COVID-19 Testing Scenarios for School Reopening

Public Schools of Brookline

Remote Learning Task Force

Expert Advisory Panel 4: Public Health, Safety and Logistics

Why test?

- Identify individuals with COVID-19→isolate/quarantine to avoid transmission
  - Symptomatic individuals
  - Asymptomatic individuals
- Exclude COVID-19 in symptomatic individual→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]
  - 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/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
- Asymptomatic adults can transmit SARS-CoV-2[4]
- Kids may have lower infection/transmission rates[4,5]

(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

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
- 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**
- **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

- Sick individual→calls PCP→scheduled for testing (0-1D)→test obtained→results return to PCP (1-4D)→results return to individual (0-1D)→individual responsible for reporting to PSB (0-2D)
- Not all teachers/families may have PCPs
- Could provide list of walk-in testing centers, but similar time constraints apply
- Time from symptoms to actionable result available to PSB could be 2-8D→delays in notification and quarantine→**spread within PSB community**.
- **Without improvements to process*, too many days before actionable results**
- ***Could request parents sign a waiver at time of testing to have results sent immediately to Brookline DPH/School nurse**
- ***Could attempt to identify/refer to providers with faster TAT's**

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 DPH, 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
- Staff would come to CTS even if they live elsewhere, just like healthcare workers. [Alternative: each teacher identifies specific testing site in own hometown (but will increase the TAT)]
- Would not do any sample collection at individual schools; anyone who gets sick at school should leave the school as quickly as possible. Teachers could go to the CTS before heading home.
- **Results returned both to patient AND, rapidly, to Brookline DPH/school nurse to allow quarantine plan implementation/decision about return to school**
- CTS would need to bill insurance
- 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**
- E.g. Partners Urgent Care Brookline (Beacon St.)
  - ? Capacity/TAT
  - Need to consider who is entering order (could it be standing order from Brookline DPH, vs Partners provider?); has implications for results reporting as well as billing
  - Could patient/family sign a waiver at time of testing to allow results to go directly from this CTS to Brookline DPH/school nurse? (rather than from testing lab→State→Brookline DPH→school)
- E.g. State-run testing site, if developed?

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 by parent (at home or in CTS) or by school nurse (in CTS)
  - 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 both to patient AND, rapidly, to Brookline DPH/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
  - 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
  - **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; 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 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, if set up to do so, **MA** DPH)
    - **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)

Questions needing answers

- What resources does PSB have to support any testing program?
- How will Brookline DPH and PSB nurses be involved in results management?
- 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 $/bandwidth to set up our own CTS?
- Is there a broader argument for a CTS? Could serve town employees or residents as well?
- Can State set up regional/local testing programs for school students/staff?
- 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?