# COVID-19 Testing Scenarios for School Reopening

Public Schools of Brookline

Remote Learning Task Force
Expert Advisory Panel 4: Public Health, Safety and Logistics

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# Why test?

- Identify individuals with COVID-19→isolate/quarantine to avoid transmission
  - Symptomatic individuals
  - Asymptomatic individuals
- Exclude COVID-19 in symptomatic individual→earlier return to school
- Monitoring number of cases to guide schooling decisions about modifications to procedures, closures of classrooms, etc.
- Testing will have highest impact if results can be generated and used quickly.

# Background: what test?

- Reference test method: molecular testing (rRT-PCR) to detect SARS-CoV-2.
  - Performed under FDA Emergency Use Authorization[1] (EUA)
  - Most testing in central laboratory setting (hospital or reference lab)
  - Testing capacity/supplies have been an issue throughout, but capacity ramping up throughout state
  - Labs with unused capacity exist in Boston (TBD)
  - Point-of-care (POC) testing overall unavailable
    - POC molecular platforms exist but are $$ and supplies limited even for major hospitals
    - Low-cost field-ready POC tests with high sensitivity/specificity do not yet exist
- Test turn-around time (TAT)
  - **Must include time for sample collection, transport, testing, and results return**

https://www.fda.gov/medical-devices/emergency-situations-medical-devices/emergency-use-authorizations#covid19ivd

# Background: what sample?

- Sample type: Nasopharyngeal (NP) flocked swab still preferred by FDA, but anterior nasal (AN) swab is accepted alternative (and CDC has no preference)[1,2]
  - **AN swab can be self-collected by adult/potentially collected by parent**; NP swab requires trained professional[1,2]
  - NP swab is more specialized than AN swab
  - Both swab types have high sensitivity in newly symptomatic COVID (high viral load)
  - Variable yield in asymptomatic cases and late in illness
  - University serial testing programs planning to use AN swab

(1) https://www.fda.gov/medical-devices/emergency-situations-medical-devices/faqs-testing-sars-cov-2#whatif
(2) https://www.cdc.gov/coronavirus/2019-nCoV/lab/guidelines-clinical-specimens.html

# Background: who should be tested?

- Patients with COVID have a wide range of possible presentations, ranging from asymptomatic to severely ill[1]
- Children have milder disease overall[1]
- Symptomatic adults and children have similar range of viral loads in the NP[2]
- Asymptomatic/pre-symptomatic adults have range of viral loads, including very high viral loads[3,4]
  - ??Range of viral loads in asymptomatic children—??same; TBD
- Asymptomatic adults can transmit SARS-CoV-2[4]
- Kids appear to have lower infection/transmission rates[4,5,6]


(1) https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html
(2) https://www.medrxiv.org/content/10.1101/2020.06.08.20125484v1
(3) https://www.nejm.org/doi/10.1056/NEJMoa2008457
(4) https://www.acpjournals.org/doi/10.7326/M20-3012
(5) https://www.nature.com/articles/s41591-020-0962-9
(6) Sommers et al, presentation to Advisory Panel 7-2-20

# Background:  insurance coverage and test access

- COVID testing ordered by a physician is covered by insurance without copay or prior authorization
  - Uninsured:  MassHealth will cover, but enrollment within 90D would be needed
- Testing of asymptomatic people must conform to CDC guidelines to meet insurers' medical necessity criteria for reimbursement
  - Recent contact with someone known or suspected to have COVID-19
  - For purposes of early ID in "special settings"
  - By public health officials to track spread of virus
  - In practice, this means any testing ordered by a provider will likely qualify
- **Not all testing sites around the state will test children (BCH has created a list of sites that will)**
- **Each PCP office has set up their own plan for testing (reference lab vs hospital vs referral elsewhere)**
  - **Test access and TAT currently has high variability for the kids, parents, and teachers in the PSB system**
  - **TAT can range from <24h (e.g. BCH system) to many days or more (e.g. sendout to reference lab)**

# Guiding principles and testing scenarios

- **If a child/teacher develops new or worsening symptoms c/w COVID[1] (checklist to be provided to parents and school nurses), at a minimum, they should stay home from school. Ideally, TEST, to allow quarantine, contact tracing, and return to school.**
  - TBD: What about mild symptoms? (e.g. headache only, GI symptoms only)
  - TBD: How long should they stay home?
    - **Test positive vs test negative vs no testing**
- **Three testing scenarios:**
  - **1. Leave testing up to each individual/family**
  - **2. Centralized program to rapidly test all with symptoms**
  - **3. Centralized program to test everyone (or only staff) serially (includes asymptomatic people)**

https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html

# **Testing scenario 1**: each individual gets tested in system of choice (status quo)

- Individual with symptoms consistent with COVID-19

→calls PCP or local testing site

→scheduled for testing (0-1D)

→sample obtained

→testing results return to MA DPH/*Local HD (MAVEN) + ordering provider (**1-7D**)

→For Brookline residents with positive results, Brookline HD initiates contact tracing, including notification of school nurse and individual (0-1D)

→For non-Brookline residents, local HD manages positive result (??D)

→Provider returns results to individual (0-1D)→ individual can notify HD/PSB (1-2D)

*Brookline HD only follows results for Brookline residents, and is focused on POSITIVE results

# **Testing scenario 1**: each individual gets tested in system of choice (continued)

- The Brookline HD→school notification process already appears to be as fast as possible, **BUT**:
  - Not all teachers/families have PCPs
  - Could provide list of walk-in testing centers, but similar time constraints apply
  - **Positive results for teachers and students who do not live in Brookline will go to their <u>hometown DH</u> (and PCP), not Brookline HD**
  - **[Negative results (for return to school) will have to be reported to school nurse by individuals]**
- Time from symptoms to actionable positive result available to PSB could be **2-11D**→delays in notification and quarantine→**increased risk of spread within PSB community**.
- **Need improvements to process to reduce delays:**
  - ***Could ask teachers/families who live outside of Brookline to call their results directly to Brookline HD/School nurse/supervisor**
  - ***Could attempt to identify/refer to testing sites with faster TAT**
  - ***<u>Could make testing process faster and centralized….</u>**

# **Testing scenario 2**: centralized PSB program for all **symptomatic** individuals (students, staff, and potentially parents) with **RAPID TAT**

- **Goals: a) identify cases quickly, allowing rapid quarantine and contact tracing; b) exclude COVID-19 quickly, allowing faster return to school**
- **To make program more useful than scenario #1:**
  - TAT of **actionable results** would need to be as fast as possible, and ideally ≤24h
  - Need designated testing site(s) providing same-day appointments
  - **Results need to rapidly reach staff member/family, AND those responsible for making quarantine decisions for PSB** (Brookline HD, school nurses)
  - Ideally, 7D/week
- How many people per day?
  - Per 5/12/20 presentation, K-8 (n = 5,516 students, each school ~80 staff?), BHS (2,083 students, 358 staff), BEEP x 4 (n = ?)
  - ?100 students/20 staff with consistent Sx per day? More in flu season? (*need school nurse input*)

# Centralized PSB testing program--concept

- Student/staff with new/worsening Sx c/w COVID (per provided list): call **Centralized Testing Site** (CTS) for screening/appt
- CTS located centrally within Brookline
- PSB staff/students would come to CTS even if they live elsewhere, just like healthcare workers.
- Would not do any sample collection at individual schools; anyone who gets sick at school should leave the school as quickly as possible. Teachers/students could go to the CTS before heading home.
- **Results returned rapidly both to patient AND to Brookline DH→school nurse to allow quarantine plan implementation/decision about return to school**
- CTS would need to bill insurance; need consistent ordering provider
- Would need to route non-resident teacher/student results to Brookline DH to expedite
- Families/staff could have option to do testing elsewhere (testing scenario #1)

# Where could PSB do centralized testing?

- **Option 1: utilize existing CTS, if sufficient capacity exists and TAT is reasonable**
- **Need to consider who is entering order** (could it be standing order from Brookline HD?); has implications for results reporting as well as billing
- E.g. Quest[1]
  - Interest in setting up Patient Service Center for sample collection (location(s) TBD)
  - Can have single ordering provider and web-based order entry/results interface; results also go to patient and to MAVEN
  - Quest can bill insurance and if patient doesn't have insurance, bill "client" (PSB, Town)
  - Samples labeled as "priority" (symptomatic) can get 24h TAT (lab entry→result in system)
  - *Uncertainty around TAT--depends on local/national test volume
- E.g. Partners Urgent Care Brookline (Beacon St.) (still TBD)
  - ? Capacity/TAT
- ***E.g. State-run testing site, if developed?

(1) Per informal discussion 7-10-20

# Where could PSB do centralized testing?

- **Option 2:  create our own PSB CTS**
- CTS located centrally within Brookline (with proper infection control)
- AN swabs collected at CTS (depending on lab's EUA, ? option for home collection by parent)
  - AN swabs/tubes available in CTS (vs pre-positioned at home/school, if FDA allows)
  - Samples would not be collected at school
- Workflow:
  - Samples dropped off and/or collected at CTS
  - Patient information collected/order placed at CTS
  - **Samples go by courier (e.g 2x/day) from CTS to specific contracted laboratory (TBD); results returned in <24h to CTS**
  - **Results returned rapidly both to patient AND Brookline HD→school nurse to allow quarantine plan implementation/decision about return to school**
- CTS would need to bill insurance

# If we create our own CTS, we need a lab partner

- E.g. Broad Institute's Clinical Sequencing Research Platform (CRSP)
  - High-throughput CLIA-certified genomics lab in Cambridge, converted for COVID testing
  - Current capacity 35,000/day, goal 100,000/day or more
  - Cost per test currently $50 if samples delivered to Broad, but hoping to reduce to $25-35 by fall
  - Using AN swabs; good performance vs NP in internal studies
  - 7D/week testing
  - Developing a relationship with a partner that can help communities set up a CTS
    - "Assurance Testing Alliance," Cambridge
  - **Goal TAT <u>≤</u>24h**
    - TAT= <u>time from sample arrival in lab to result report</u>

Public Q+A, 6/4/20, and informal followup 7/8/20; all would need to be confirmed if PSB interested in partnering.

# Broad/CRSP logistics, continued

- Sample collection
  - CRSP can provide AN swabs and tubes with labels
  - PSB/town CTS could manage sample collection
  - We would need to courier samples to CRSP
- Ordering, resulting, and billing
  - Every test needs an MD order
    - Could identify MD to order for PSB
    - Potential for standing “blanket” order
  - Two choices for ordering and results return
    - Set up a full website user interface (with CRSP assistance)
    - Upload of a manifest file and push results to a bucket/spreadsheet
  - CRSP will return results to ordering provider and MAVEN
  - ****CRSP does not manage insurance billing—PSB would need to do that.**

Public Q+A, 6/4/20, and informal followup; all would need to be confirmed if PSB interested in partnering.

# Testing scenario 3: centralized program to test all PSB individuals serially

- **Goal: capture asymptomatic cases**
- All students and staff; testing regardless of Sx
- Alternative: staff only
- Testing **weekly** (testing less frequently could miss new infections and interim spread)
- N = HUGE
- Insurance may not cover asymptomatic screening testing

**Testing all students/staff serially does not seem feasible. Testing staff (only) serially could be considered, especially to reduce anxiety**

**Would be important to avoid false sense of security; would still need to maintain infection control (masks, distancing, etc.)**

**Funds spent on this level of testing might be better spent on infection control measures (note that healthcare workers are not being serially tested in this way, but some university students/staff are.)**

# Questions needing answers

- What resources does PSB have to support any testing program?
  - Should limited resources be put towards testing, or only towards infection control within the schools?
  - School nurse feedback on testing volume (based on past flu/noro seasons)
  - Is there an existing location in Brookline that can function as a CTS for PSB?
  - Does PSB have the $/space/staff to set up our own CTS?
- Can we approach the town (Select Board) for resources, and have CTS also serve town employees/residents?
- Can State set up regional/local testing programs for school students/staff, to help **ALL** school systems?
- If we can't set up a Brookline CTS, how can we expedite results management for:
  - Non-Brookline residents who test positive (managed by their local HD)
  - Negative results (for return to school; self-reporting)
- Can we expect DESE guidance on the following:
  - Exactly which symptoms should prompt staying home/testing?
  - How long should kids/staff stay home when sick?
    - Test positive vs **test negative** vs no testing
  - What should trigger temporary classroom/school closure?

# Prior to school start, all families and staff will need clear instructions:

- What symptoms should prompt staying home and getting tested for COVID-19
- Where to get tested (list of options)
- What to do with results as soon as they are received
- What to expect for positive vs negative test results in terms of quarantine and return to school

Ideally, we will have a CTS in place to maximize efficiency.

Even in the absence of a CTS, thinking through testing and response plans IN ADVANCE will reduce delays, reducing risk of transmission and increasing time in school.