PUBLIC SCHOOLS of BROOKLINE

Advisory Panel 4: Public Health, Safety, & Logistics

Metrics Review

New SARS-CoV-2 Variant

January 8, 2021

Community Benchmarks - Status

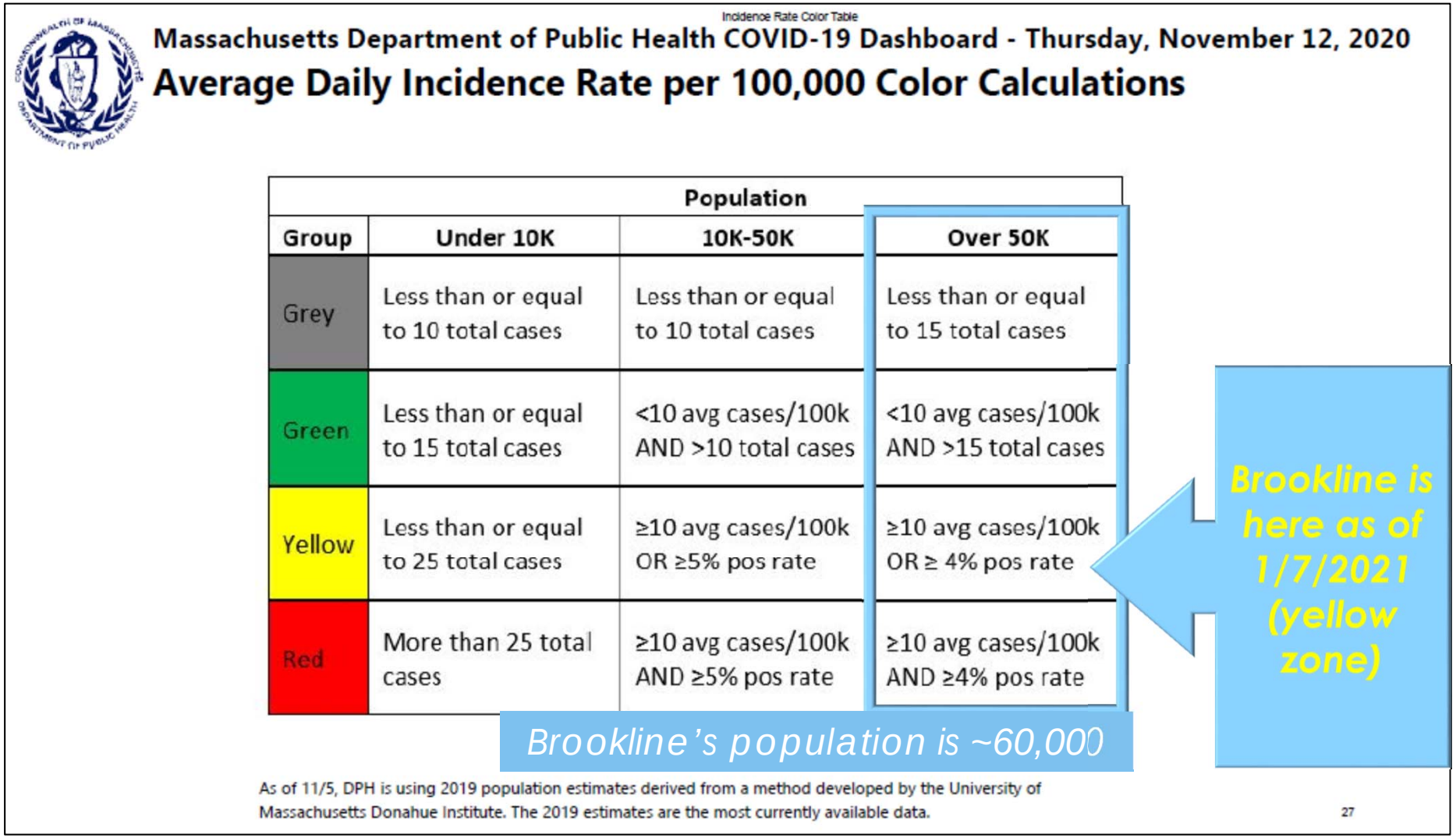
Benchmark (each measured over prior 14 days)	Status 12/16/20	Status 12/23/20	Status 12/30/20	**Status 1/6/21**
Avg. daily new case count in Brookline = <10 per 100k people	19.8	23.8	23.8	**25.4**
Avg. daily new case count in Mass. = <10 per 100k people	65.1	63.2	58.3	**61.1**
Avg. test positivity rate in Brookline = <5.0%	1.46%	1.77%	2.16%	**3.19%**
Avg. test positivity rate in Massachusetts = <5.0%	6.01%	6.14%	6.51%	**7.71%**

Because at least two of these four thresholds have been exceeded, Panel 4 has discussed how we advise PSB to respond. To date, our guidance has focused on enhancements to anti-transmission measures in school:

www.brookline.k12.ma.us/cms/lib/MA01907509/Centricity/Domain/62/PSB%20Advisory%20Panel%204%20-%20Statement%20of%20Recommendations%20for%20Times%20of%20Elevated%20Community%20Spread_12.11.20.pdf

Data source: https://www.mass.gov/info-details/covid-19-response-reporting#covid-19-weekly-public-health-report-

Updated MA DPH Color Scale



Incidence Rate Color Table

Massachusetts Department of Public Health COVID-19 Dashboard - Thursday, November 12, 2020

Average Daily Incidence Rate per 100,000 Color Calculations

	Population		
Group	**Under 10K**	**10K-50K**	**Over 50K**
Grey	Less than or equal to 10 total cases	Less than or equal to 10 total cases	Less than or equal to 15 total cases
Green	Less than or equal to 15 total cases	<10 avg cases/100k AND >10 total cases	<10 avg cases/100k AND >15 total cases
Yellow	Less than or equal to 25 total cases	≥10 avg cases/100k OR ≥5% pos rate	≥10 avg cases/100k OR ≥ 4% pos rate
Red	More than 25 total cases	≥10 avg cases/100k AND ≥5% pos rate	≥10 avg cases/100k AND ≥4% pos rate

Brookline's population is ~60,000

Brookline is here as of 1/7/2021 (yellow zone)

As of 11/5, DPH is using 2019 population estimates derived from a method developed by the University of Massachusetts Donahue Institute. The 2019 estimates are the most currently available data.

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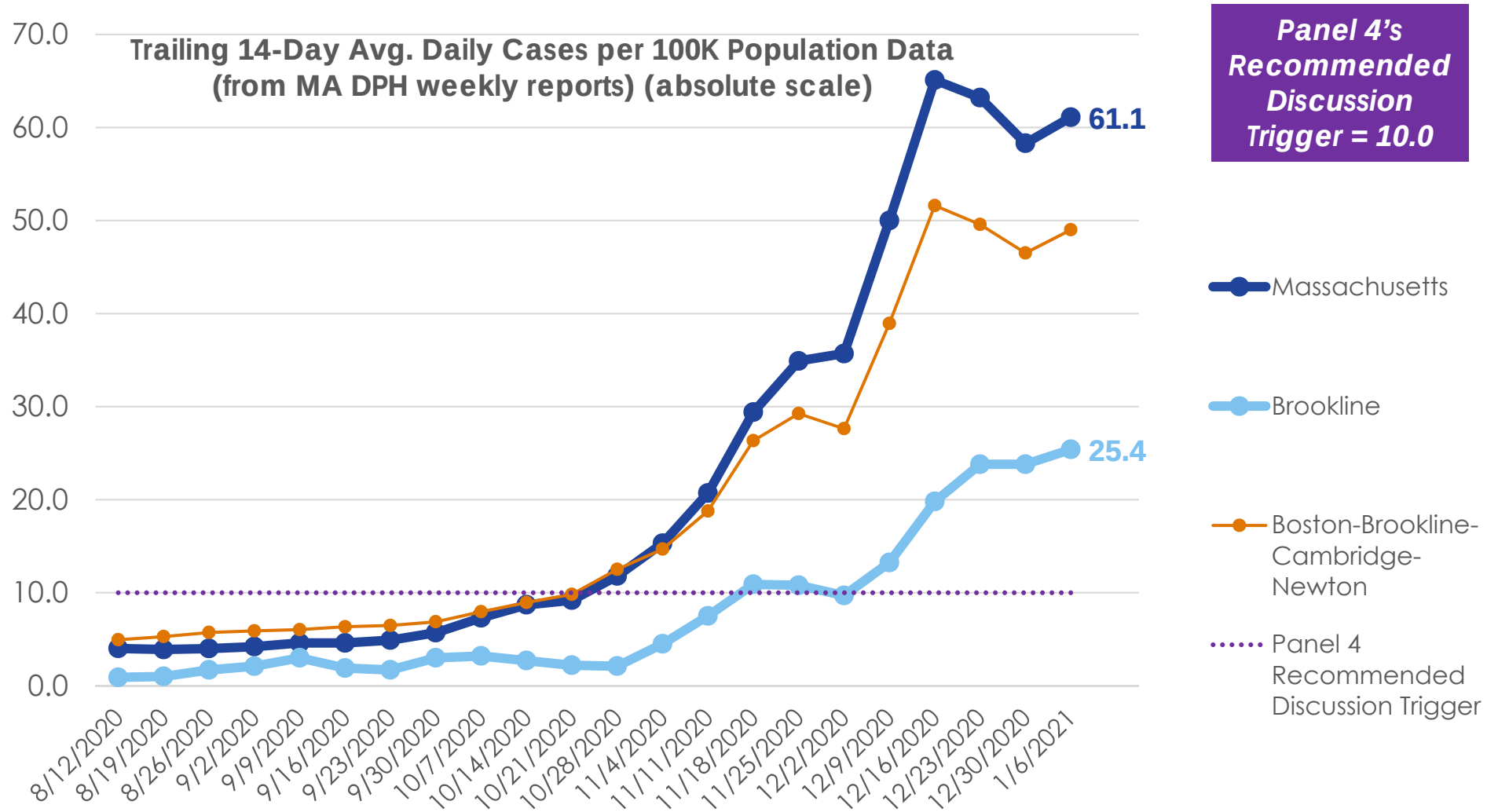
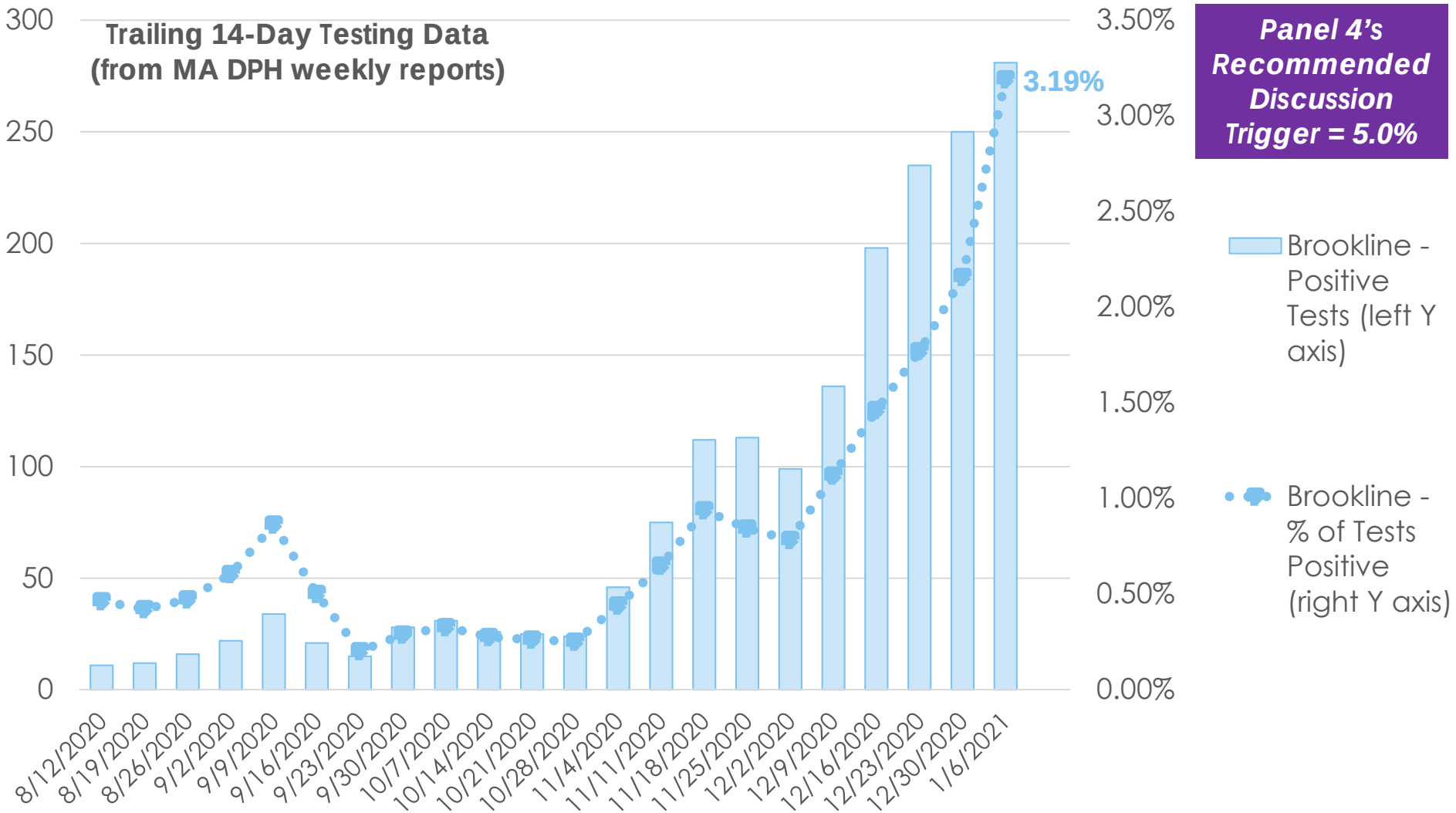
Chart source: https://www.mass.gov/info-details/covid-19-response-reporting

Community Benchmarks - Status



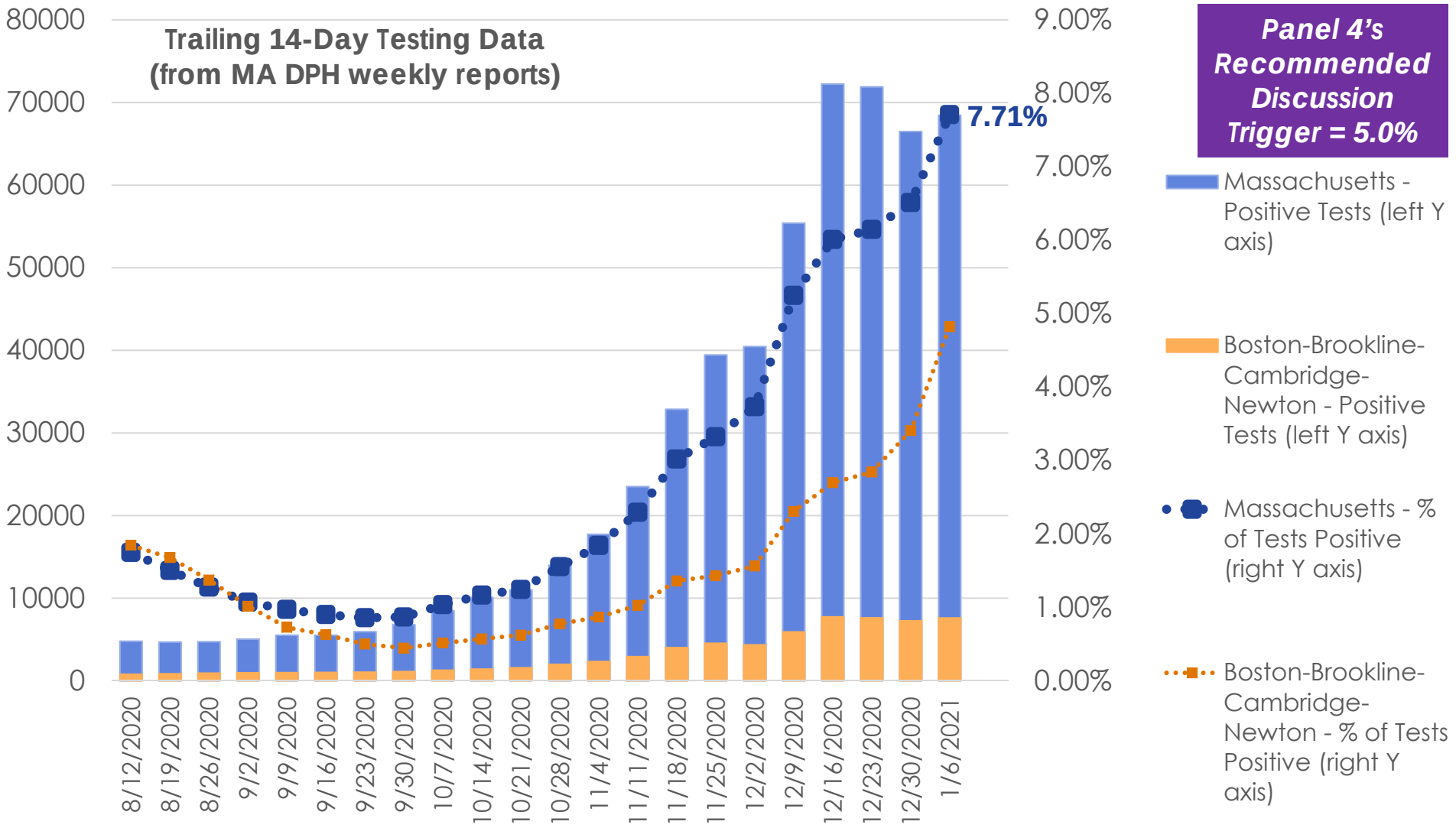
Data source: https://www.mass.gov/info-details/covid-19-response-reporting#covid-19-weekly-public-health-report-

Community Benchmarks - Status



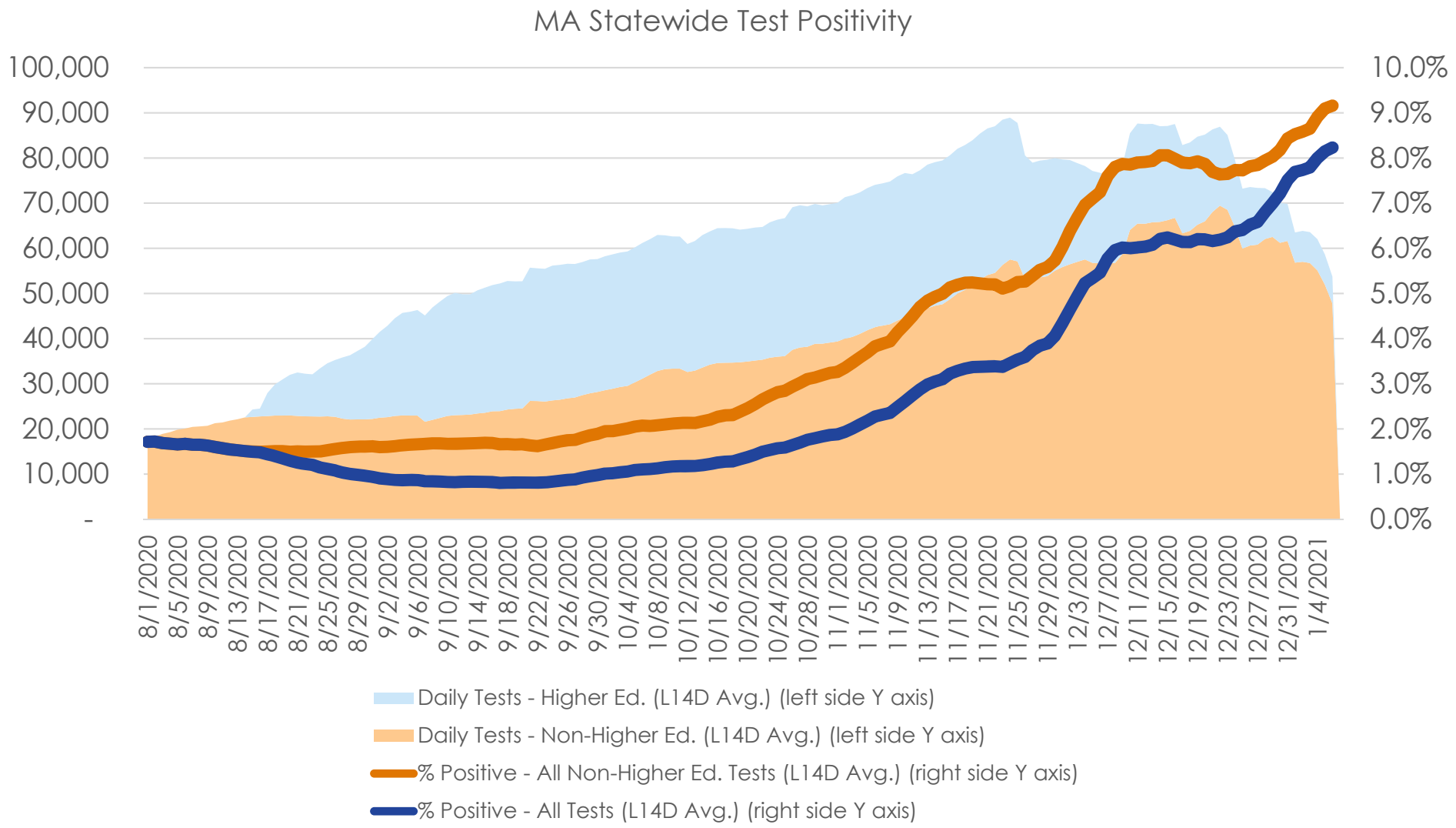
Data source: https://www.mass.gov/info-details/covid-19-response-reporting#covid-19-weekly-public-health-report-

Community Benchmarks - Status



Data source: https://www.mass.gov/info-details/covid-19-response-reporting#covid-19-weekly-public-health-report-

Statewide Test Positivity



Data source: https://www.mass.gov/info-details/covid-19-response-reporting

Brookline in Regional Context
(as of 1/7/2021)

Municipality	Avg. Daily Cases/100k L14D	% of Tests Positive L14D	Total Tests L14D / Muni. Population
Milton	**59.1**	**5.2%**	**18%**
Boston	**57.4**	**5.9%**	16%
Watertown	**55.8**	**5.1%**	**18%**
Dedham	**47.5**	**5.9%**	**12%**
Somerville	39.4	3.5%	**18%**
Needham	37.4	3.5%	16%
Belmont	33.6	**4.3%**	**12%**
Newton	29.4	3.1%	15%
Cambridge	26.8	**1.8%**	**24%**
Arlington	26.0	3.6%	**11%**
Brookline	**25.4**	**3.2%**	**14%**
Wellesley	**19.5**	**2.3%**	13%

Data source: https://www.mass.gov/info-details/covid-19-response-reporting#covid-19-weekly-public-health-report-

Public Schools of Brookline Case Count

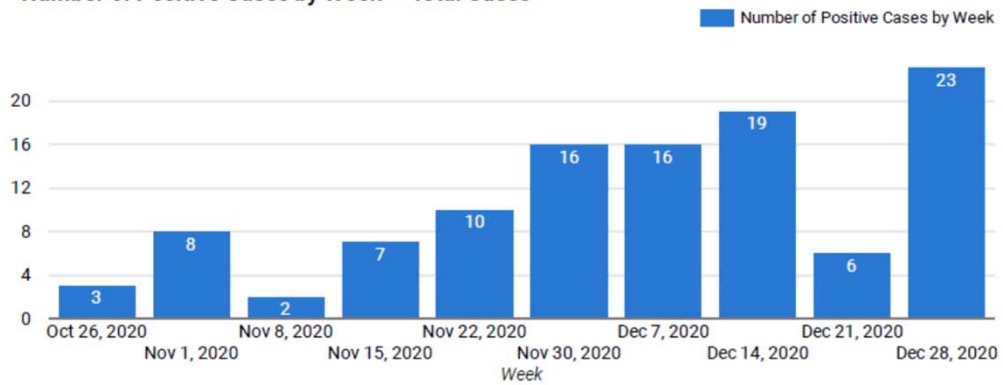
Data Last Updated: 1/5/21

PUBLIC SCHOOLS of BROOKLINE

COVID-19 CASES: DISTRICT DASHBOARD

Dashboard outlines number of positive COVID-19 cases in the PSB school community by week and learning model. For the purpose of this dataset, weeks run Monday - Sunday.
Source: Public Schools of Brookline School Health Services Department

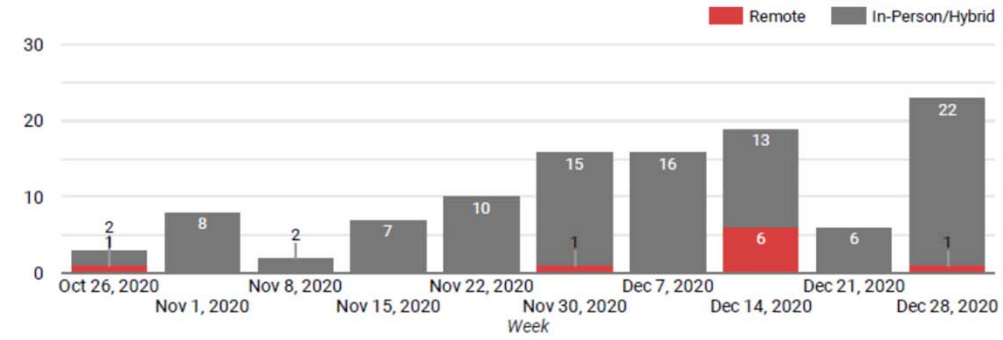
Number of Positive Cases by Week -- Total Cases



TOTAL PSB CASES TO DATE:

124

Number of Positive Cases by Week and Learning Model



TOTAL PSB CASES TO DATE:

Remote: 19
In-Person/Hybrid: 105

Chart source: https://sites.google.com/psbma.org/psb-reopening-hub/dashboard?authuser=0

Public Schools of Brookline Case Count

PUBLIC SCHOOLS of BROOKLINE

Data Last Updated: 1/5/21

COVID-19 CASES: SCHOOL BY SCHOOL DASHBOARD

The table outlines the number of positive COVID-19 cases by week and the number of cumulative cases for the year at each school. For the purpose of this dataset, weeks run Monday - Sunday.
Source: Public Schools of Brookline School Health Services Department

Number of Positive Cases by School & District Offices -- # by Week and Total Cumulative Cases

School	Weekly Positive Cases (12/28)	Cumulative Positive Cases
BEEP @ Beacon	0	1
BEEP @ Clark	0	1
BEEP @ Lynch	0	0
BEEP @ Putterham	0	0
Baker	3	22
Driscoll	2	10
Florida Ruffin Ridley	2	8
Heath	0	4
Lawrence	3	10
Lincoln	5	13
Pierce	0	14
Runkle	0	7
Remote Learning Academy K-8	1	6
Brookline High School	7	25
Total	23	121

	Weekly Positive Cases (12/28)	Cumulative Positive Cases
District Office	0	3

Chart source: https://sites.google.com/psbma.org/psb-reopening-hub/dashboard?authuser=0

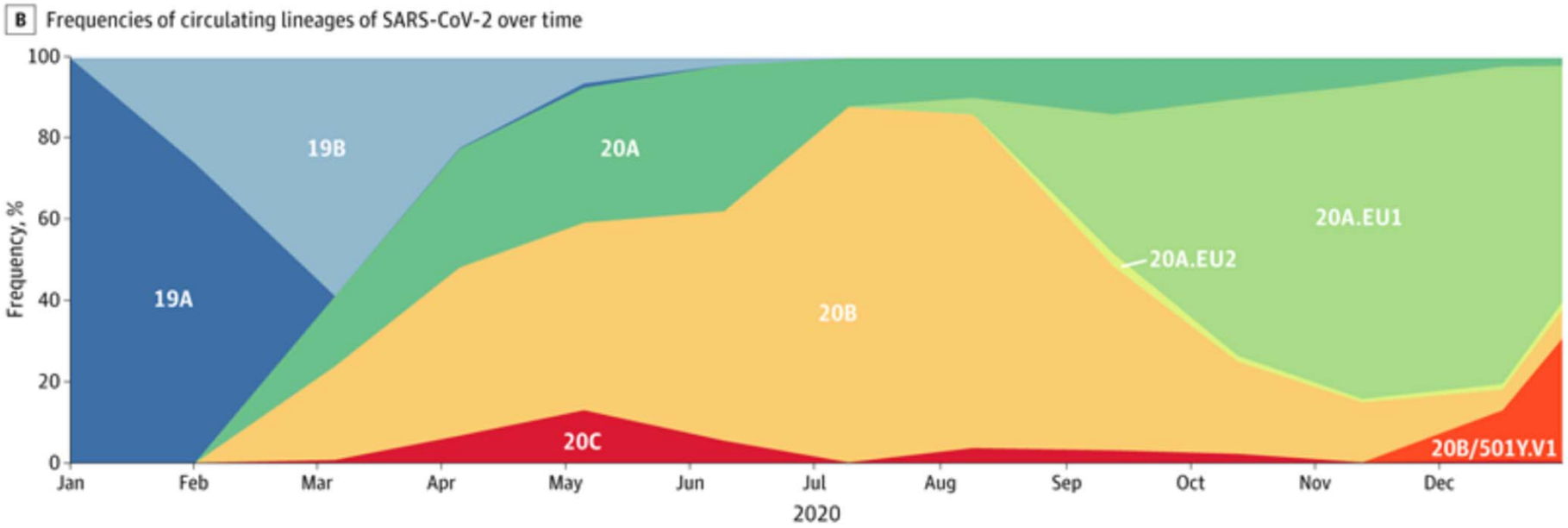
SARS-CoV-2 Mutations

- Mutations are **common and expected** as viruses evolve
- **Many SARS-CoV-2 variants have circulated** in the last 13 months, and several are circulating now
- When new variants emerge, the **key question is how did that variant become common?**
  - "Founder effect" – by pure chance, this variant arrived first, and so it "founded" the epidemic in a region and is the typical virus in circulation.
  - Mutation to escape pressure - this is evolution in the Darwinian sense. Mutations to escape pressure can impact things like transmissibility, infectiousness, virulence, immune response, etc.

Notable SARS-CoV-2 Mutation
20B/501Y.V1, VOC 202012/01, or B.1.1.7

- Emerged in UK Fall 2020; now present in US
  - Confirmed present in at least CA (26 cases), FL (22), CO (2), GA (1), and NY (1) so far
  - Likely also present here in MA but not yet confirmed
- Per CDC 1/7/2021: "At this time, there is **no evidence** that these variants cause **more severe illness or increased risk of death**."
- **Early checks of Pfizer/BioNTech vaccine are encouraging**, but research is ongoing
- Key issue is **increased transmissibility** of new variant

Circulating SARS-CoV-2 in U.K.



A, Phylogenetic tree showing the relationship of lineage B.1.1.7 (20B/501Y.V1, orange branch and tips) to other circulating lineages. The long branch length for this lineage reflects the fact that it accumulated a significant number of mutations prior to being discovered. B, Frequencies of circulating lineages over time. Lineages are colored as in the tree, with lineage B.1.1.7 (20B/501Y.V1) shown in orange.

B.1.1.7 Variant - Transmissibility

- Estimated to be 50-75% more transmissible than most common existing strain
  - Example: in a context where 10 infected people currently might be expected to infect 11 new people ($R \approx 1.1$); same 10 people infected with B.1.1.7 variant might be expected to infect roughly 15-18 new people ($R \approx 1.5$-1.8)
- Masks, physical distancing, enhanced ventilation, hand hygiene, **still appear to be effective** to reduce transmission risk

B.1.1.7 Variant – Common Questions

- Does the mutation affect the accuracy of testing? – No!
- Does the mutation affect vaccine efficacy? – No!
- Could future mutations occur? – Yes
- Is it possible that a future variant "escapes" the vaccine – Yes, it is possible, but the vaccine recognizes the entire spike protein, which is encouraging and likely robust to single mutations.

B.1.1.7 Variant - Kids

- Some early public discussion that new variant might infect children more easily, but that's **far from clear**
- From Imperial College London's public research summary: "The study finds that **individuals under 20 years old make up a higher proportion** of [new variant] cases than [existing SARS-CoV-2] cases. However, it is **too early to determine the mechanism** behind this change according to the researchers. They explain that it may partly have been influenced by the variants spread coinciding with a period where lockdown was in force but schools were open. **Further research is ongoing** on the specific nature of any changes in how the virus affects this age group."
- From 12/30/2020 commentary by Prof. Joseph Allen of Harvard T.H. Chan School of Public Health: "While the **extent to which this new variant is more transmissible in kids in still unknown**, even if it ends up being more transmissible in school-age children, the **evidence so far is that it won't be deadlier for them**. And there's research suggesting a biological reason that this is so."

UK School Impacts

- Subgroup of UK Scientific Advisory Group for Emergencies (SAGE) on 12/22/2020: "As a consequence of the uncertainty around the mechanisms for increased transmission, enhanced mitigation measures are likely to be necessary including: reconsidering the **2m rule** and requiring that where regular **interactions less than 2m are necessary this should include correctly worn face coverings**; **enhancing ventilation rates** to account for possible higher viral loads; and reinforcing the **importance of using face coverings, including in settings where they are not currently mandated, such as education**, workplaces, and crowded outdoor spaces (medium confidence)."

- Primary/secondary schools across UK as of 1/7/2021:
  - Open in-person for essential workers' children and others deemed "vulnerable" for various reasons (including lack of home computer access, etc.)
  - Otherwise all remote for now

- English and Welsh daycares/pre-schools still open in-person; Scotland more limited

- Status being reevaluated mid-January for potential return early/mid February

School Impact Examples Elsewhere Internationally

- Germany – school closures until end of January
- France – schools have re-opened after winter recess
- Nigeria – schools closed since December
- India, Italy, Spain, others – varies by region
- Japan - schools remaining open amid new state of emergency

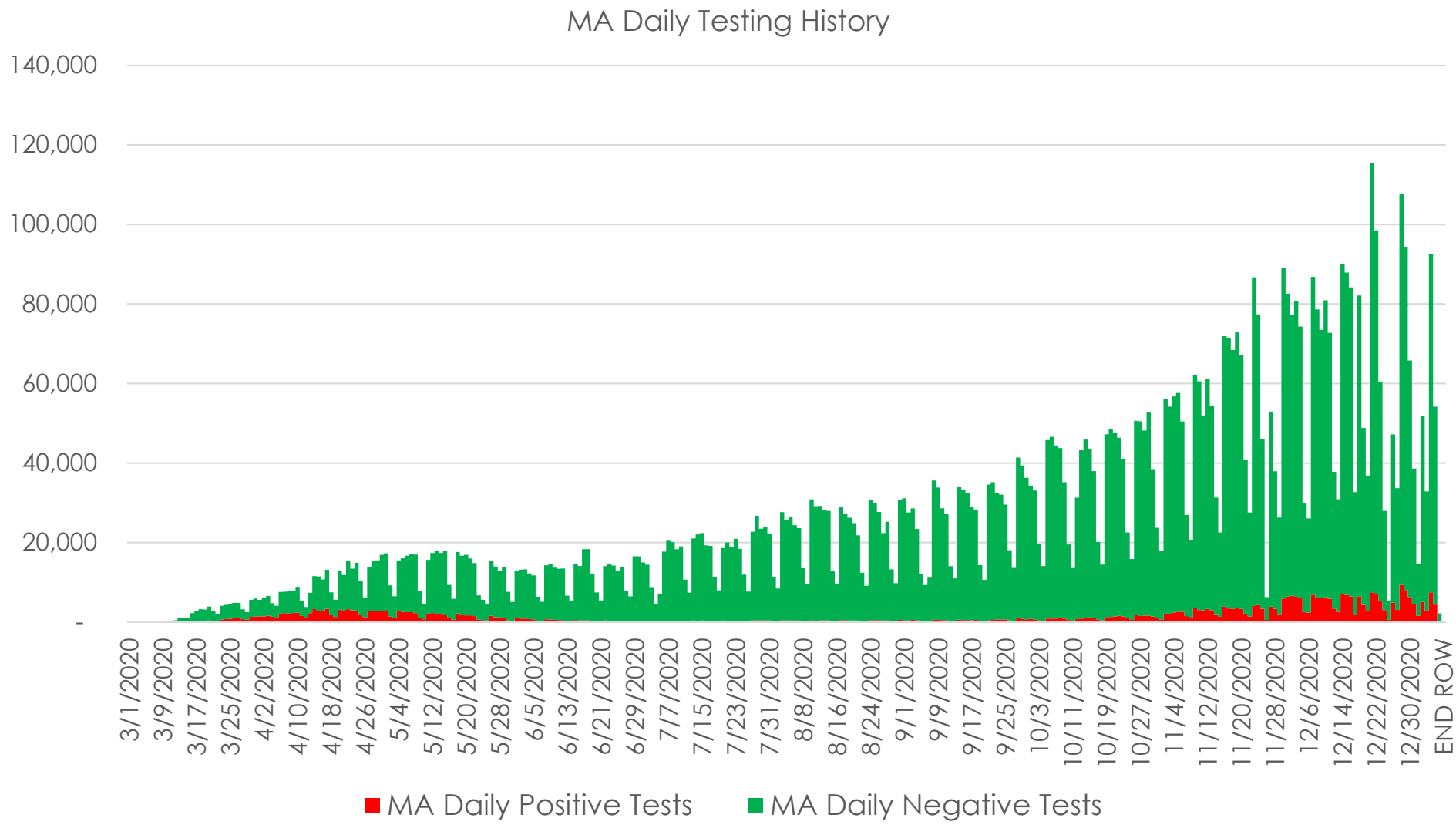
- **Bottom line: other countries are taking varying approaches**

Sources

- https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/948607/s0995-mitigations-to-reduce-transmission-of-the-new-variant.pdf
- https://www.bbc.com/news/education-51643556
- https://www.biorxiv.org/content/10.1101/2021.01.07.425740v1.full.pdf;
- https://www.cdc.gov/coronavirus/2019-ncov/more/science-and-research/scientific-brief-emerging-variants.html;
- https://www.cdc.gov/coronavirus/2019-ncov/transmission/variant.html
- https://www.ft.com/content/8121ca0a-4d96-4cf5-b5df-a73adc16a606
- https://www.imperial.ac.uk/news/211793/new-covid-19-variant-growing-rapidly-england/
- https://www.imperial.ac.uk/mrc-global-infectious-disease-analysis/covid-19/report-42-sars-cov-2-variant/
- https://www.irishtimes.com/news/politics/covid-19-cabinet-agrees-to-keep-schools-closed-for-january-in-most-challenging-phase-of-all-1.4451482
- https://jamanetwork.com/journals/jama/fullarticle/2775006
- https://www.livescience.com/uk-variant-coronavirus-faq.html
- https://news.trust.org/item/20210108022715-m5obt
- https://www.nytimes.com/interactive/2020/world/europe/united-kingdom-coronavirus-cases.html
- https://www.reuters.com/article/us-health-coronavirus-japan/japan-declares-state-of-emergency-for-tokyo-area-as-covid-19-cases-surge-idUSKBN29C03O
- https://www.reuters.com/article/us-health-coronavirus-nigeria-lagos-idUSKBN28S2S4
- https://www.statnews.com/2020/12/21/looming-questions-new-variant-coronavirus/;
- https://www.thelocal.fr/20210104/analysis-is-france-right-to-keep-its-schools-open-during-pandemic
- https://www.washingtonpost.com/opinions/2020/12/30/new-covid-strain-schools/

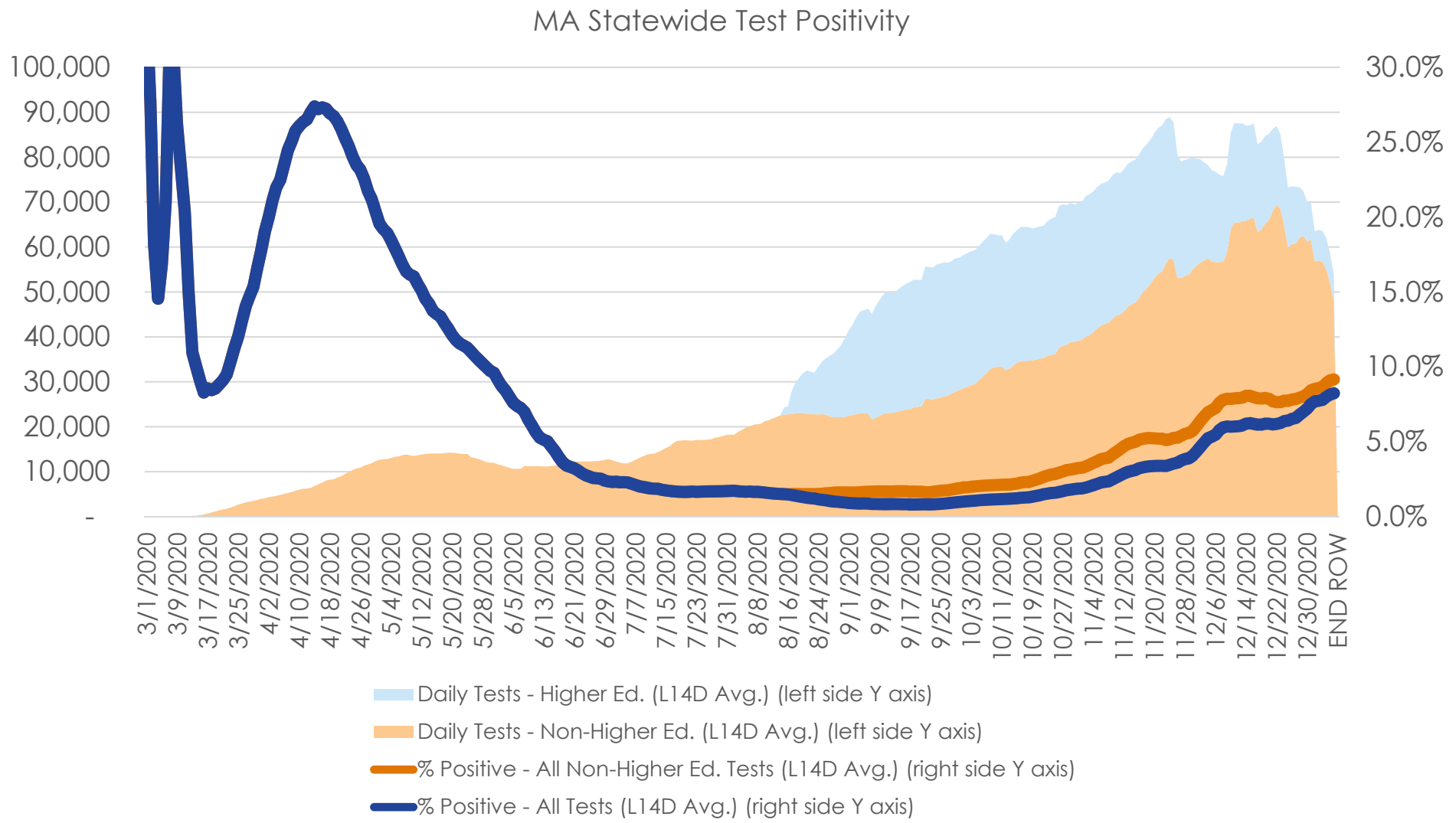
Appendix – For Reference As Needed

Statewide Test Results



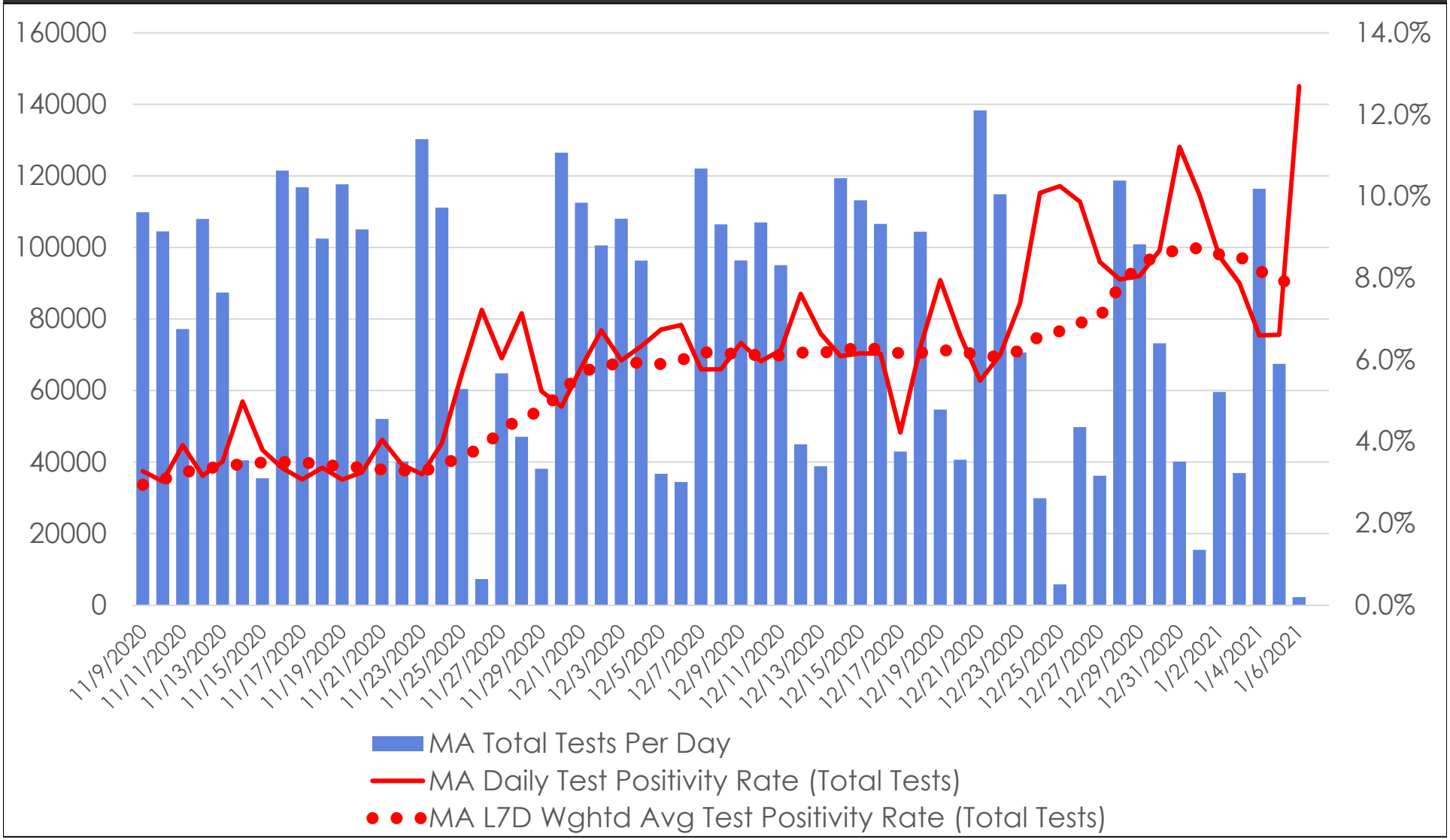
Data source: https://www.mass.gov/info-details/covid-19-response-reporting

Statewide Test Positivity



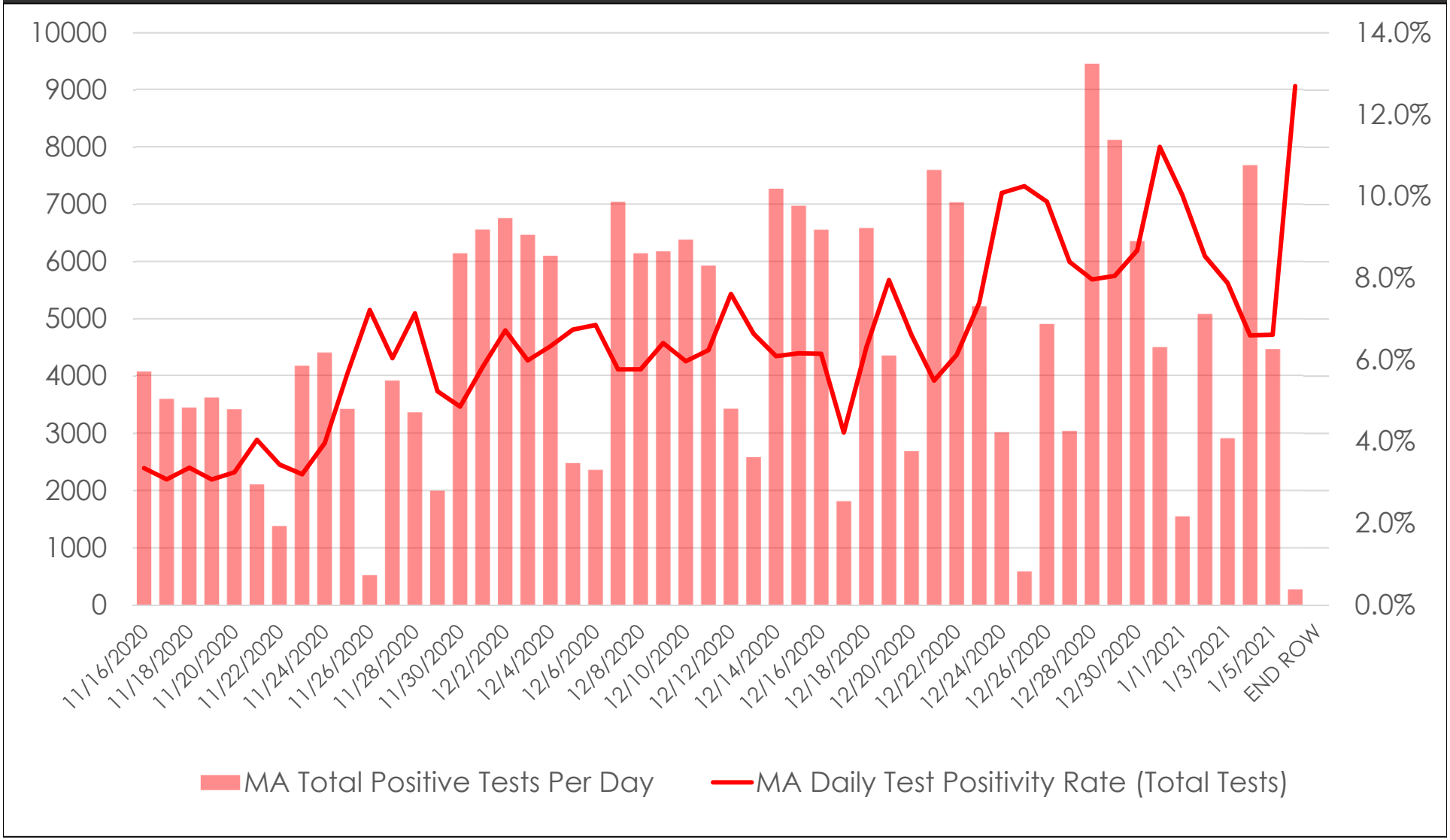
Data source: https://www.mass.gov/info-details/covid-19-response-reporting

Statewide Daily Test Data



Data source: https://www.mass.gov/info-details/covid-19-response-reporting

Statewide Daily Test Data



Data source: https://www.mass.gov/info-details/covid-19-response-reporting

MA DESE Guidance – In-Person/Remote

https://www.doe.mass.edu/covid19/on-desktop/interpreting-dph-metrics.html

- ***Districts are expected to prioritize in-person learning across all color-coded categories, unless there is suspected in-school transmission, in accordance with DESE's Guidance on Responding to COVID-19 Scenarios.*** *Transmission in schools is defined as spread of the virus between people during interactions in the school setting. While there have been positive COVID-19 cases of staff and students in schools, most of these infections have occurred outside of the school setting. If there is suspected in-school transmission, then the affected classrooms or schools should temporarily shift to remote learning, in accordance with DESE's Guidance on Responding to COVID-19 Scenarios. Classrooms and schools should reopen after appropriate mitigation strategies have been implemented, as determined in consultation with the local board of health, DPH, and DESE.*

MA DESE Guidance – In-Person/Remote

https://www.doe.mass.edu/covid19/on-desktop/interpreting-dph-metrics.html

- ***Districts and schools in communities designated gray, green, or yellow are expected to have students learning fully in-person, if feasible.*** *A hybrid model should be used only if there is no other way to meet health and safety requirements. Parents and caregivers will continue to have the option to choose a district's remote learning program for their children.*

- ***Schools in red communities should implement hybrid models, while maximizing in-person learning time for high-needs students.***

...

- ***Fully remote instructional models should be implemented only as a last resort*** *in classrooms, schools, or districts when there is suspected in-school transmission or a significant municipal outbreak, in accordance with DESE's Guidance on Responding to COVID-19 Scenarios. Classrooms and schools should reopen after appropriate mitigation strategies have been implemented, as determined in consultation with the local board of health, DPH, and DESE.*