
Helen Boucher, MD


Douglas Golenbock, MD


Robin Ingalls, MD


Matthew Leibowitz, MD


Robert Plenge, MD

Viral Testing Webinar

The Scientific Rationale

Wednesday, Sep 2, 7:00pm

The focus of this webinar will be on the scientific rationale for a viral testing program, and it will include panelists from the testing task force's scientific advisory committee. Panelists will respond to questions from the community.

Panelists will include:

Dr. Helen W. Boucher, MD: Chief, Division of Geographic Medicine and Infectious Diseases, Tufts Medical Center

Dr. Douglas Golenbock, MD: Chief of Infectious Disease, UMass Medical

Dr. Robin Ingalls, MD: Professor of Medicine and Microbiology, Boston University Medical Center

Dr. Matthew Leibowitz, MD: Chief, Division of Infectious Diseases, Newton-Wellesley Hospital

Dr. Robert Plenge, MD: Senior Vice President, Head of Immunology, Bristol Myers Squibb

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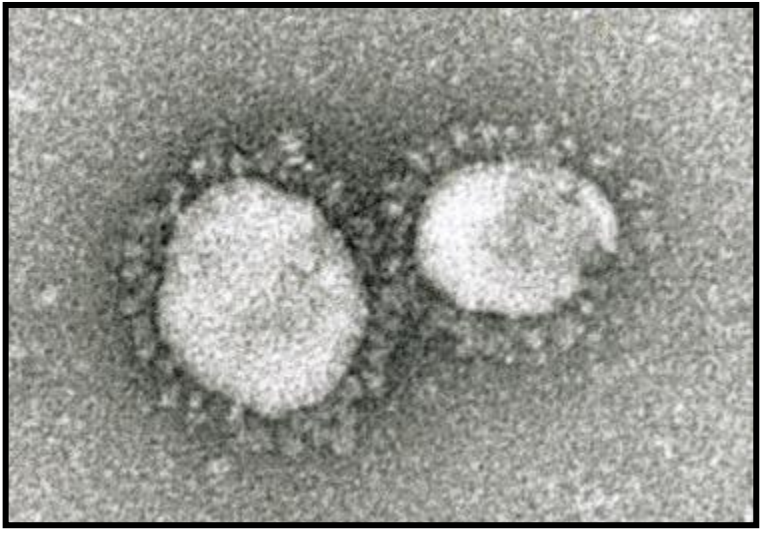
Wellesley Education Foundation
Inspiring the Love of Learning

This is the first of two webinars. Tonight we will focus on the scientific justification for viral testing in K-12 classrooms. The next webinar will have more information on the operational logistics of how testing will be conducted.

Agenda

- **Agenda (Robert, 2-minutes)**
- **Introductory remarks (David Lussier, 3-minutes)**
- **Introduction to COVID-19 (Helen, 5-minutes)**
- **Introduction to viral testing (Robert, 5-minutes)**
- **NWH perspective (Matt, 5-minutes)**
- **Submitted FAQs (Robin, 10-minutes)**
- **Open Q&A (Doug, 30-minutes)**

Throughout, physicians will share their experiences in the hospital, which underscore that adherence to universal precautions will keep our K-12 classrooms safe.



Tufts Medical Center

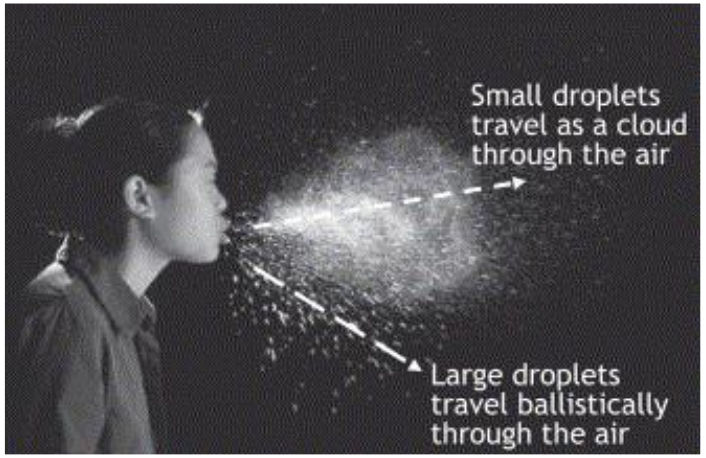
COVID-19

Helen W. Boucher MD FACP FIDSA

Chief, Division of Geographic Medicine and Infectious Diseases

Tufts | CENTER FOR INTEGRATED MANAGEMENT OF ANTIMICROBIAL RESISTANCE

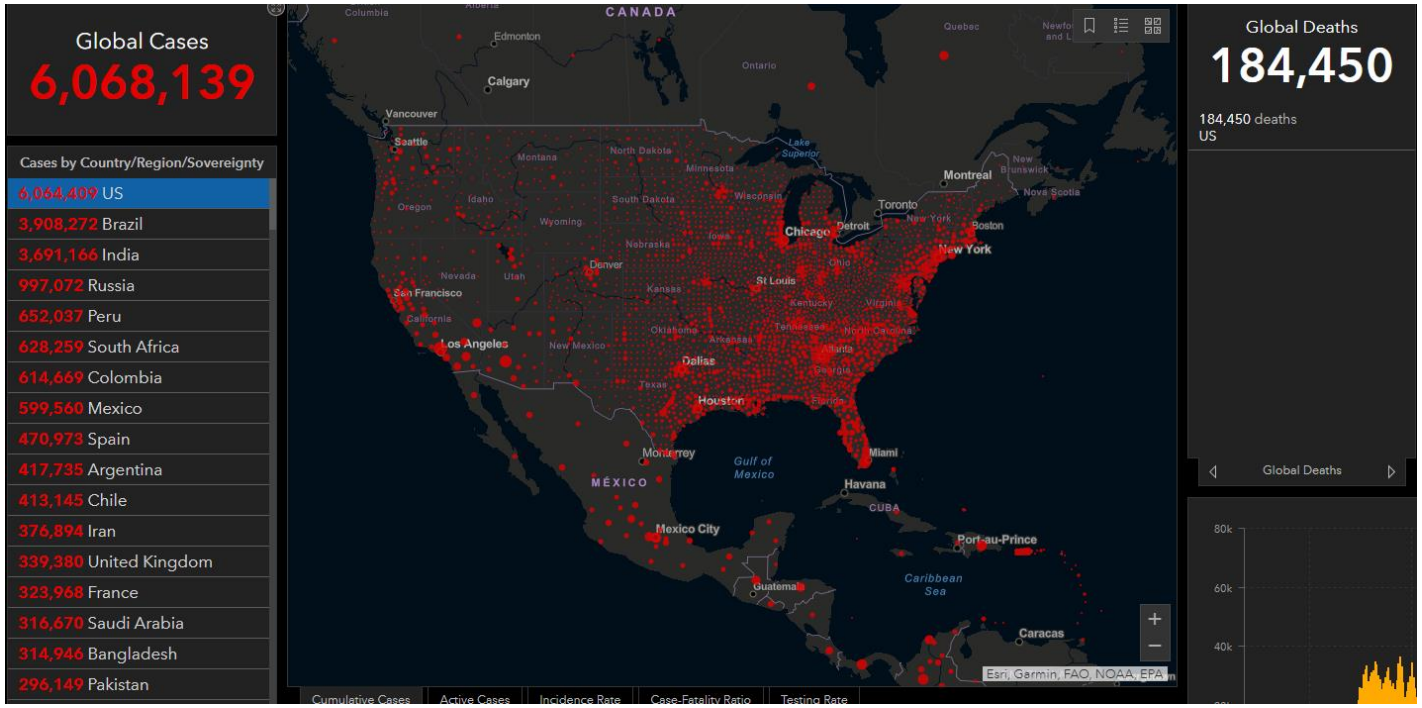
COVID-19

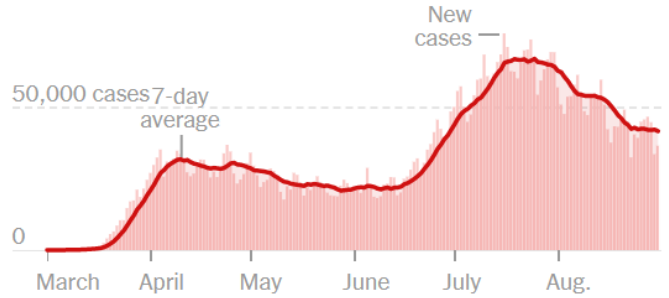


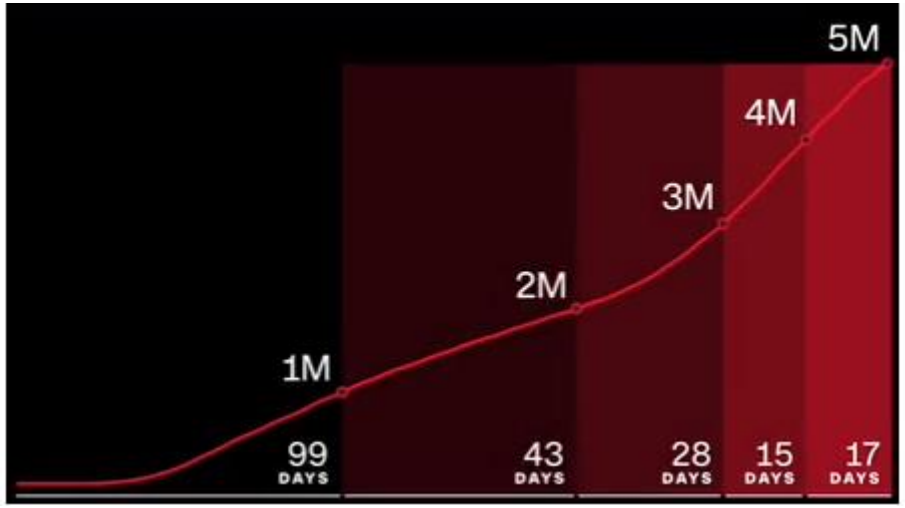
Tang JW et al, *J Hosp Infect* 2006; 64:100-14.

- Respiratory illness caused by the virus SARS-CoV-2
  - Coronavirus
    - Causes the common cold, SARS, MERS
    - SARS-CoV-2 is a NOVEL coronavirus
- Transmission
  - Via respiratory droplets like other respirator viruses (ex. Influenza, the common cold viruses)
  - When the virus comes in contact with mucosal surfaces (eyes, mouth, nose) it can invade the body and cause infection
  - There is evidence of transmission from asymptomatic or pre-symptomatic people (MMWR March 2020)

United States September 1st



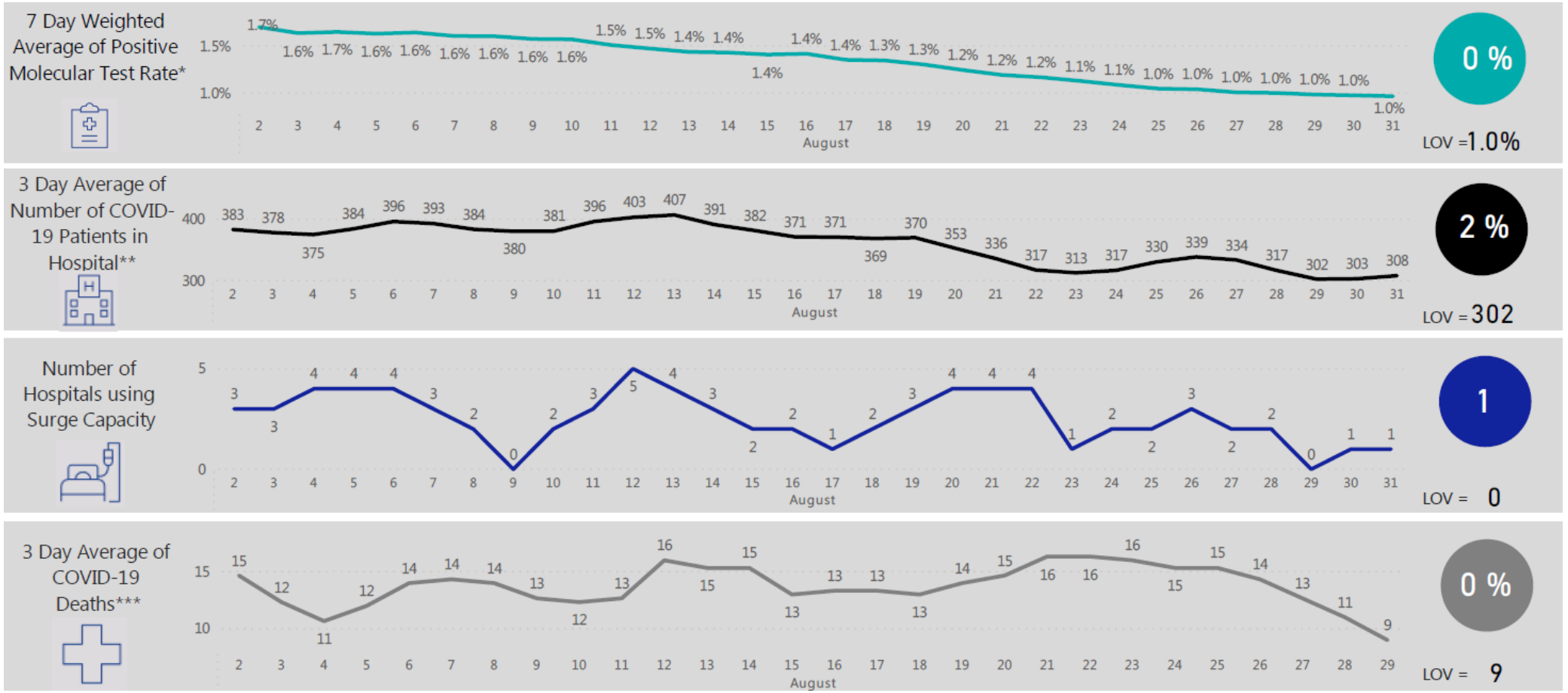




- 31,406cases/24 hrs

www.covidtracking.com; nytimes.com; CNN.com

MA DPH Dashboard – Favorable Trends September 1st



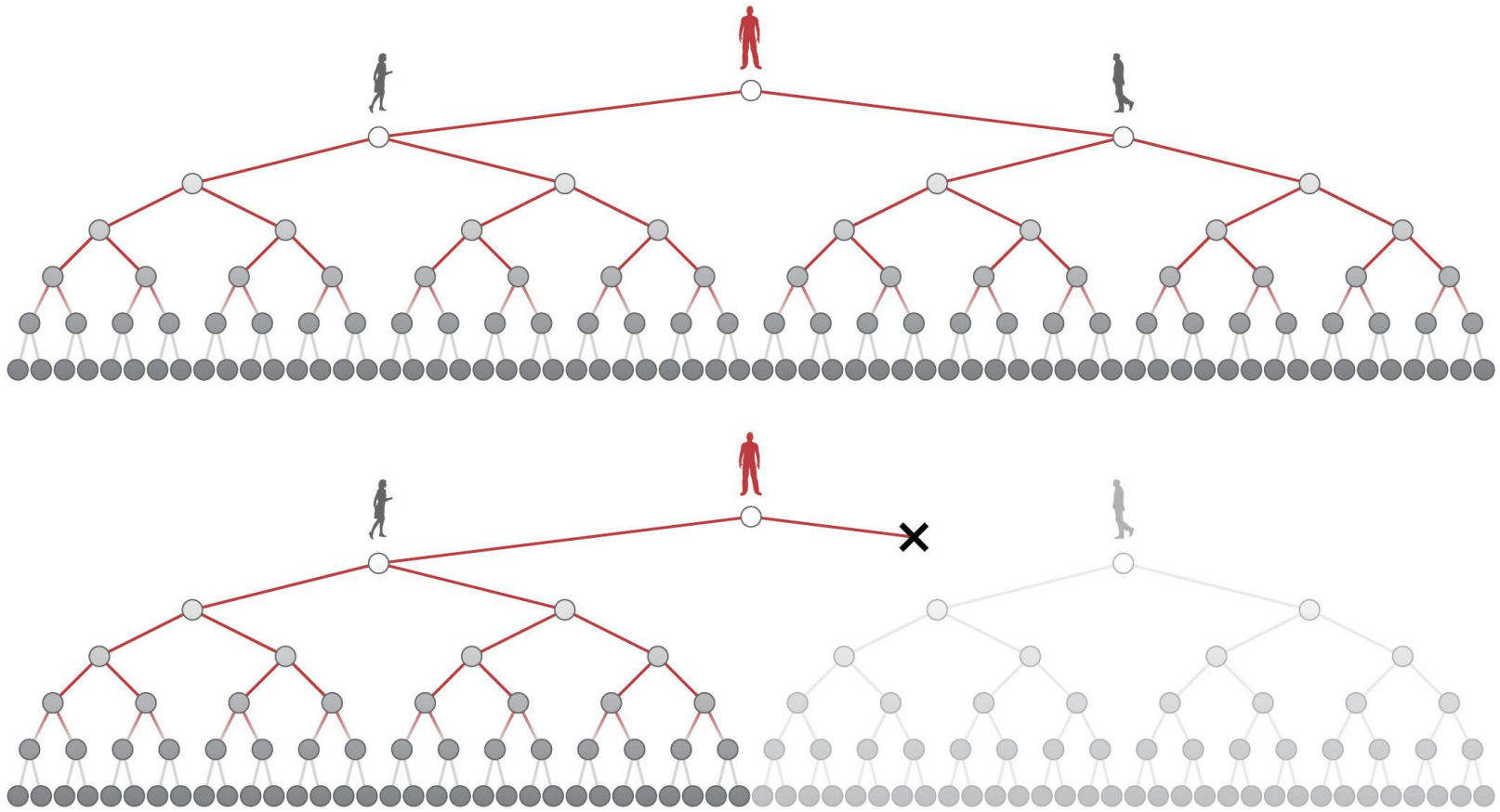
Measures YOU Can Take

Tufts Medical Center

Public health interventions

- Wash your hands with soap and water thoroughly for 20 seconds (or use hand sanitizer if necessary) frequently
- DO NOT touch your face – this could introduce virus on your hands to mucous membranes
- **Physical distancing** to avoid exposure
  - Exposure – being 6 feet from an infected person for 15 minutes or more without wearing a mask (CDC)
  - Avoid gatherings of people
  - Avoid people who are coughing or appear ill
  - DO NOT go to work/school or be around others if you develop symptoms

Stopping the transmission of COVID-19 by even one person makes a big difference!



Jonathan Corum and Siobhan Roberts, New York Times, March 19, 2020

Masks Work!


DO choose masks that
Have two or more layers of washable, breathable fabric
Completely cover your nose and mouth
Fit snugly against the sides of your face and don't have gaps
DO NOT choose masks that
Are made of fabric that makes it hard to breathe, for example, vinyl
Have exhalation valves or vents, which allow virus particles to escape
Are intended for healthcare workers, including N95 respirators or surgical masks


Caution: Gaiters & Face Shields
Evaluation is on-going but effectiveness is unknown at this time
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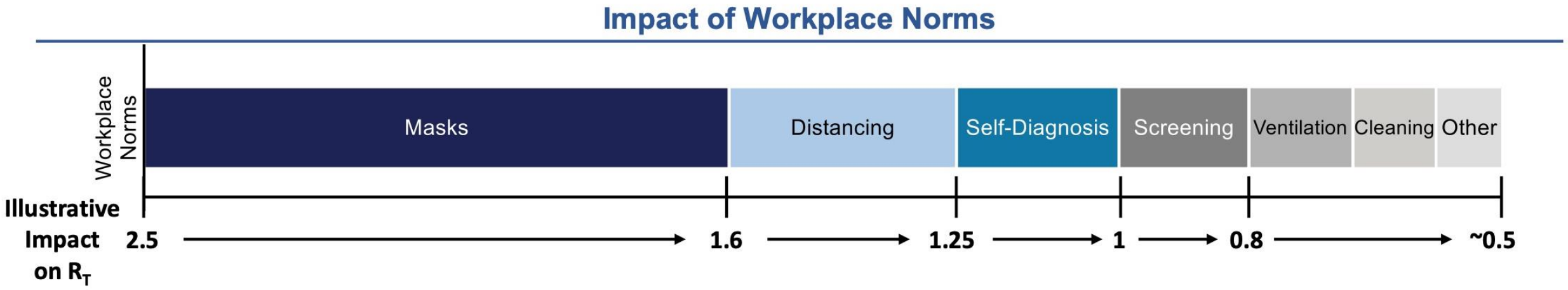
Special Situations: Glasses
If you wear glasses, find a mask that fits closely over your nose or one that has a nose wire to limit fogging
Special Situations: Children
If you are able, find a mask that is made for children
If you can't find a mask made for children, check to be sure the mask fits snugly over the nose and mouth and under the chin
Do NOT put on children younger than 2 years old

Thank You!

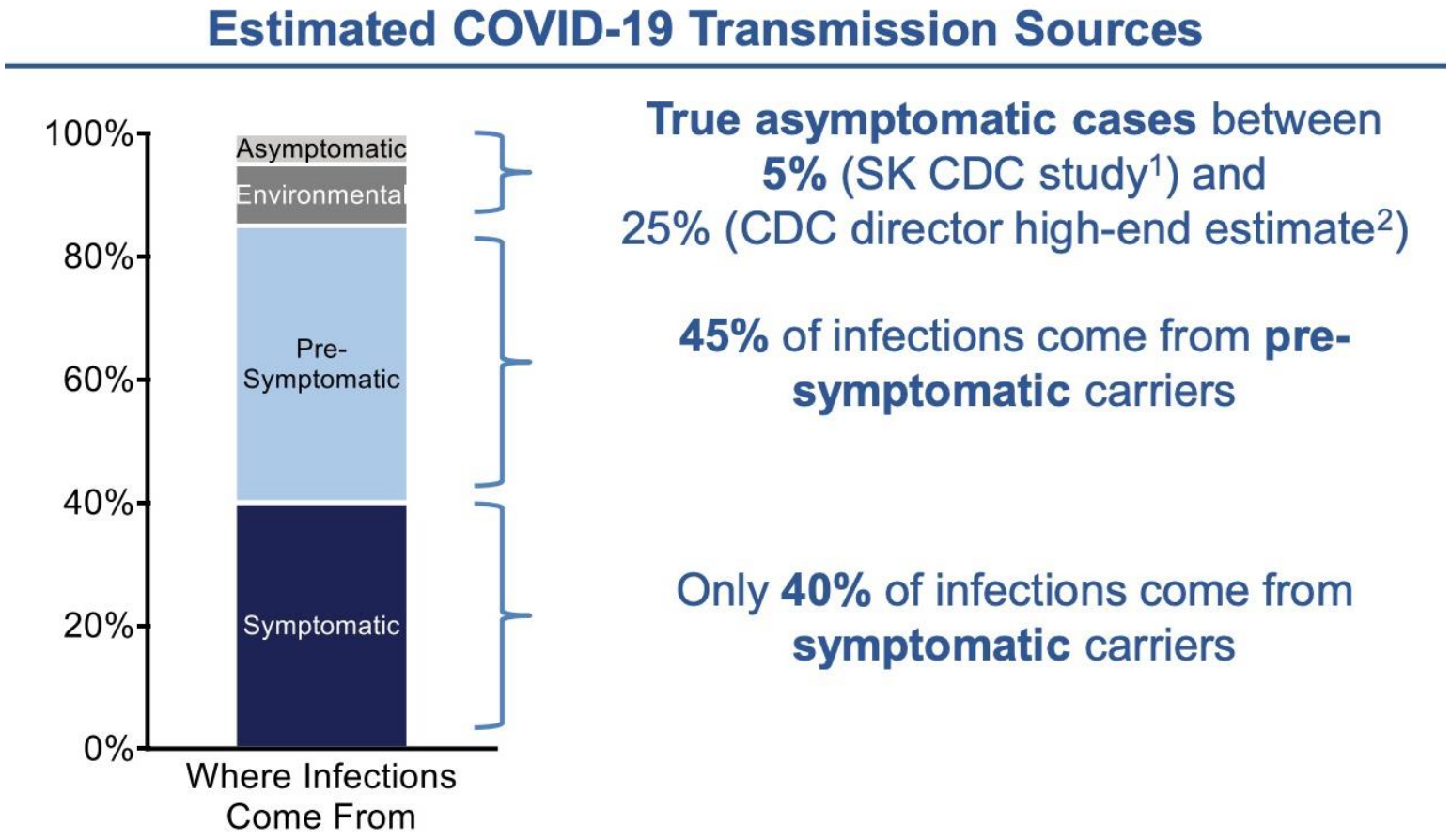
“Universal precautions” are our core defense against viral spread in K-12 schools



<u>Take home message #1</u>: viral testing will provide objective data that universal precautions are working. In turn, viral testing will provide *reassurance* to students, families, teachers, and staff that our schools are safe for in-person education.

Source: Massachusetts High Technology Council

Most transmission occurs in those *without* symptoms – hence surveillance testing



Take home message #2: catching new cases early prevents spread through communities. Preventing silent spread will prevent outbreaks. Viral testing in those without symptoms (i.e., surveillance testing) represents our best chance to prevent another lockdown.

Source: Massachusetts High Technology Council

There are different types of ”viral tests” for active infection, which are different than serology tests for past infections

	PCR	Antigen	PCR Pooling	Antibody (Serology)
	• **Viral DNA/RNA test** from nasal/throat or saliva • Samples typically **processed in scale clinical labs or large hospitals** with complex testing equipment	• **Nasal swab test to detect viral surface proteins (antigens)** • Samples typically **processed in at-home, at doctor's offices or clinics** with $500 readers	• **Pooling of PCR samples** to run same process reducing cost for low-risk testing • **Useful for large populations like colleges**	• **Detection of the antibody response to the virus** • **Backwards looking surveillance tool** • Samples typically processed In large hospital or clinical **labs**
Timing	**Early** (can detect ~2-3 days before symptoms present)	**Later than PCR** (often detection commences in line with onset of symptoms)	**Early** (in line with PCR testing)	**During or after-the-infection**
Accuracy	**High** (95% sensitivity) reported but lower (80%) in practice	**Medium** (80% PCR sensitivity) lower in practice (limited data)	**High** same as PCR, but requires additional follow up testing	**Medium** with false positives (~5%) a concern
Commercial Cost	**Medium** (~$100+ fully-loaded cost, ~$30-50 'at cost')	**Low** (~$20-30 fully-loaded cost)	**Low** (~$15-20 pooled / test)	**Medium** (~$50-120 cost)

Source: Massachusetts High Technology Council

Note: many PCR and antigen tests today use a *shallow, anterior nares swab*, which is not uncomfortable.

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Take home message #3: we propose PCR-based “molecular” tests, as these are available now; the infrastructure established will enable adoption of “rapid antigen tests” once they are widely available.

Source: Massachusetts High Technology Council

Viral testing is not monolithic – different populations should be *prioritized* based on available funding

MHTC prioritization

Suggested priority of K-12 viral testing

1. Symptomatic testing and contact tracing
2. Baseline ”time zero” testing of all students, teachers, staff
3. Surveillance testing of teachers and staff
4. Surveillance testing of older students
5. Surveillance testing of younger students

Take home message #4: prioritize K-12 populations for viral testing based on available funds

Source: Massachusetts High Technology Council


Matthew Leibowitz, MD

Newton Wellesley Hospital (NWH) perspective

- NWH is your local community hospital, affiliated with Mass General Brigham, many primary care providers and pediatricians, providing care for symptomatic patients
  - Access to testing for symptomatic patients, ordered by primary care
  - Access to testing for asymptomatic patients before procedures, travel, etc
  - Additional access to testing planned for symptomatic children at school in Newton, Wellesley and Waltham
- Public health value of baseline time zero testing, symptomatic testing, surveillance testing in teachers and students

Why do surveillance testing?

- Why would we conduct asymptomatic testing on a random basis? Couldn't we cut costs by focusing on symptomatic individuals?
- Can we opt-in with stipulations, e.g. we only want our child tested if symptomatic?
- How will this testing program improve safety beyond the standard protocols in the setting of the town's low COVID-19 rates?
- Is the testing program "necessary" to reopen schools? What about places where kids have returned to school without such a program?

What is the best test to use, PCR or antigen?

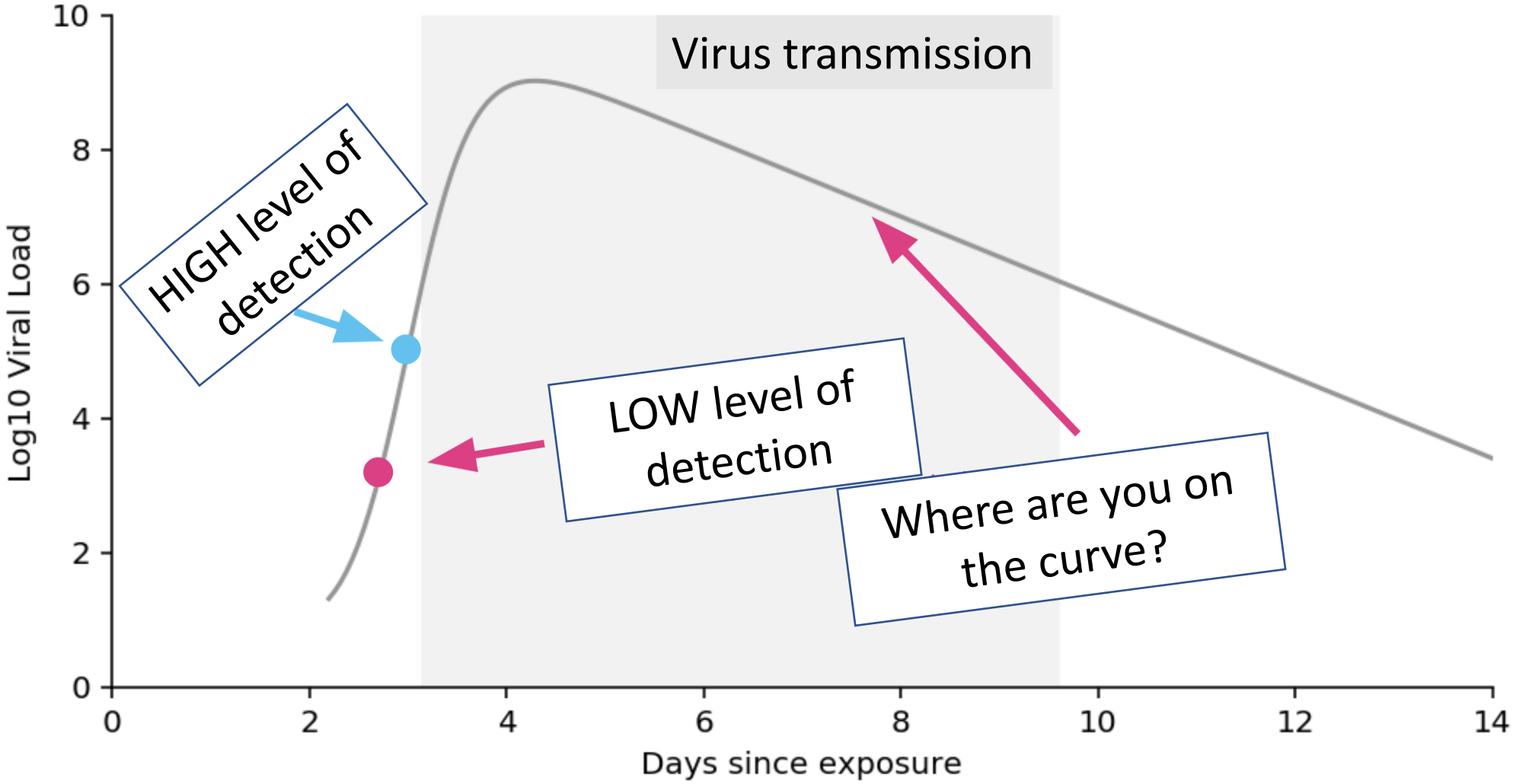
- Is PCR a better test?
- Why not wait for cheaper, rapid antigen tests?
- The PCR test has a very high cost and slow turnaround time. It is overly sensitive and detecting viral fragments in patients who are no longer contagious for weeks after their infection.
- What about that New York Times article?
  - NY Times August 29, 2020 by Apoorva Mandavilli

    Your Coronavirus Test Is Positive. Maybe It Shouldn't Be.

    The usual diagnostic tests may simply be too sensitive and too slow to contain the spread of the virus

Rapid Tests vs PCR

Which type of test is better for routine monitoring?



Adapted from Paul Sax, NEJM Journal Watch blog

Viral load estimates and test sensitivities from Larremore, 2020
https://www.medrxiv.org/content/10.1101/2020.06.22.20136309v2.full.pdf

Who should be tested and how often?

- How is the program valuable if we aren't testing every student, every week? If we miss a case, won't this negate the value of the entire program?
- What about batch testing/pooled testing? Won’t that will save money?
- What about testing wastewater?

Contact tracing and confidentiality

- How will positive results be handled?
- Who will get this information?
- What will happen to the rest of the class if a teacher or students tests positive?

All positive tests from an approved lab in the state automatically get uploaded to the state database. All test results will abide by HIPPA regulations. Only the Wellesley Board of Health will have the jurisdiction to determine who has access to the results of testing. Any contact tracing will be determined and conducted by the BoH.