MI COVID RESPONSE DATA AND MODELING UPDATE

NOTE: All data as of May 1 unless otherwise noted

May 4, 2021

Executive summary

Percent Positivity is down 11% and **Case Rate** is down 30% since mid-April highs. Positivity (12.6%, ↓1.5%) and case rates (397.8, ↓157.2) have decreased for three weeks

Michigan has the **2nd highest number of cases (↔),** and **highest case rate (↔)** in the last 7 days (source: CDC COVID Data Tracker)

Percent of inpatient beds occupied by individuals with COVID has decreased 20% since the April 20 high to 15.9% (↓3.1%). Trends for COVID hospitalizations are decreasing for 1 week

Michigan has the **highest inpatient bed utilization (↔),** and the **highest adult ICU bed utilization (↑1)** (source: US HHS Protect)

Deaths have increased 371% since Mar 9 low. There were 452 (↑37) between April 18 and April 24, and the **Death Rate** is 6.5 deaths per million residents (↑1.0)

Michigan has the **5th highest number of deaths (↔)**, and **2nd highest death rate (↔)** in the last 7 days (source: CDC COVID Data Tracker)

The 7-day average **state testing rate** has decreased to 3,662.0 tests/million/day (↓522.3). **Daily diagnostic tests (PCR)** is 36.4K per day (↓6.1), and the **weekly average for PCR and antigen tests** conducted in Michigan is 66.6K (↓2.0K).

7.0 million **COVID-19 vaccine** doses reported to MDHHS, 50.6% of Michigan population 16+ has at least one dose

Comparison across states: Summary

What we see today (data through 5/1):

- 5 states are seeing increasing 1 week case trends (>=10%) (same as last week)
- 14 states are seeing 1 week increases (>=10%) in new COVID hospital admissions (up vs. 12 last week)
- Michigan, DC, Pennsylvania, Maryland and Delaware have highest per capita hospitalized patient numbers.
- Midwest (case data from CDC as of 5/2):
  - Wisconsin with slight decrease in hospitalizations (66/M) and stable cases (88/100k last 7d)
  - Indiana with stable hospitalizations (124/M), and slight increase in cases (117/100k last 7d)
  - Illinois showing slight decrease in hospitalizations (155/M), and stable cases (148/100k last 7d)
  - Ohio with decrease in hospitalizations (129/M) and slight decrease in cases (92/100k last 7d)
  - Michigan showing decrease in hospitalizations (303/M) and decrease in cases (252/100k last 7d)

COVID-19 Spread

Statewide positivity has decreased to 12.6%

- One week decrease of 11% (vs. 14% decrease last week)
- Decreasing for three weeks (32% decrease since April 8 high)
- Positivity is declining in all MERC regions but remains above 10% in seven regions
  - Saginaw remains above 15%

Case rates (397.8 cases/million) are decreasing in the state (555.0 cases/million last week)

- One week decrease of 30% (vs. 14% decrease last week)
- Decreasing for three weeks (40% decrease since April 11 high)
- Cases per million are declining in all MERC regions
- Variants in Michigan: 6,857 confirmed B.1.1.7; 38 confirmed B.1.351; 249 confirmed B.1.427/B.1.429 ; 88 confirmed P.1

- Number of active outbreaks is up 2% from previous week
  - There were 311 outbreaks in K-12 school settings
  - In the past week, the highest number of new clusters have been identified in baseball/softball, volleyball, lacrosse, soccer, and track and field

Confirmed and probable case indicators

Table Date: 5/1/2021 (7 days from date table was produced: 4/24/2021)

Risk levels: Low A B C D E

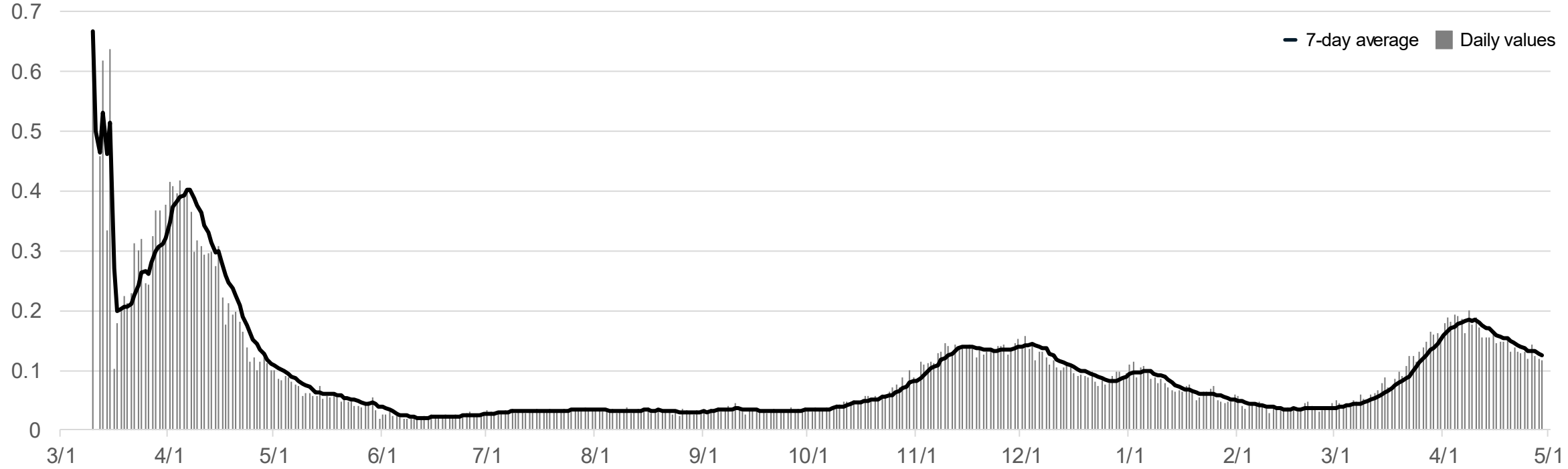
	Overall Risk Level	Absolute Cases (per million)	CDC Case Trend	Average Percent Positivity	Positivity Trend	Tests (per million)	% IP Beds Occupied by COVID-19 Cases	% Occupied IP Beds Trend	Absolute Deaths (per million)	Death Trend
Detroit	E	404.5	decline [19 days]	12.1	Decrease - 3wk	3830.9	17.0	Decrease - 1wk	7.5	Increase - 6wk
Grand Rapids	E	457.1	decline [13 days]	14.7	Decrease - 2wk	3855.4	15.8	Decrease - 1wk	3.9	Increase - 1wk
Kalamazoo	E	374.4	decline [15 days]	13.4	Decrease - 2wk	2971.4	14.3	Decrease - 1wk	4.5	Increase - 3wk
Saginaw	E	464.9	decline [17 days]	15.5	Decrease - 2wk	3130.1	13.1	Decrease - 1wk	8.4	Increase - 2wk
Lansing	E	321.7	decline [21 days]	11.4	Decrease - 2wk	2945.2	19.7	Decrease - 1wk	7.1	Increase - 1wk
Traverse City	E	310.5	decline [18 days]	12.1	Decrease - 3wk	2577.1	10.9	Decrease - 2wk	6.8	Increase - 2wk
Jackson	E	364.7	decline [16 days]	11.7	Decrease - 2wk	3813.9	16.4	Decrease - 1wk	7.5	<20 wkly deaths
Upper Peninsula	E	231.8	decline [15 days]	5.4	Decrease - 2wk	3032.5	5.2	Decrease - 1wk	0.9	<20 wkly deaths
Michigan	E	397.8	decline [18 days]	12.6	Decrease - 3wk	3662.0	15.9	Decrease - 1wk	6.5	Increase - 6wk

Cases Low: <7 | A: 7-20 | B: 20-40 | C: 40-70 | D: 70-150 | E: >=150

Positivity Low: <3% | A: 3-7% | B: 7-10% | C: 10-15% | D: 15-20% | E: >=20%

Statewide Positivity Trends

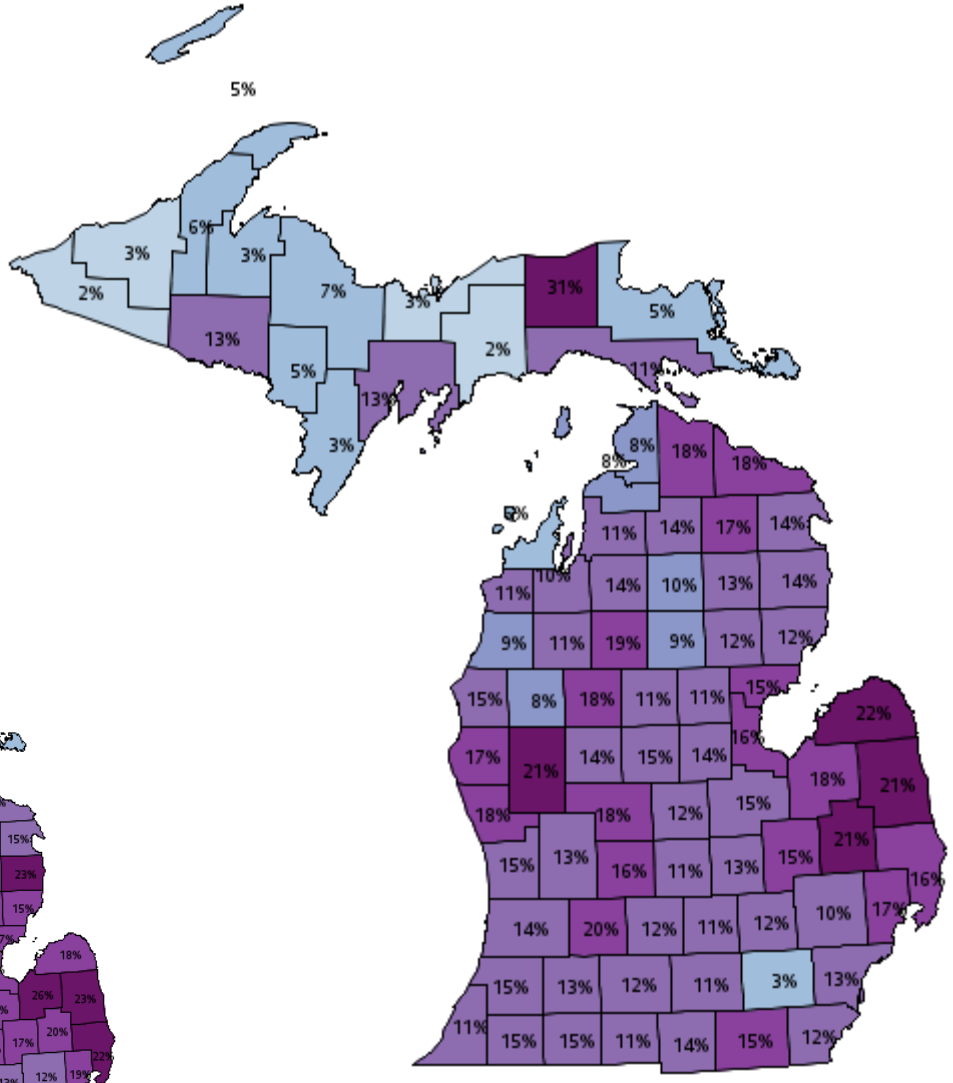
Daily positivity and 7-day rolling average positivity for Michigan



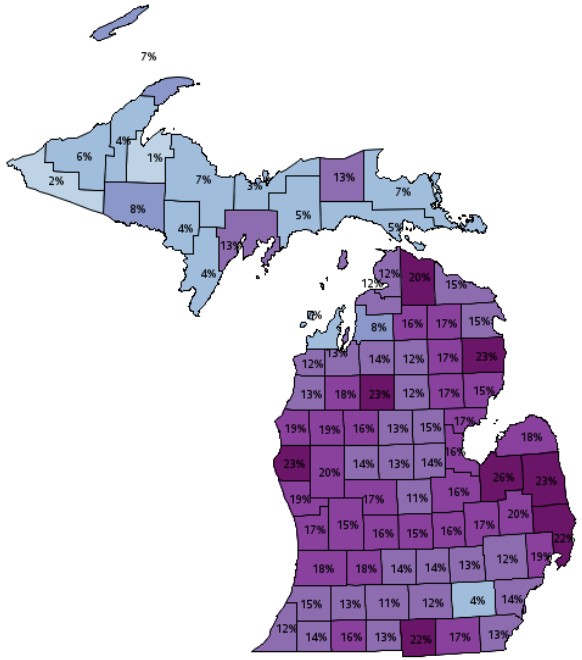
- Early in the pandemic, testing was not as robust as it has been since July 2020 to present
- Positivity is an indicator of whether we are testing enough to identify cases and an early indicator of SARS-CoV-2 transmission (as positivity increases, we expect case rates to follow)
- Positivity decreased by 11% between this week and last
- Note: These are for PCR tests only and exclude tests conducted with Michigan Department of Corrections

Note: Case information sourced from MDHHS and reflects date of onset of symptoms
Source: MDHHS – Michigan Disease Surveillance System

Positivity by county, 4/23-4/29



Last week, 4/16-4/22



Average positivity per day	# of counties	This week	Last week
<3%		4	2
3-7%		9	11
7-10%		6	3
10-15%		42	31
15-20%		17	28
>=20%		5	8

Updates since last week:

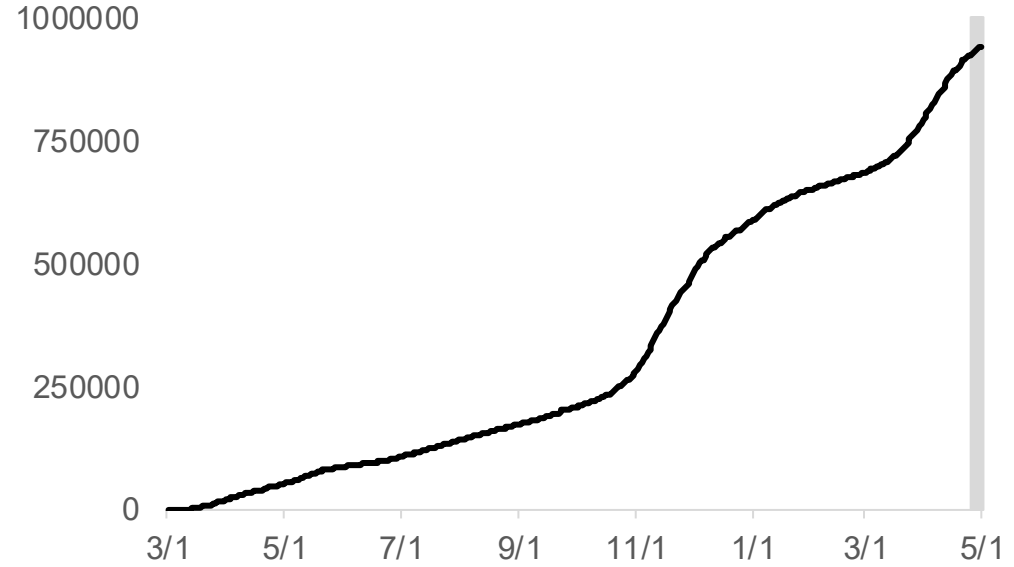
64 of 83 counties saw double digit positivity in the last week (3 county decrease)

70 of 83 counties saw positivity > 7% in the last week (steady)

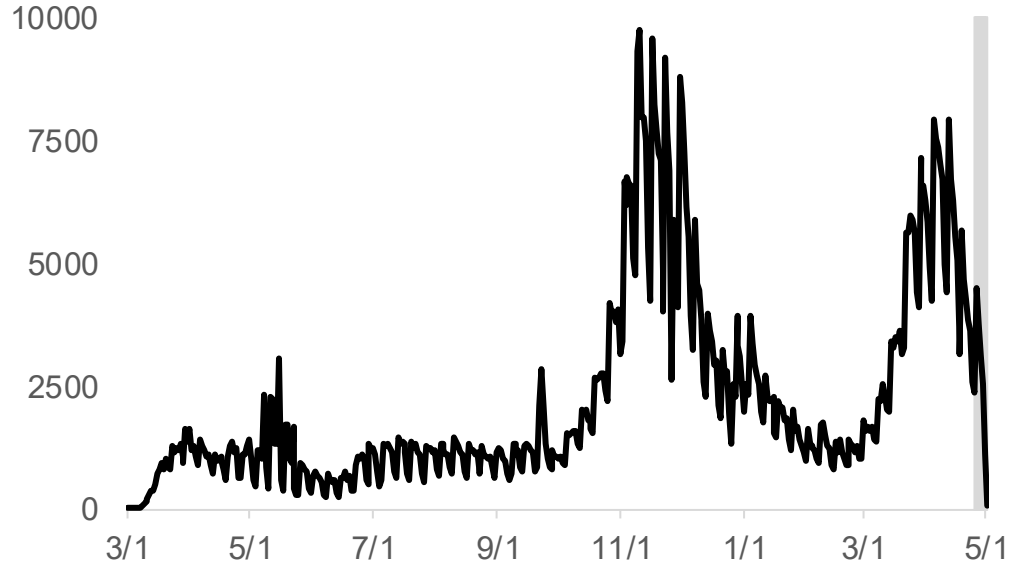
Source: SEOC Testing Results – Excluding MDOC

COVID-19 cases by onset date: State of Michigan

Cumulative confirmed and probable cases, by date of onset of symptoms



New confirmed and probable cases, by date of onset of symptoms

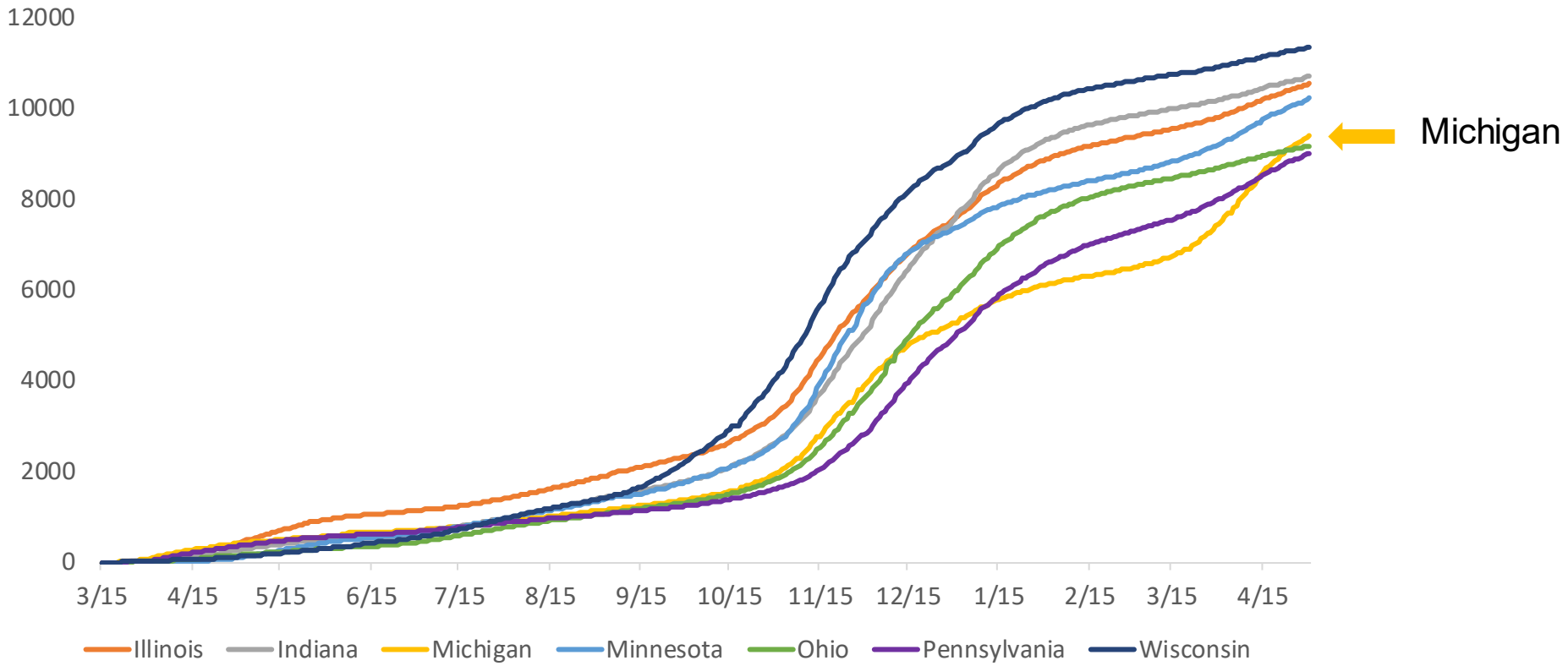


Updates since last week:

- Cases have decreased for three weeks
- Statewide case rate is at risk level E (above 150 cases/million)
- There are nearly 4,000 new cases per day (data through 4/24) which is down 1,500 from the prior week
- Almost 950,000 cases since Mar 1, 2020

Note: Case information sourced from MDHHS and reflects date of onset of symptoms (refers to lab-confirmed cases). Case spike on 5/12 is a result of batch of test results, not all of which have onset date of symptoms completed
Source: MDHHS – Michigan Disease Surveillance System

Cumulative COVID-19 Case Rates: Midwest Comparison + PA

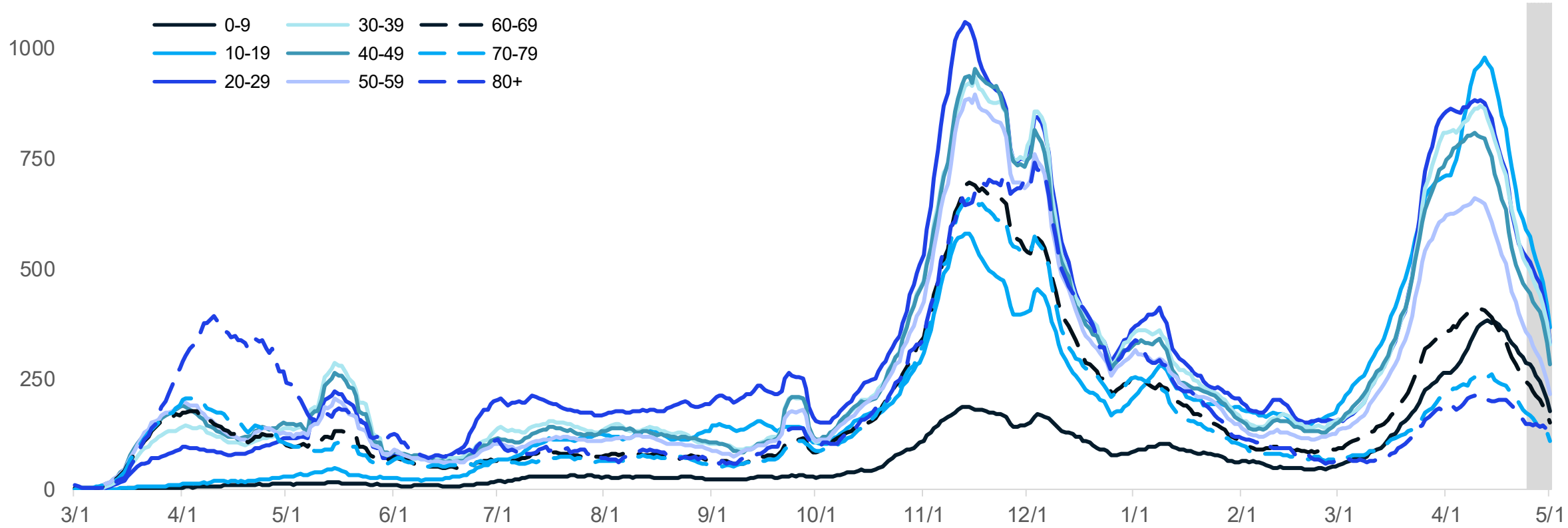


- Cumulative incidence per 100,000 cases in Michigan has been lower than other states in the Midwest following spring 2020 surge
- Michigan's mitigation policies helped control the spread of SARS-CoV-2 relative to other states in the Midwest, particular during surge in November and December
- The current trajectory in Michigan has brought us into the range of cumulative case rates of our Midwest neighbors

Source: CDC COVID Data Tracker – State Trend Comparison

Age group: average new daily cases

Daily new confirmed and probable cases per million by age group (7-day rolling average)



- All age groups by decade are now decreasing
- Those aged 10-19 have the highest case rates, followed by 20-29 and 30-39 age groups
- Case rates for all age groups are near or above 150 cases per million (Risk Level E)

Note: Case information sourced from MDHHS and reflects date of onset of symptoms
Source: MDHHS – Michigan Disease Surveillance System

Age group: average new daily cases and daily case rate

Daily new confirmed and probable cases per million by age group (7-day rolling average)

Age Group	Average daily cases	Average Daily Case Rate	One Week % Change (Δ #)	% Change since 4/11/21* (Δ #)
0-9	331.4	287.5	-21% (-87)	-23% (-98)
10-19	740.9	590.4	-30% (-322)	-39% (-466)
20-29	726.4	526.6	-29% (-302)	-40% (-491)
30-39	620.1	511.2	-31% (-275)	-41% (-434)
40-49	540.3	458.1	-30% (-233)	-43% (-400)
50-59	482.4	357.3	-33% (-236)	-45% (-398)
60-69	313.4	245.7	-29% (-126)	-40% (-207)
70-79	132.9	173.3	-27% (-49)	-33% (-64)
80+	61.9	149.3	-26% (-22)	-29% (-25)
Total¶	3,977.4	397.8	-29% (-1,656)	-40% (-2,594)

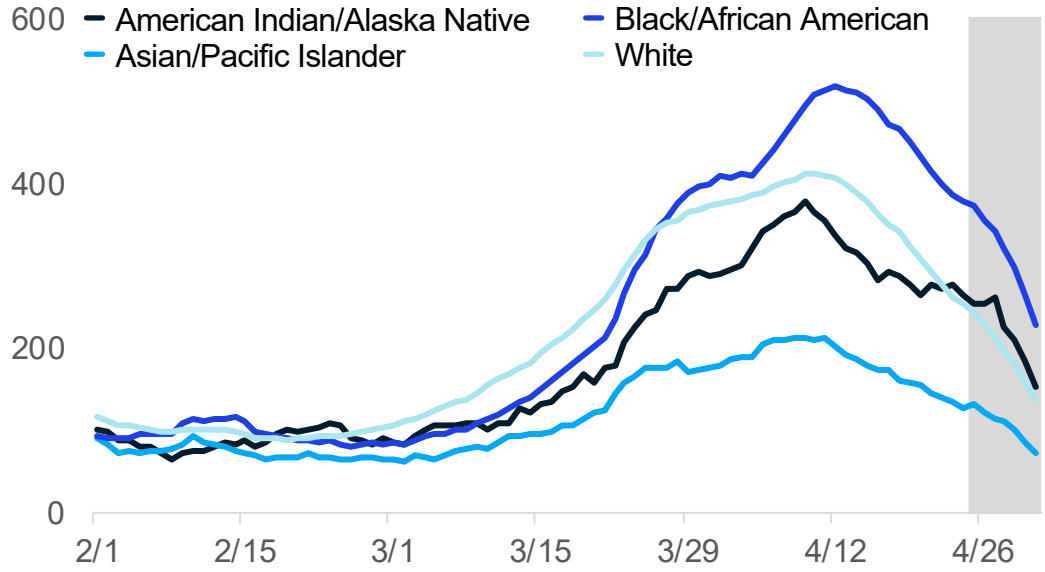
* Highest 7-day avg. following spring 2021 surge
¶ Total may not reflect state due to missing age data

- Daily number of cases (740.9) and daily case rate (590.4 cases/mil) are currently highest for those 10-19
- All age groups under 70 are experiencing an average of more than 300 cases per day
- Since April 11, case rate decreases and number of cases have been highest among those between the ages 10 to 69

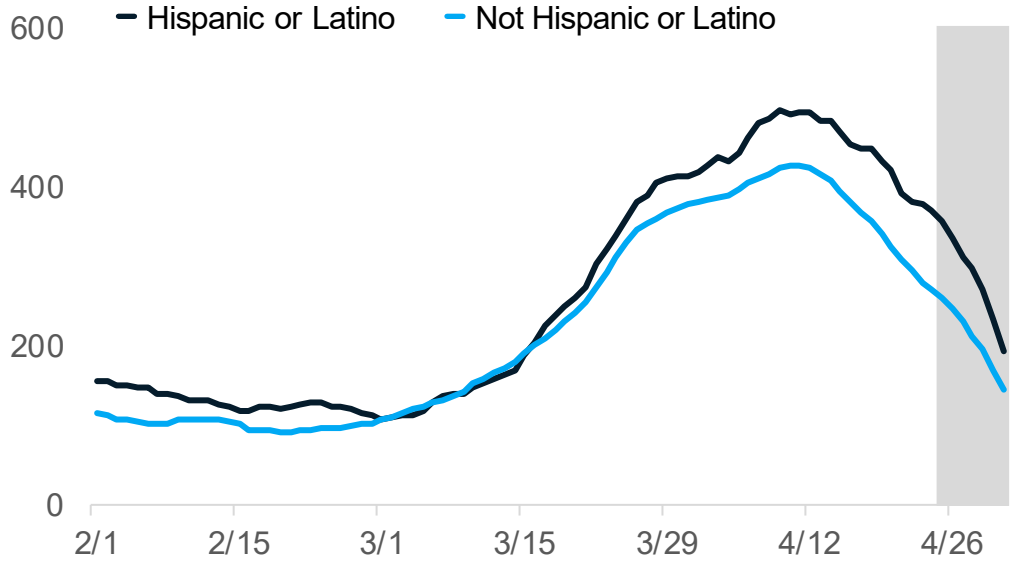
Note: Case information sourced from MDHHS and reflects date of onset of symptoms
Source: MDHHS – Michigan Disease Surveillance System

Average daily new cases per million people by race and ethnicity

Daily new confirmed and probable cases per million (7 day rolling average) by race category



Daily new confirmed and probable cases per million (7 day rolling average) by ethnicity category



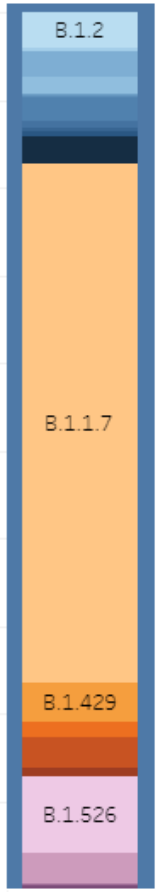
Updates since last week:

- Cases per million are decreasing for all races and ethnicities
- **Blacks and Hispanic/Latinos continue to have the highest case rates**
- In the past 30 days, 36% of all cases represent unknown, multiple, or other races (30% of race is unknown, ↓1%)
- In the past 30 days, 34% of all cases have an unknown ethnicity reported (↓1%)

Note: Case information sourced from MDHHS and reflects date of death of confirmed and probable cases.
Source: MDHHS – Michigan Disease Surveillance System

Identified COVID-19 Cases Caused by All Variants of Concern in US and Michigan

SARS-CoV-2 Variants Circulating in the United States, Mar 28 – Apr 10



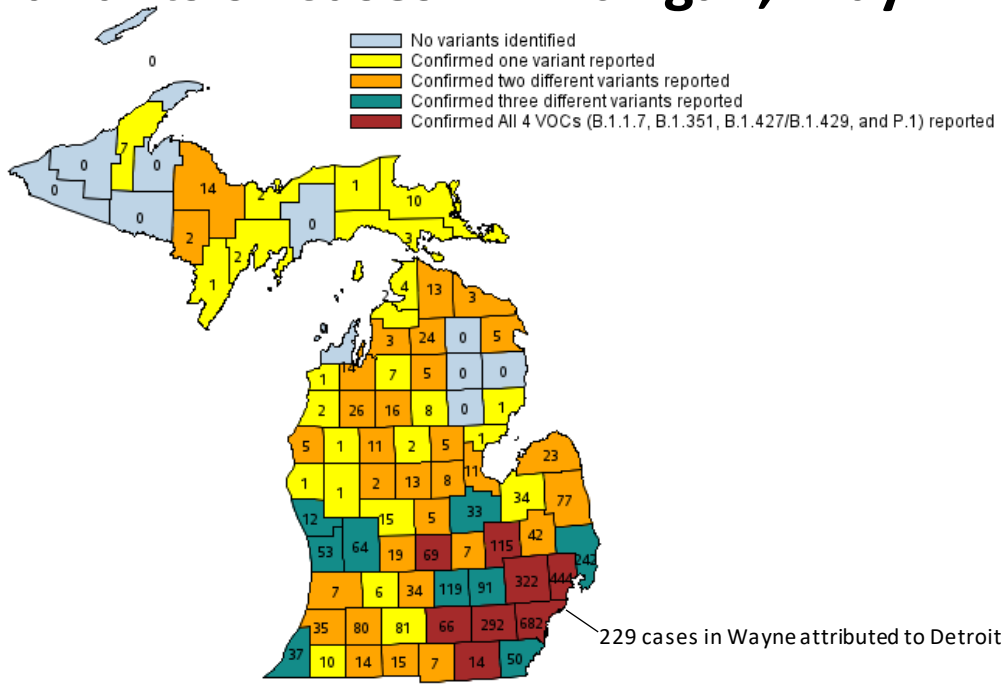
USA

	Lineage	Type	%Total	95%CI
Most common lineages	B.1.1.7	VOC	59.2%	56.1-62.2%
	B.1.526	VOI	8.7%	6.7-11.4%
	B.1.429	VOC	4.5%	3.5-5.8%
	B.1.2		4.0%	3.4-4.6%
	B.1.526.1	VOI	3.5%	3.0-4.2%
	P.1	VOC	3.5%	2.9-4.2%
	B.1.1.519		2.9%	2.4-3.6%
	B.1.526.2		2.8%	2.1-3.7%
	B.1		1.9%	1.6-2.2%
	B.1.427	VOC	1.8%	1.3-2.4%
	B.1.1		0.7%	0.4-1.0%
	B.1.596		0.5%	0.4-0.7%
	R.1		0.5%	0.4-0.7%
	B.1.575		0.5%	0.3-0.7%
	B.1.243		0.2%	0.1-0.3%
	B.1.234		0.2%	0.1-0.3%
Additional VOI/VOC lineages	B.1.351	VOC	0.9%	0.7-1.2%
	B.1.525	VOI	0.4%	0.3-0.6%
	P.2	VOI	0.2%	0.1-0.3%
Other*	Other		3.2%	2.8-3.8%

* Other represents >200 additional lineages, which are each circulating at <1% of viruses

** Most recent data are subject to change as samples from that period are still being processed

Emergent Variants of Cases in Michigan, May 1



Variant	MI Reported Cases¶	# of Counties	CDC est. prevalence
B.1.1.7	6,857*	70	69.9%
B.1.351	38	18	0.3%
B.1.427/B.1.429	249	39	4.1%
P.1	88	19	1.1%

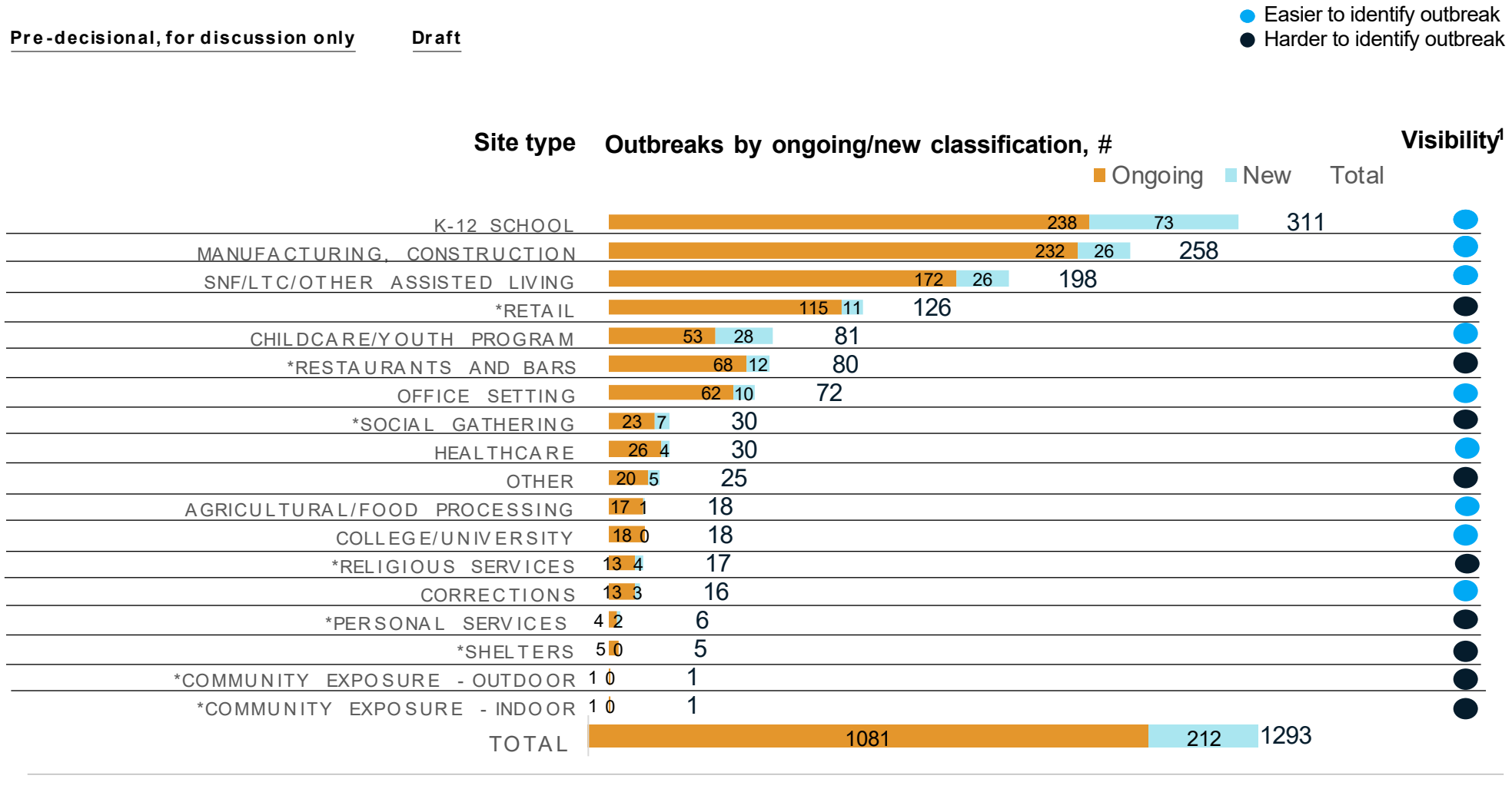
* 519 cases within MDOC; ¶ Numerous cases with county not yet determined

Data last updated May 01, 2021

Source: https://covid.cdc.gov/covid-data-tracker/#variant-proportions and Michigan Disease Surveillance System (MDSS)

Number of outbreak investigations by site type, week ending Apr 29

Pre-decisional, for discussion only **Draft**



Total number of active outbreaks is about the same from previous week

Following K-12 (73), the greatest number of new outbreaks were reported in childcare/youth programs (28), manufacturing/construction (26), SNF/LTC (26), bars & restaurants (12), retail (11), and office settings (10).

LHDs reported new outbreaks in all settings except in College and Universities, Shelters, and both Indoor and Outdoor Community Exposures.

1. Based on a setting's level of control and the extent of time patrons/residents spend in the particular setting, different settings have differing levels of ability to ascertain whether a case derived from that setting

NOTE: Many factors, including the lack of ability to conduct effective contact tracing in certain settings, may result in significant underreporting of outbreaks. This chart does not provide a complete picture of outbreaks in Michigan and the absence of identified outbreaks in a particular setting in no way provides evidence that, in fact, that setting is not having outbreaks.
Source: LHD Weekly Sitreps

K-12 school outbreaks, recent and ongoing, week ending Apr 29

There were 311 outbreaks in K-12 school settings, including 134 outbreaks in High Schools (↓), 109 outbreaks in Pre-K – Elementary (↑), 63 outbreaks in Middle/Jr High (↓), and 5 outbreaks in the Administrative settings (↑).

Region	Number of reported cases, #	# Ongoing - Excluding New	# New	Number of outbreaks	Range of cases per outbreak
Region 1		632	45	85	2-47
Region 2n		102	93	66	2-14
Region 2s		62	12	15	2-15
Region 3		501	26	56	2-51
Region 5		132	30	25	2-41
Region 6		267	13	26	2-46
Region 7		182	15	30	2-25
Region 8		39	14	8	2-19
Total		1,917	248	**311**	**2-51**

Grade level	Number of reported cases, #	# Ongoing - Excluding New	# New	Number of outbreaks	Range of cases per outbreak
Pre-school - elem.		354	121	109	2-23
Jr. high/middle school		299	52	63	2-23
High school		1,255	74	134	2-51
Administrative		9	1	5	2-3
Total		1,917	248	**311**	**2-51**

Many factors, including the lack of ability to conduct effective contact tracing in certain settings, may result in significant underreporting of outbreaks. This chart does not provide a complete picture of outbreaks in Michigan and the absence of identified outbreaks in a particular setting in no way provides evidence that, in fact, that setting is not having outbreaks.
Source: LHD Weekly Sitreps

COVID-19 K-12 Sports Related Clusters and Cases

Cumulative Since Jan 2021 through Apr 2021

488 cases
123 clusters

351 cases
56 clusters

280 cases
72 clusters

108 cases
23 clusters

44 cases
4 clusters

43 cases
24 clusters

43 cases
13 clusters

33 cases
8 clusters

19 cases
10 clusters

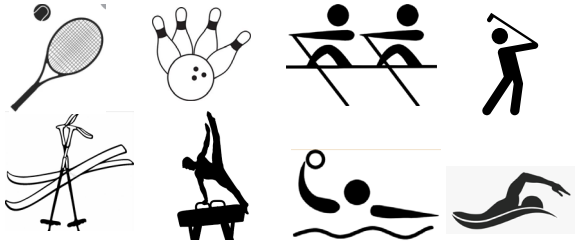
17 cases
9 clusters

15 cases
7 clusters

14 cases
3 clusters

11 cases
8 clusters

27 cases
16 clusters



- Cases identified by local public health which include school-affiliated and club/travel/regional sports (spectators, collegiate, and professional sports as well as secondary cases to collegiate/professional sports are excluded)
- Since January 2021, basketball, hockey, and wrestling have had the highest number of cases and clusters
- Largest number of new clusters identified in spring sports of baseball/softball, volleyball, lacrosse, soccer, and track
- Cases and clusters have occurred in 24 different sport settings

Source: MDHHS – Michigan Disease Surveillance System

COVID-19 and Healthcare Capacity and COVID Severity

Multisystem Inflammatory Syndrome in Children (MIS -C) has been identified in 106 children in Michigan

- Majority of cases are male, between the ages of 5-10, Caucasian, and non-Hispanic/Latino

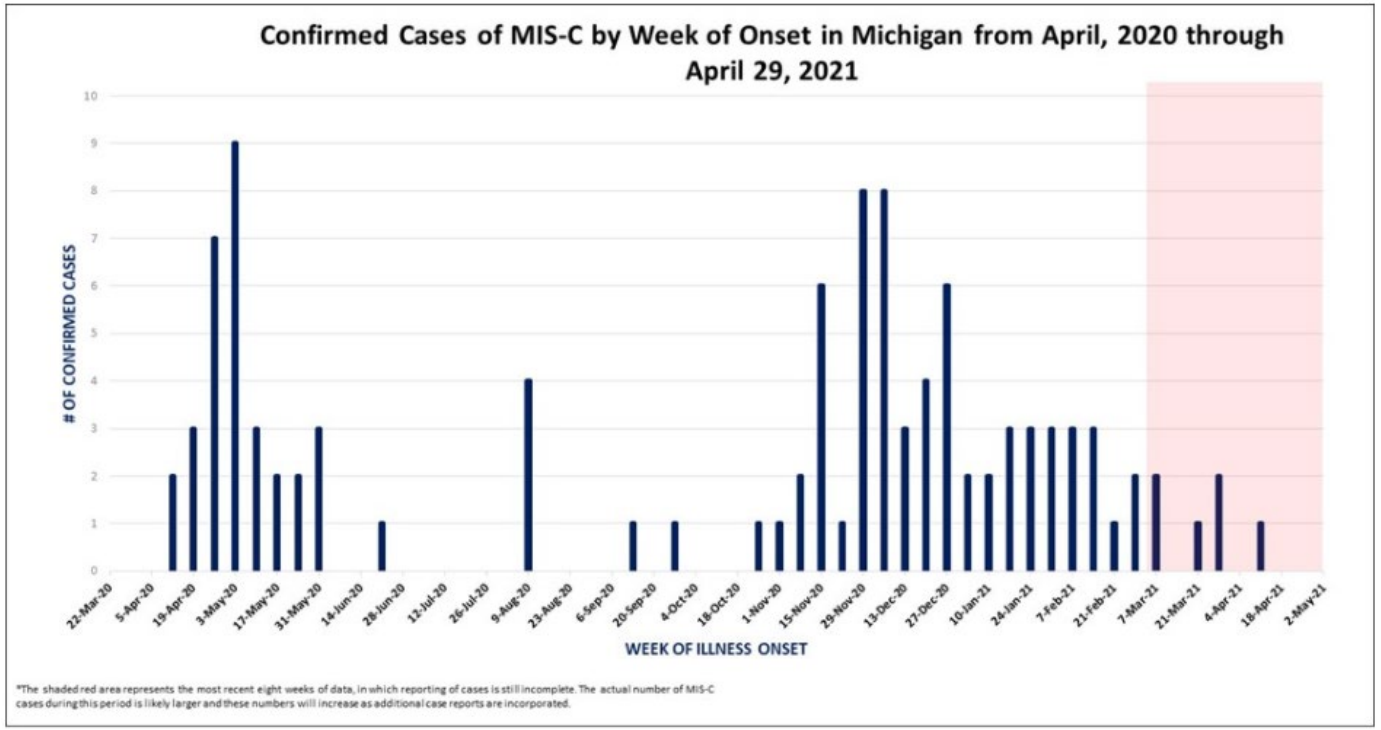
Hospitalizations and ICU utilization are decreasing

- COVID-like illness (CLI) has fallen to 6.4% (vs. 7.6% last week)
- Overall hospital admissions are decreasing but trends vary by age group
  - Since last week, those under 29 years are increasing
  - Since April peak, peds have increased 40%
- Hospitalizations down 19% since last week (vs. 16% decline week prior)
- All regions are showing some level of decline in hospitalization trends this week
- Volume of COVID-19 patients in intensive care (ICU) has decreased 10% since last week (vs. 5% decline week prior)

Death rate has increased to 6.5 daily deaths per million people

- Deaths are a lagging indicator of cases and hospitalization
- 371% increase since the March 9 low
- Proportion of deaths among those *under 60 years* of age is increasing

Multisystem Inflammatory Syndrome in Children (MIS -C)



Red shading indicates the expected reporting lag for new cases. Cases with onset dates in this time period may not have been detected or reported yet.

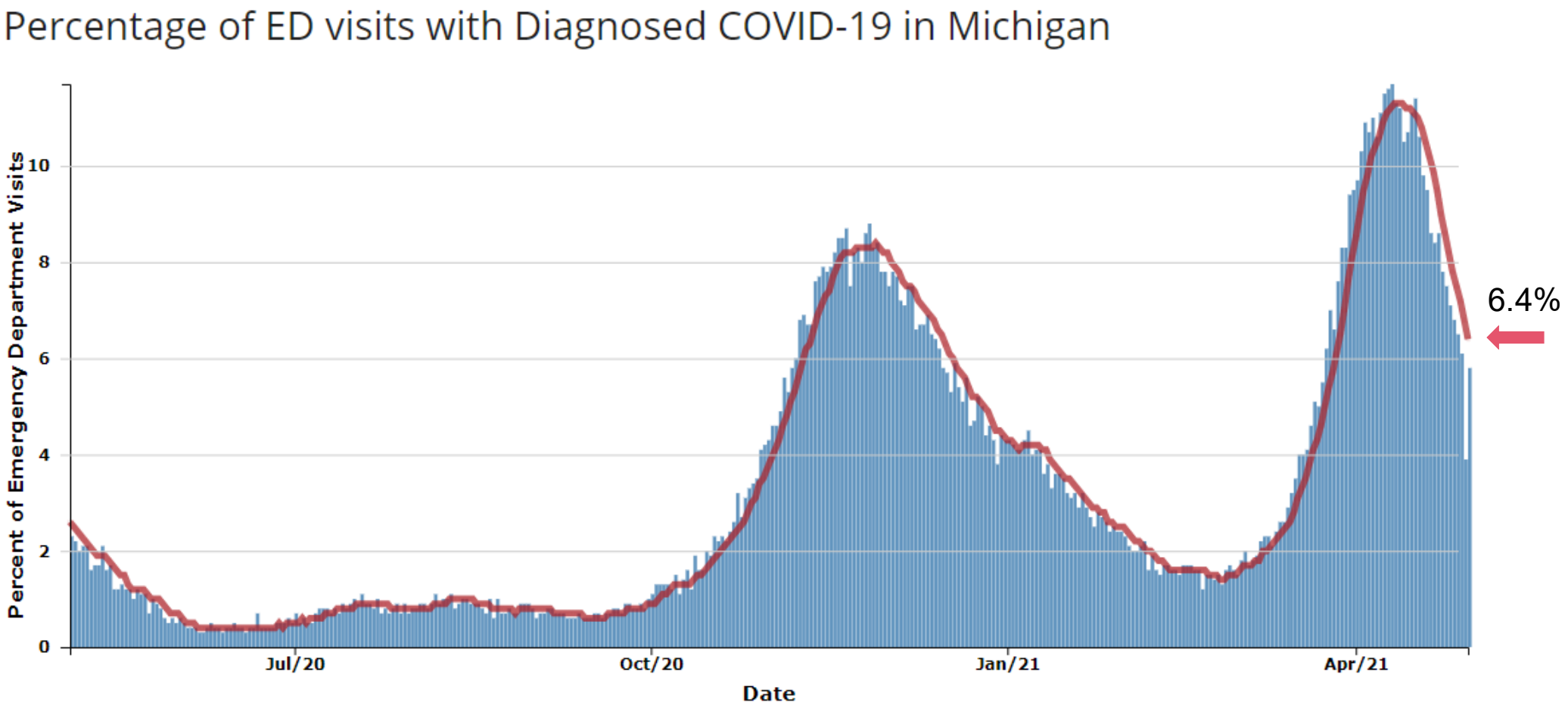
Multisystem Inflammatory Syndrome in Children (MIS-C) Michigan Data Summary 4/29/2021

# Cases Confirmed and Reported to CDC*	106
MIS-C associated Deaths	5 or fewer
Cases admitted to ICU	73 (68.9%)
Onset Date Range	04/14/20 to 4/12/2021
Age Range	0-20 years

*Meets CDC Case definition
https://emergency.cdc.gov/han/2020/han00432.asp

Source: MDHHS – Michigan Disease Surveillance System and Michigan.gov/coronavirusdashboard

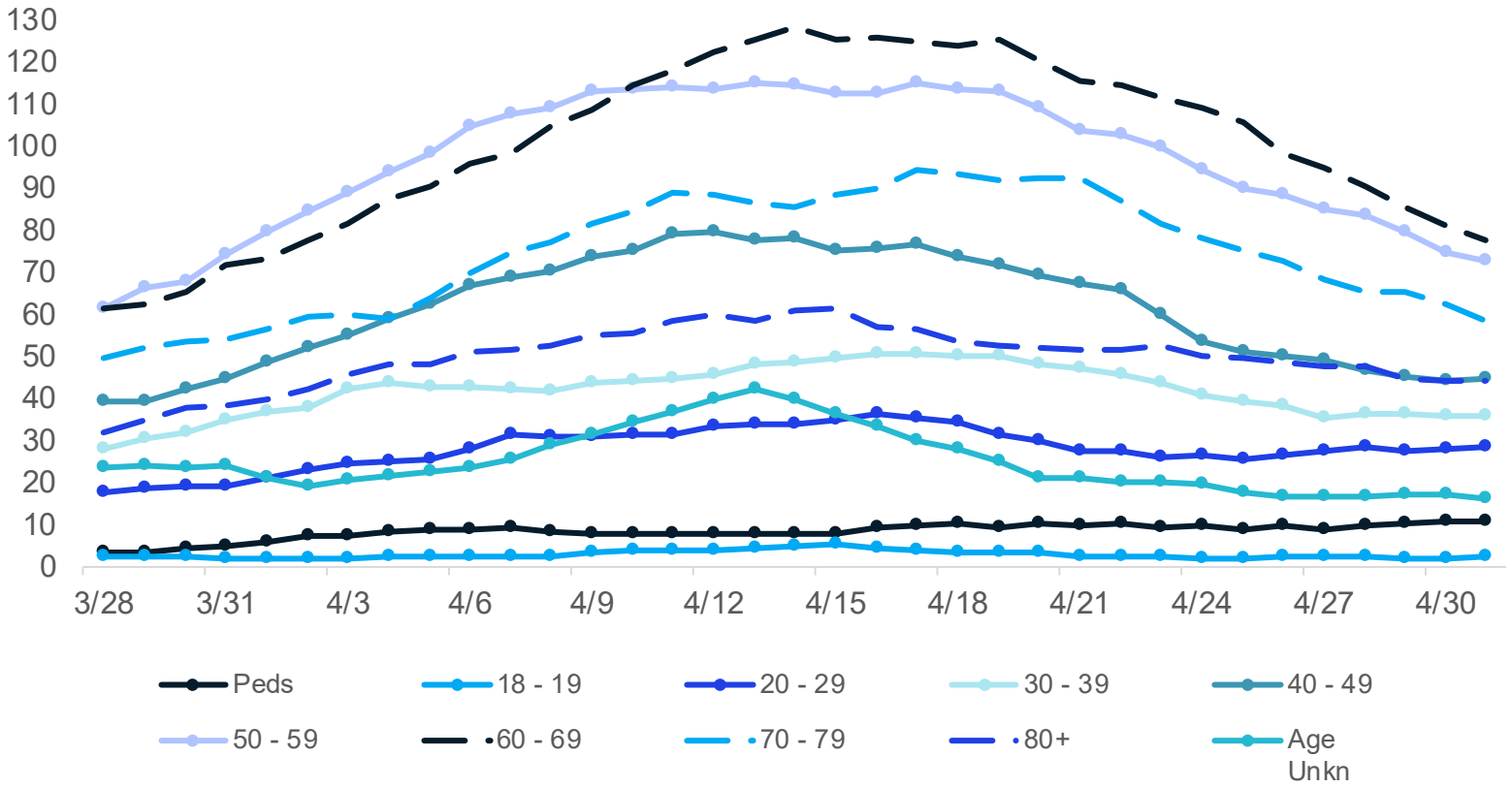
Michigan Trends in Emergency Department Visits for COVID-19-Like Illness (CLI)



Source: https://covid.cdc.gov/covid-data-tracker/#ed-visits

Average Hospital Admissions by Age

Confirmed COVID-19 Hospital Admissions by Age Group - Statewide Rolling Weekly Average



Age Group	Daily Avg Adm.	One Week % Change (#)	% Change since 4/14* (#)
Peds	10.4	9% (0.9)	40% (3.0)
18-19	2.1	25% (0.4)	-56% (-2.7)
20-29	28.1	8% (2.0)	-17% (-5.6)
30-39	35.7	-12% (-4.9)	-26% (-12.7)
40-49	44.0	-17% (-9.1)	-43% (-33.4)
50-59	74.7	-23% (-21.4)	-36% (-41.7)
60-69	80.9	-29% (-31.3)	-40% (-50.9)
70-79	62.3	-25% (-19.7)	-32% (-27.3)
80+	44.0	-12% (-6.0)	-28% (-16.7)
Total¶	389.1	-19% (-93)	-35% (-212)

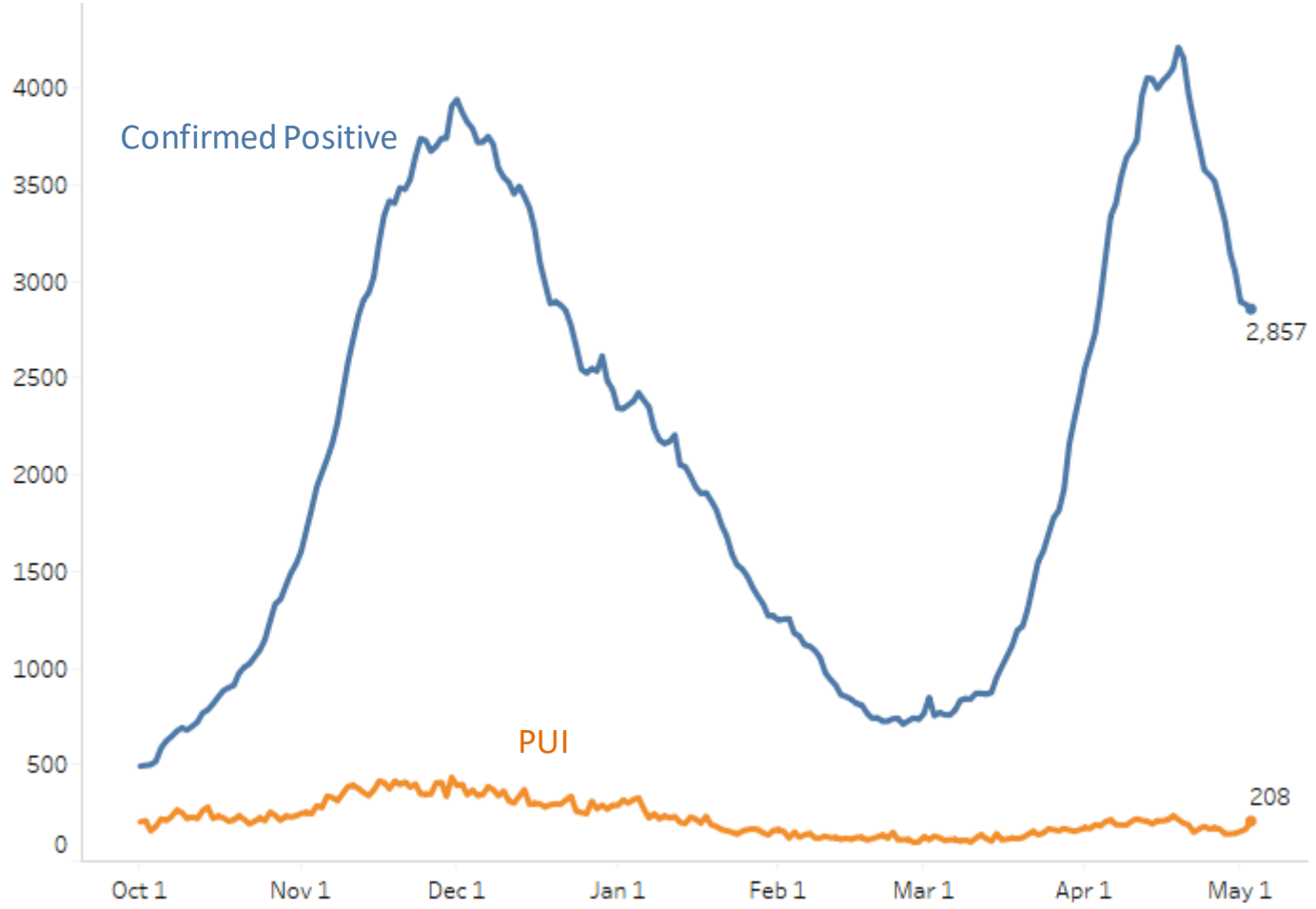
* Highest 7-day avg. hosp. adm. following Spring 2021 surge
¶ Total may not reflect state due to missing age data

- Currently, there are approximately 389 daily hospital admissions for COVID-19
- Over the past week, those 60-69 have seen the highest avg. daily hospital admissions (81 admissions)
- Since Apr 14 high, those 40-79 have seen the > 30% decrease in avg. daily hospital admissions

Source: CHECC & EM Resource

Statewide Hospitalization Trends: Total COVID+ Census

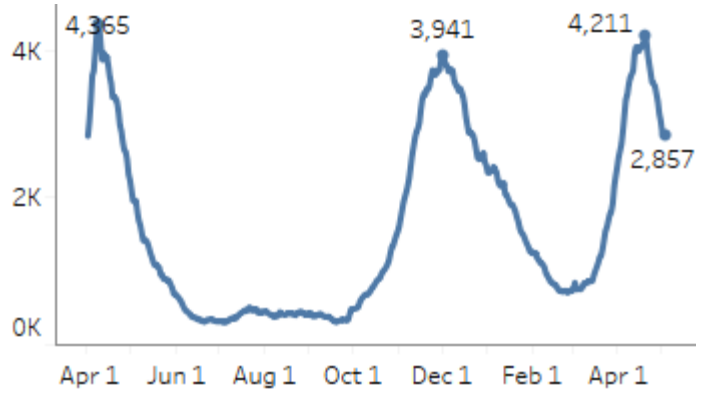
Hospitalization Trends 10/1/2020 – 5/3/2021
Confirmed Positive & Persons Under Investigation (PUI)



COVID+ census in hospitals continues to decline from the April 19th peak.

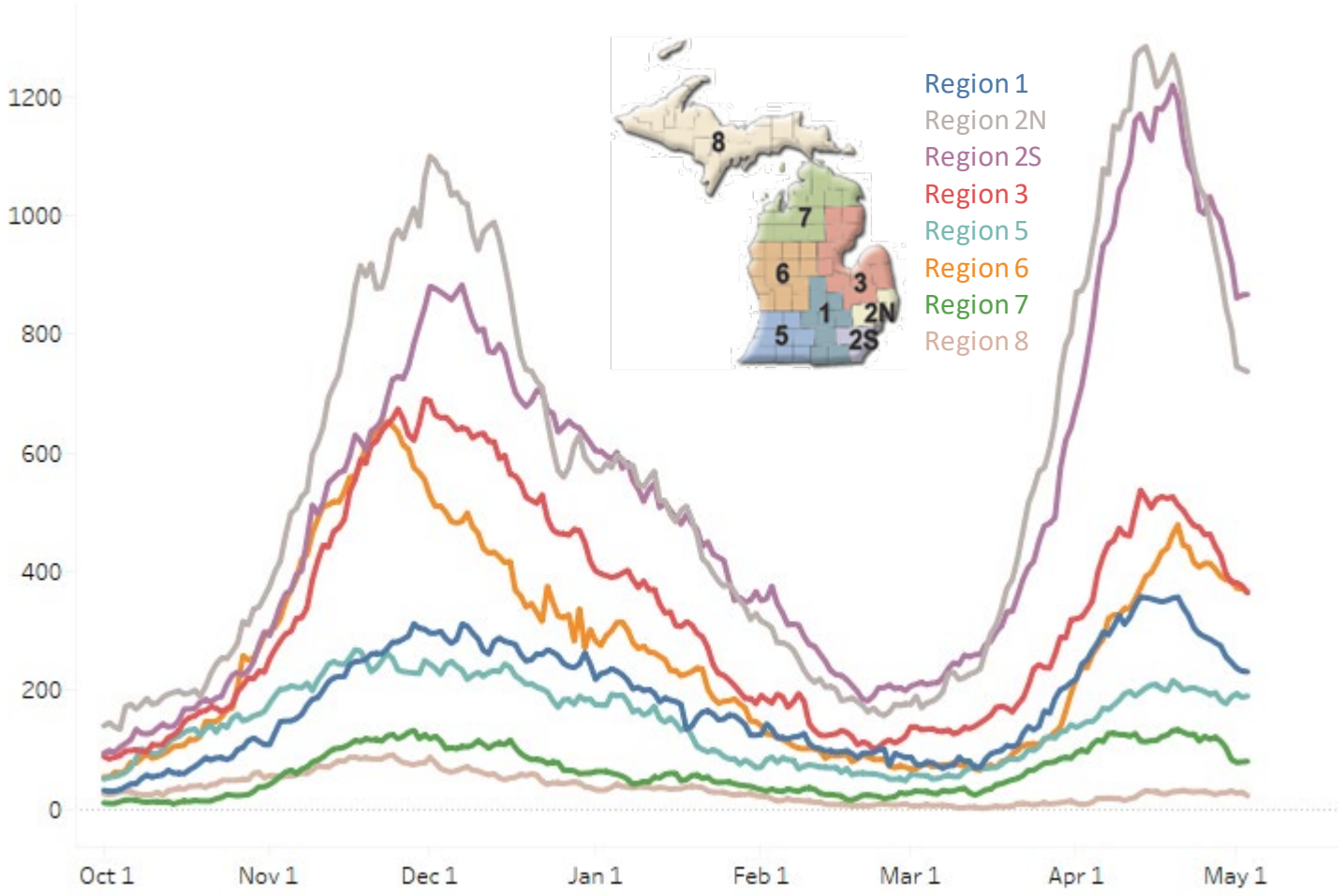
This week is down 19% from the previous week (vs. 16% decline the week prior).

Hospitalized COVID Positive Long Term Trend (beginning March 2020)



Statewide Hospitalization Trends: Regional COVID+ Census

Hospitalization Trends 10/1/2020 – 5/3/2021
Confirmed Positive by Region



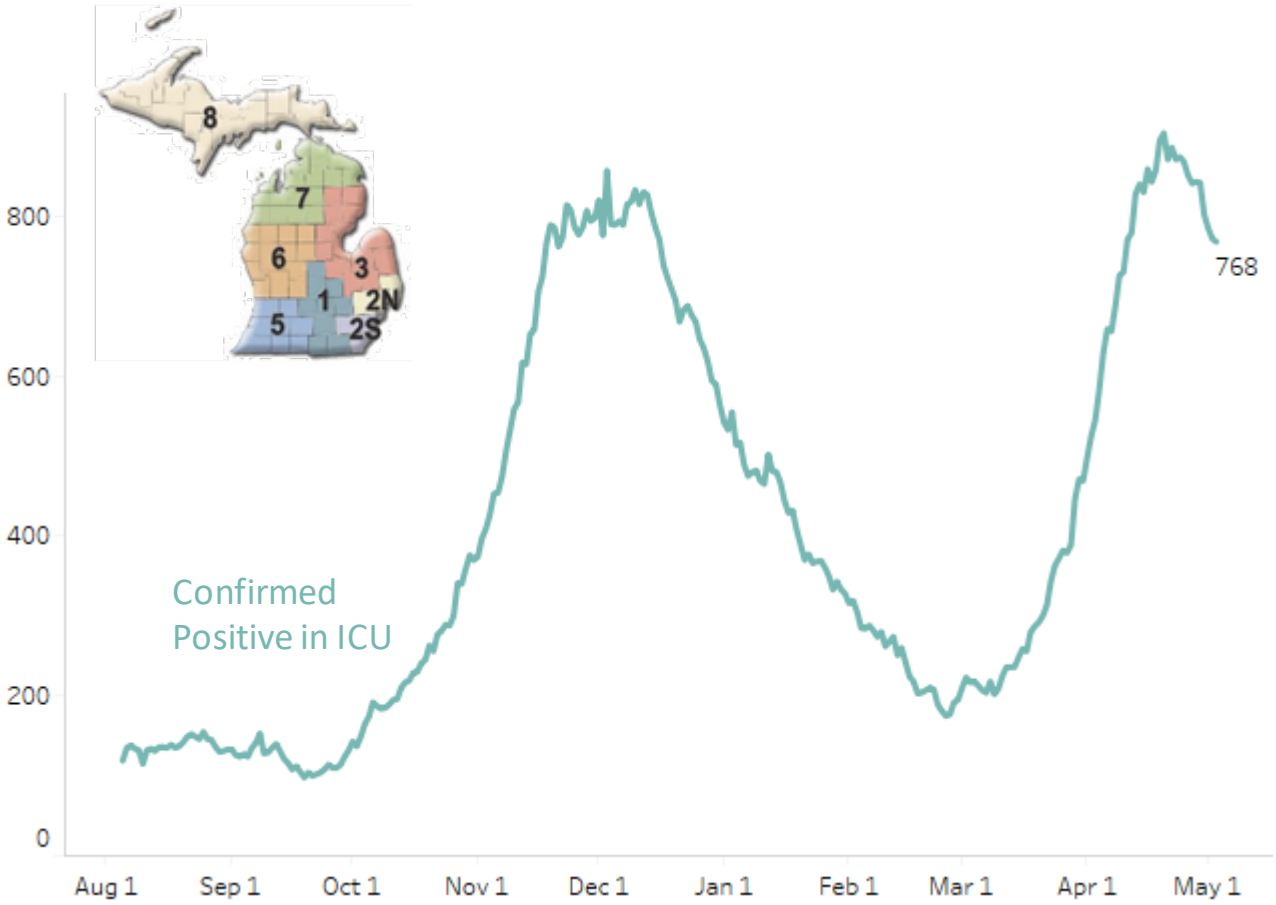
All regions are showing decreasing hospital COVID census trends this week although the decline is minimal in Region 5 (SW).

All regions are now below 400/M population hospitalized, with 3 regions (Regions 5, 7, and 8) now below 200/M hospitalized.

Region	COVID+ Hospitalizations (% Δ from last week)	COVID+ Hospitalizations / MM
Region 1	231 (-19%)	214/M
Region 2N	737 (-25%)	333/M
Region 2S	867 (-16%)	389/M
Region 3	364 (-21%)	321/M
Region 5	190 (-1%)	199/M
Region 6	366 (-12%)	250/M
Region 7	80 (-32%)	160/M
Region 8	22 (-19%)	71/M

Statewide Hospitalization Trends: ICU COVID+ Census

Hospitalization Trends 8/1/2020 – 5/3/2021
Confirmed Positive in ICUs



Overall, the census of COVID+ patients in ICUs has decreased 10% from last week, with all regions showing decreases.

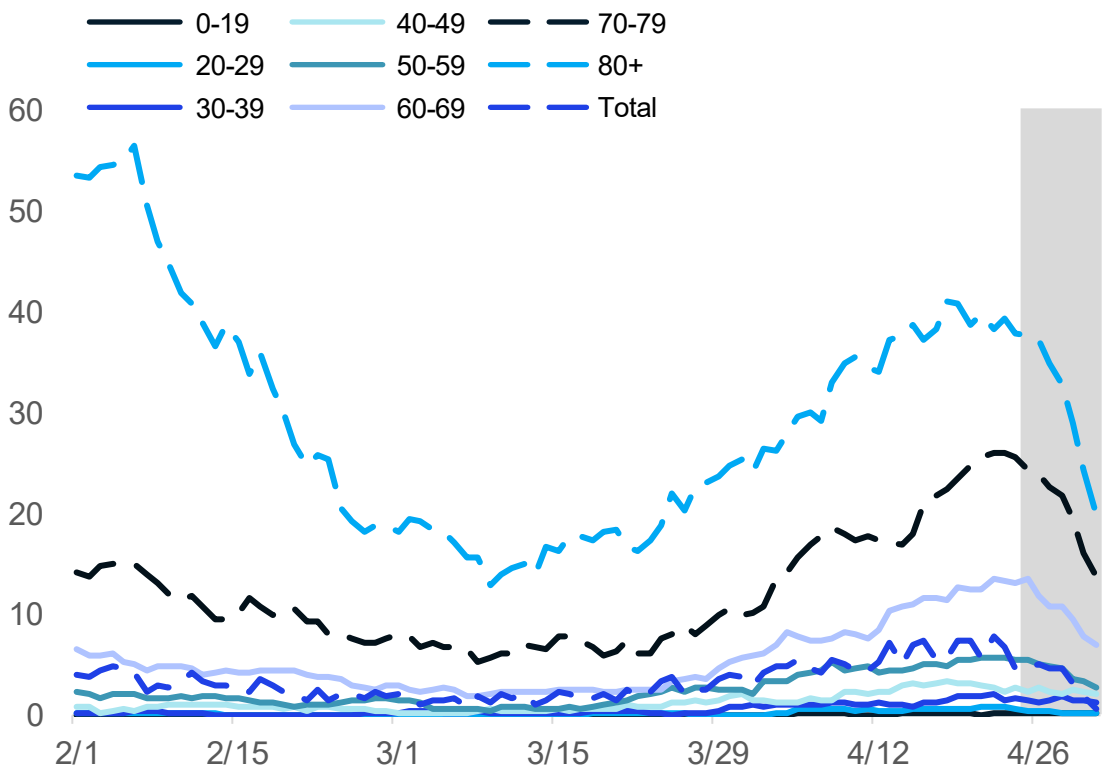
Regions 2S and 6 continue to have >30% ICU beds occupied with COVID patients and Region 3 continues to have >90% overall ICU occupancy.

Region	Adult COVID+ in ICU (% Δ from last week)	Adult ICU Occupancy	% of Adult ICU beds COVID+
Region 1	56 (-5%)	90%	28%
Region 2N	156 (-20%)	87%	25%
Region 2S	250 (-7%)	85%	32%
Region 3	107 (-4%)	94%	29%
Region 5	43 (-4%)	79%	25%
Region 6	108 (-8%)	85%	40%
Region 7	40 (-13%)	67%	22%
Region 8	8 (-20%)	76%	14%

Hospital bed capacity updated as of 4/30

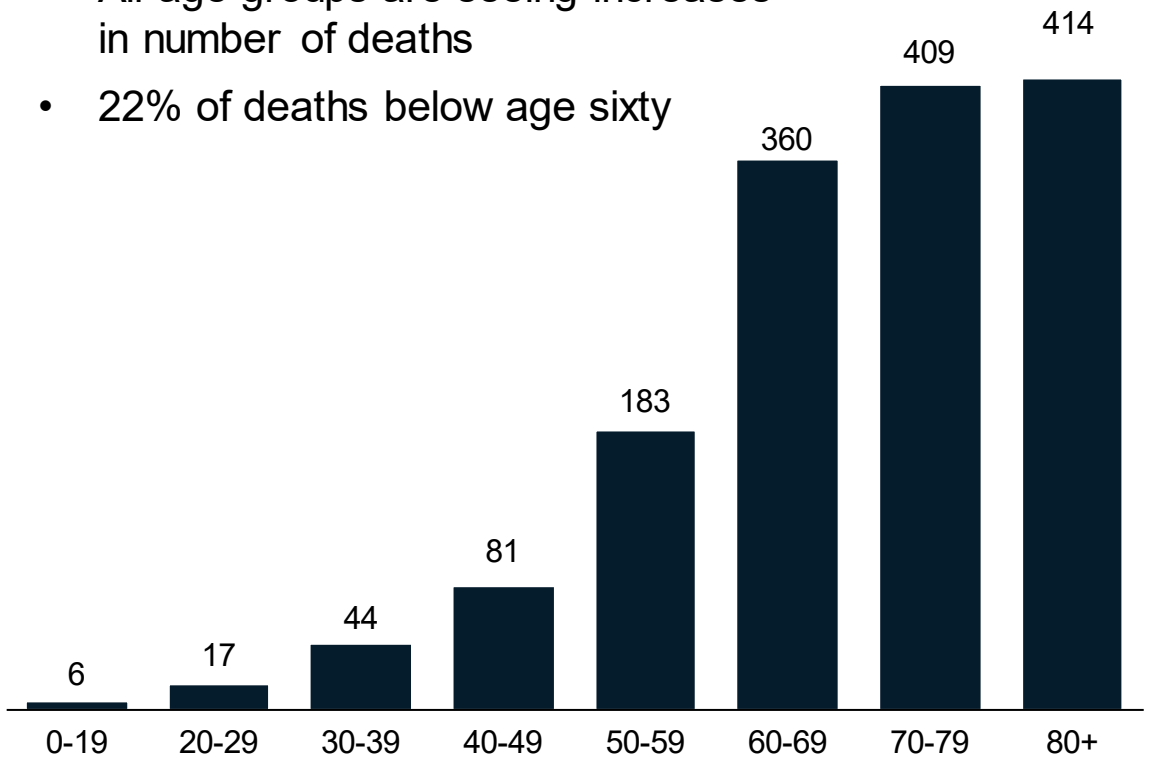
Average and total new deaths, by age group

Daily confirmed and probable deaths per million by age group (7 day rolling average)



Total confirmed and probable deaths by age group (past 30 days, ending 4/24/2021)

- All age groups are seeing increases in number of deaths
- 22% of deaths below age sixty

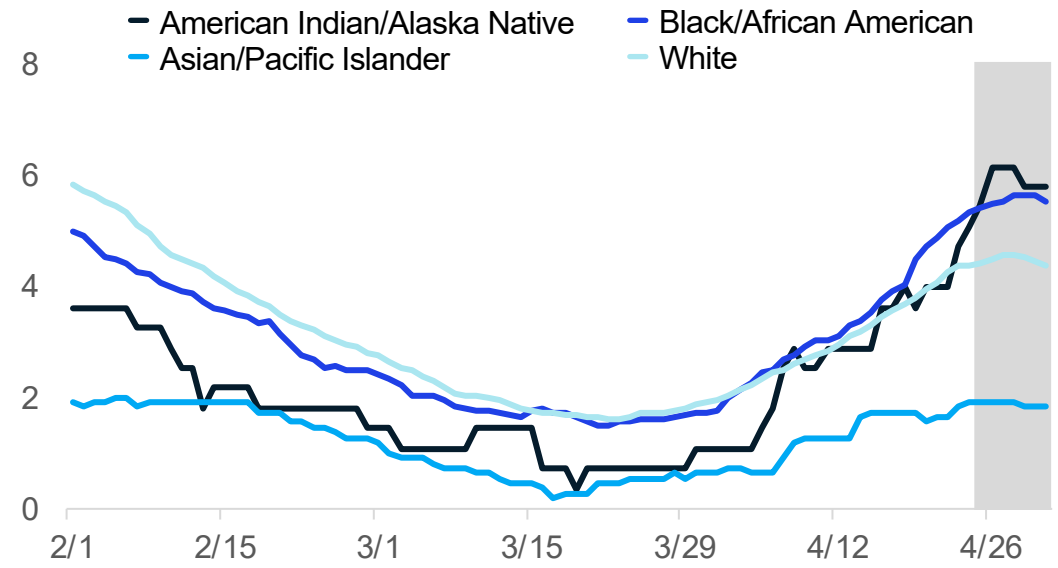


Note: Death information sourced from MDHHS and reflects date of death of confirmed and probable cases.

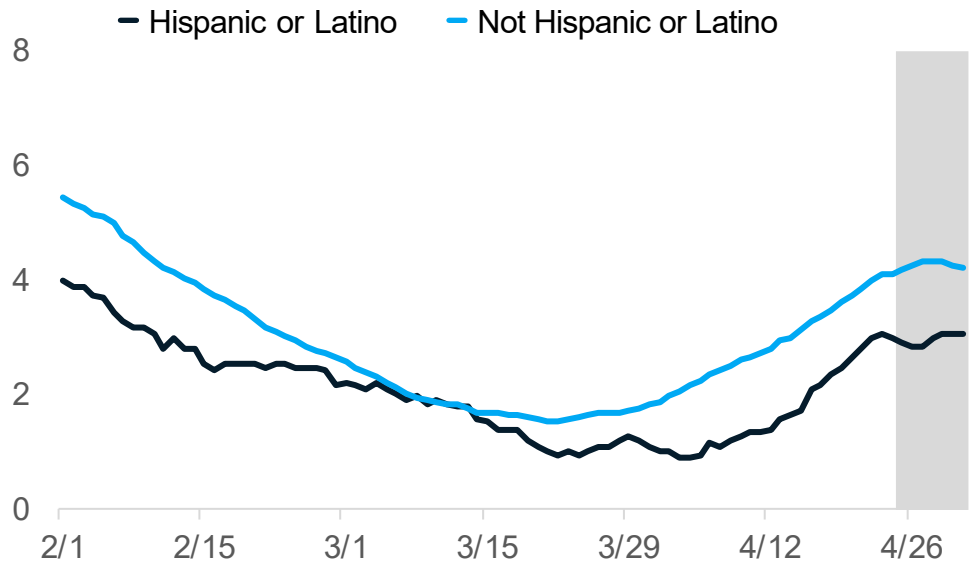
Source: MDHHS – Michigan Disease Surveillance System

30-day rolling average daily deaths per million people by race and ethnicity

Average daily deaths per million people by race



Average daily deaths per million people by ethnicity



Updates since last week:

- Deaths are a lagging indicator of cases, and death rates are increasing among racial and ethnic groups
- All racial and ethnic groups are seeing an increase in COVID deaths
- American Indian/Alaskan Natives, Blacks and Non-Hispanics/Latinos have the most reported deaths per capita
- Deaths are not adjusted for confounders (e.g., age, sex, comorbidities)

Note: Death information sourced from MDHHS and reflects date of death of confirmed and probable cases.
Source: MDHHS – Michigan Disease Surveillance System

How is public health capacity?

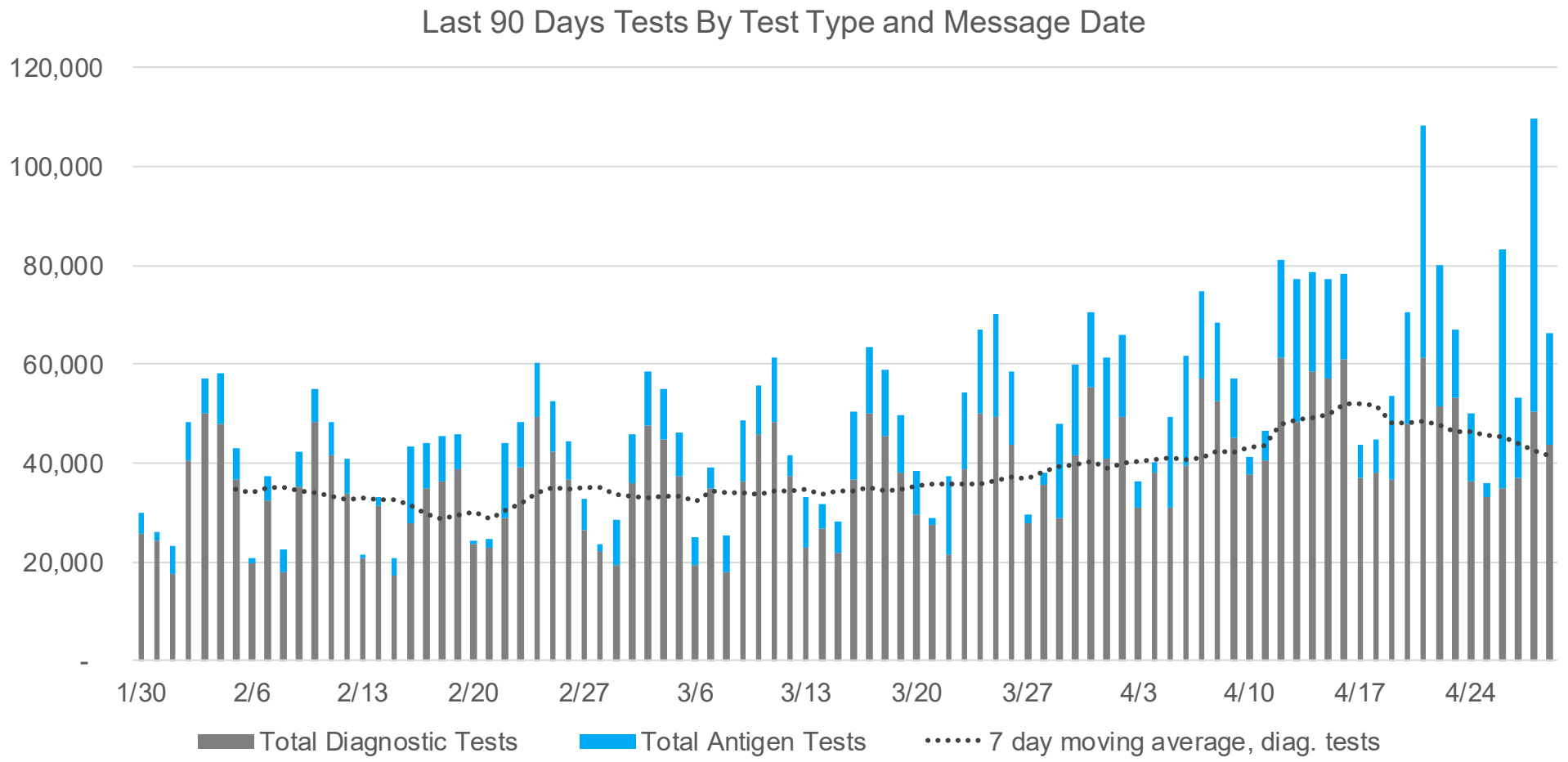
Diagnostic testing volume (PCR and antigen) has decreased slightly from last week

- PCR testing decreased since last week
- Percent of antigen tests have increased since last week

Cases identified for investigations has declined

- Number of cases not investigated this week (15,881) is 33% lower than prior week (24,409)
- Consistent low proportion of cases interviewed with a source of known infection (indicating community acquisition)
  - As cases have decreased, the percent of interviews attempted has improved
- Consistent low proportion of those quarantining when their symptoms begin (indicating no effective halt in community transmission)

Daily diagnostic tests, by message date



Weekly Update

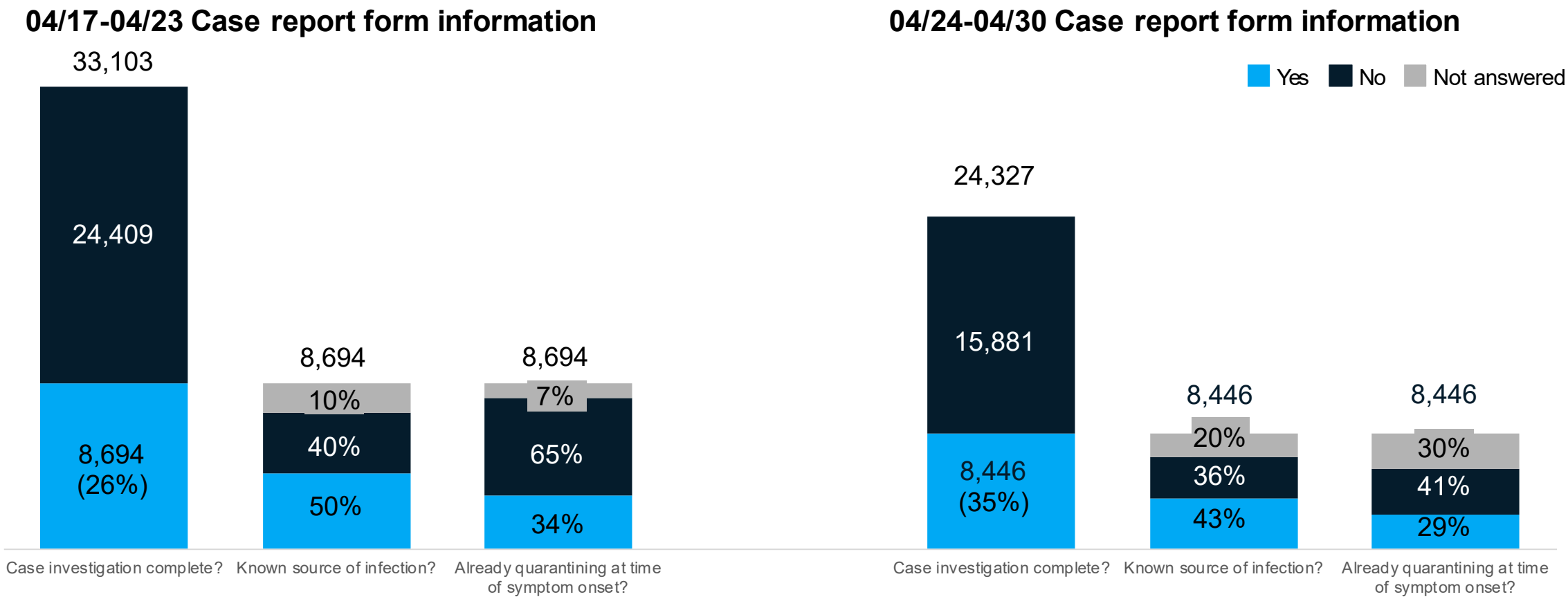
- 66,557 rolling 7-day average daily diagnostic tests reported to MDHHS (PCR + Ag) (↓)
- 41,304 average daily PCR tests (↓)
- 37.9% are antigen tests over the past week (↑)
- 12.6% positivity in PCR tests (↓)

Source: MDSS/Michigan Medical Advantage Group, MDHHS, testing labs

New Case Investigation Metrics (Statewide)

New Communicable Disease metrics this week:

- Number of cases identified for investigations (↓), and percent of completed interviews (↑) have improved from prior week
- 43% of investigated cases having a known source (50% last week, 55% week prior)
- 29% of investigated cases noted that they were quarantining before symptoms (34% last week)



Source: MDHHS – Michigan Disease Surveillance System

COVID-19 Vaccination

Administration

- 8th among all states for doses administered; 7th for number fully vaccinated (CDC data tracker 5/3/2021)
- 77.9% adjusted administration ratio (excluding federal entities, CDC channel portfolio 5/2/2021)
- Weekly doses administered declined for two weeks

Coverage

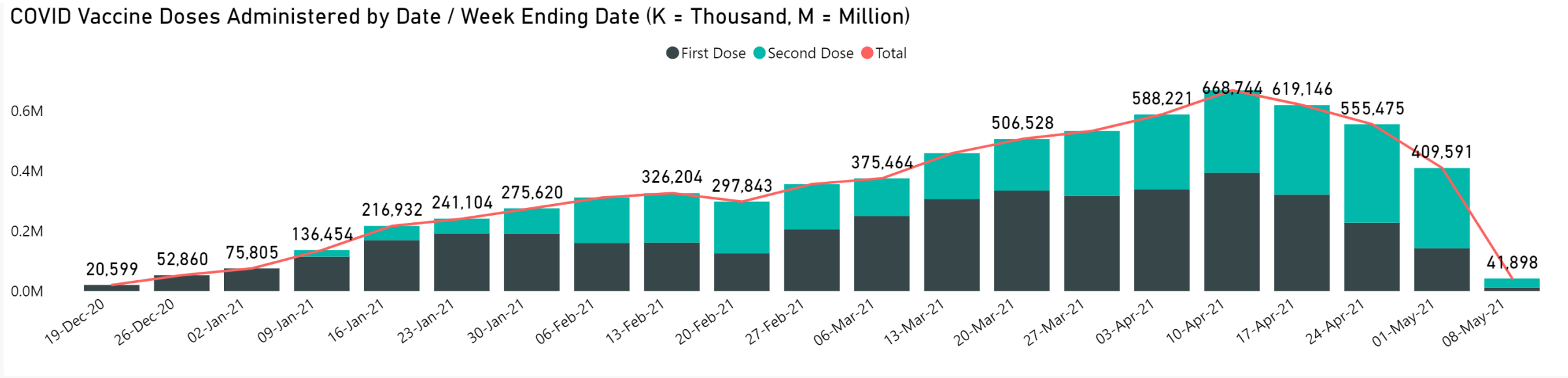
- 50.6% of MI residents age 16+ have initiated COVID vaccination and 39.3% have completed their series
- Coverage is highest among 65-75 and 75+ age groups, but more than 66% of people 50-64 have started vaccine
- Initiation coverage was highest among Asian, Native Hawaiian or Pacific Islander individuals

Vaccinated Individuals Who Test Positive

- Number of cases who are fully vaccinated (n=4,031) is not in excess of what might be expected with vaccines with 95% efficacy.
- Possibility of infection and further transmission is why recommend precautions in public (e.g., wearing masks, washing hands and social distancing) even after receiving the vaccine until more Michiganders have been able to be vaccinated

Doses Delivered and Administered, and Coverage as of 5/4

9,702,905 doses delivered to Michigan providers*



7,068,833 doses Administered

- 77.9% Federal-Jurisdiction adjusted administration ratio (excluding federal entities, per CDC channel portfolio as of 5/2/2021)
- 6 weeks with more than 500,000 doses administered in a week; 19 days over 100,000 in a day
- 409,591 doses administered last week (down ~135,100 doses over previous week). Loss is in first doses.

*Includes state allocated doses ordered by State of Michigan, SOM allocation transferred to federal programs, and federal doses from federal programs to Michigan providers. Does not include federal doses sent to federal providers (i.e., Veteran's Administration hospitals, federal prison system, or Department of Defense programs). The State of Michigan does not have control over how much vaccine is allocated or administered by Federal program.

Coverage Demographics as of 5/4/2021

50.6% of MI residents age 16+ have initiated COVID vaccination

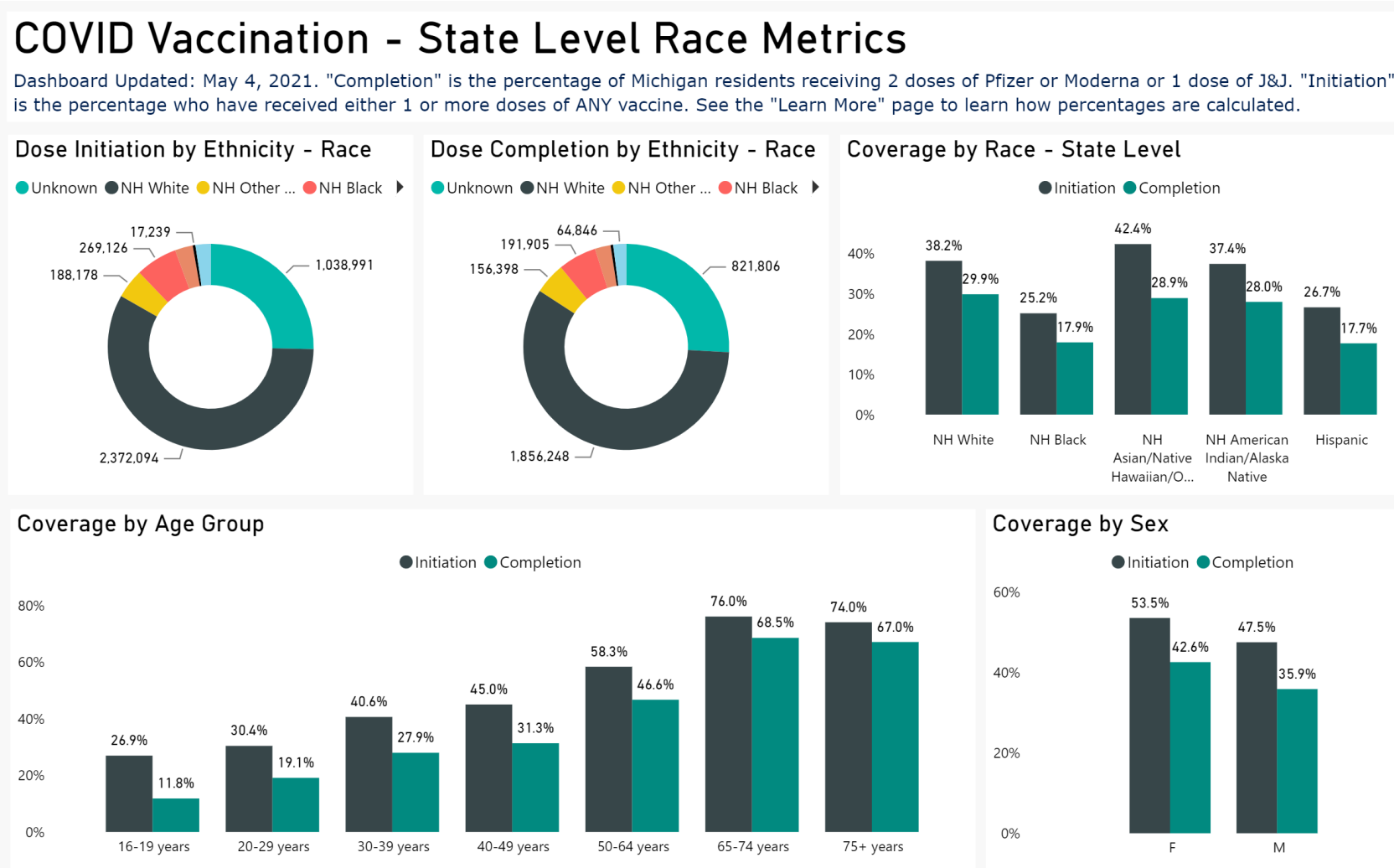
3,182,912 people have completed series

Age Group

- 66.1% of those 50+ have started vaccine series
- 67.9% people aged 65 or older have completed their vaccine series

Race/Ethnicity

- Initiation coverage highest among those of Asian, Native Hawaiian or Pacific Islander Race (42.4%) then NH (Non-Hispanic) White (38.2%), American Indian (37.4%), NH Black or African American (25.2%) Races, and Hispanic (26.7%) ethnicity
- 25.4% data missing or unknown



Source: Michigan Coronavirus Dashboard https://www.michigan.gov/coronavirus/0,9753,7-406-98178_103214-547150--,00.html

Potential COVID-19 Vaccination Breakthrough Cases

Process:

- Michigan part of CDC's nationwide investigation (COVID-19 Breakthrough Case Investigations and Reporting | CDC)
- Weekly match COVID-19 cases to records of all fully vaccinated persons
- Absence of a positive test less than 45 days prior to the post-vaccination positive test
- Send data to CDC and, if available, gather respiratory specimens for whole genome sequencing

Michigan Data (1/1/21 through 4/27/21):

- 4,031 cases met criteria based on a positive test 14 or more days after being fully vaccinated
- Less than 1% of people who were fully vaccinated met this case definition
  - Includes 34 deaths, 32 persons 65 years or older, one had prior PCR positive greater than 45 days prior
  - 135 cases were hospitalized

Summary Points:

- Number of potential cases identified to date is not in excess of what might be expected with vaccines with 95% efficacy.
- Proportions of those symptomatic, hospitalized, and who died are all lower than those who are unvaccinated.
- Continue to encourage precautions while out in public, including wearing masks, washing hands and social distancing, even after receiving the vaccine until more Michiganders have been able to be vaccinated.

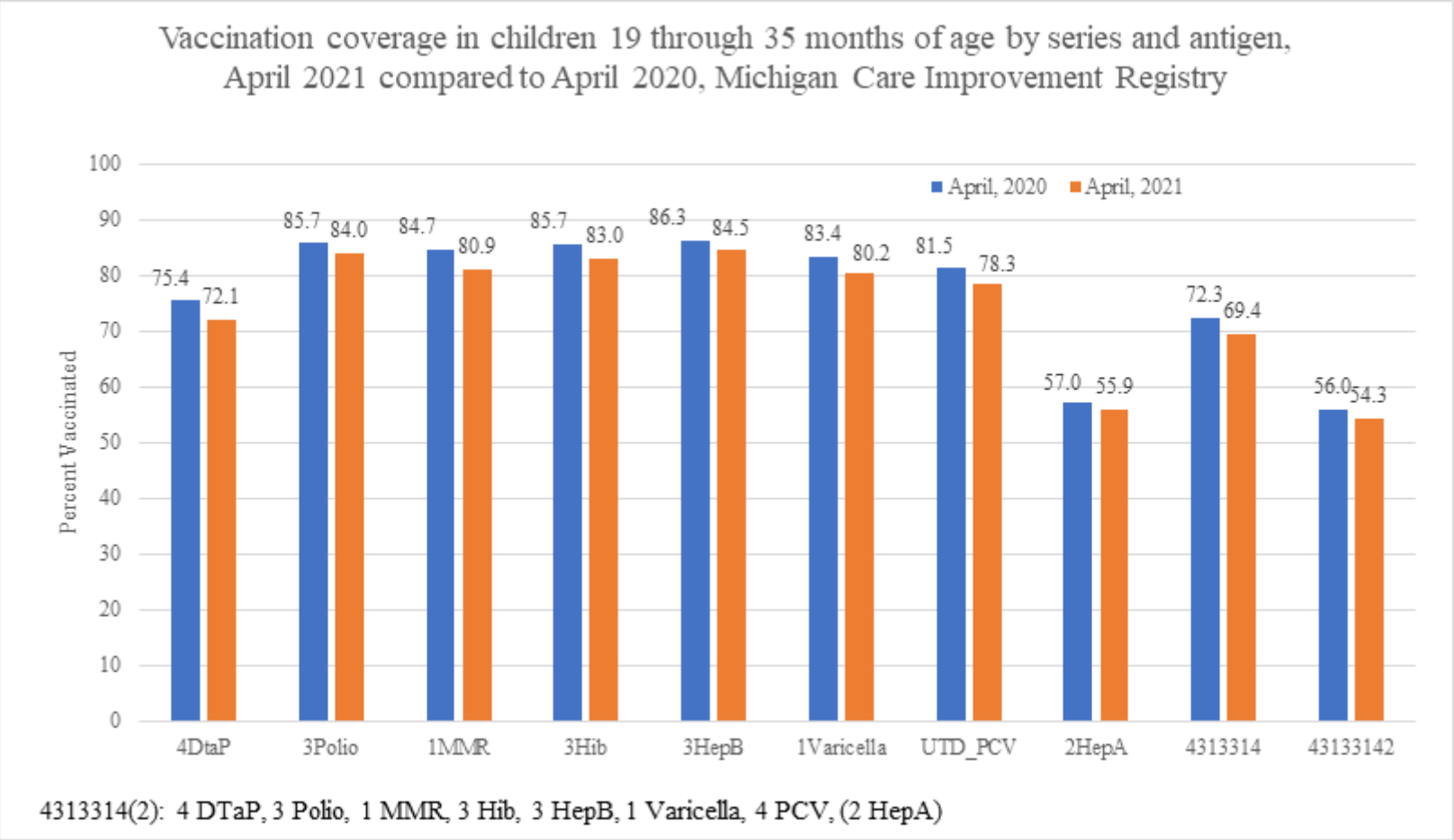
Other Public Health Indicators

Childhood Vaccination Coverage

- Vaccination coverage for Michigan children 19 through 35 months of age has declined from April 2020 to April 2021
- Since 2020Q2, trends for vaccination coverage among children 19-35 months has decreased for most races with the greatest disparities among those who are black or for whom race is missing or unknown

Routine Childhood Vaccination Coverage

- Vaccination coverage for Michigan children 19 through 35 months of age has declined from April 2020 to April 2021
- Coverage for the primary 4313314 series has decreased 2.9%, from 72.3 to 69.4%
- Coverage for each individual antigens assessed decreased
- Most concerningly, coverage for 1 dose of the measles containing MMR vaccine has declined the most (3.7%) and is only at 80.9% (recommended: 95% to achieve herd immunity*)



* WHO recommendations

Source: Michigan Department of Health and Human Services – Immunization Program

Routine Childhood Vaccination Coverage: Racial Disparities

19 through 35 months child vaccine series coverage by mother's race, by quarter and month

Race	2019Q2	2019Q3	2019Q4	2020Q1	2020Q2	2020Q3	1-Nov-20	4-Dec-20	2-Jan-21	10-Apr-21
American Indian	73.16	74.48	74.74	74.01	71.07	68.88	68.65	68.65	69.12%	67.38%
Asian/Pacific Islander	81.44	80.80	80.39	79.97	78.29	78.31	78.00	77.97	77.84%	78.20%
Black	63.04	63.51	62.48	60.97	57.44	56.13	55.39	55.61	54.93%	53.25%
White	79.02	79.37	78.86	77.89	75.81	75.74	75.60	75.64	75.33%	74.55%
Other	75.51	77.68	77.92	76.17	73.21	73.74	73.57	73.96	73.78%	72.98%
Missing/Unknown	60.42	59.38	57.46	56.57	54.12	53.22	55.51	55.84	55.75%	52.70%

4313314: 4 DTaP, 3 Polio, 1 MMR, 3 Hib, 3 HepB, 1 Varicella, 4 PCV

- This table displays the trends over time by race for the childhood vaccine coverage of 4313314 (4 DTaP, 3 Polio, 1 MMR, 3 Hib, 3 HepB, 1 Varicella, 4 PCV)
- Since 2020Q2, trends for vaccination coverage among children 19-35 months has decreased for most races
- Vaccine coverage is lowest for Black and Missing/Unknown Race

Source: Michigan Department of Health and Human Services – Immunization Program

Science Round Up

Nationwide Seroprevalence Update

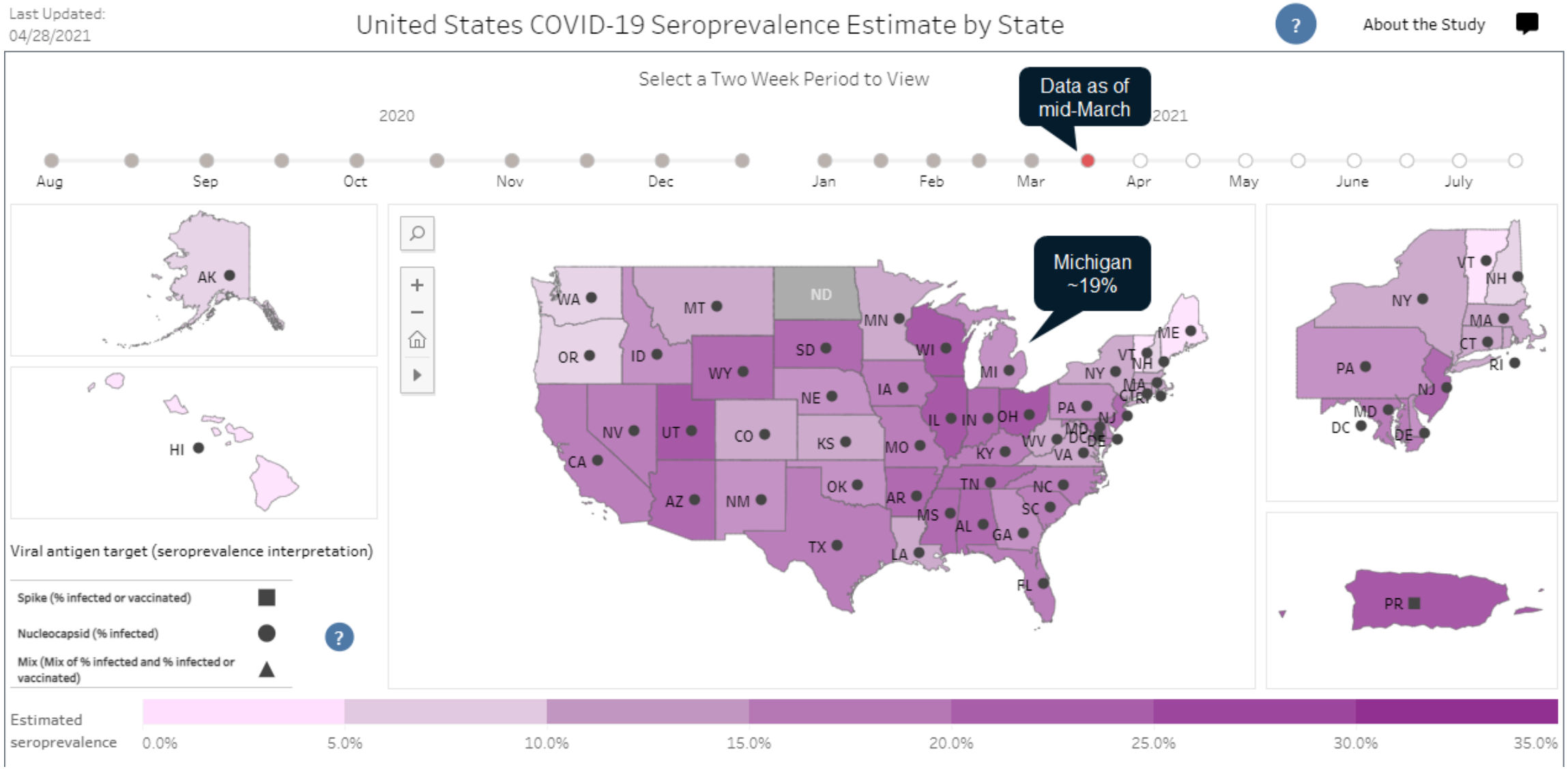
- Approximately 19.7% of Michiganders have been infected with SARS-CoV-2 (lower than neighboring states)
- This equates to almost 2 million Michiganders
- Those who are younger and female are more likely to have antibodies for SARS-CoV-2 in this study

International Update: India

- Healthcare capacity overwhelmed
- Perfect Storm: easing of restrictions + emergency of variants (B.1.1.7 and B.1.617)
- B.1.617: WHO Variant of Interest

Concepts in Herd Immunity

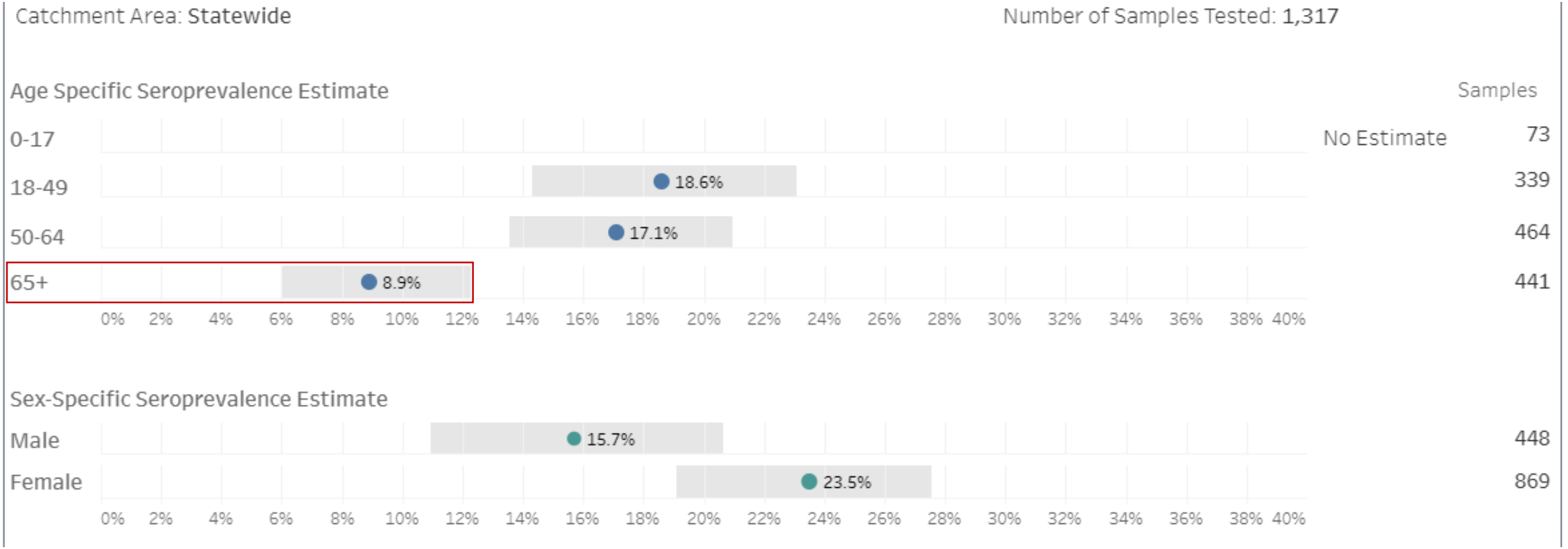
- Using testing, surveillance, and vaccination to estimate future projections



- Michigan seroprevalence has been relatively stable between 17-20% since January
- Michigan had lower estimated seroprevalence than some of our neighboring states (WE, IL, IN, OH estimates range from 25-32%)

Source: https://covid.cdc.gov/covid-data-tracker/#national-lab

Michigan Commercial Laboratory Seroprevalence Survey – Age and Sex Distributions

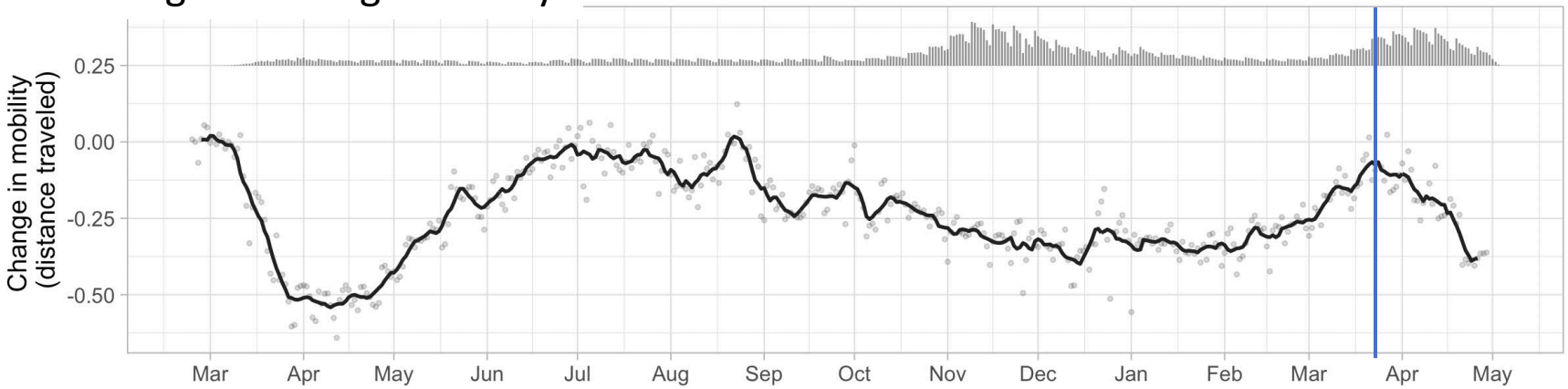


Unacast mobility patterns in MI

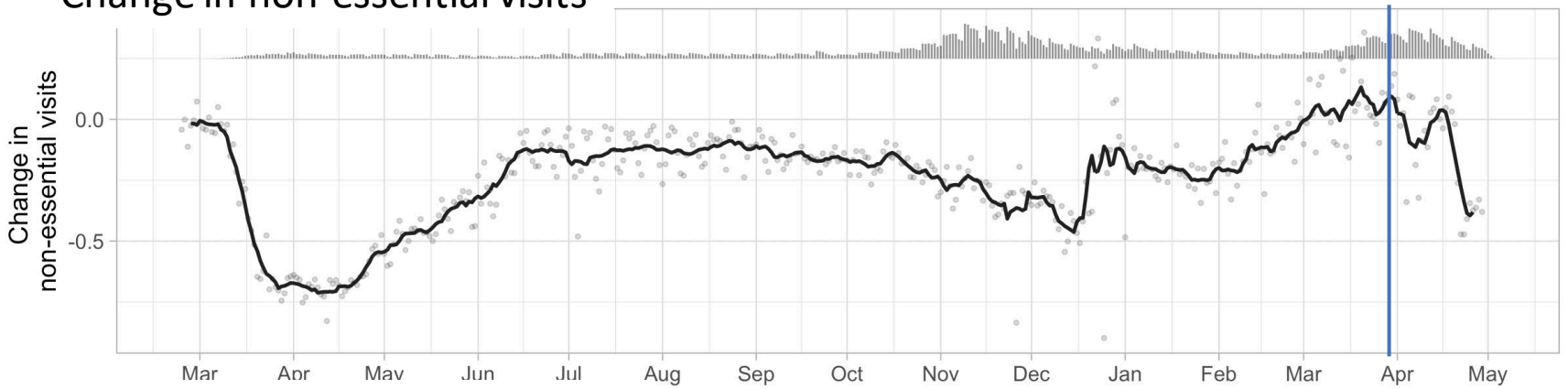
- All metrics decreasing, particularly avg. mobility & non-essential visits
- Mobility decreases precede case decreases
- Blue lines show approximately when mobility decreases began, cases shown as bars at top of each chart
- Data through 4/29/21 (data as of 5/3/21)

Unacast social distancing scoreboard https://www.unacast.com/covid19/social-distancing-scoreboard

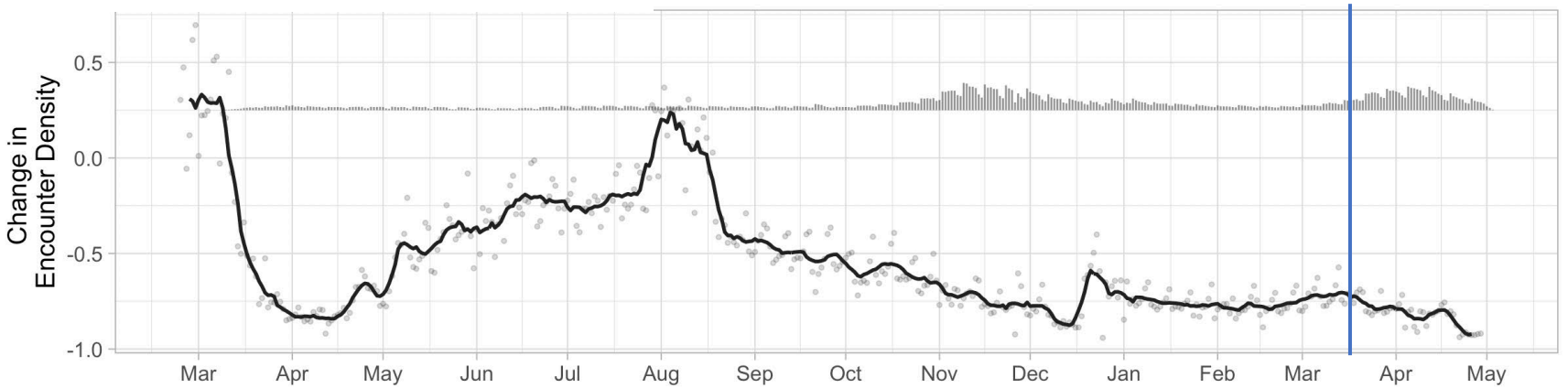
Change in average mobility



Change in non-essential visits

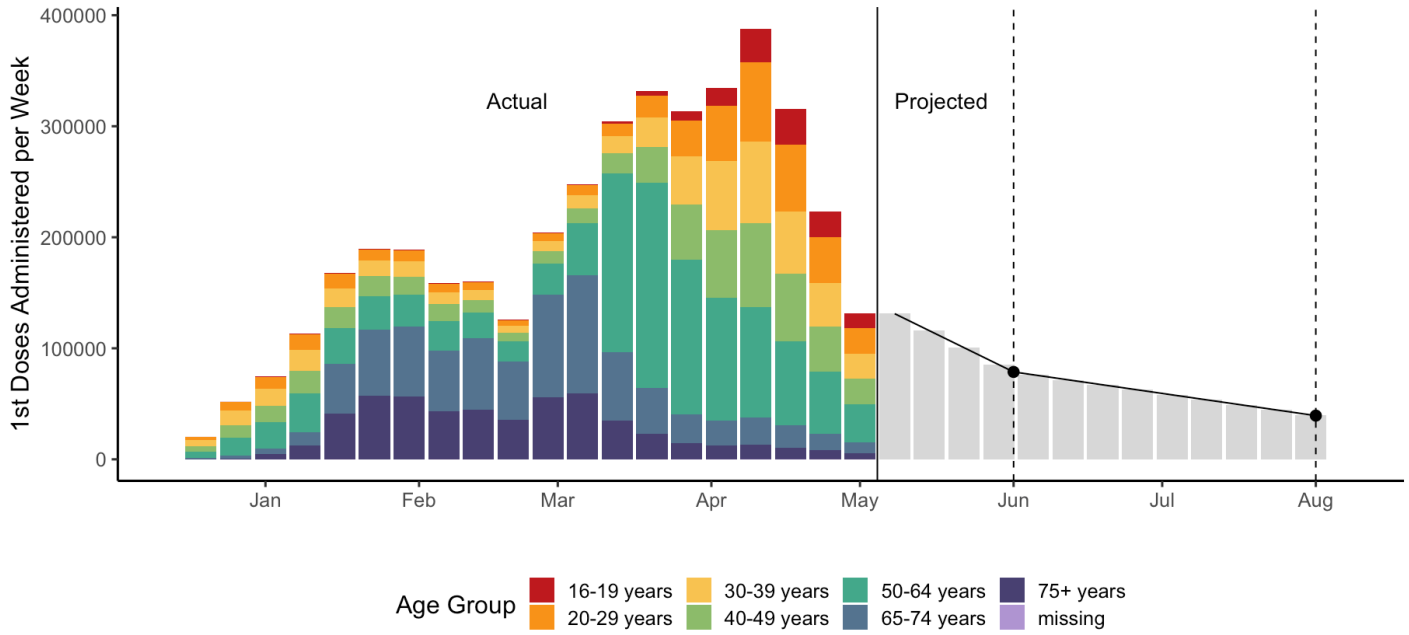


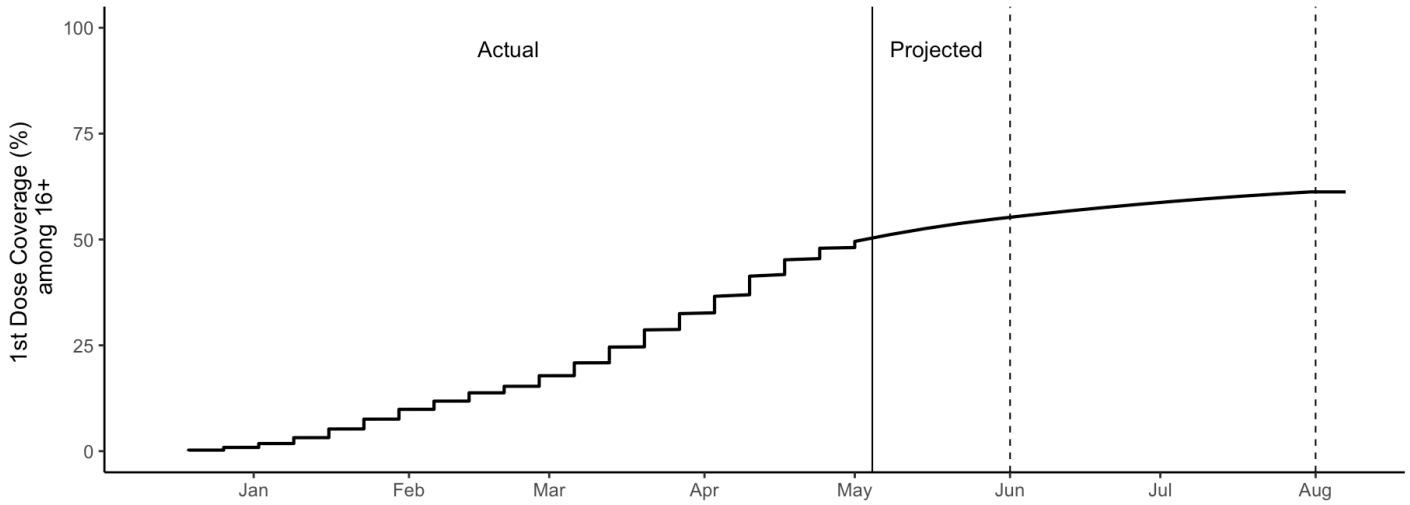
Difference in encounter density

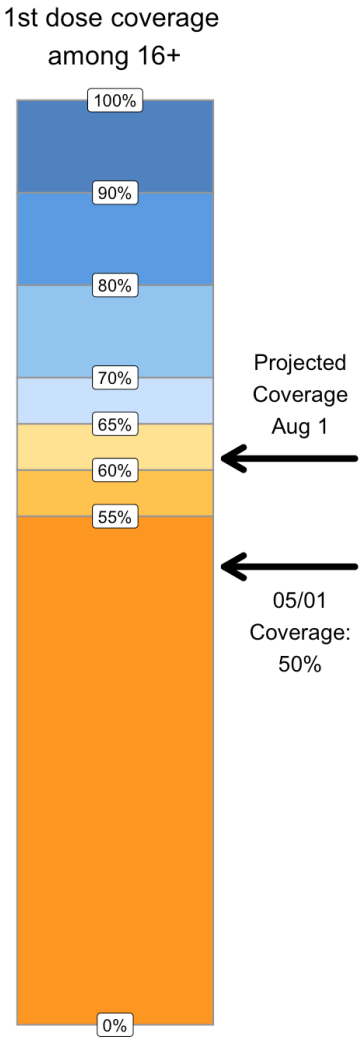


How might vaccination levels change through the summer?

- If 1st doses/week fall to 60% of last week by 6/1 and 30% by 8/1, expect 60-65% 1st dose coverage by August 1
- If 1st doses/week stay constant at last week levels, could reach 70% by August 1
- Sooner if 1st doses/week return to previous weeks levels







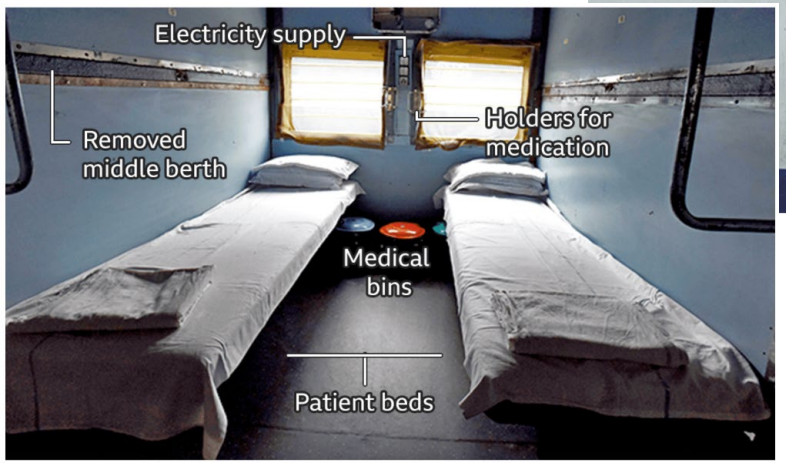
PUBLIC HEALTH

https://sph-umich.shinyapps.io/covid19-vaccines/

International Update: India

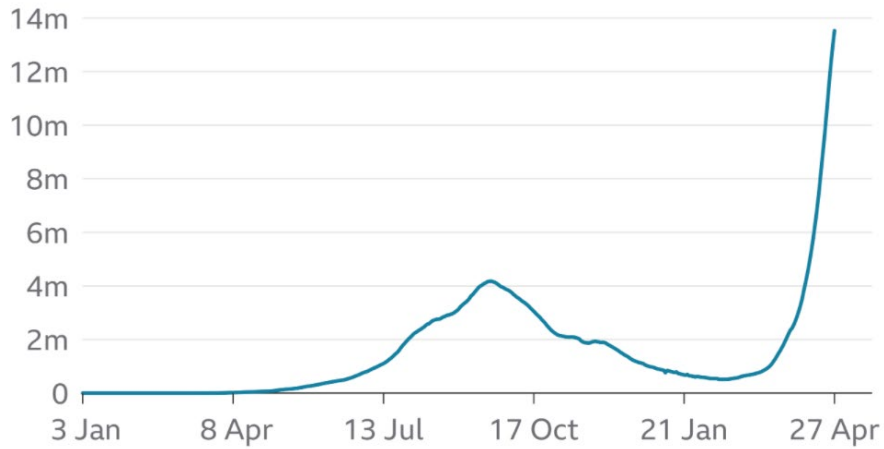
- Oxygen shortages
- Medication shortages
- Overwhelmed hospitals
- Crematoriums full

The Indian Railways coaches have basic medical facilities



India's oxygen needs as cases surge

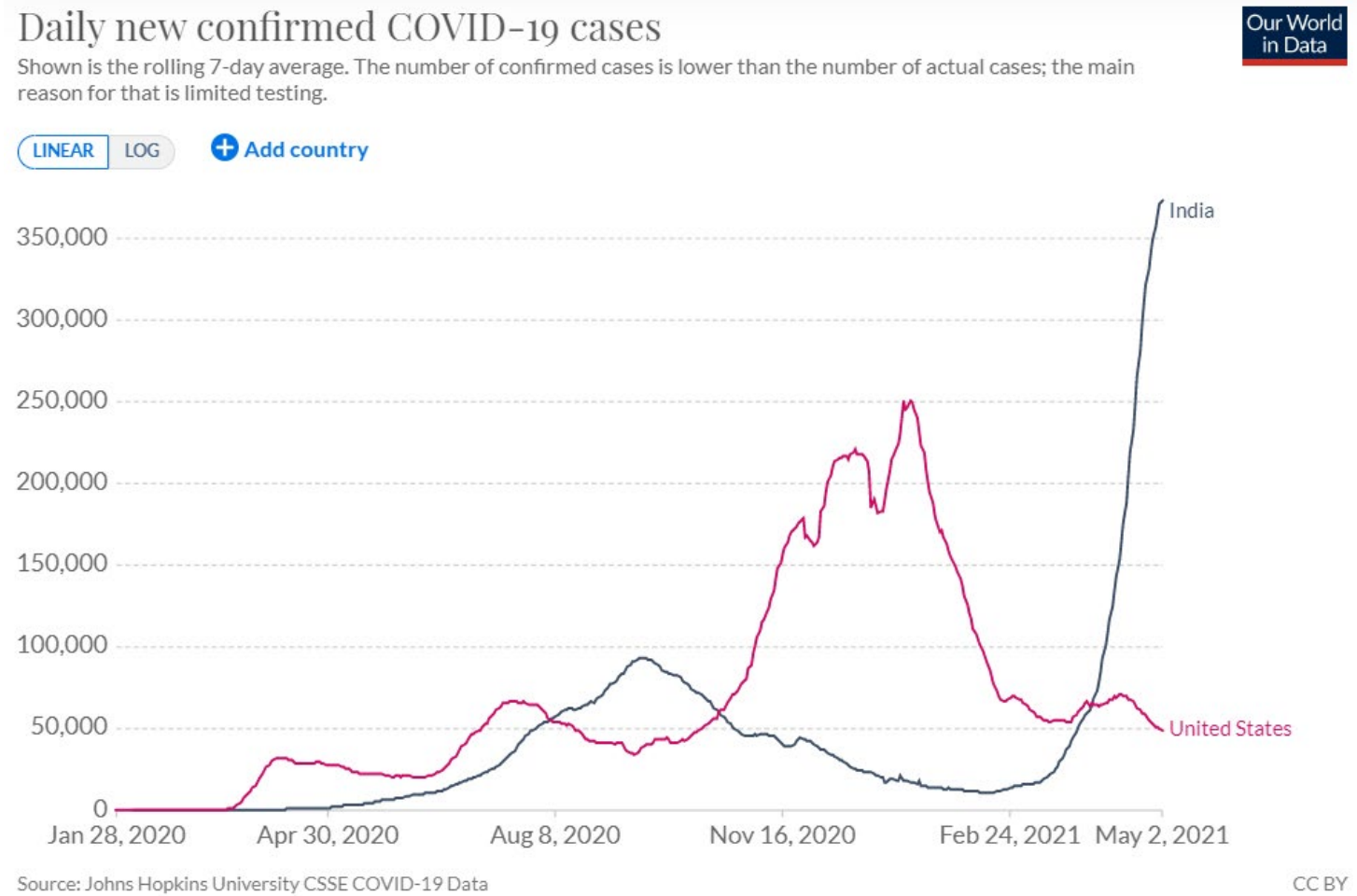
Estimated daily oxygen needed for Covid-19 patients, in cubic metres

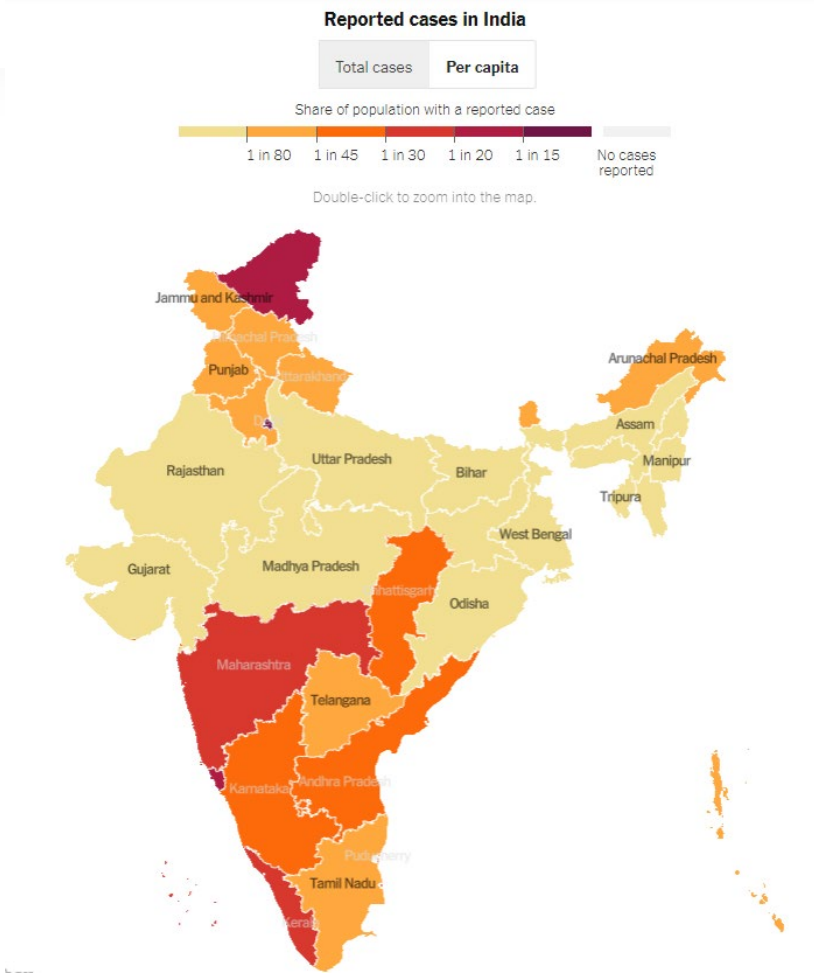


Data estimated using the World Health Organization figures for new reported Covid-19 cases and the % expected to require oxygen

Source: PATH Covid-19 Oxygen Needs Tracker, updated 27 April BBC

https://www.bbc.com/news/world-asia-india-56891016


Daily new confirmed COVID-19 cases
Shown is the rolling 7-day average. The number of confirmed cases is lower than the number of actual cases; the main reason for that is limited testing.
Our World in Data
LINEAR
LOG
Add country
India
United States
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
Jan 28, 2020
Apr 30, 2020
Aug 8, 2020
Nov 16, 2020
Feb 24, 2021
May 2, 2021
Source: Johns Hopkins University CSSE COVID-19 Data
CC BY

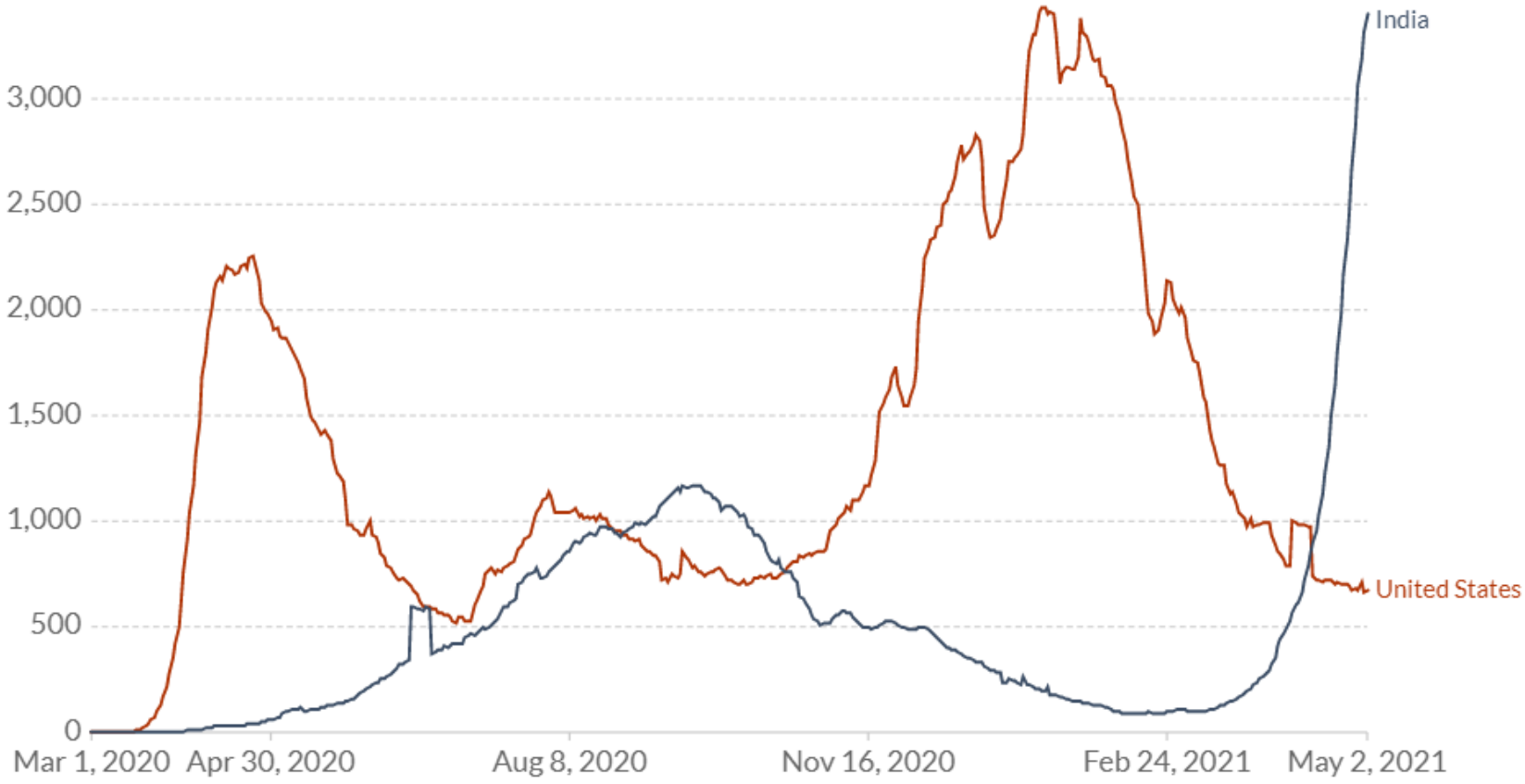

Reported cases in India
Total cases
Per capita
Share of population with a reported case
1 in 80
1 in 45
1 in 30
1 in 20
1 in 15
No cases reported
Double-click to zoom into the map.
Jammu and Kashmir
Punjab
Arunachal Pradesh
Assam
Manipur
Tripura
Rajasthan
Uttar Pradesh
Bihar
West Bengal
Gujarat
Madhya Pradesh
Odisha
Maharashtra
Telangana
Tamil Nadu

Daily new confirmed COVID-19 deaths

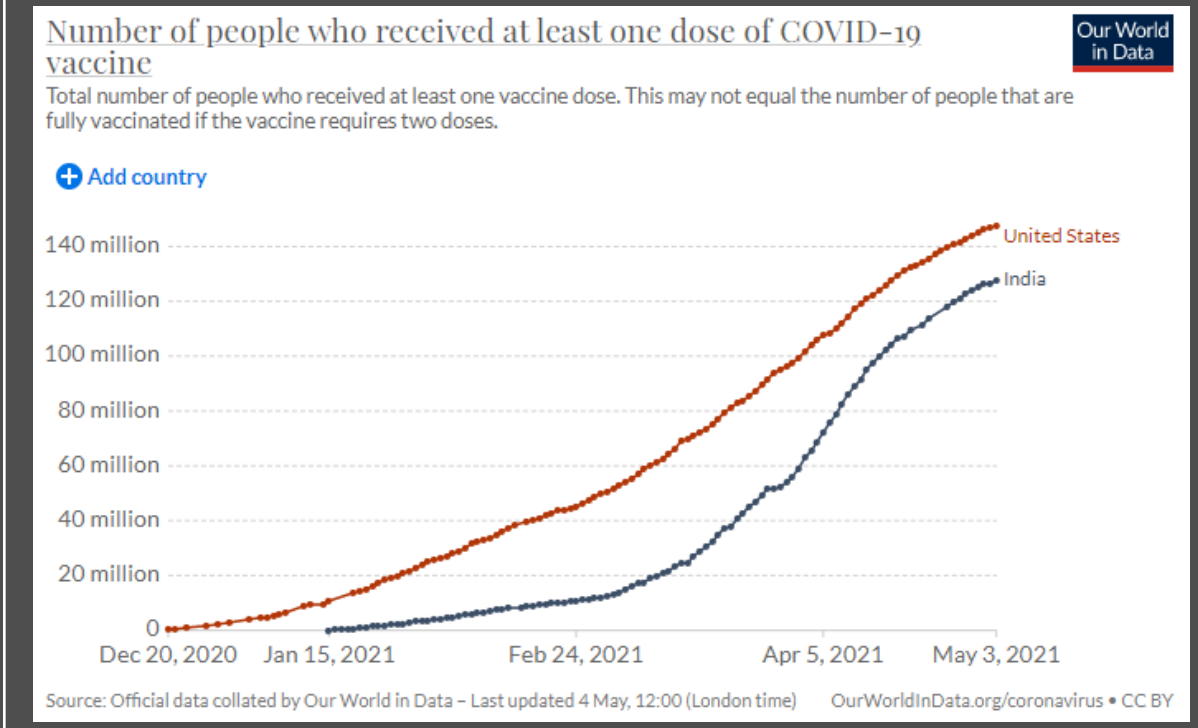
Shown is the rolling 7-day average. Limited testing and challenges in the attribution of the cause of death means that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19.

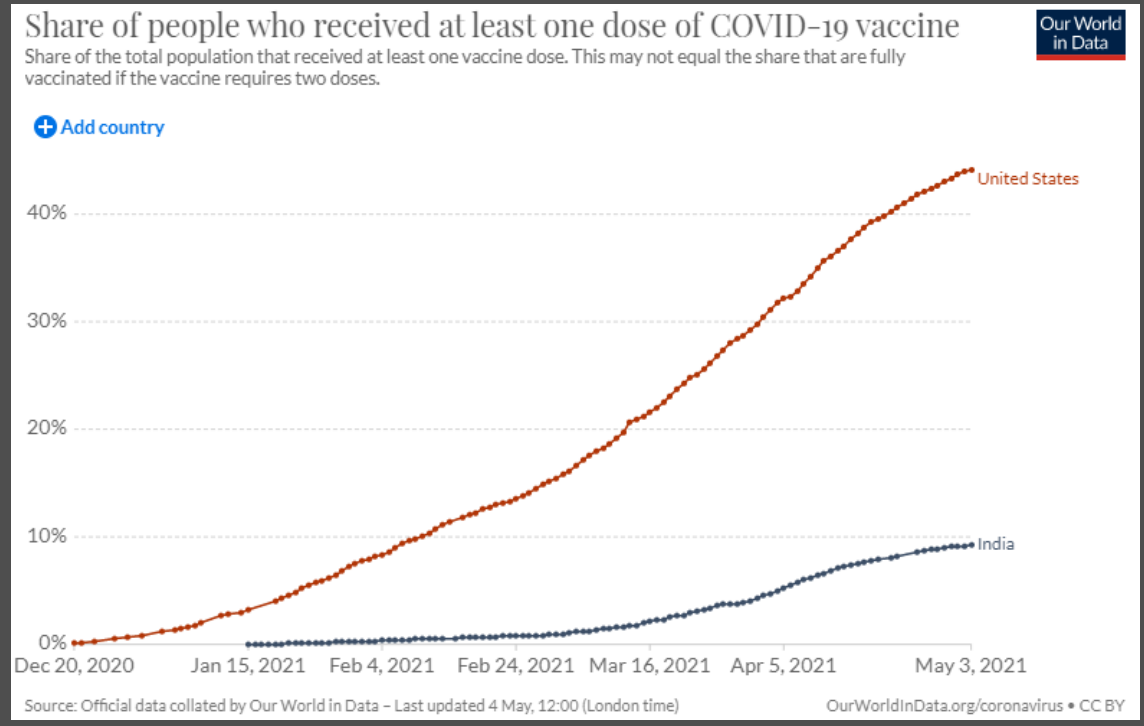
Our World in Data

LINEAR LOG Add country



Source: Johns Hopkins University CSSE COVID-19 Data


Number of people who received at least one dose of COVID-19 vaccine
Our World in Data
Total number of people who received at least one vaccine dose. This may not equal the number of people that are fully vaccinated if the vaccine requires two doses.
Add country
140 million
120 million
100 million
80 million
60 million
40 million
20 million
0
United States
India
Dec 20, 2020
Jan 15, 2021
Feb 24, 2021
Apr 5, 2021
May 3, 2021
Source: Official data collated by Our World in Data – Last updated 4 May, 12:00 (London time)
OurWorldInData.org/coronavirus • CC BY


Share of people who received at least one dose of COVID-19 vaccine
Our World in Data
Share of the total population that received at least one vaccine dose. This may not equal the share that are fully vaccinated if the vaccine requires two doses.
Add country
40%
30%
20%
10%
0%
United States
India
Dec 20, 2020
Jan 15, 2021
Feb 4, 2021
Feb 24, 2021
Mar 16, 2021
Apr 5, 2021
May 3, 2021
Source: Official data collated by Our World in Data – Last updated 4 May, 12:00 (London time)
OurWorldInData.org/coronavirus • CC BY

What Happened?

India had escaped an earlier onslaught

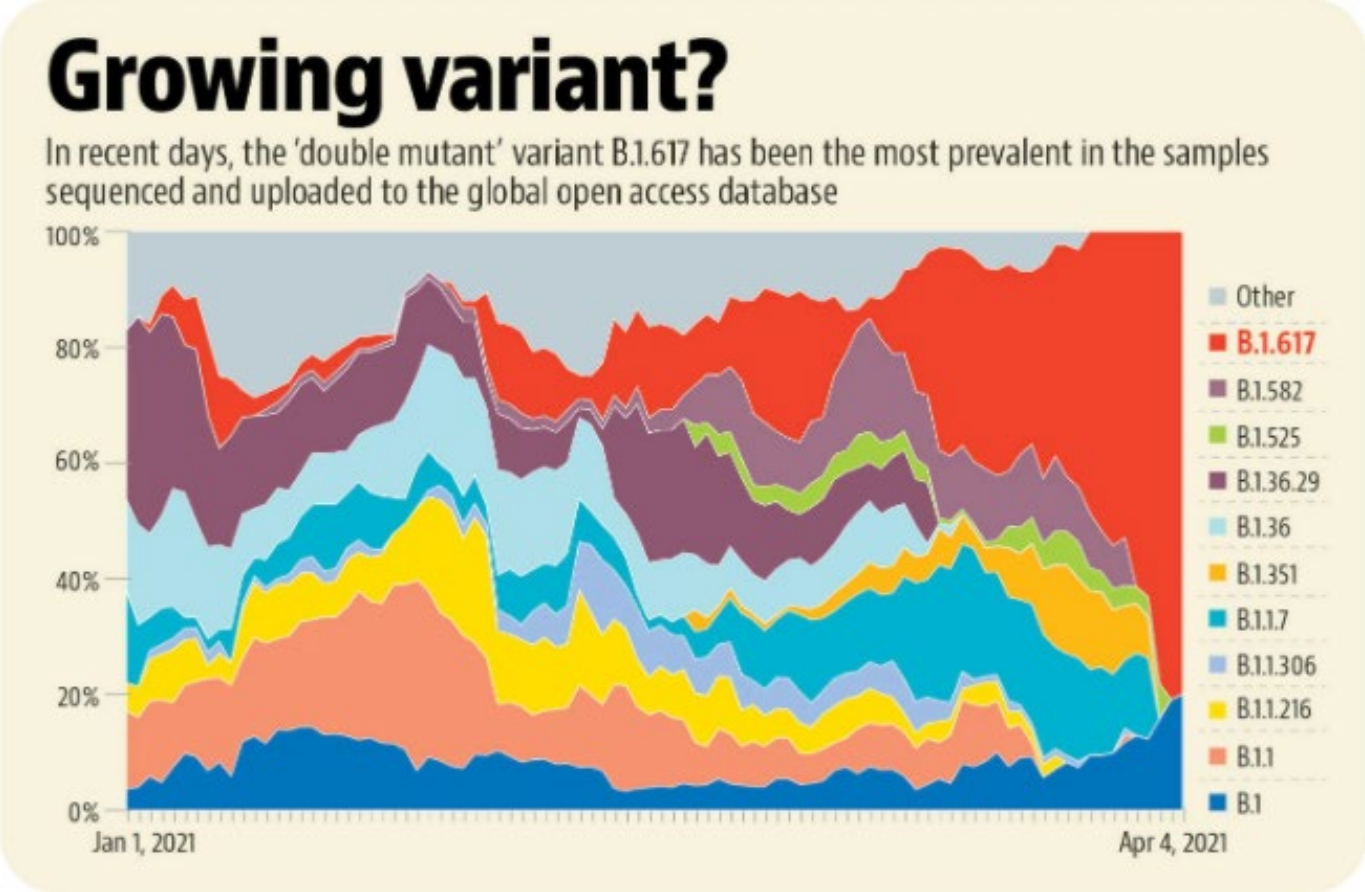
- More time spent outdoors
- Low levels of obesity
- Relatively young population
- Previous viruses had created natural immunity?

Dry tinder for viral spread

- Relaxed restrictions
  - Weddings, political rallies, religious gatherings
- Variants
  - B.1.617 & B.1.1.7
- Those with previous mild infections may have had limited immunity

https://www.nytimes.com/2021/04/26/briefing/Nomadland-Europe-travel-Covid-19.html?smid=url-share

B.1.617



WHO Variant of Interest

"Preliminary modelling by WHO based on sequences submitted to GISAID suggest that B.1.617 has a higher growth rate than other circulating variants in India, suggesting potential increased transmissibility."

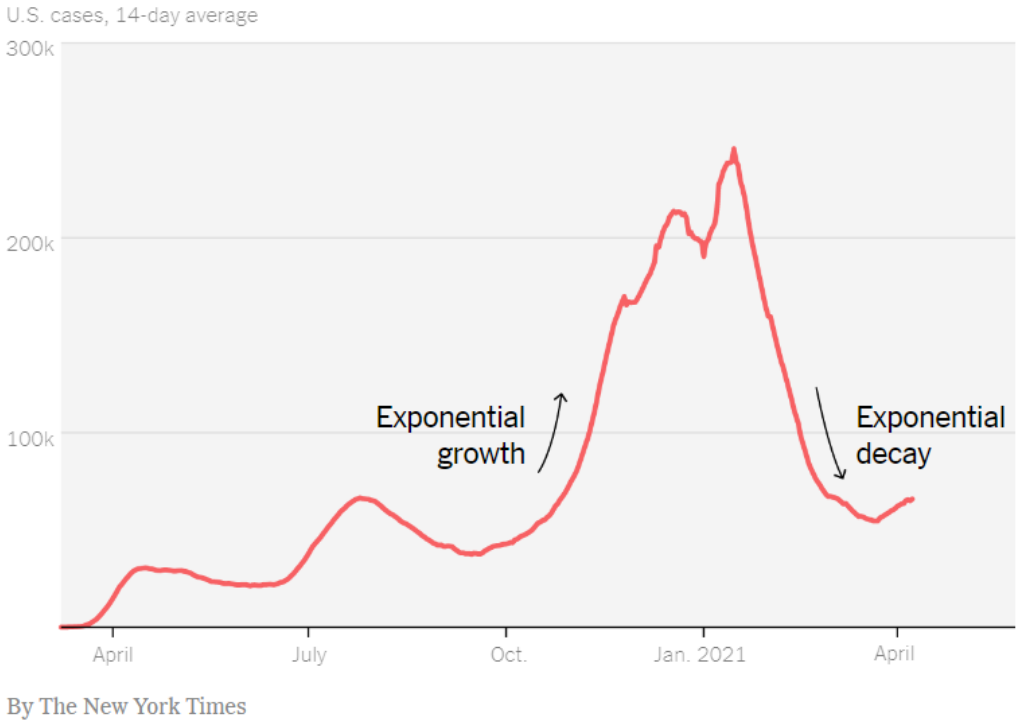
"Double mutant"

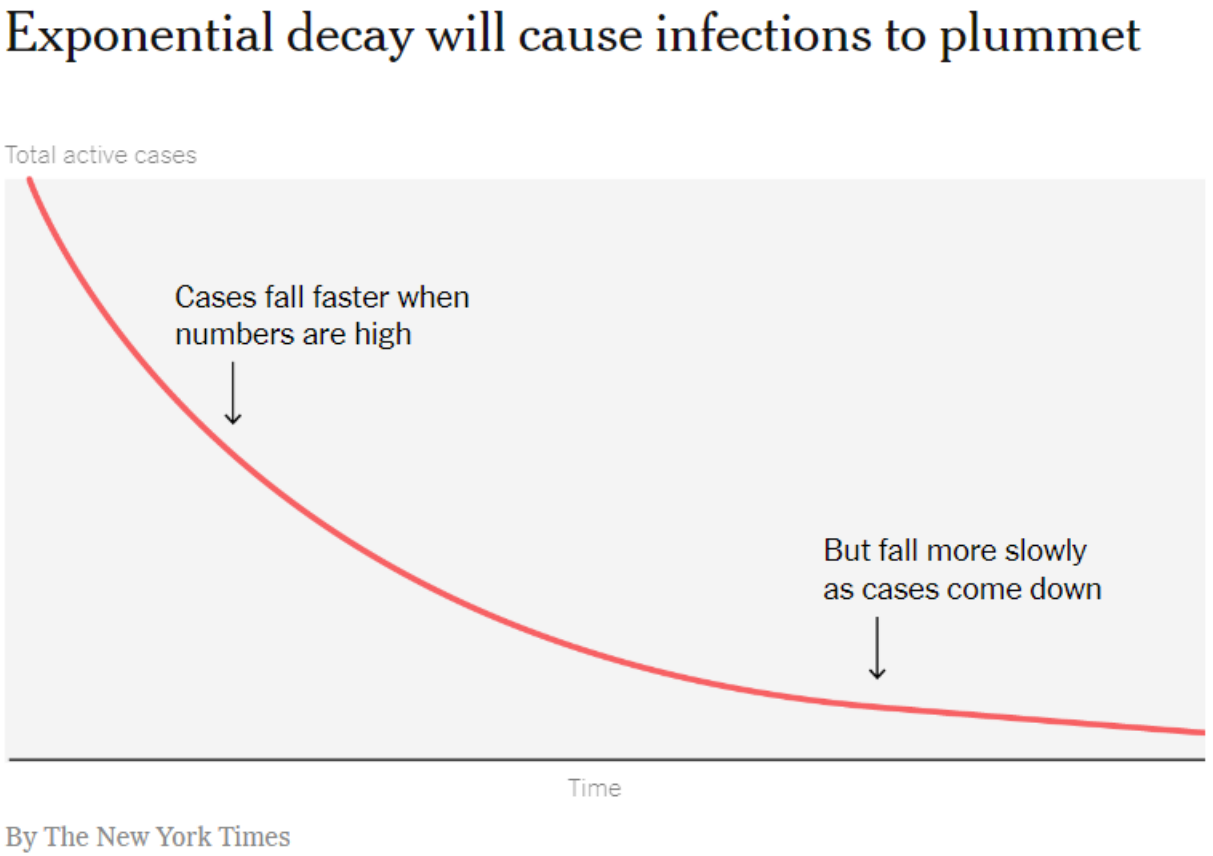
L452R found in the B.1.427/B.1.429 variant (California), associated with increased transmissibility.

E484Q, is similar to the E484K mutation found in the P.1 variant (Brazil) and the B.1.351 variant (South African). May help the virus partially evade immunity from prior infection or vaccines.

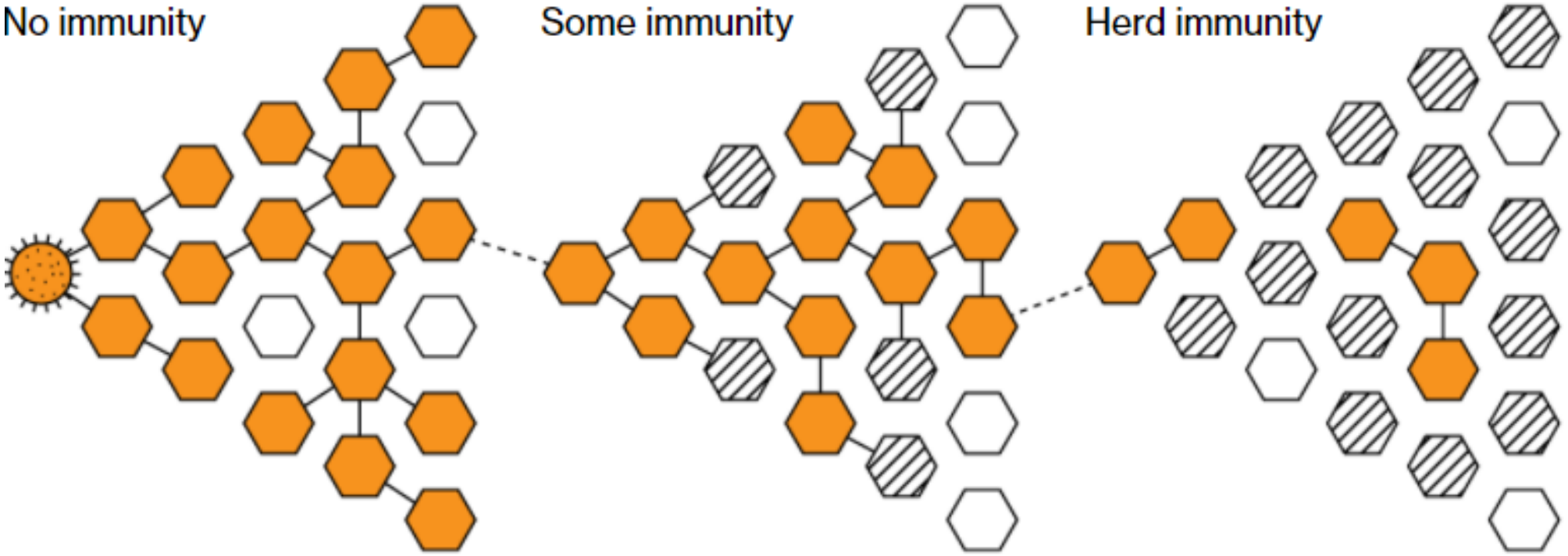
https://www.hindustantimes.com/india-news/double-mutant-now-most-common-of-variantsdata-101618512310963.html
https://www.the-scientist.com/news-opinion/what-scientists-know-about-the-b-1-617-coronavirus-variant-68733

The End of the Pandemic:
First exponential growth, now exponential decay





The Journey to Herd Immunity



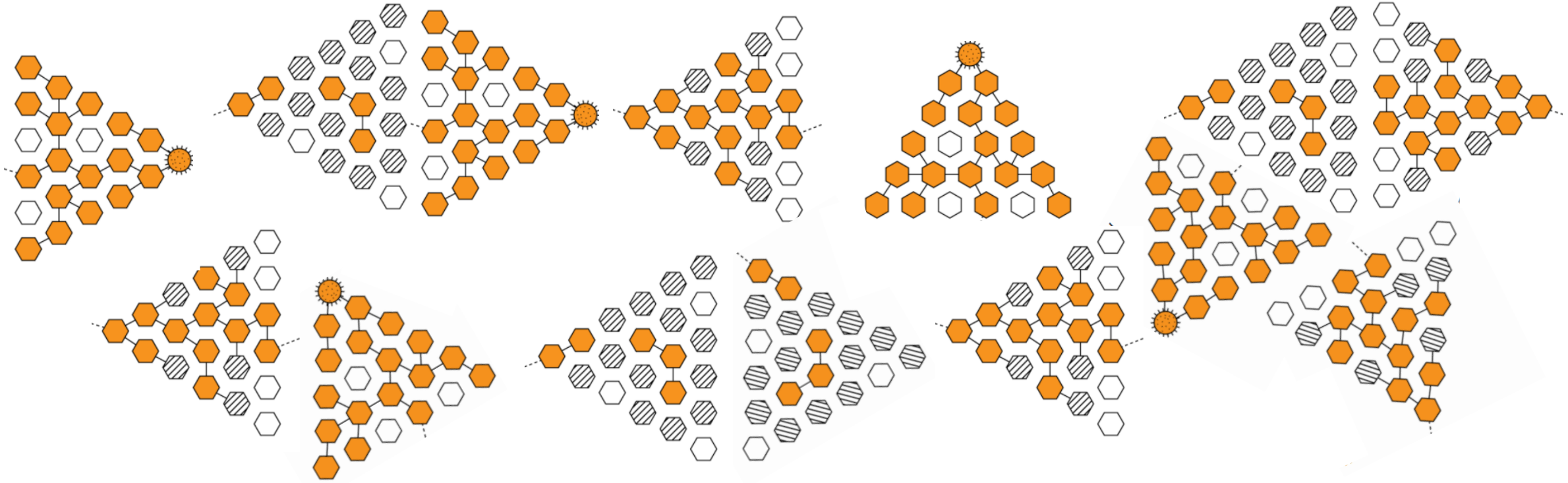
- **Widespread symptomatic testing** and contact tracing is needed to identify cases and prevent large-scale transmission.
- **Asymptomatic screening** is helpful to identify occult infections.

- **Targeted testing** and case identification is needed to prevent outbreaks.
- **Surveillance** is needed to gauge the incidence of disease.

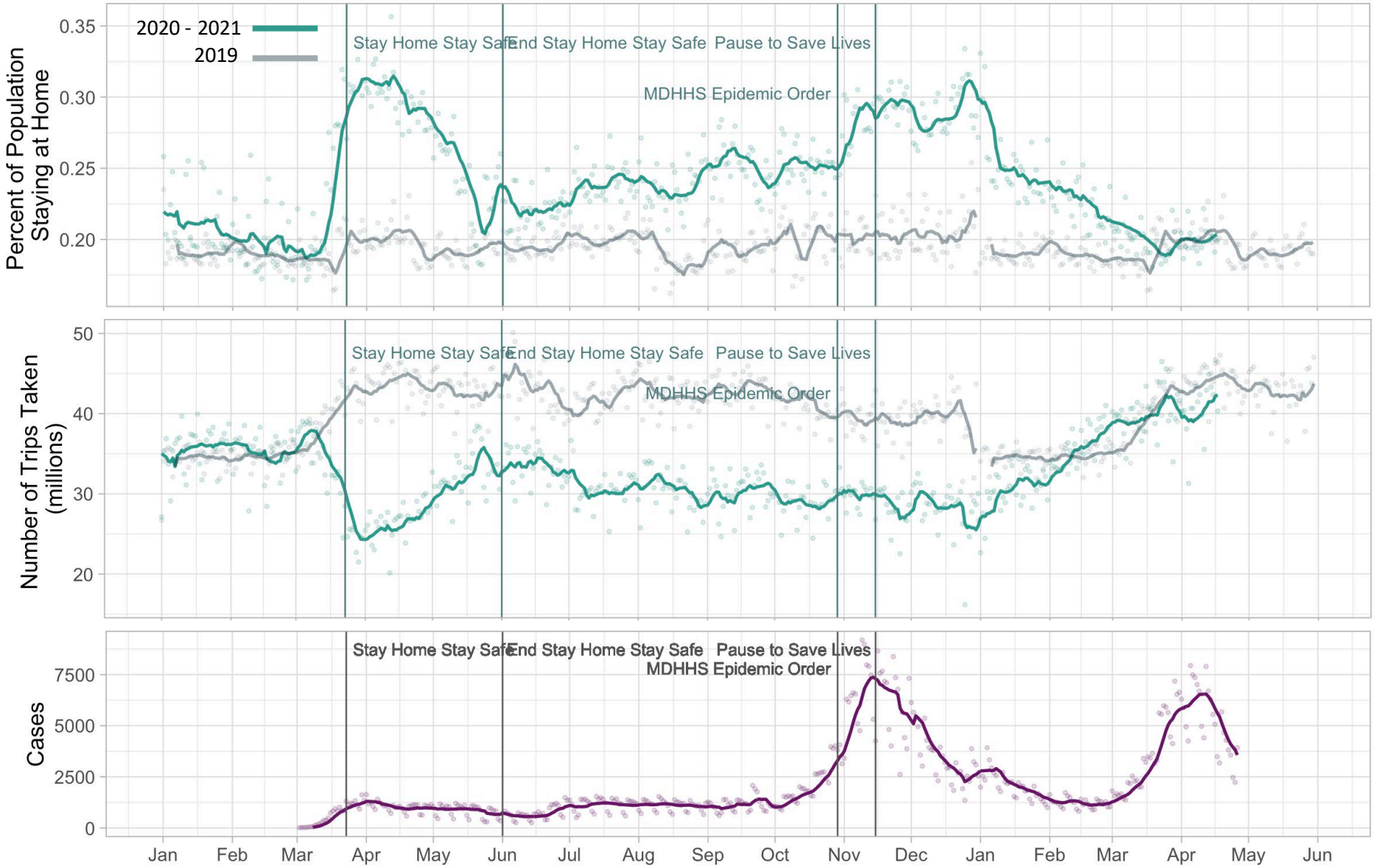
Graphic courtesy of https://www.bloomberg.com/

The reality

Pockets with high levels of vaccination and pockets with low levels



How many people are staying at home in Michigan?



- % Stay-at-home levels have declined to 2019 levels
- Number of trips taken/day has increased to 2019 levels
- Most recent data is 4/17/21 (data as of 4/26/21)

Data Source: [Bureau of Transportation Statistics]

PUBLIC HEALTH