 6/1 9/1

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Cases per 100K

Cases

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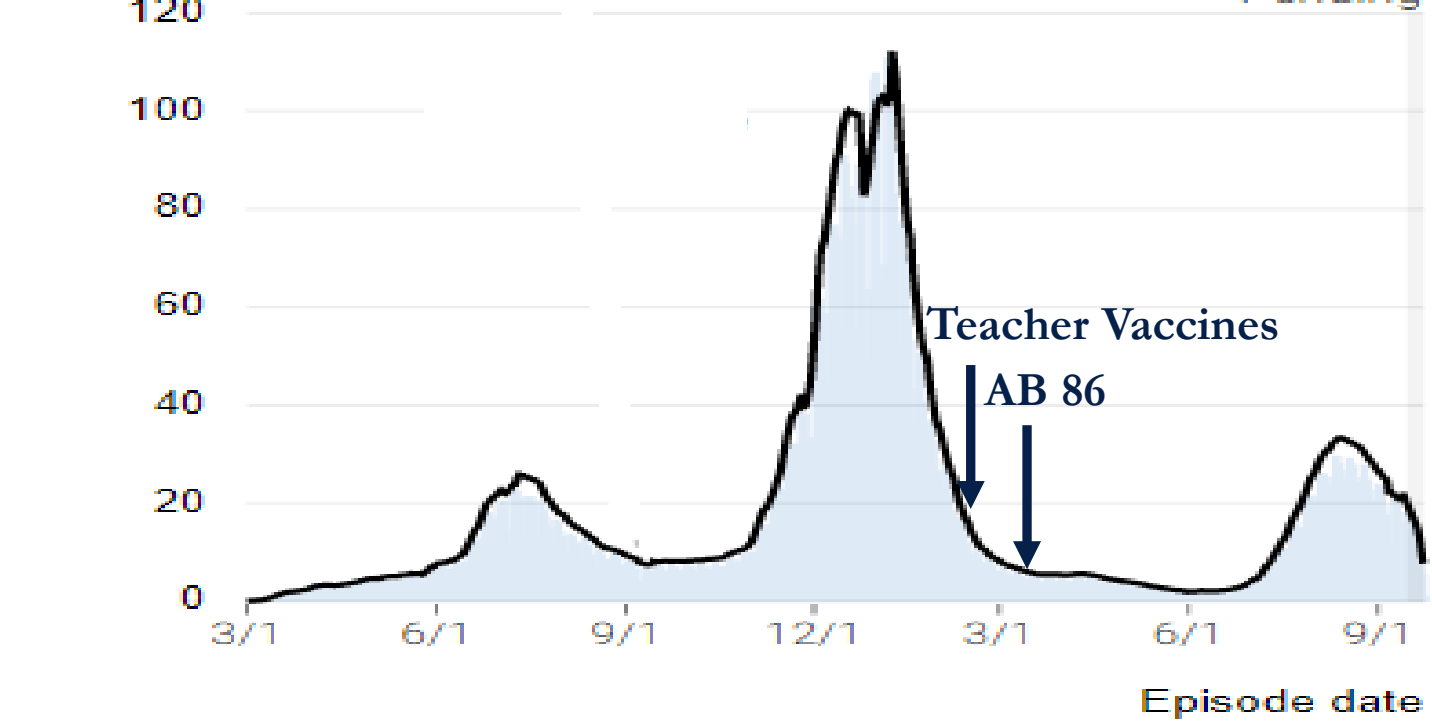
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Teacher Vaccines

AB 86



Cases per 100K

Cases

120
100
80
60
40
20
0

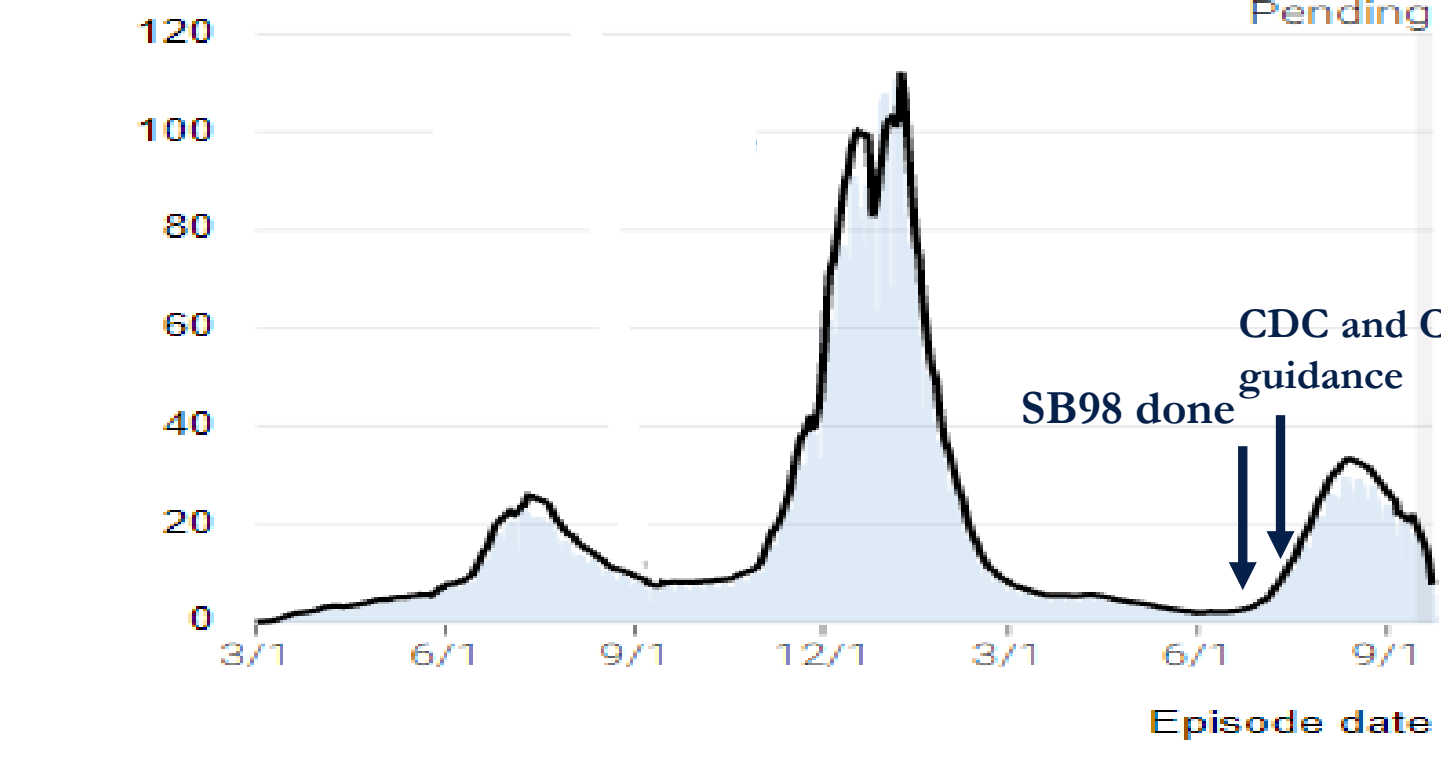
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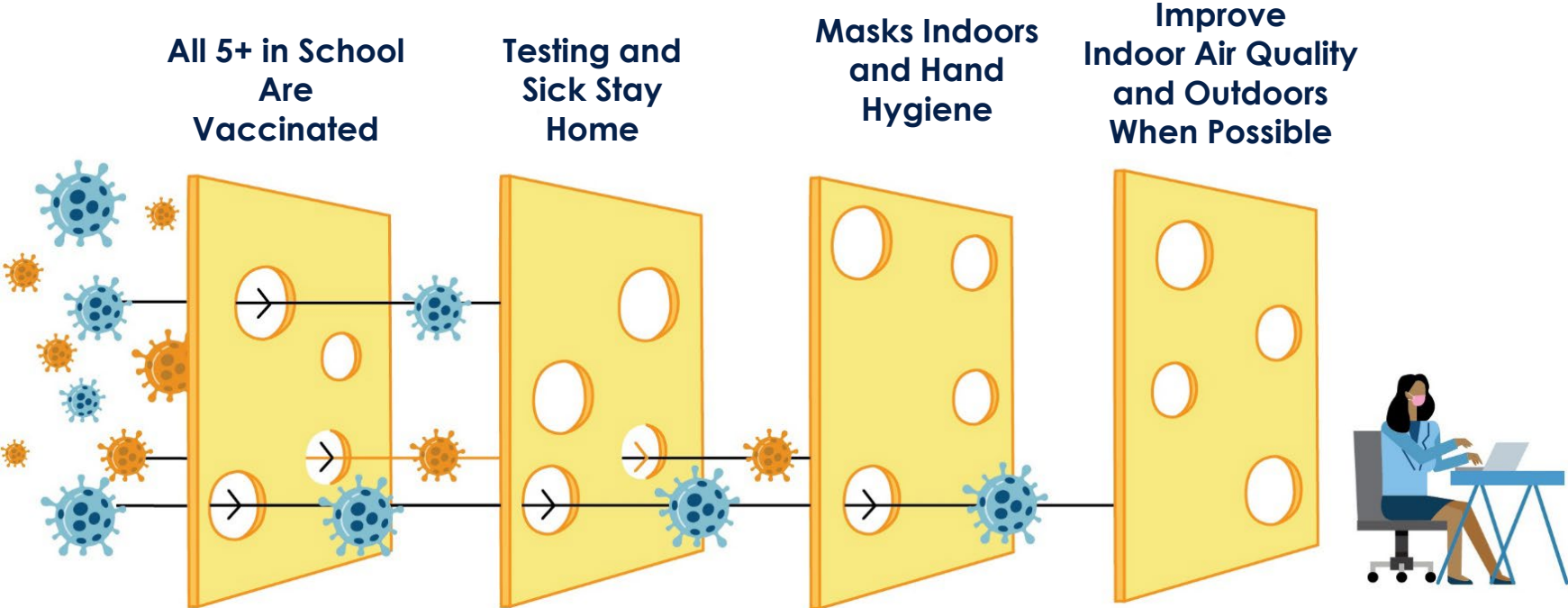
SB98 done
CDC and CDPH guidance



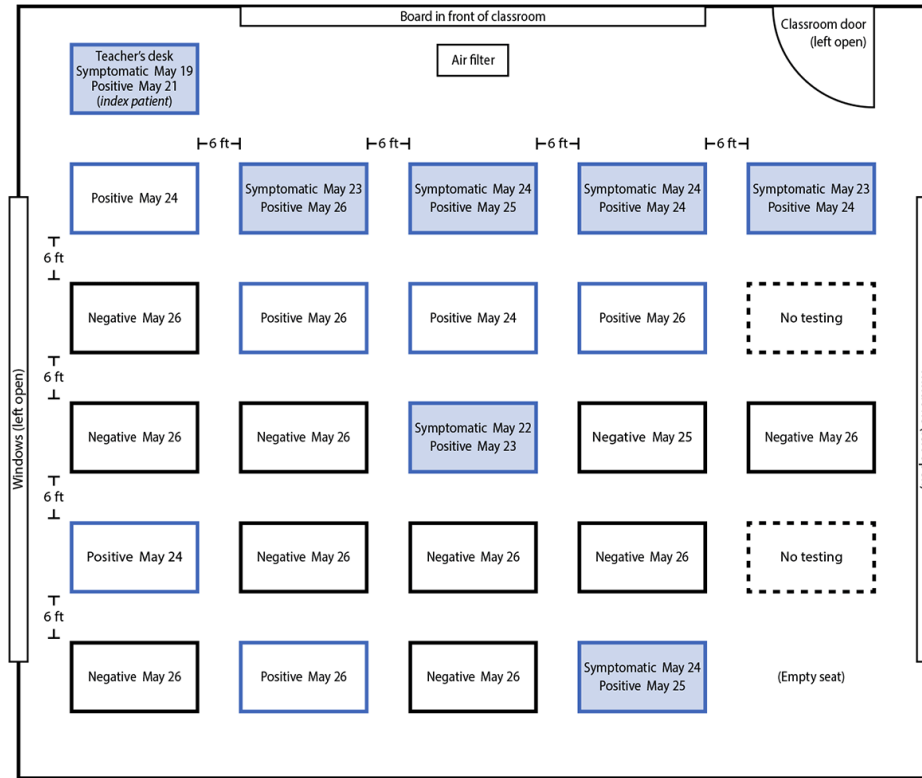
Conceptual Model of Spread from Schools informing 2021-22 Guidance



Key Safety Layers: Making Schools the Safest Places in the Community

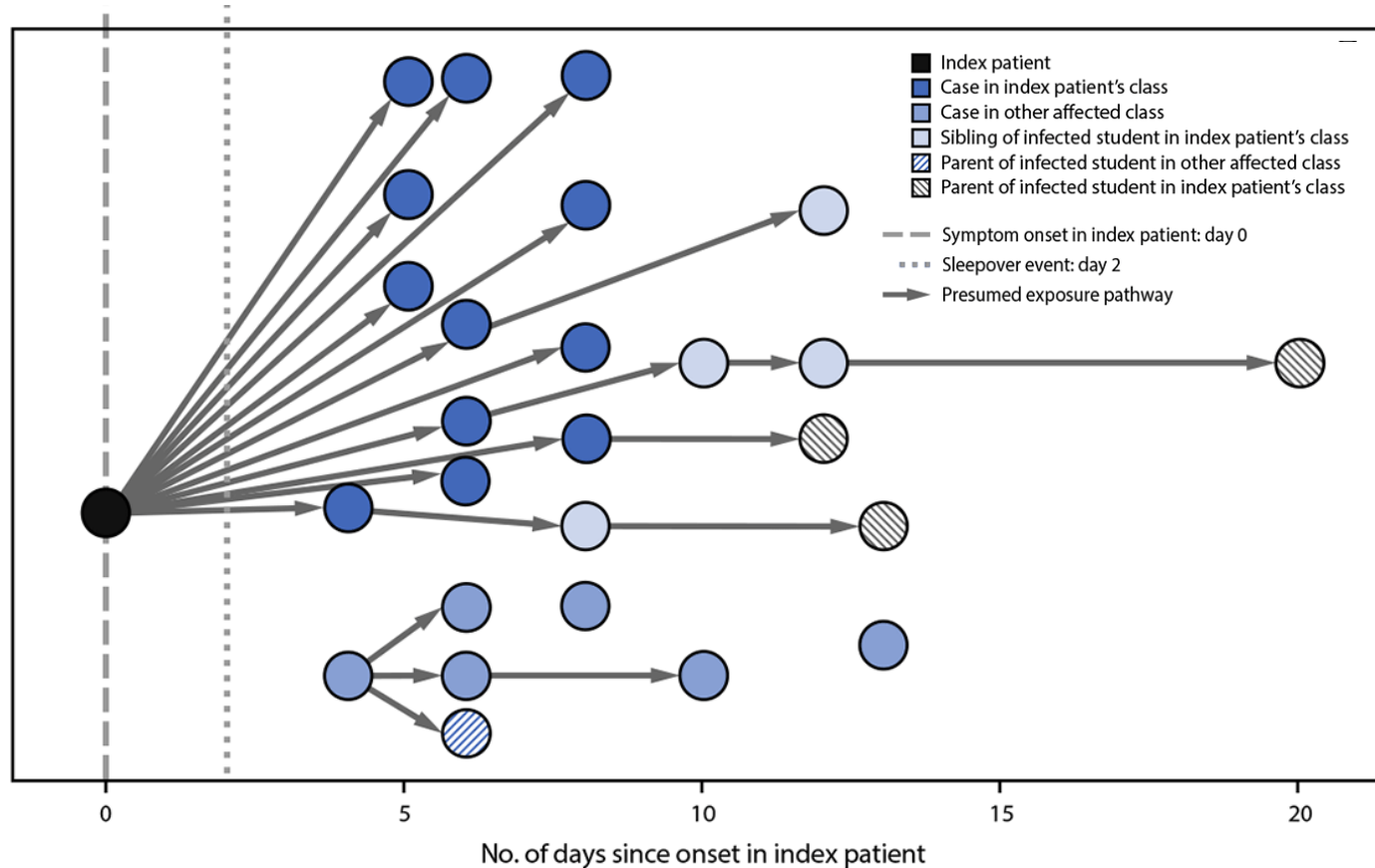


Outbreak in Marin Elementary School— Delta Associated, May 2021

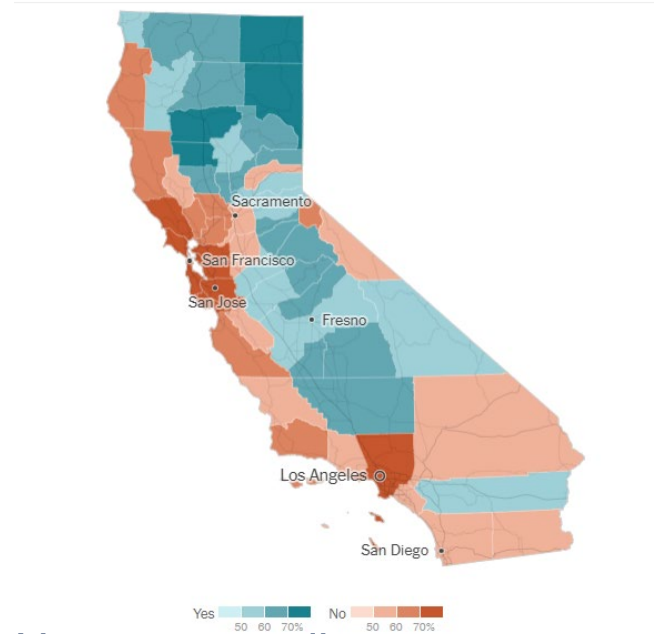
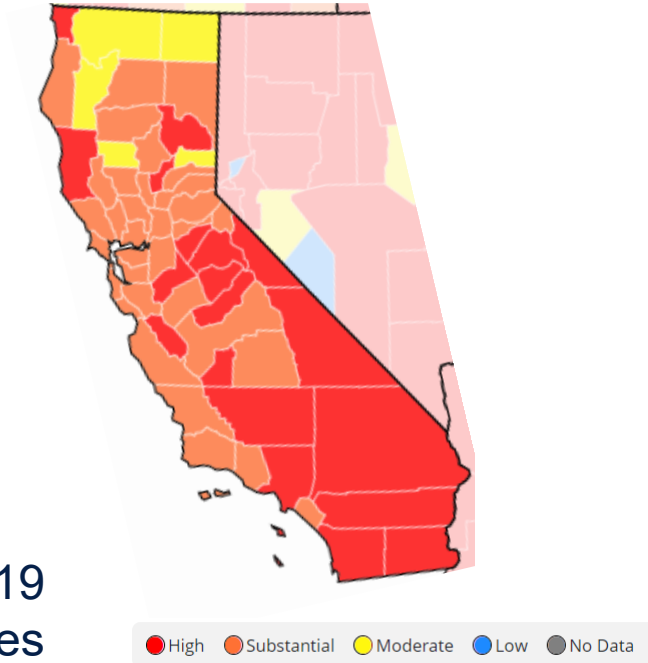


- Symptomatic case
- Asymptomatic case
- Negative test result
- No testing

Outbreak in Marin Elementary School— Delta Associated, May 2021

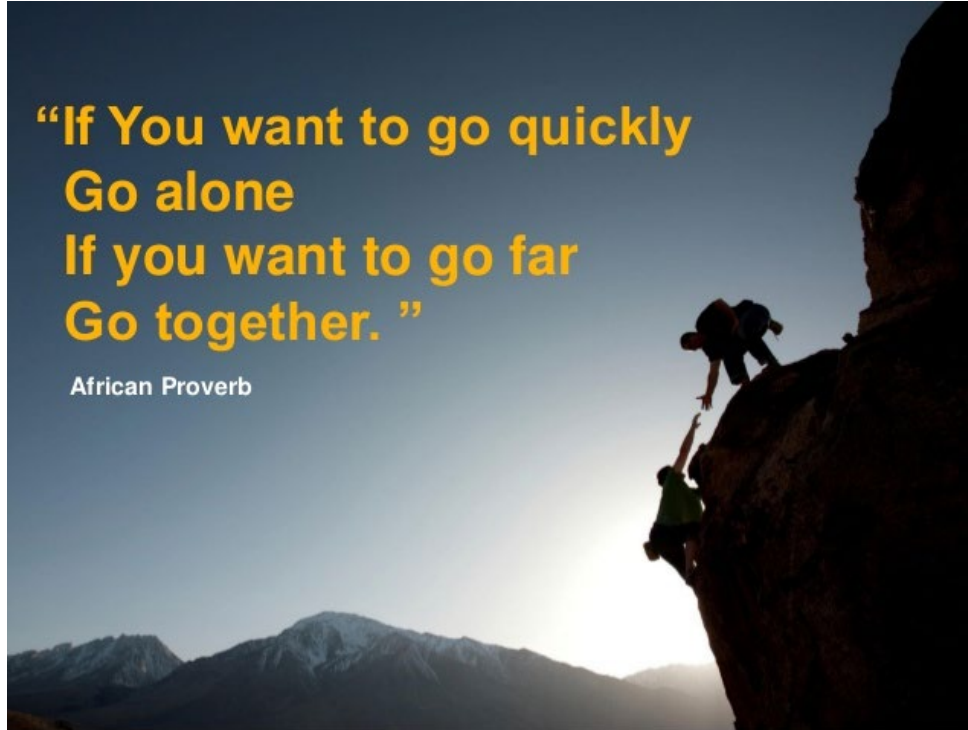


The great diversity of CA's 58 counties



**“If You want to go quickly
Go alone
If you want to go far
Go together. ”**

African Proverb



School year 2021-22
Masking in Schools:

“If we don’t enforce,
COVID enforces”



Cases per 100K

Cases

120

Pending

60K

100

40K

80

60

Distancing
and HS Law
suit

Mask Law suit

40

20K

20

0

0K

3/1

6/1

9/1

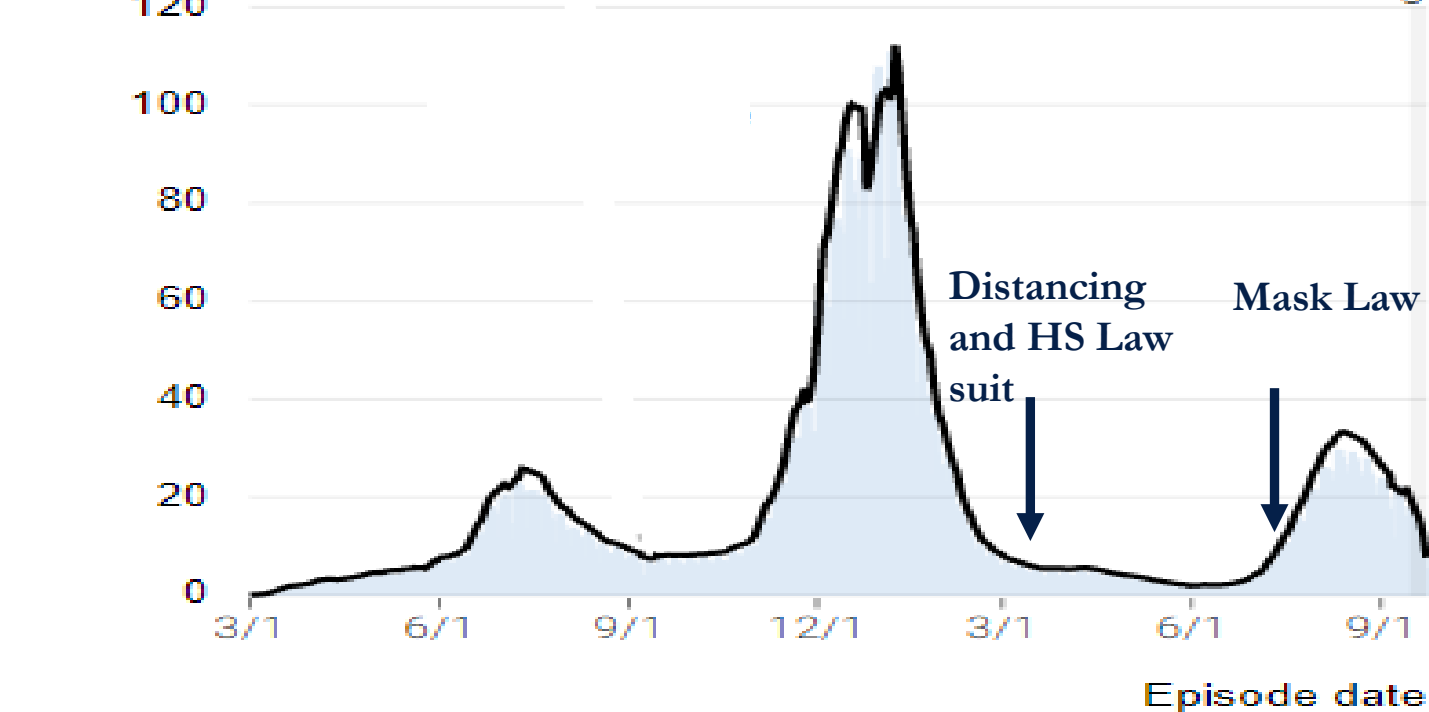
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Listening for, eliciting, and lifting up voices

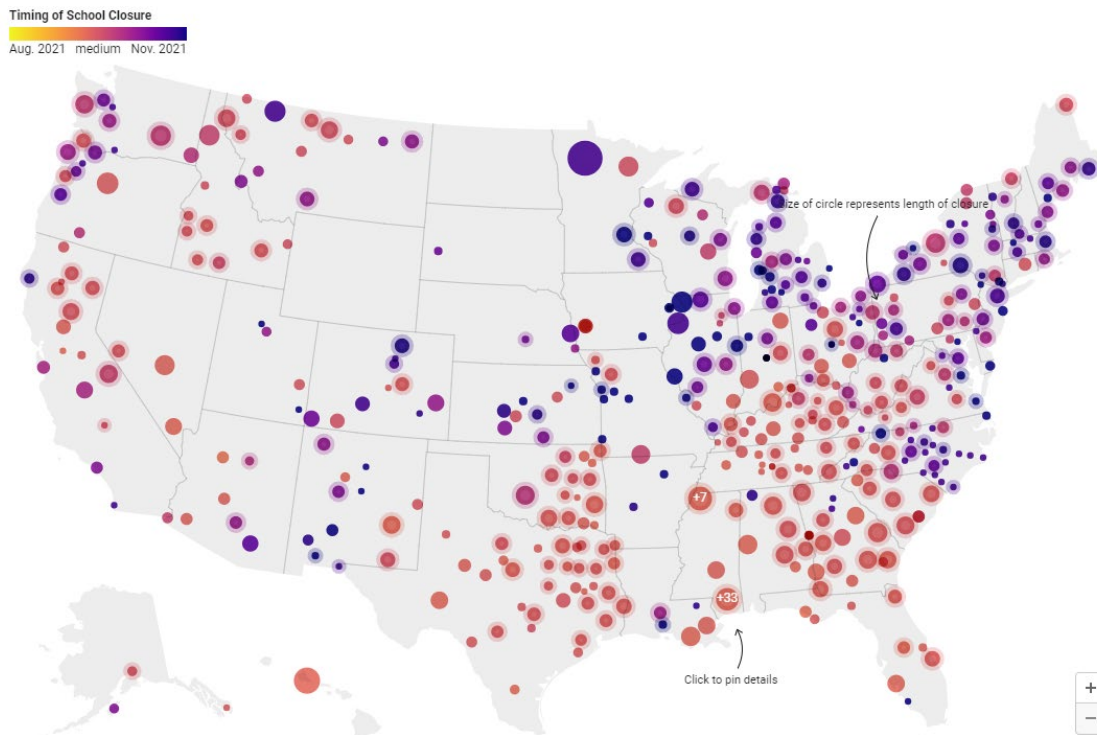
- “Please send me emails!”
- Need to remember to listen to the often-silent voices, to reach out to them, otherwise the loud voices dominate.

Stories and lessons learned

- Interplay between legislative branch, executive branch, judicial branch
- “Compared to what?” Safe AND Successful
- “The only way we are going to get through this is unprecedented levels of collaboration”
- The great diversity of CA
 - Partnership with local public health officers
 - Partnership with schools
- “COVID is the enemy”
- Fighting inequity: Whose voices get heard? Listen into the silence and lift up all voices

National and State Context

~halfway through the year, having opened during the Delta surge



As of 12/14, in Burbio school tracker

Key tools for safe and successful 2021 CA school reopenings

- Summer communications campaign to share science and instill confidence
- Mask mandate for all, no minimum physical distancing
- “Test to stay” for mask-on-mask exposures at any distance and shortened quarantine option
- High vaccination rates
- Testing capacity (\$887 million plus \$300 million for LA)



Where are we now and what should we consider on the path forward?

Situation Looking Forward

- Ongoing surges
- Safe and Successful still the twin goals
 - “Not on our watch”
 - Keep kids in school
- Schools continue to be a structured environment → masking policies are more effective in school than outside of school



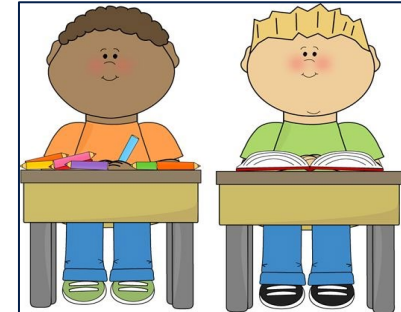
Policy Thoughts Looking Forward

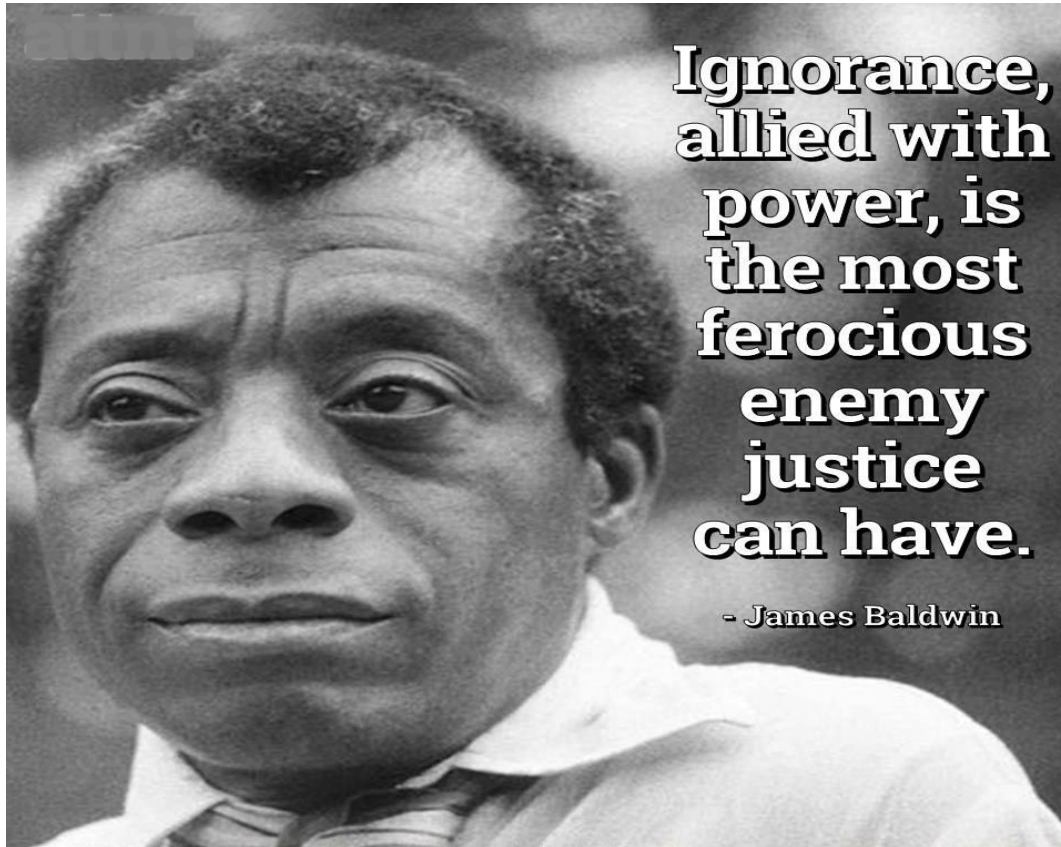
- Mask policies linked to case rates and outbreaks on campus (On- and Off-ramps for masking)
 - San Diego Unified guidance



Policy Thoughts Looking Forward

- Mask policies linked to case rates and outbreaks on campus (On- and Off-ramps for masking)
 - San Diego Unified guidance
- Minimize isolation and quarantine practices in the setting of good masking
 - If you talk to kids, the fear right now of getting COVID is about missing out on events and school, not about putting a mask back on





**Ignorance,
allied with
power, is
the most
ferocious
enemy
justice
can have.**

- James Baldwin

Questions?

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