MI COVID RESPONSE DATA AND MODELING UPDATE

August 31, 2021

Executive Summary – All Indicators Show Increases

Michigan remains at High Transmission

Percent Positivity (9.1%) is increasing for two months (up from 8.6 % last week), and **Case Rate** (148.7 cases/million) have increased for two months (up from 127.2 last week)

Michigan has 35th lowest number of cases (33rd last week), and 9th lowest case rate (8th last week) in the last 7 days

99% of positive tests available for sequencing in Michigan were **Delta variant** in the last 4 weeks* (BOL data)

Percent of inpatient beds occupied by individuals with COVID (5.7%) has increased for five weeks (up from 4.7% last week).

Michigan has 8th lowest inpatient bed utilization (7th last week), and 8th lowest adult ICU bed utilization (5th last week)

Deaths (1.3 deaths/million) are increasing for three weeks (1.2 deaths/million last week). 93 COVID deaths between Aug 17 and Aug 23.

Michigan has the T31st lowest number of deaths (40th last week), and T12th lowest death rate (T22nd last week) in the last 7 days

7-day average **state testing rate** is steady at 2,406.1tests/million/day. **Daily diagnostic tests (PCR)** is 24K per day, and the **weekly average for PCR and antigen tests** conducted in Michigan is 41.9K.

10.18 million **COVID-19 vaccine** doses administered, 50.5% of population is fully vaccinated (5.0 million people)

Science Round Up

Average daily incidence per 100,000 cases in Michigan is currently lower than other states experiencing a surge in delta cases

Cases and deaths are projected to continue increasing across the Midwest and Michigan

57% of students in Michigan school districts are covered by some mask policy

11 school outbreaks reported this week

50.5% of the population is fully vaccinated but account for ~20% of cases, hospitalizations, and deaths

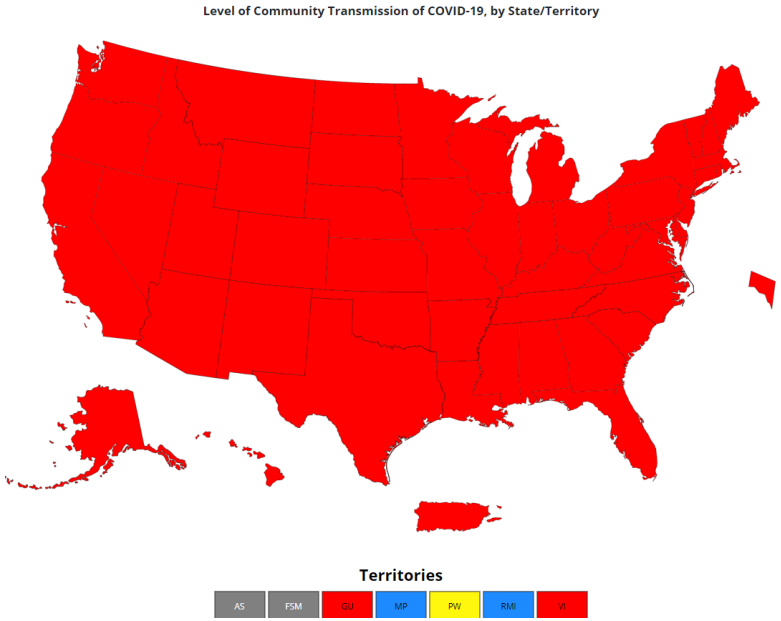
Global and National Comparisons: US cases increasing

What we see today (data through 8/30):

- Globally, 216,603,365 cases and 4,504,692 deaths*
- Countries with the highest case count are U.S. (38,799,396), India (32,737,939), and Brazil (20,741,815)*
- Nearly all US jurisdictions have high community transmission†
- States with the highest seroprevalence (national seroprevalence: 21.6% through end of June)†:

State	Est. Seroprevalence	95% CI
1. Ohio	37.3%	34.3% - 40.4%
2. Illinois	35.4%	31.8% - 39.1%
3. Wisconsin	32.9%	29.4% - 36.8%
4. Texas	32.2%	28.1% - 36.0%
11. Michigan	**27.8%**	**25.0% - 31.2%**

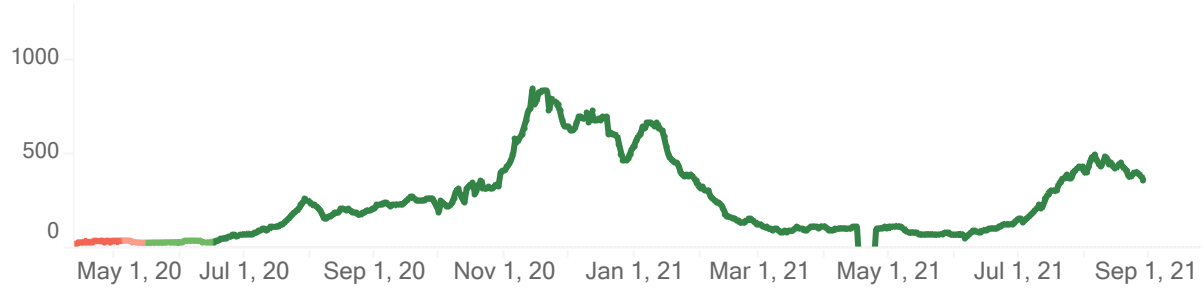
– Other notable states: AL (29.2%), AR (22.9%), GA (14.4%), FL (24.1%), LA (12.7%), MO (26.5%), MS (31.5%), TN (29.2%)

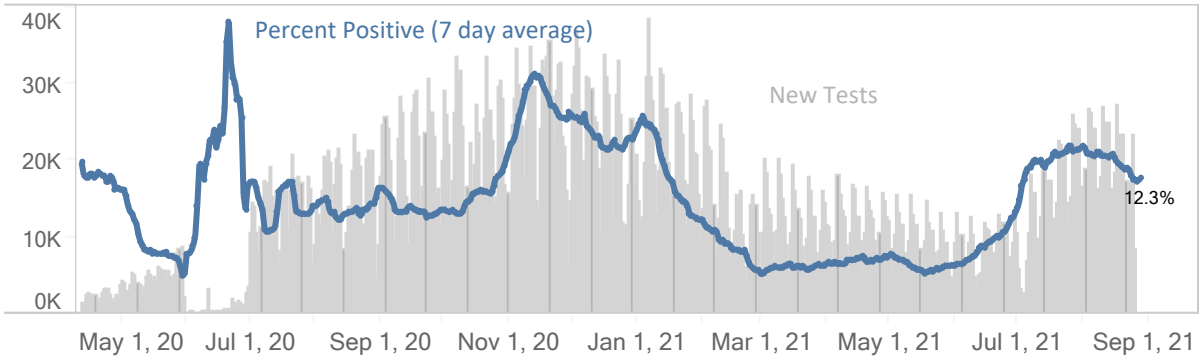


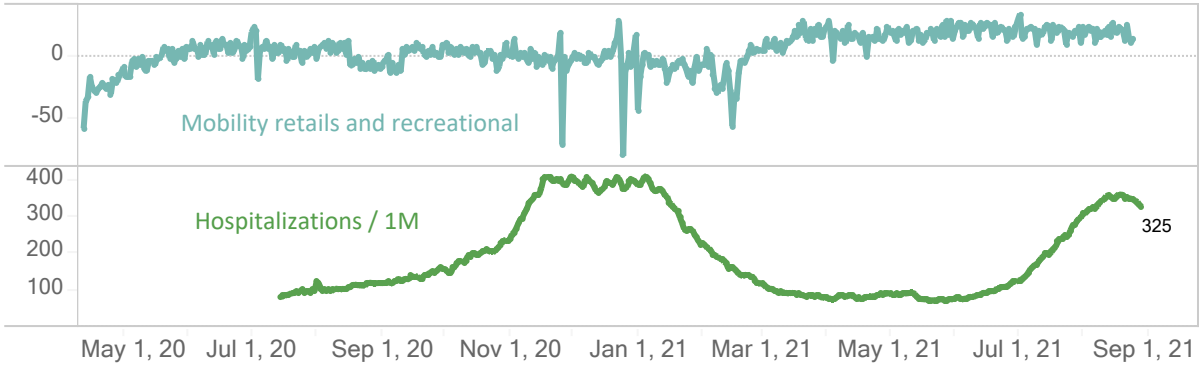
Source: * Johns Hopkins COVID-19 Dashboard; † CDC COVID Data Tracker

State Comparisons: Missouri and Arkansas

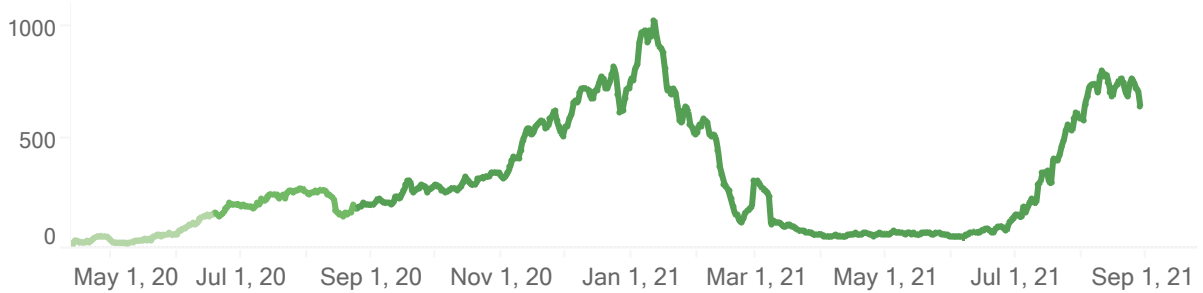
Missouri Confirmed New Cases / 1M (7 days average)

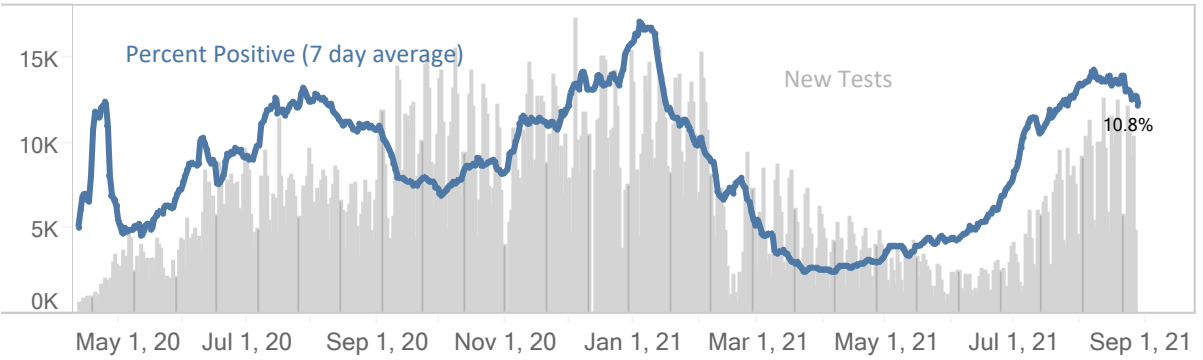


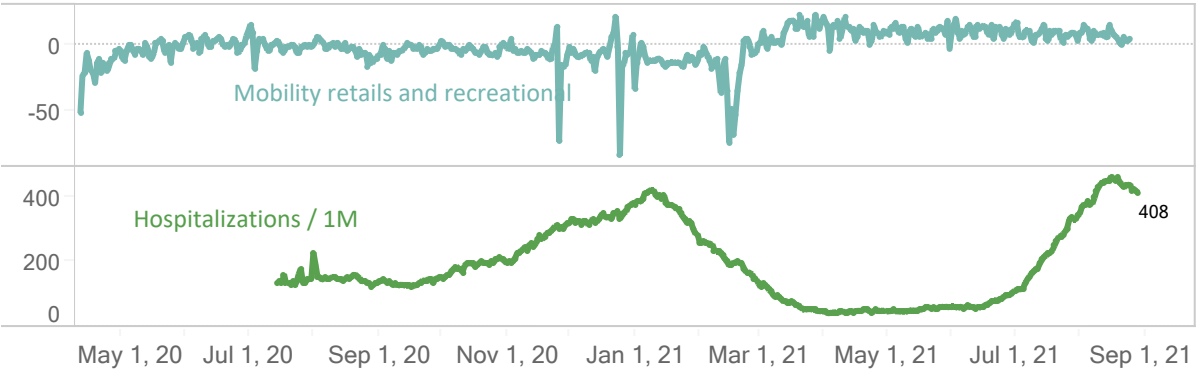




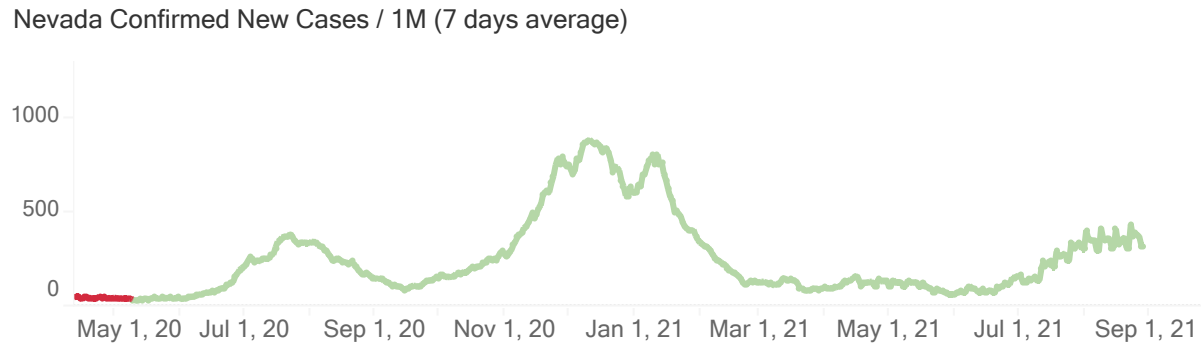
Arkansas Confirmed New Cases / 1M (7 days average)

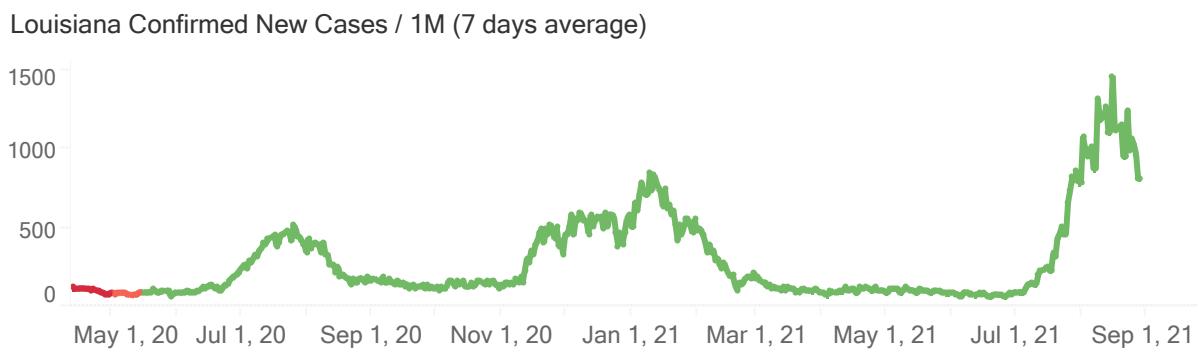


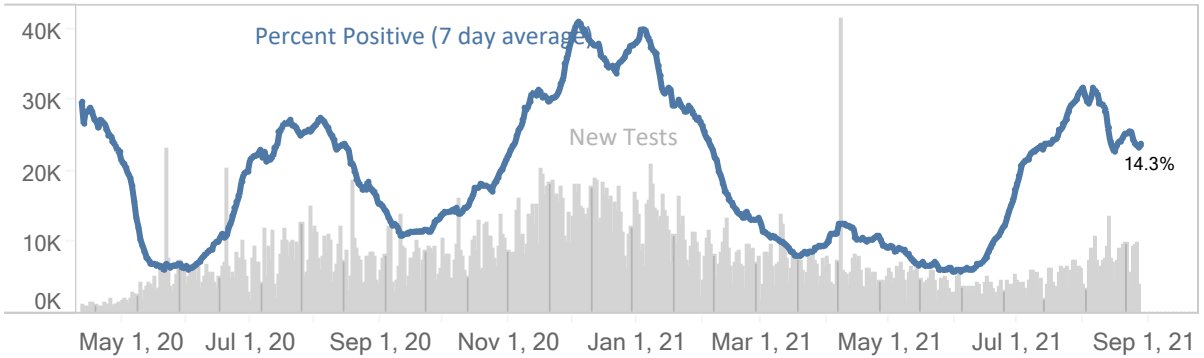


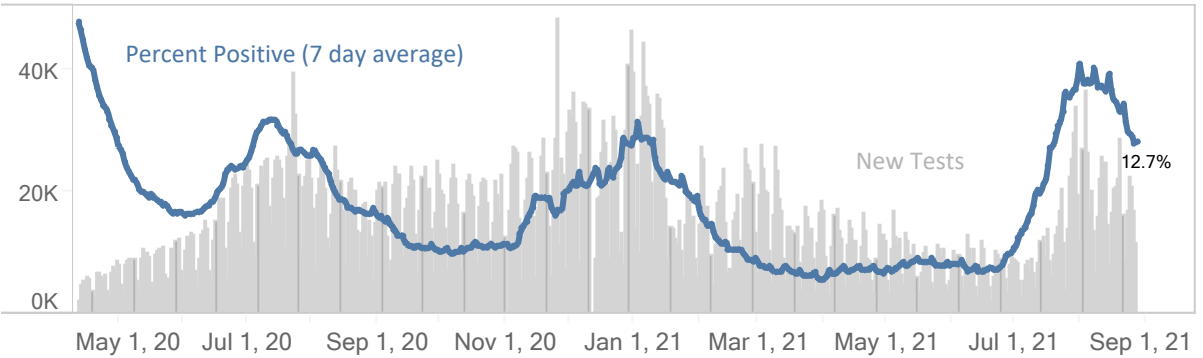


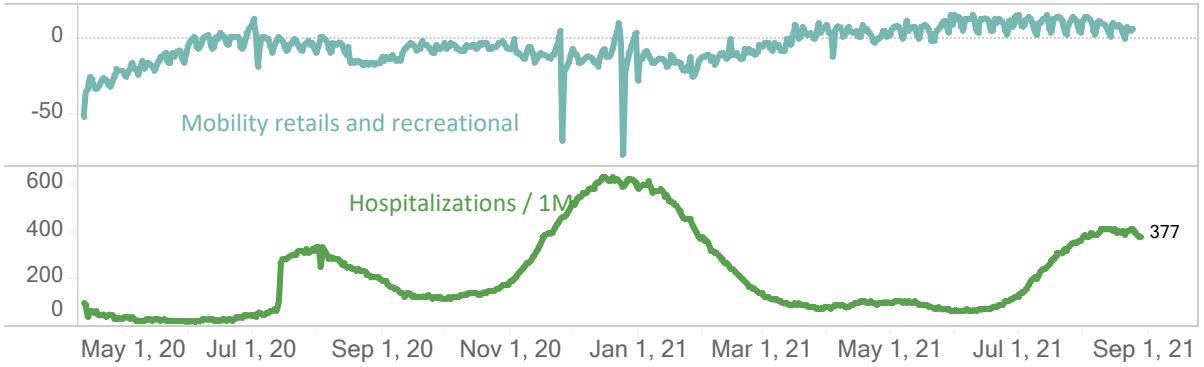
State Comparison: Nevada and Louisiana

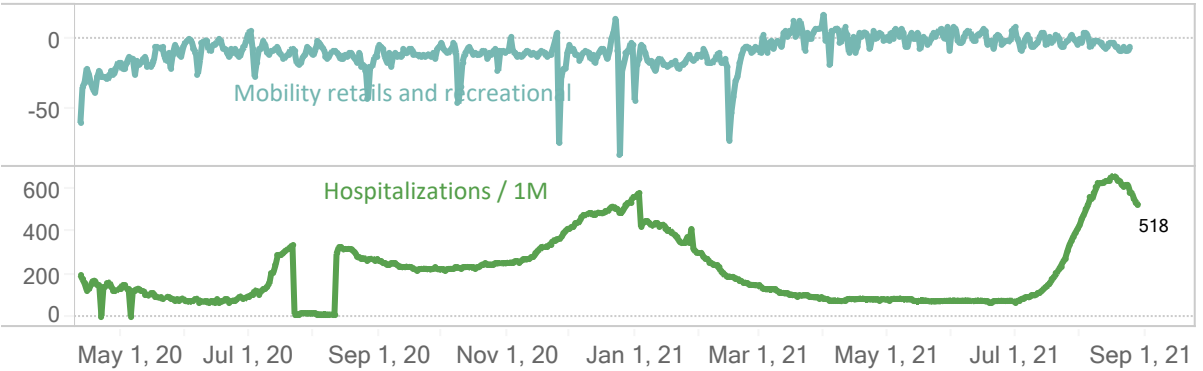




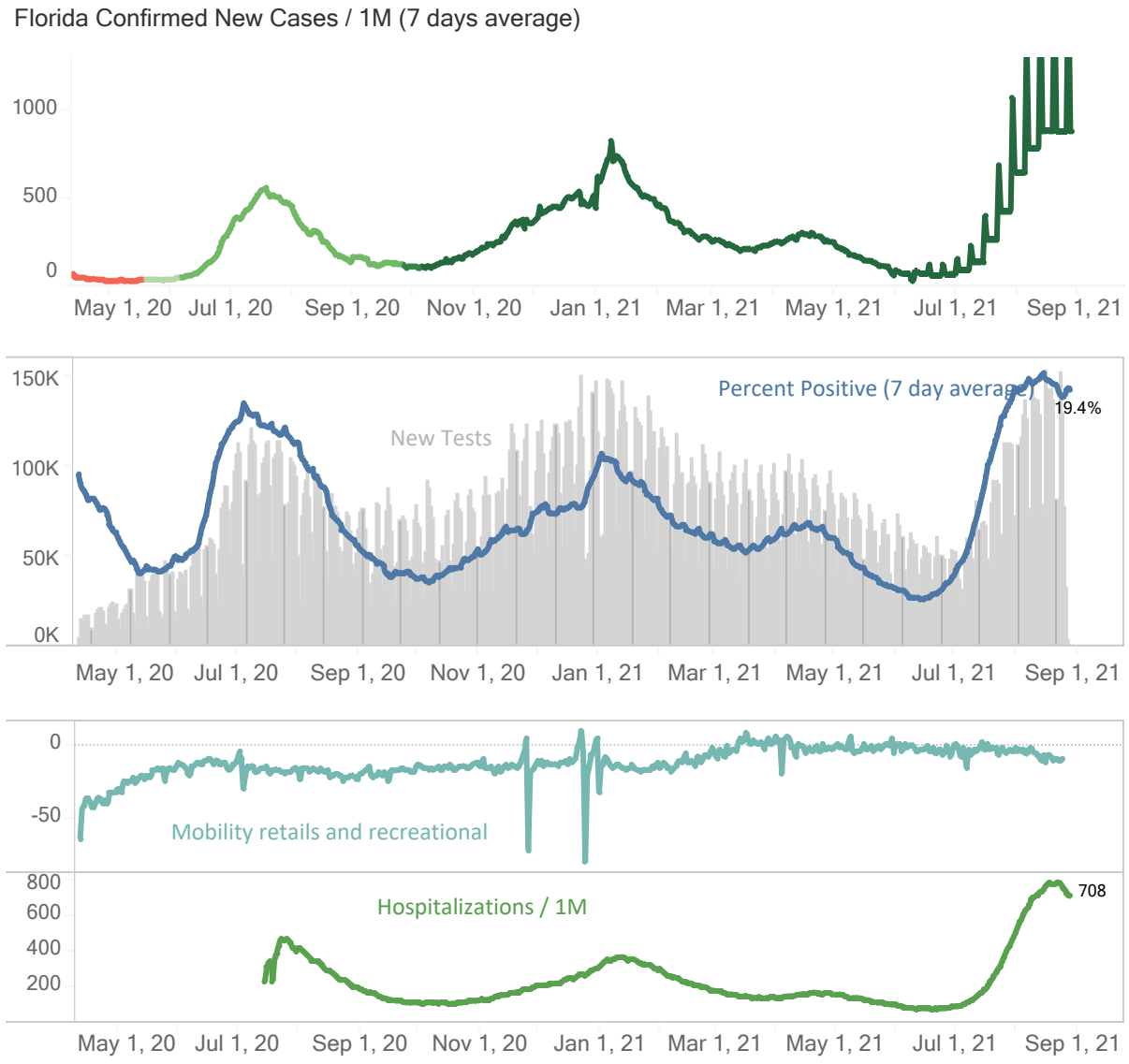


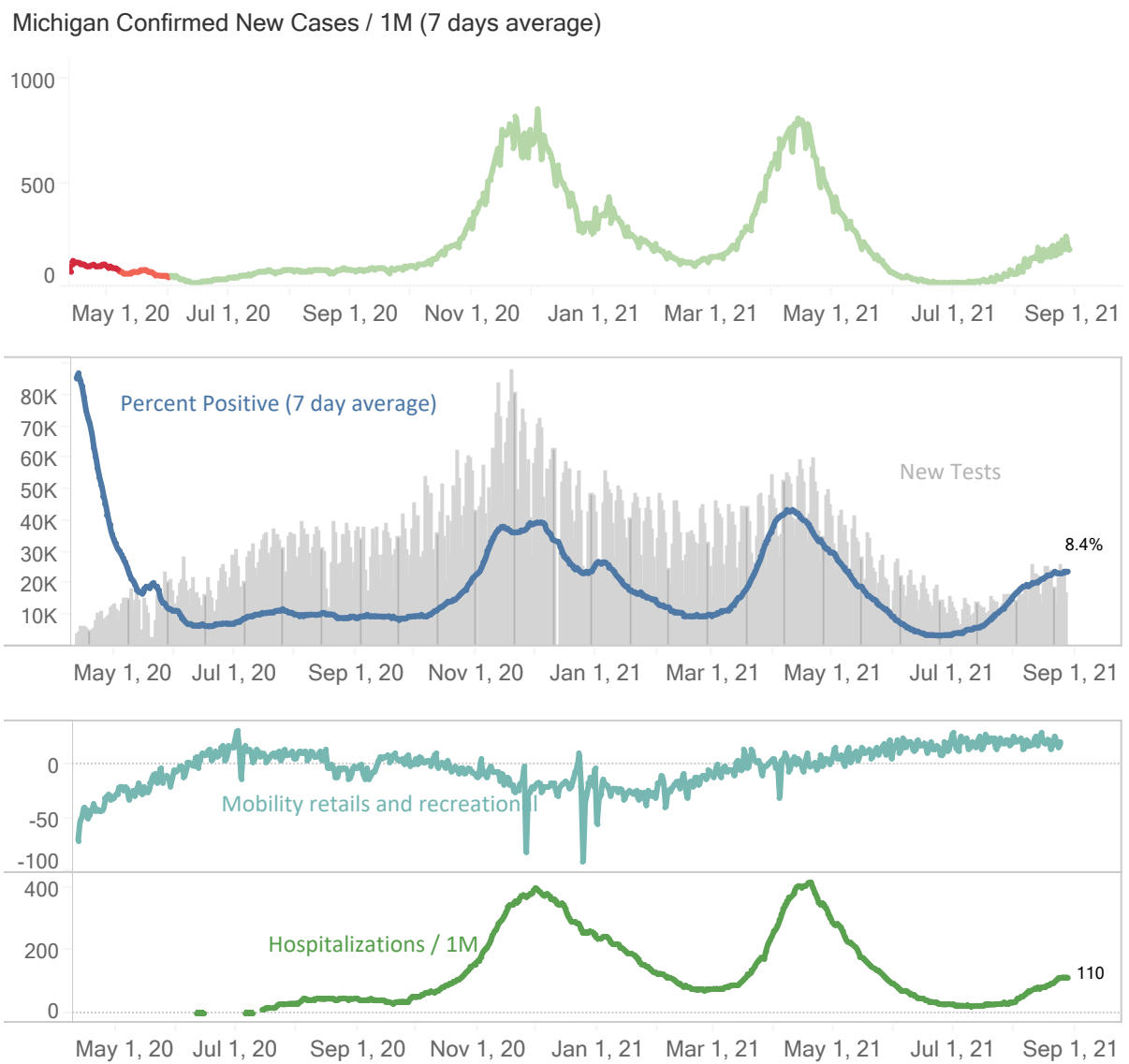






State Comparisons: Florida and Michigan





Key Messages: COVID-19 is Spreading Faster with Delta

Statewide positivity has increased to 9.1% (last week: 8.6 %)

- One week percent change is up 6% (vs. up 11% last week)
- Increasing for two months (Jun 26 low of 1.2%)
- Positivity is increasing in most MERC regions; and four regions > 10%

Case rate (148.7 cases/million) increasing for two months (last week: 127.2 cases/million)

- One week increase of 5% (vs. 10% increase last week)
- Increasing for two months (Jun 26 low of 15.4 cases/million)
- Cases per million are increasing in most MERC regions

Michigan is at High Transmission level

- More than 90% of the counties in Michigan are at high transmission level
- CDC recommends all individuals, regardless of vaccination status, should mask indoors
- The U.S. is at high transmission level (272.9 cases/100,000 in last 7 days) with 54 states/territories in substantial or high transmission

Number of active outbreaks is up 11% from last week

- Seventy-nine new outbreaks were identified in the past week
- SNF/LTC reported the most new and ongoing outbreaks this week

Confirmed and probable case indicators

Table Date: 8/30/2021 (7 days from date table was produced: 8/23/2021)

Risk levels: Low | A | B | C | D | E

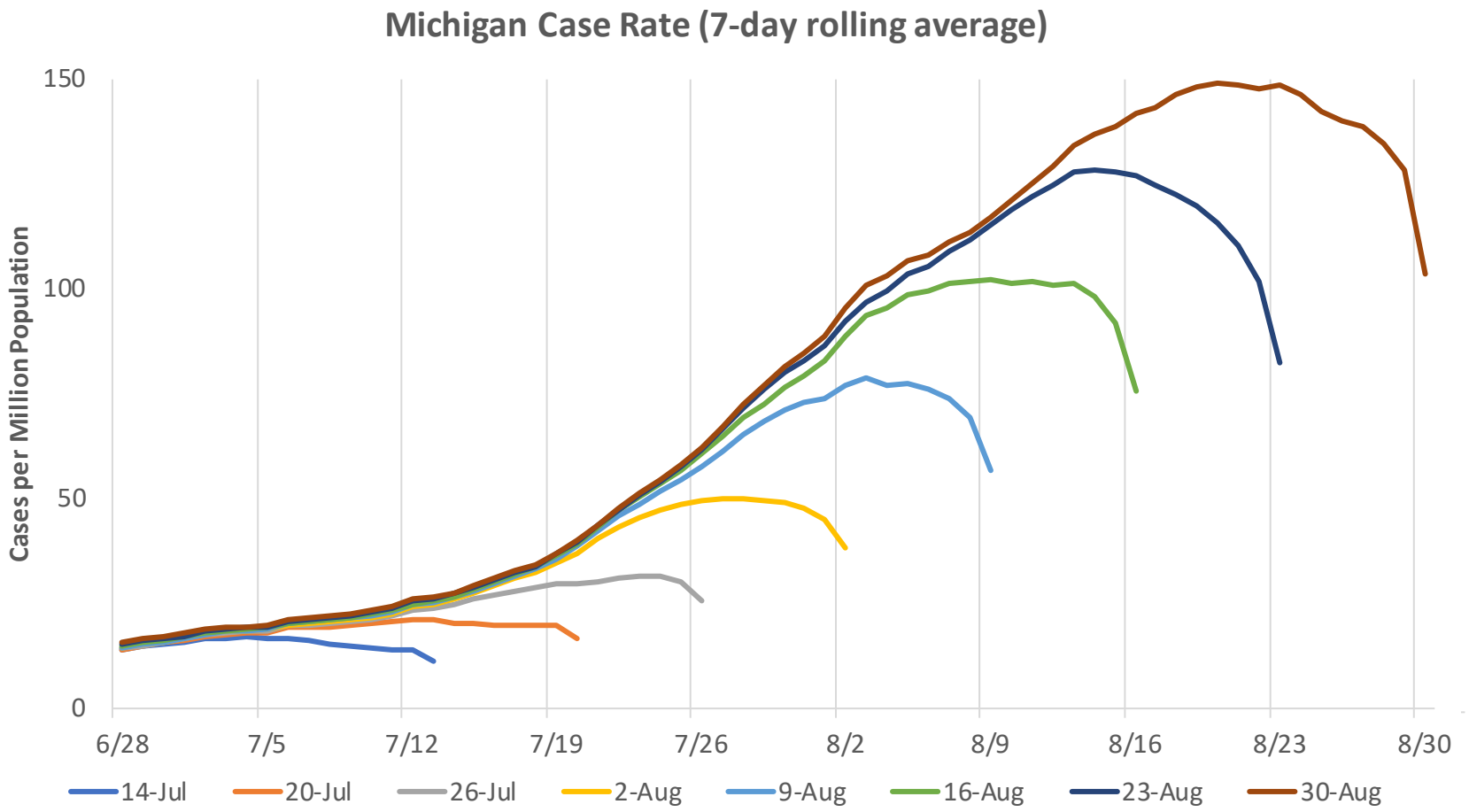
	CDC Transmission Risk Level	Absolute Cases (per million)	CDC Case Trend	Average Percent Positivity	Positivity Trend	Tests (per million)	% IP Beds Occupied by COVID-19 Cases	% Occupied IP Beds Trend	Absolute Deaths (per million)	Death Trend
Detroit	High	137.7	elevated incidence plateau	7.3	Increase - 6wk	2585.3	5.2	Increase - 6wk	1.1	Increase - 1wk
Grand Rapids	High	158.0	elevated incidence growth	11.6	Increase - 8wk	2381.4	6.3	Increase - 6wk	1.3	<20 wkly deaths
Kalamazoo	High	172.3	decline [6 days]	12.0	Increase - 8wk	2003.2	8.2	Increase - 4wk	1.6	<20 wkly deaths
Saginaw	High	161.2	elevated incidence plateau	12.1	Increase - 8wk	1766.6	4.8	Increase - 5wk	1.6	<20 wkly deaths
Lansing	High	135.7	elevated incidence plateau	8.7	Increase - 2wk	2051.1	8.4	Increase - 6wk	2.4	<20 wkly deaths
Traverse City	High	138.4	decline [7 days]	8.3	Increase - 2wk	1907.2	5.6	Increase - 5wk	1.3	<20 wkly deaths
Jackson	High	189.4	elevated incidence plateau	12.1	Decrease - 1wk	2145.6	10.3	Decrease - 1wk	2.4	<20 wkly deaths
Upper Peninsula	High	192.3	elevated incidence plateau	9.6	Increase - 5wk	1625.6	4.2	Increase - 2wk	0.5	<20 wkly deaths
Michigan	High	148.7	elevated incidence plateau	9.1	Increase - 8wk	2406.1	5.7	Increase - 6wk	1.3	Increase - 4wk

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%

Backfill of case data by onset date is lagging by two weeks

- Over the last 8 weeks, it has taken longer for cases to be reported to local public health which means that the graphs are not as accurate for recent days
- More cases are reported to local public health with an earlier onset date (i.e., between 7 and 14 days prior)
- The likely explanation is that fewer individuals are seeking a COVID-19 test earlier in their disease progression



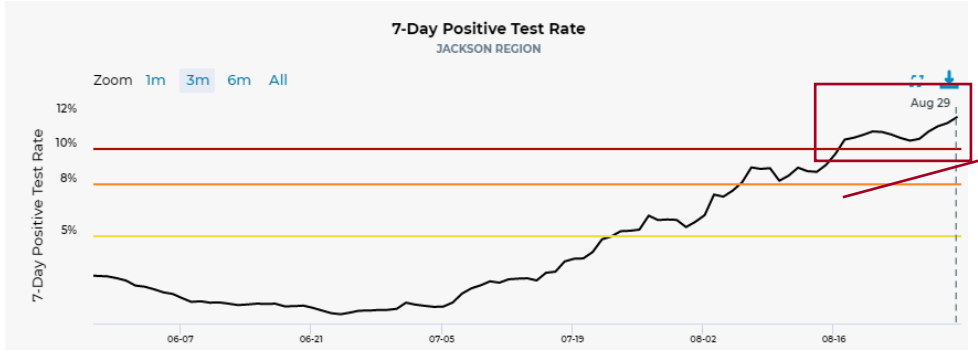
Source: MI Start Map; MDOC excluded

Regional Time Trends

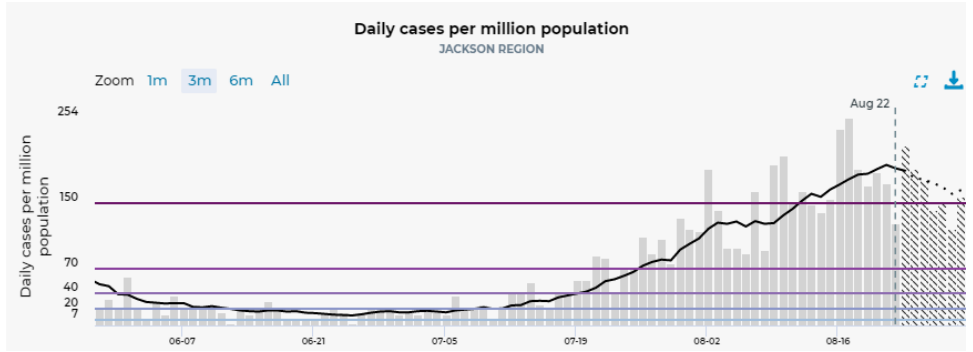
- Metrics for three regions on the postage stamp showed potential downward trends:
  - Jackson Positivity Trend
  - Kalamazoo CDC Case Trend
  - Traverse City CDC Case Trend
- While these metrics could be indicative of shifts in the Delta surge, a more likely explanation is the shift in test seeking behavior and the reporting of tests to local public health
- Jackson region saw a one-week decline in positivity, but this was due to a single day positivity drop (Aug 25 at 8%). All subsequent days have reported > 12%
- Kalamazoo and Traverse City saw a one week decrease in cases by onset date yet cases by report date continue to increase
- **At this point, cumulative data do not suggest that the delta surge in Michigan is subsiding**

Jackson Region

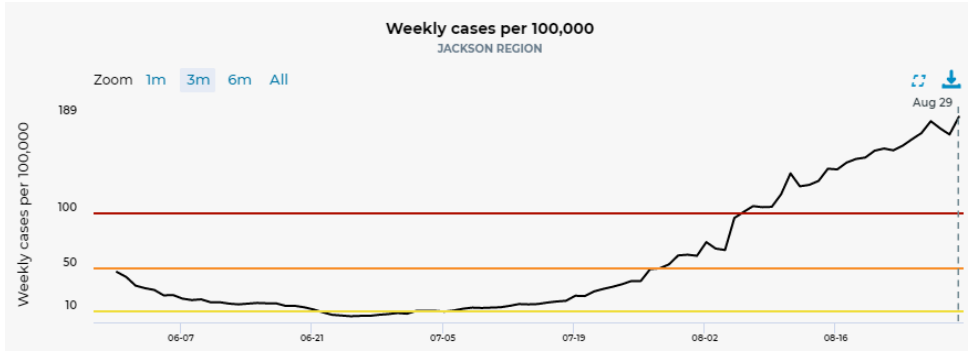
Positivity



Case Rates by Onset Date



Case Rates by Report Date



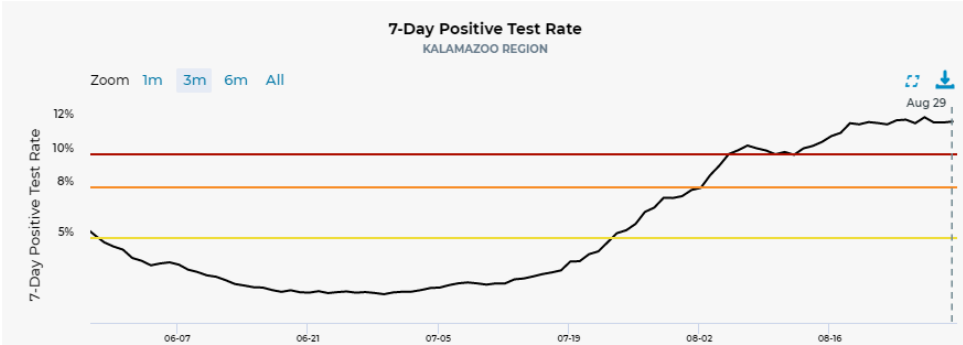
All charts represent data from 05/31/21 – 08/29/21

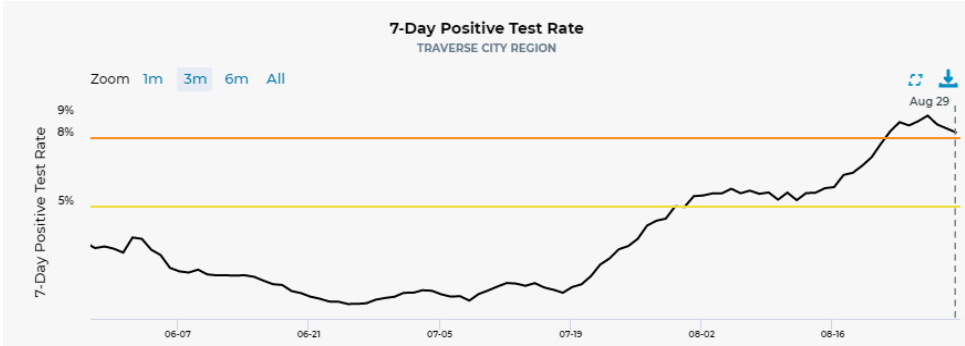
Source: MI Start Map; MDOC excluded

Kalamazoo Region

Traverse City Region

Positivity





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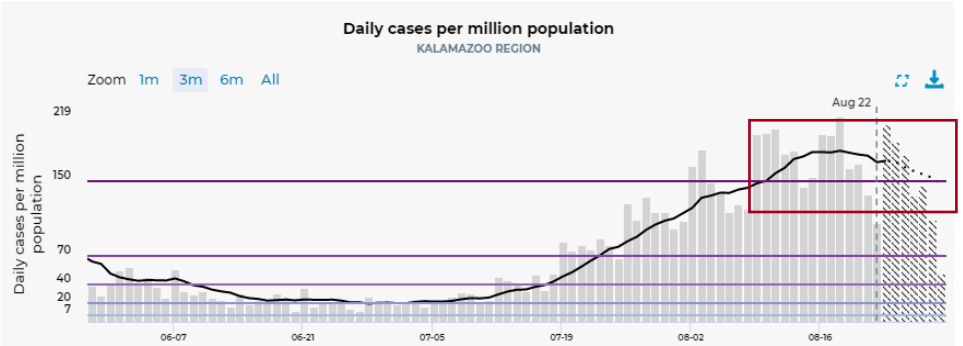

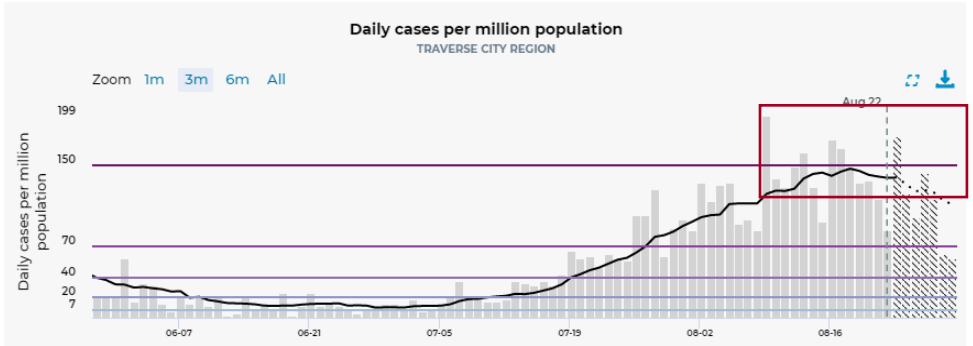

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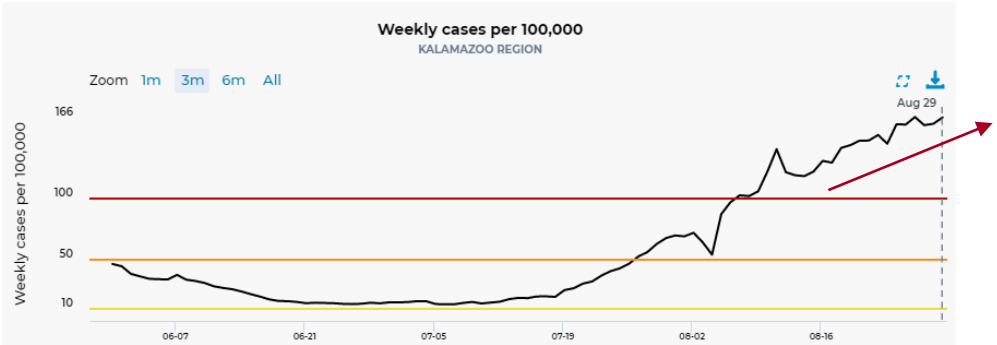
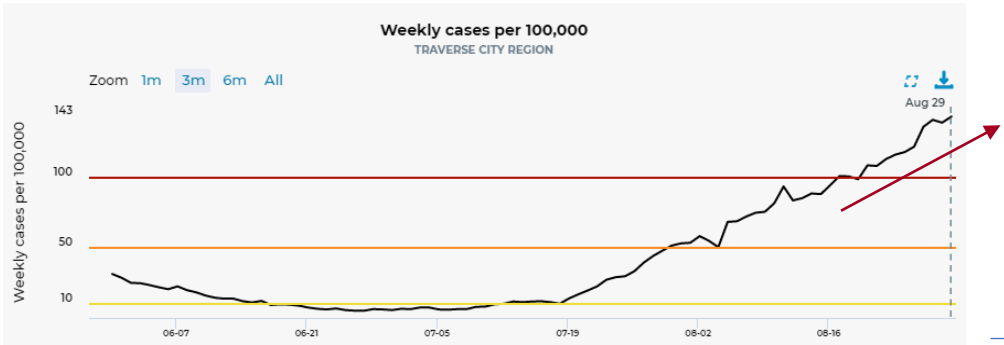
Case Rates by Report Date





Source: MI Start Map; MDOC excluded

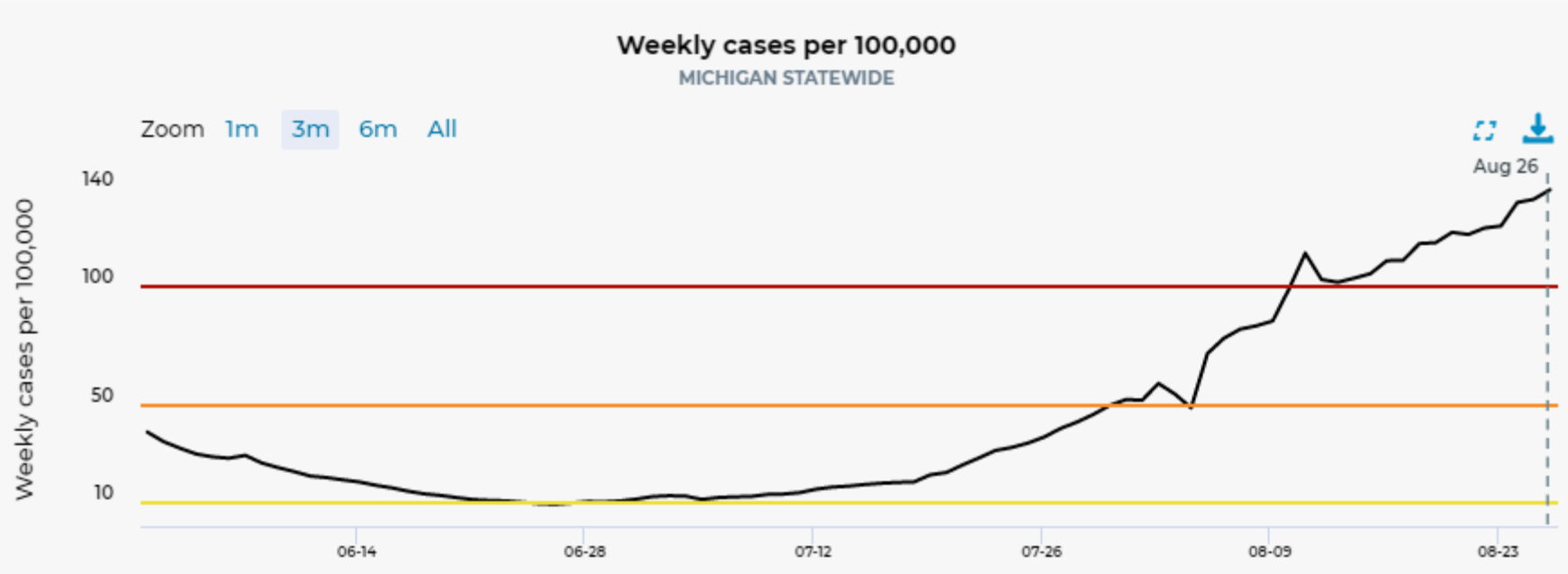
Overview of metrics for individuals < 18

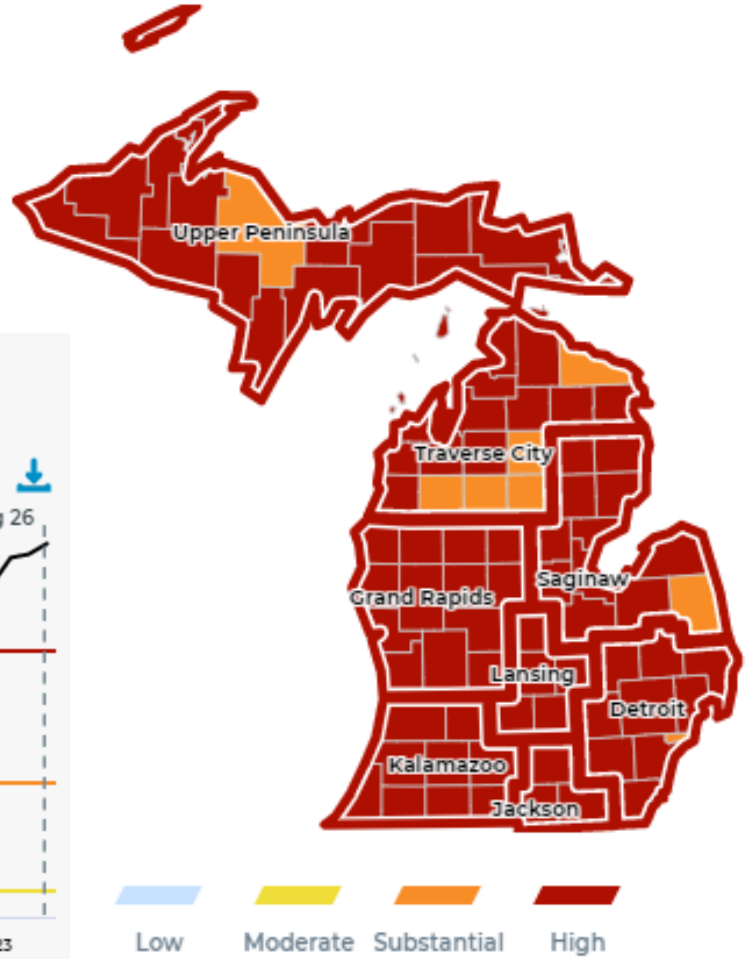
	Region	Population (<12 yrs)	Population (<18 yrs)	Cumulative Case Count (<12 yrs)	7-day Average Daily Case Count (<12 yrs)	7-day Average Daily Case Rate per Million (<12 yrs)	7-day Average Daily Pediatric Hospitalization Count (<18 yrs)	7-day Average Daily Pediatric Hospitalization Rate per Million (<18 yrs)	7-day Average Daily Death Count (<12 yrs)
1	Detroit	735529	1134247	31121	76.7	104.3	26.1	23.0	0
2	Grand Rapids	230120	350652	10549	23.3	101.3	7.3	20.8	0
3	Kalamazoo	140422	214801	5803	15.7	111.8	1.7	7.9	0
4	Saginaw	78759	122834	3469	8.3	105.4	1.1	9.0	0
5	Lansing	78140	119915	3461	9.1	116.5	1.1	9.2	0
6	Traverse City	53099	83462	1696	5.0	94.2	0.4	4.8	0
7	Jackson	41274	64091	1612	3.4	82.4	1.4	21.8	0
8	Upper Peninsula	34645	53875	1529	4.4	127.0	0.0	0.0	0
99	Michigan	1391988	2143877	59297	146.0	104.9	39.3	18.3	0

Note: Data as of 8/30; case data 8/23, hospitalization data 8/30. Hospitalization data is for pediatric patients (<18)

Michigan at High Transmission Level and continuing to increase

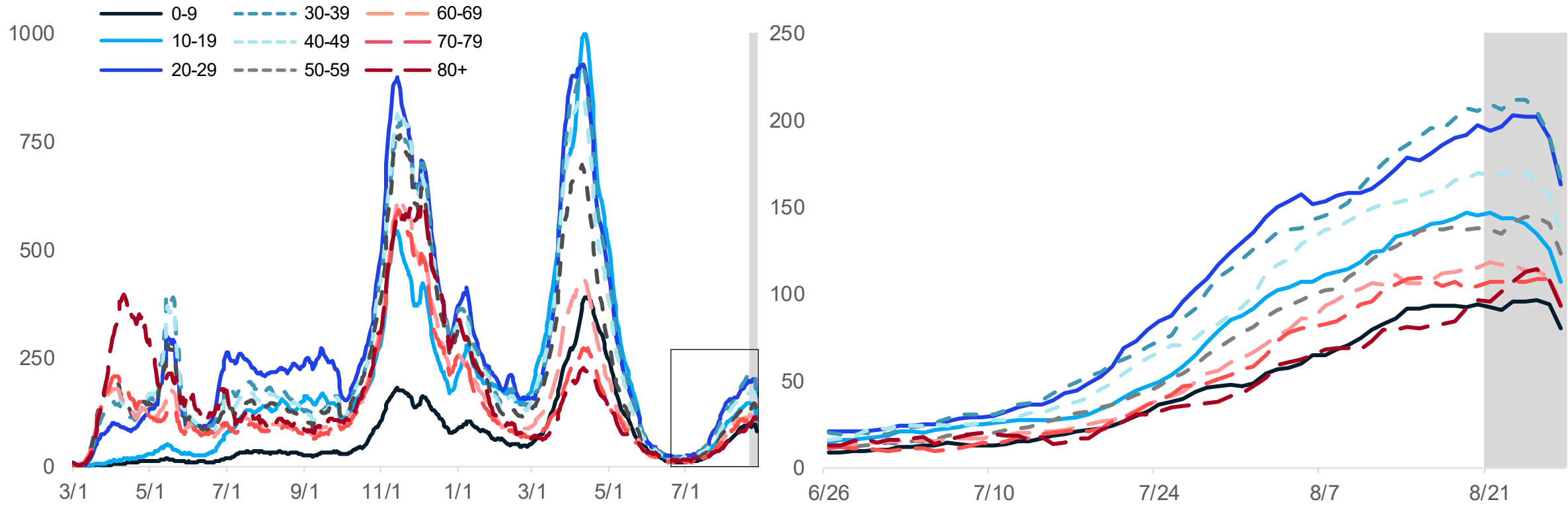
[Dashboard | CDC | MI Start Map](#) for most recent data by reporting date





Case Rate Trends are Increasing for All Age Groups

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



- Case rate trends for all age groups are increasing
- Case rates for all age groups are between 95 and 205 cases per million (through 8/16)
- Case rate trends are highest for 30-39-year-olds followed by 20-29, 40-49, 10-19, and 50-59

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

Number of Cases and CaseRates are Increasing for Most Age Groups

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 #)
0-9	111.0	96.3	2% (+1-5)
10-19	185.6	147.9	4% (+7)
20-29	**265.3**	**192.3**	6% (+14)
30-39	250.1	**206.2**	5% (+12)
40-49	201.6	**170.9**	6% (+12)
50-59	190.9	141.3	1% (+1-5)
60-69	151.7	118.9	9% (+12)
70-79	82.1	107.1	-1% (-1-5)
80+	44.0	106.2	28% (+10)
Total¶	1489.0	192.3	5% (+69.4)

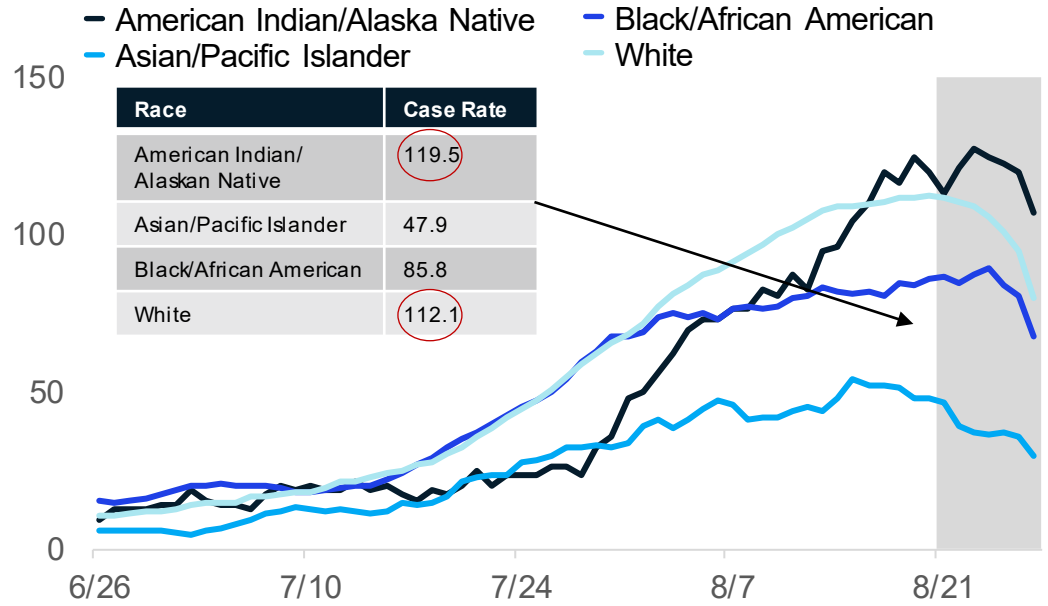
† Rolling 7-day average
Note: Case information sourced from MDHHS and reflects date of onset of symptoms
Source: MDHHS – Michigan Disease Surveillance System

- Average daily number of cases (265.3) is highest for those aged 20-29
- Avg. daily case rate (206.2 cases/mil) is currently highest for 30-39
- Case rates for all age groups are between 96-206 cases per million
- Case rate trends are increasing for many age groups
- Case rates bottomed out on June 26, 2021

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

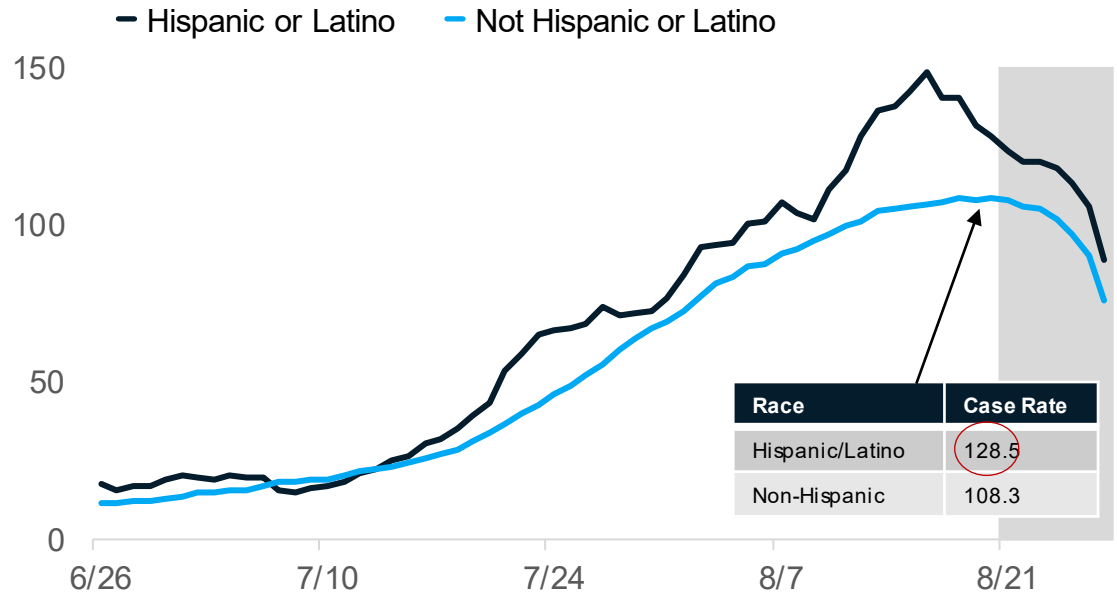
Racial and Ethnic Case Rates are Increasing

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



Race	Case Rate
American Indian/ Alaskan Native	119.5
Asian/Pacific Islander	47.9
Black/African American	85.8
White	112.1

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



Race	Case Rate
Hispanic/Latino	128.5
Non-Hispanic	108.3

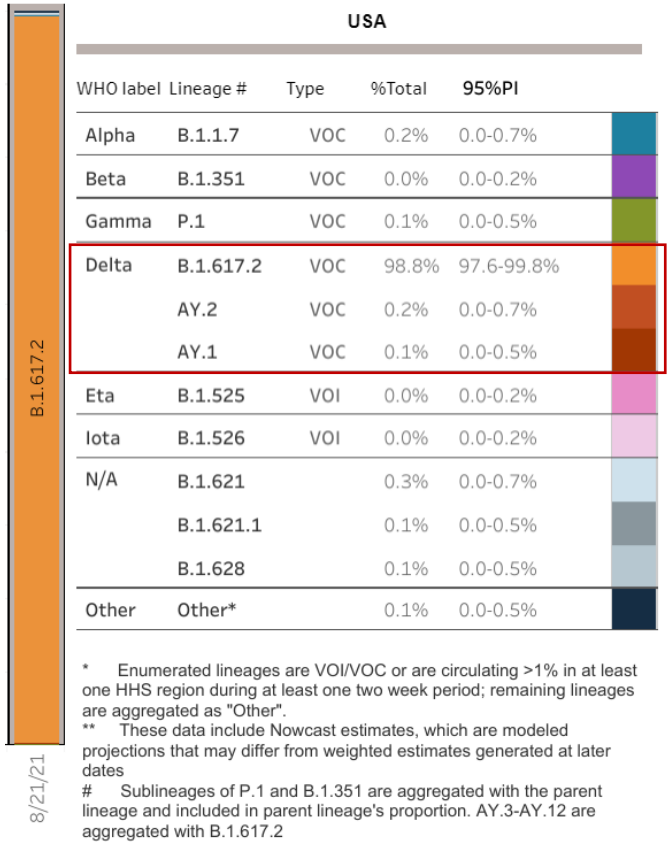
Updates since last week:

- Cases per million are increasing for all races and ethnicities
- **Hispanics, American Indian/Alaskan Native, and Whites have the highest case rates**
- In the past 30 days, 20% (↑3%) of race data and 24% (↑4%) ethnicity data was either missing or reported as unknown

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 (VOC) in US and Michigan

Variants Circulating in United States, Aug 8 – Aug 14 (NOWCAST)

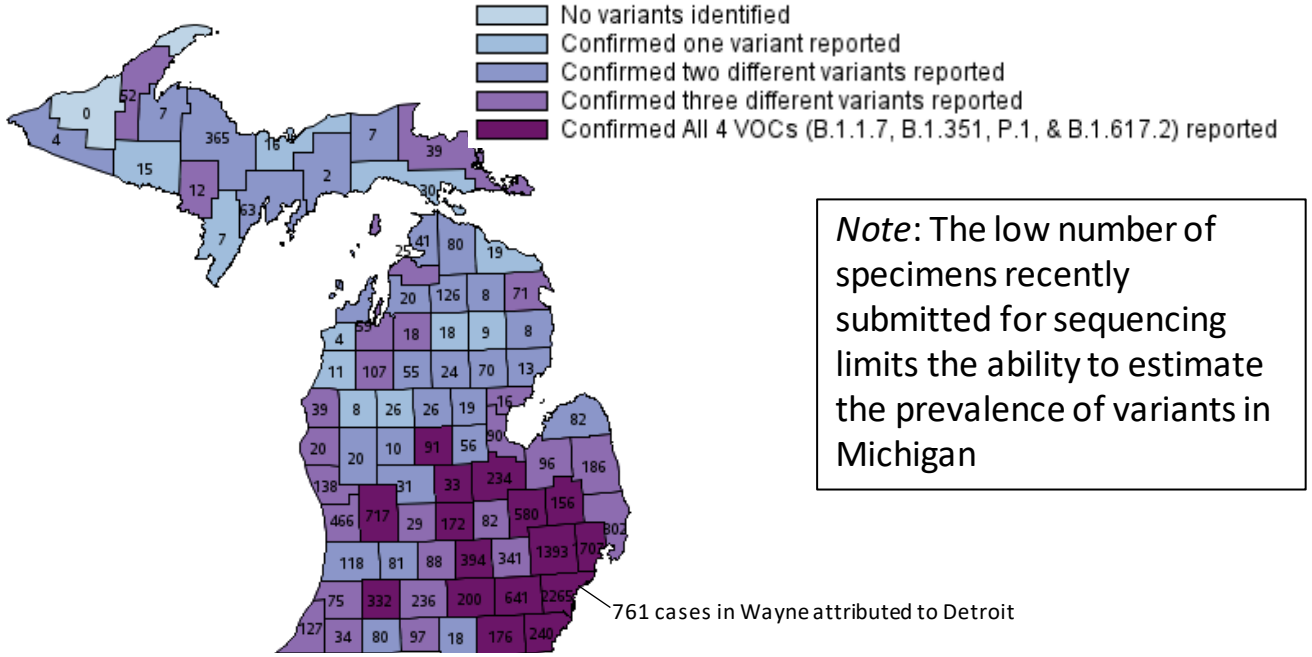


WHO label	Lineage #	Type	%Total	95%PI
Alpha	B.1.1.7	VOC	0.2%	0.0-0.7%
Beta	B.1.351	VOC	0.0%	0.0-0.2%
Gamma	P.1	VOC	0.1%	0.0-0.5%
Delta	B.1.617.2	VOC	98.8%	97.6-99.8%
	AY.2	VOC	0.2%	0.0-0.7%
	AY.1	VOC	0.1%	0.0-0.5%
Eta	B.1.525	VOI	0.0%	0.0-0.2%
Iota	B.1.526	VOI	0.0%	0.0-0.2%
N/A	B.1.621		0.3%	0.0-0.7%
	B.1.621.1		0.1%	0.0-0.5%
	B.1.628		0.1%	0.0-0.5%
Other	Other*		0.1%	0.0-0.5%

* Enumerated lineages are VOI/VOC or are circulating >1% in at least one HHS region during at least one two week period; remaining lineages are aggregated as "Other".
** These data include Nowcast estimates, which are modeled projections that may differ from weighted estimates generated at later dates
# Sublineages of P.1 and B.1.351 are aggregated with the parent lineage and included in parent lineage's proportion. AY.3-AY.12 are aggregated with B.1.617.2

Data last updated Aug 23, 2021
Source: https://covid.cdc.gov/covid-data-tracker/#variant-proportions and MDSS

Variants of Concern in Michigan, Aug 30



Note: The low number of specimens recently submitted for sequencing limits the ability to estimate the prevalence of variants in Michigan

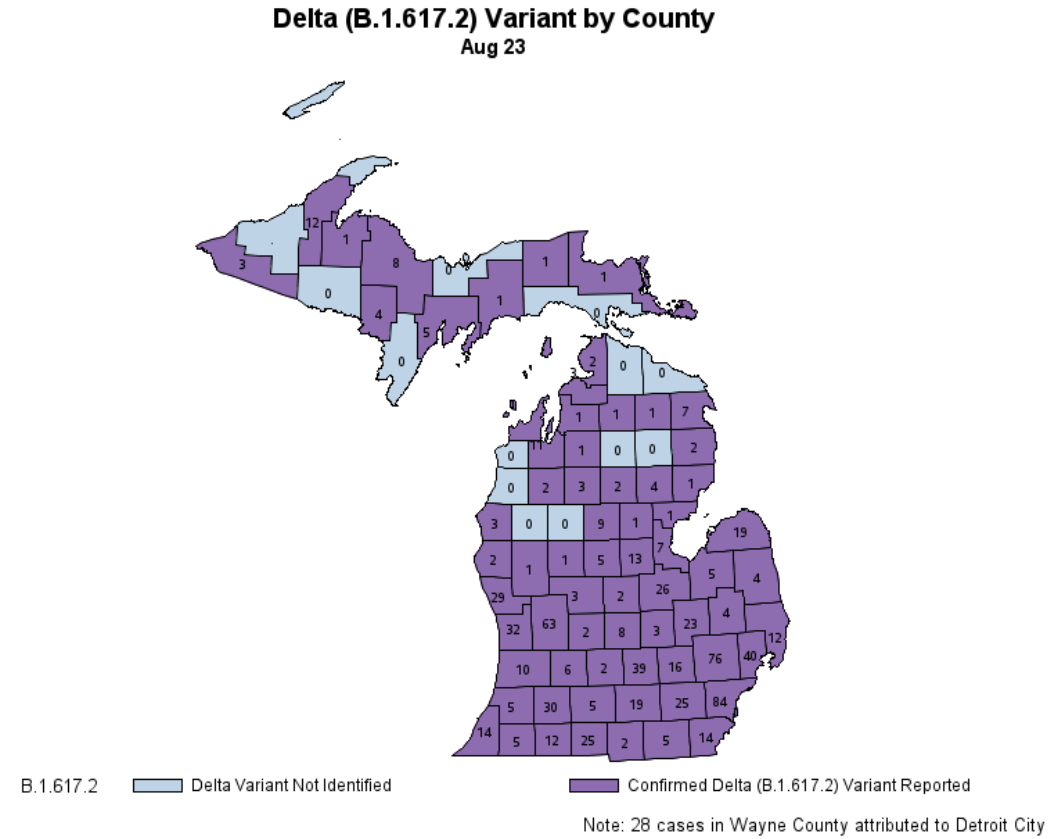
Variant	MI Reported Cases¶	# of Counties	% Specimens in last 4 wks
B.1.1.7 (alpha)	13,667*	81	0.5%
B.1.351 (beta)	85	24	0%
P.1 (gamma)	332	35	0.3%
B.1.617.2 (delta)	**1,353 (↑529)**	**73 (↑4)**	**99.2%**

* 534 cases within MDOC; ¶ 37 cases with county not yet determined

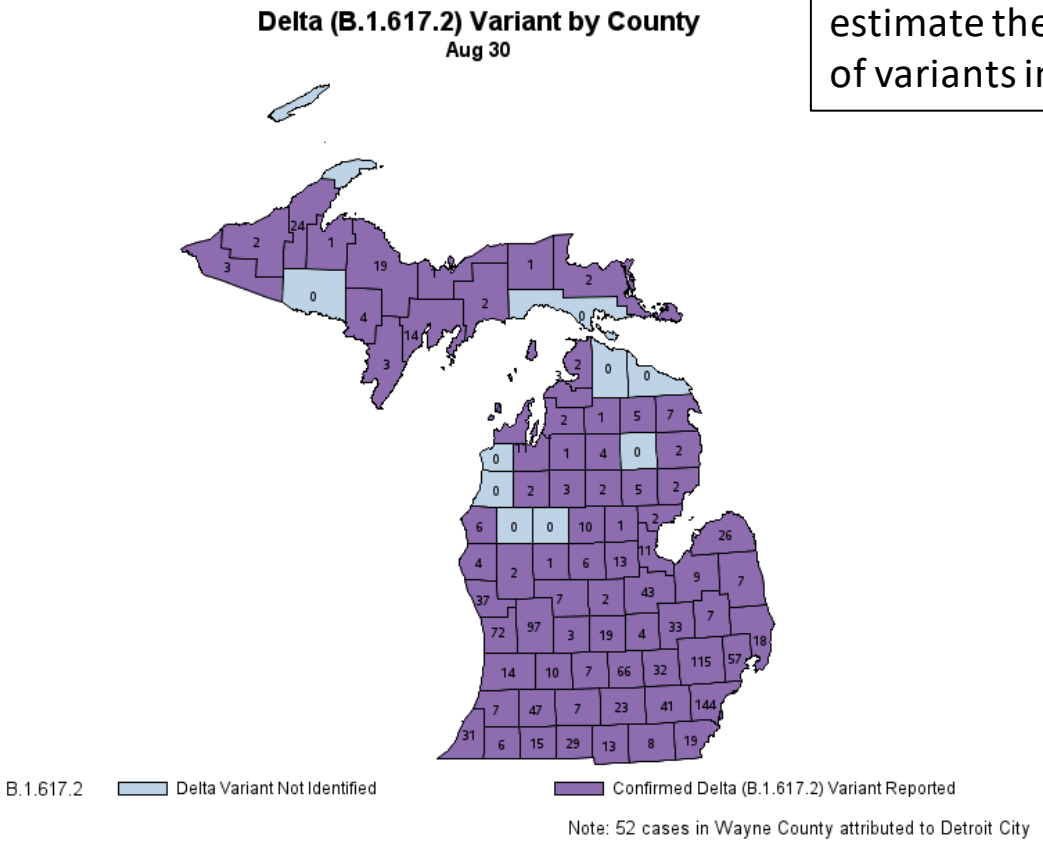
Identified COVID-19 Delta Variants by County

Note: The low number of specimens recently submitted for sequencing limits the ability to estimate the prevalence of variants in Michigan

Last week (Aug 23, 2021)



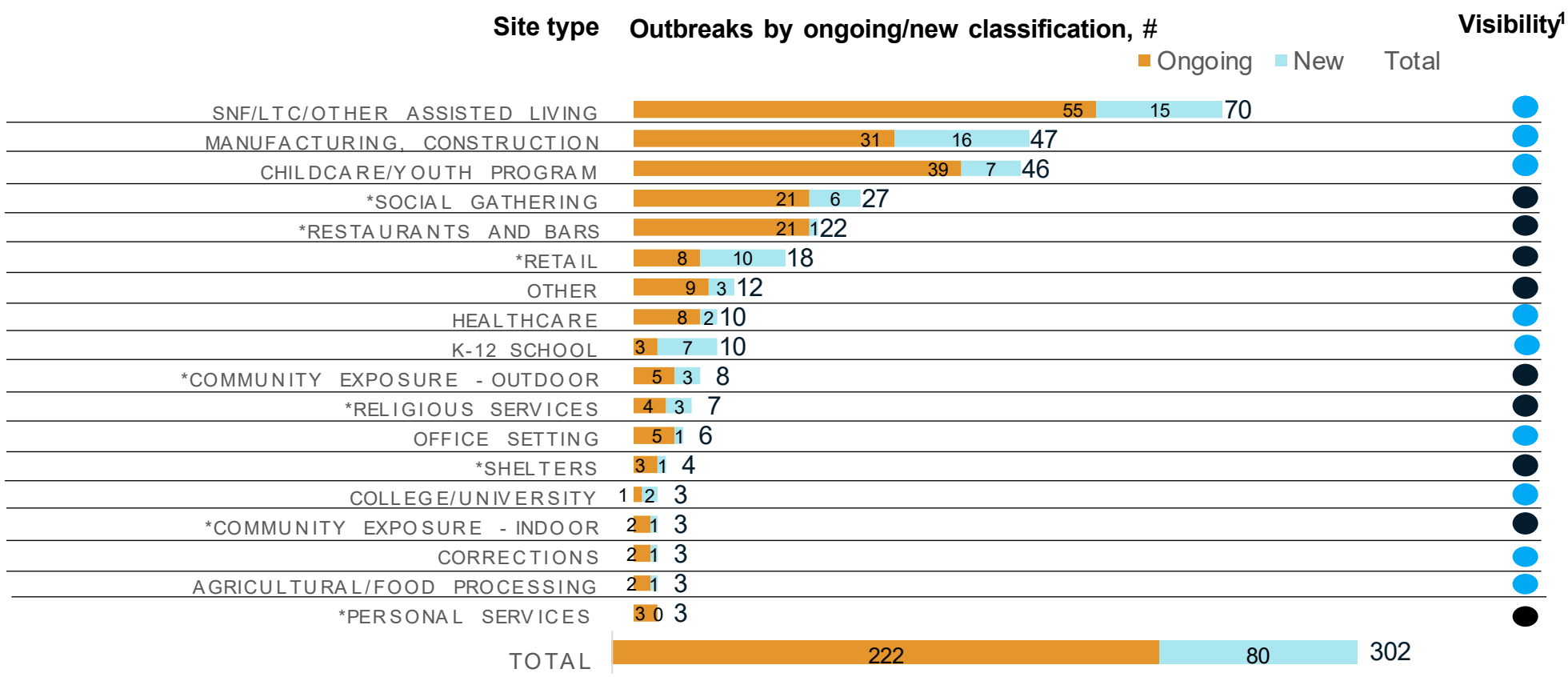
This week (Aug 30, 2021)



Data last updated Aug 30, 2021
Source: MDSS

Number of Outbreaks Reported has Increased

Number of outbreak investigations by site type, week ending Aug 26



Total number of active outbreaks is **up 11%** from previous week, with 79 new outbreaks identified (4 fewer than last week)

Manufacturing/ construction reported the greatest number of new outbreaks (16) this week, followed by SNF/LTC (15), retail (10), childcare/ youth programs (8), K-12 (7), and social gatherings (6), and ten other settings with at least 1 new outbreak in the last week.

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

Key Messages: COVID-19 and Healthcare Capacity and COVID Severity

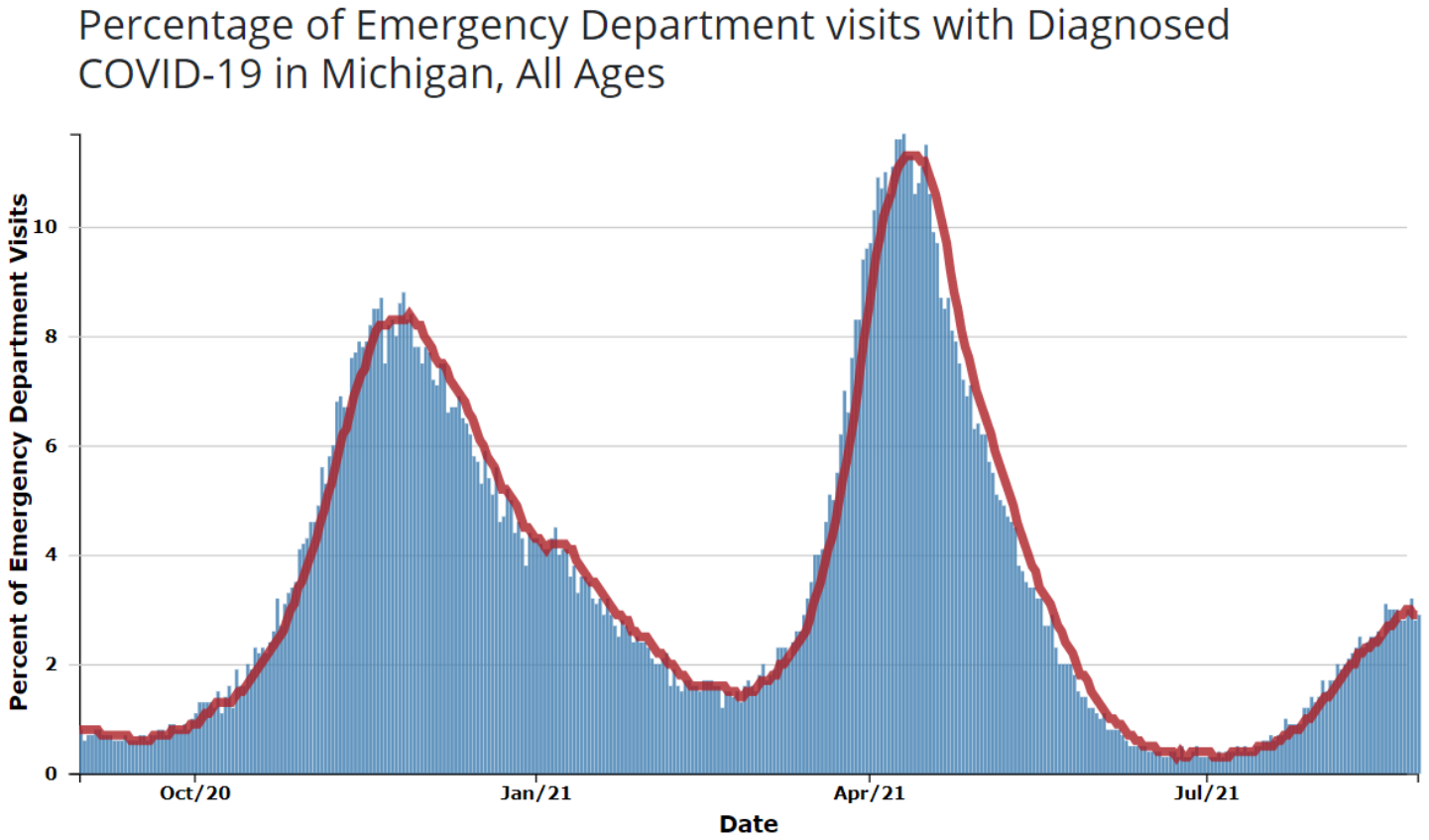
Hospitalizations and ICU utilization are increasing

- 2.9% of ED visits are for COVID-like illness (CLI) (up from 2.5% last week)
- Hospital admissions are increasing for nearly all age groups this week
- Hospitalizations up 10% since last week (vs. 29% increase week prior)
- All regions are showing increasing trends in hospitalization trends this week, except Region 2S and 5
  - Hospitalization for COVID-19 is highest in Regions 3, 2N, and 6
  - Fastest growth is in Regions 1, 6, and 8
- Volume of COVID-19 patients in intensive care has increased 28% since last week (vs. 26% increase last week)

Death rate is 1.3 daily deaths per million people

- Death rate has increased four weeks
- 220% increase since Jul 22 low
- 30-day proportion of deaths among those under 60 years of age is steady from the prior week

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

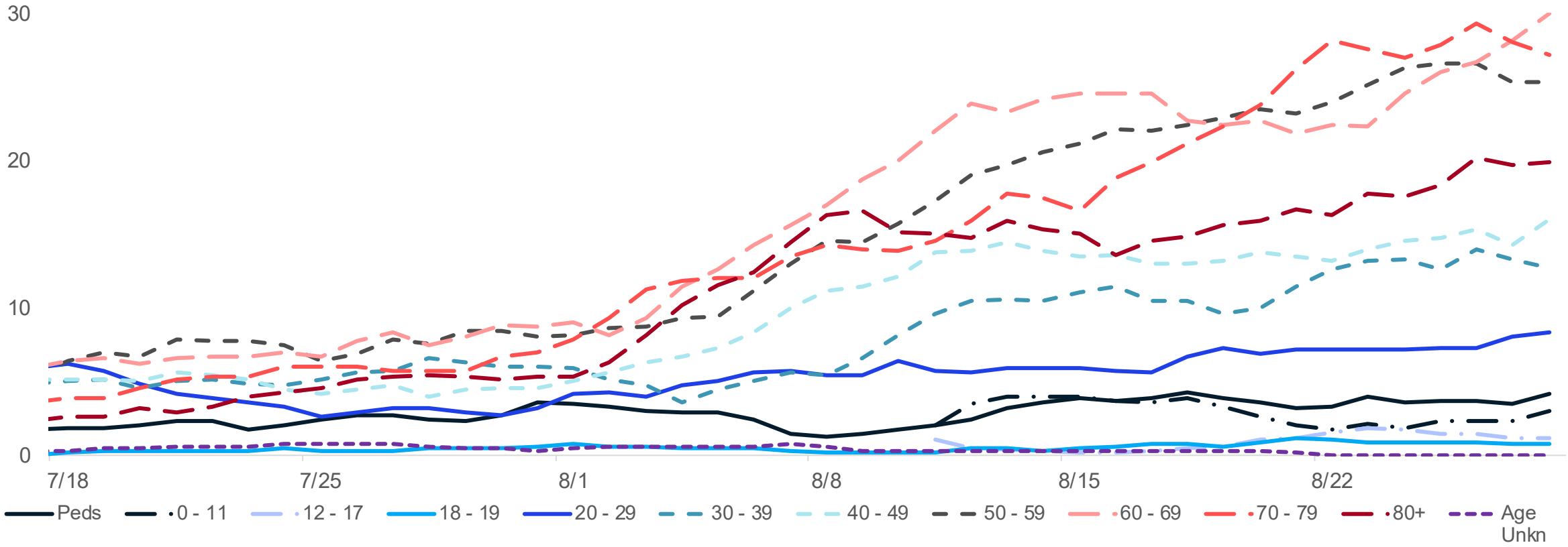


2.9%

- Trends for ED visits have increased to 2.9% since last week (up from 2.5% week prior)
- Trends vary by age groups with all age groups seeing an increase
- Over past week, those 50-64 years saw highest number of avg. daily ED CLI visits (3.7), but those between 25 and 74 all above state average

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

Average Hospital Admissions Are Increase for all Age Groups

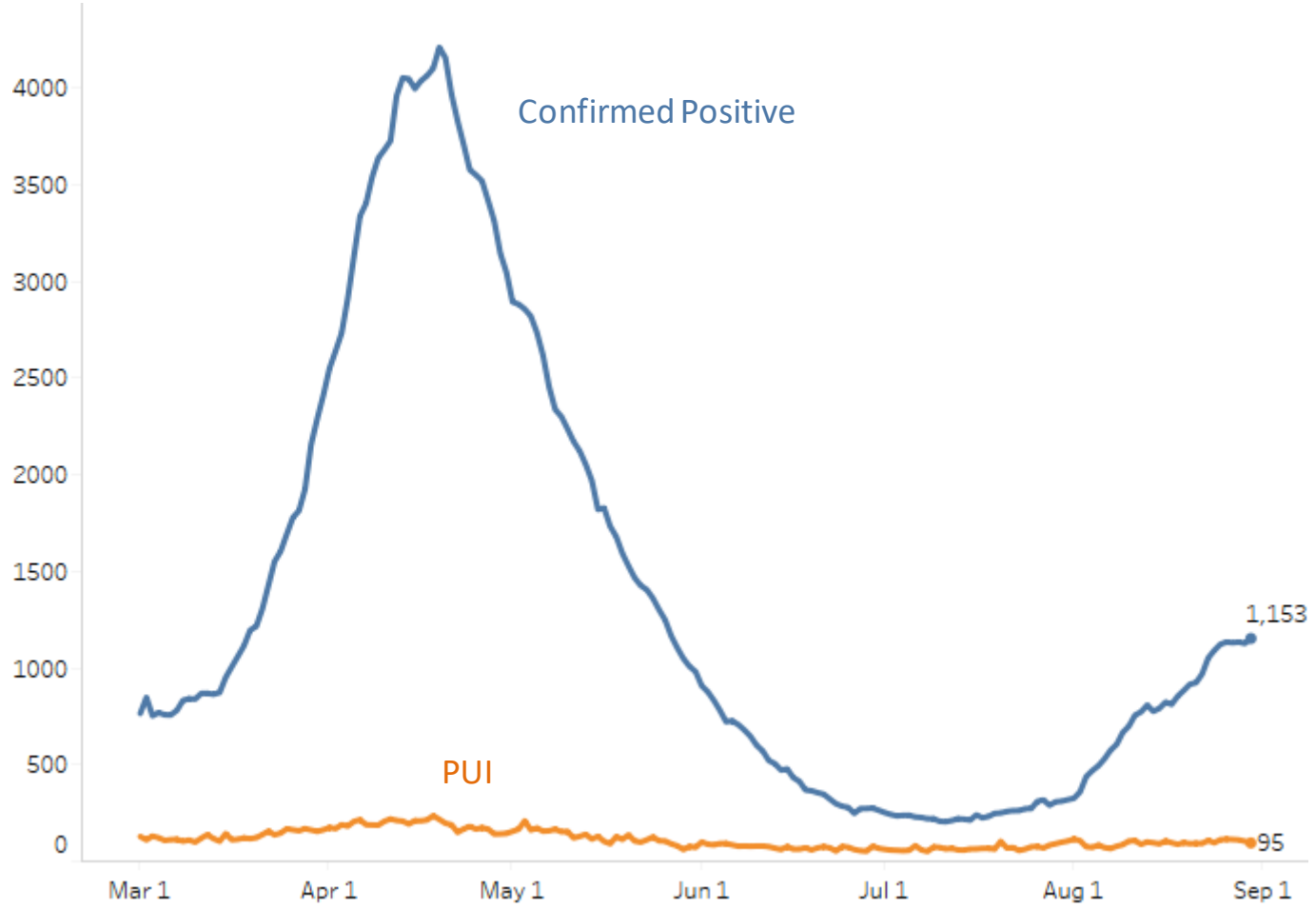


Source: CHECC & EM Resource

- Trends for daily average hospital admissions have increased 16% since last week (vs. 5% increase prior week)
- This week, nearly all age groups have experienced increases in daily hospital admissions
- Over the past week, those 60-69 years have seen the highest number of avg. daily hospital admissions (30 admissions)

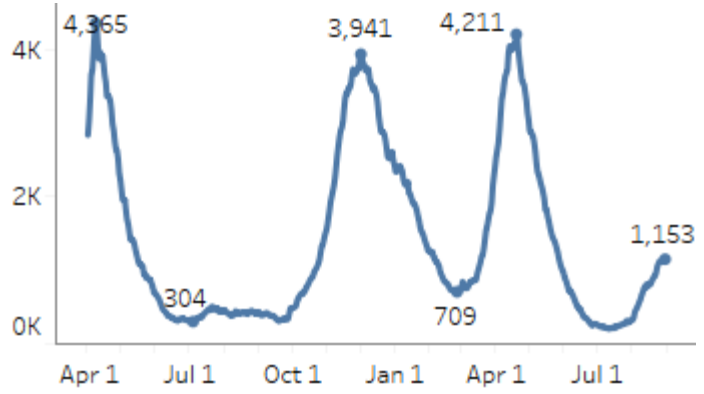
Statewide Hospitalization Trends: Total COVID+ Census

Hospitalization Trends 3/1/2021 – 8/30/2021
Confirmed Positive & Persons Under Investigation (PUI)



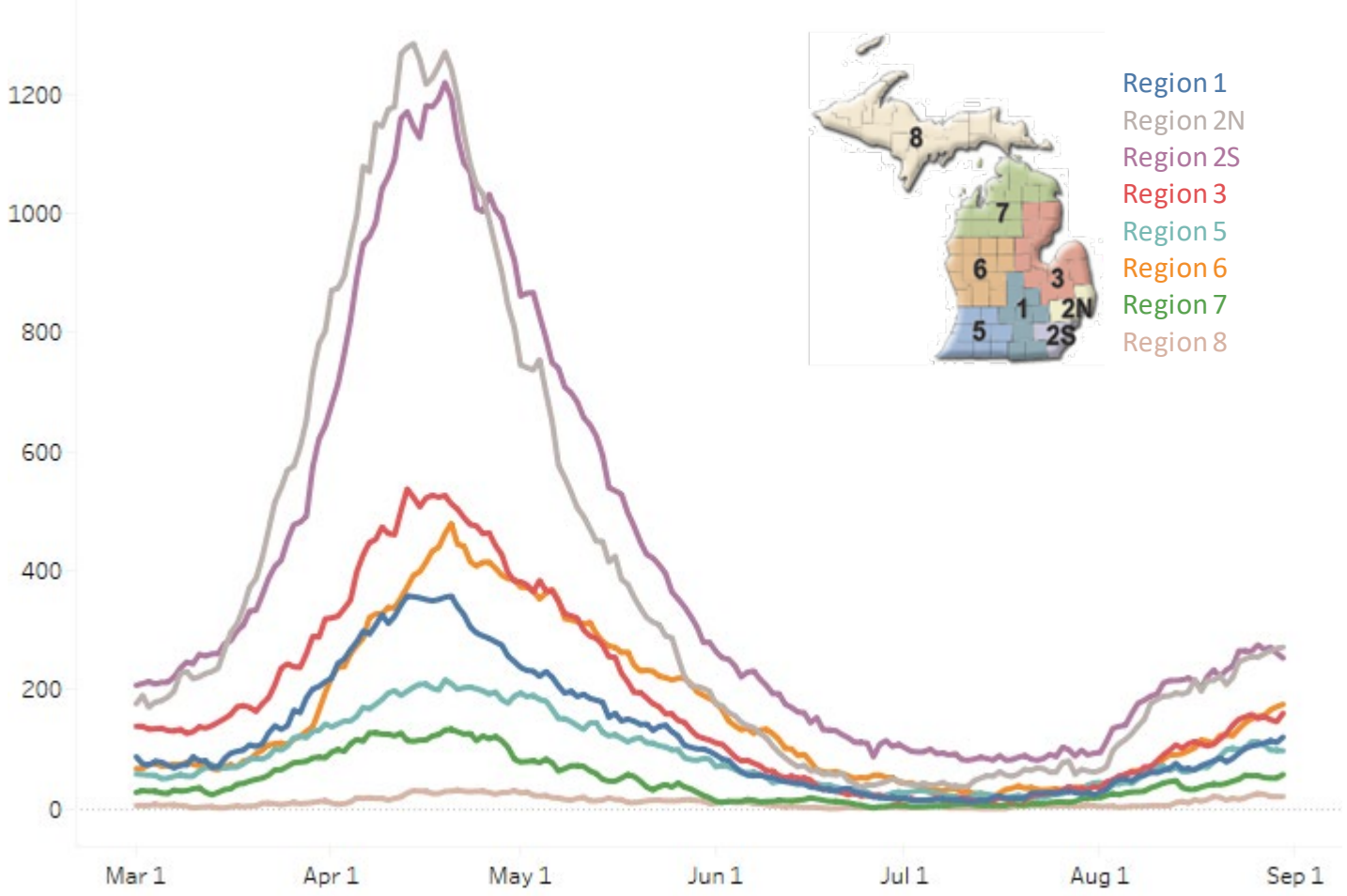
The COVID+ census in hospitals has increased 10% from the last week (previous week was up 29%).

Hospitalized COVID Positive Long Term Trend (beginning March 2020)



Statewide Hospitalization Trends: Regional COVID+ Census

Hospitalization Trends 3/1/2021 – 8/30/2021
Confirmed Positive by Region

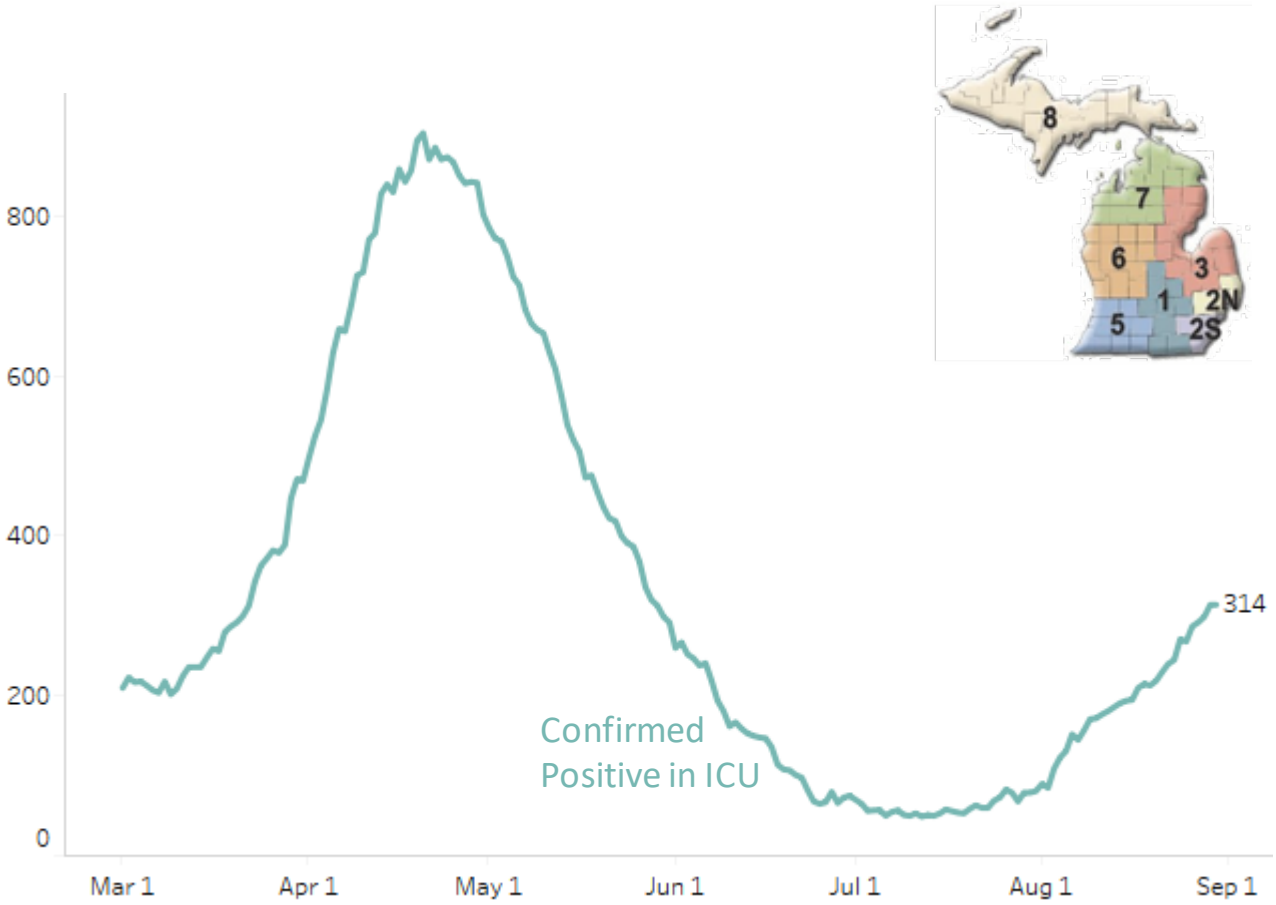


6/8 Regions are showing continued increasing hospitalization trends this week.

Regions 1, 6 and 8 showed the fastest growth while Regions 2S and Region 5 showed slight decreases.

Region	COVID+ Hospitalizations (% Δ from last week)	COVID+ Hospitalizations / MM
Region 1	120 (29%)	111/M
Region 2N	271 (10%)	122/M
Region 2S	253 (-5%)	114/M
Region 3	160 (7%)	141/M
Region 5	97 (-2%)	102/M
Region 6	175 (31%)	119/M
Region 7	57 (16%)	114/M
Region 8	20 (33%)	64/M

Statewide Hospitalization Trends: ICU COVID+ Census



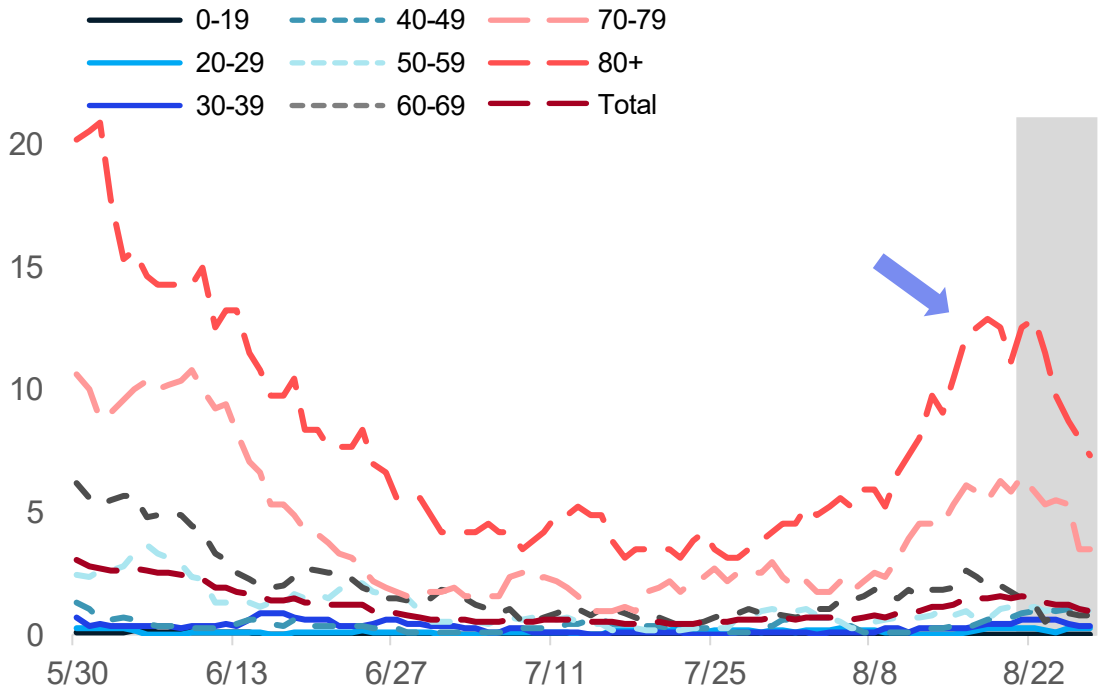
The census of COVID+ patients in ICUs has increased by 28% from last week (previous week was up 26%).

All regions have increasing ICU census from last week with the fastest growth in Regions 5-8. Regions 1 and 6-8 now have 15% or more of ICU beds occupied by COVID+ patients.

Region	Adult COVID+ in ICU (% Δ from last week)	Adult ICU Occupancy	% of Adult ICU beds COVID+
Region 1	29 (38%)	89%	16%
Region 2N	62 (7%)	72%	11%
Region 2S	74 (16%)	81%	11%
Region 3	43 (10%)	87%	13%
Region 5	27 (59%)	72%	14%
Region 6	42 (68%)	79%	18%
Region 7	28 (75%)	75%	18%
Region 8	9 (80%)	63%	15%

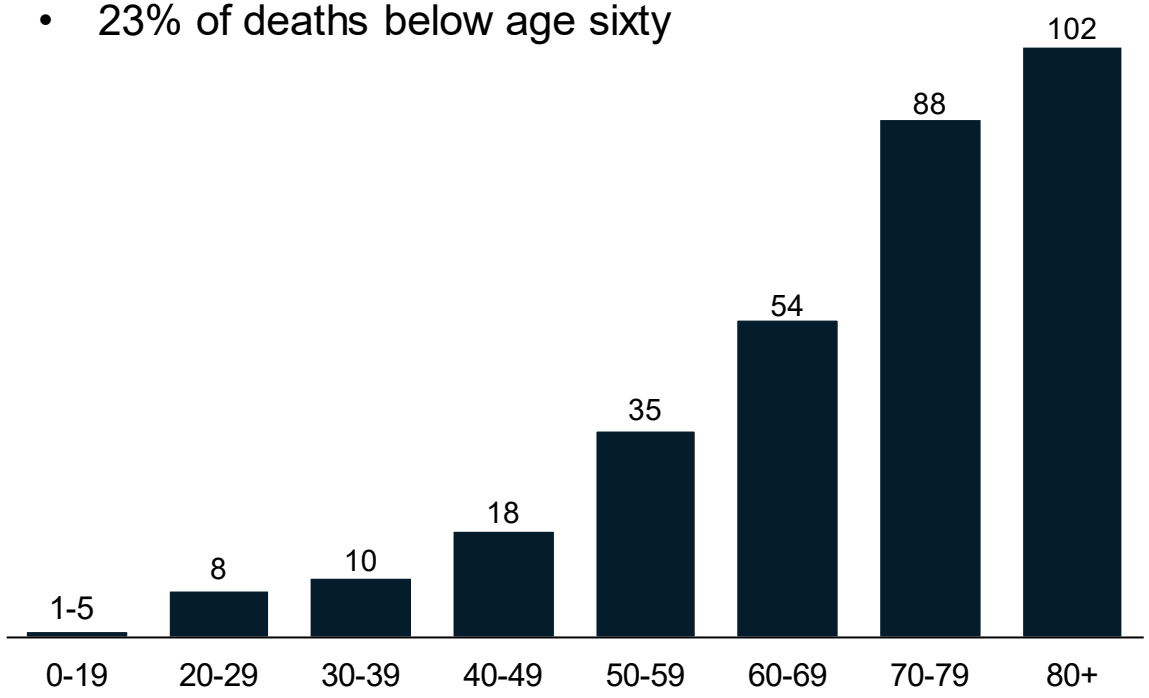
Average and total new deaths, by age group

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 8/23/2021)

- 23% of deaths below age sixty

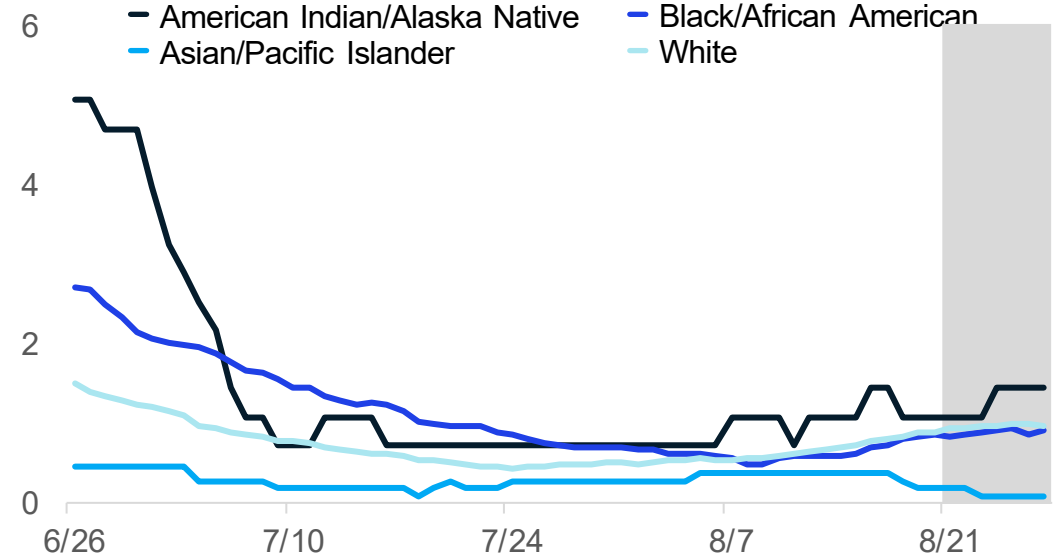


- Overall trends for daily average deaths are increasing since last week
- Through 8/23, the 7-day avg. death rate is more than 5.0 daily deaths per million people for those over the age of 70

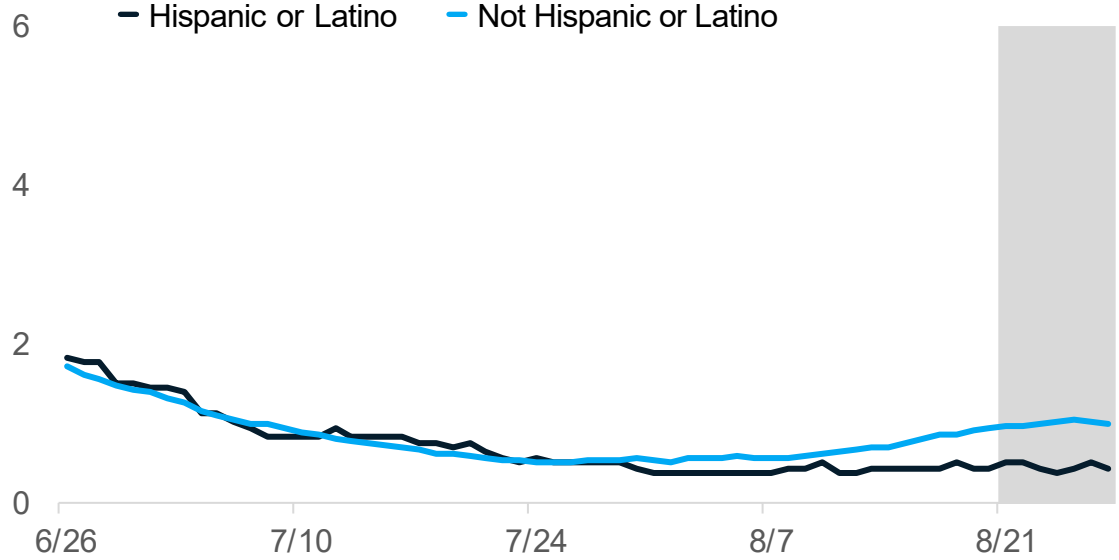
Note: Death information sourced from MDHHS and reflects date of death of confirmed and probable cases.
Source: MDHHS – Michigan Disease Surveillance System

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



- Additional reviews of vital records death data were performed the weeks of 7/6 and 8/9 to search for race and ethnicity
- This review has resulted in an adjustment of deaths for American Indian and Alaskan Natives from previous weeks
- **Currently, American Indian/Alaskan Natives have the highest death rate**

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

COVID-19 Vaccination

Administration (doses administered)

- 5,700 first doses administered each day (7 day rolling average*)
- Most administered frequently by pharmacies, local health departments, and hospitals

Coverage (people vaccinated)

5.04 million people in the state are fully vaccinated

82.7% of people aged 65 and older have completed the series (+.3%)

55.2% of total population initiated (+.5%)

- 66.4% (+0.5) of aged 18+ have had first dose of vaccine; 87,1% (+0.3) of aged 65+ have had first dose
- 5,040,341 people in Michigan have completed vaccination series (4,992,872 and 4,955,984 in last 2 weeks)
- Initiation highest among Asian, Native Hawaiian or Pacific Islander and American Indian/Alaskan Native individuals (MI COVID Vaccine Dashboard 8/31/21)
- 28,859 Additional Doses for Immunocompromised Individuals administered since 8/31
- Less than 1% of Vaccinated Individuals Later Tested Positive for COVID-19 (Number of cases who are fully vaccinated (n= 17,181)

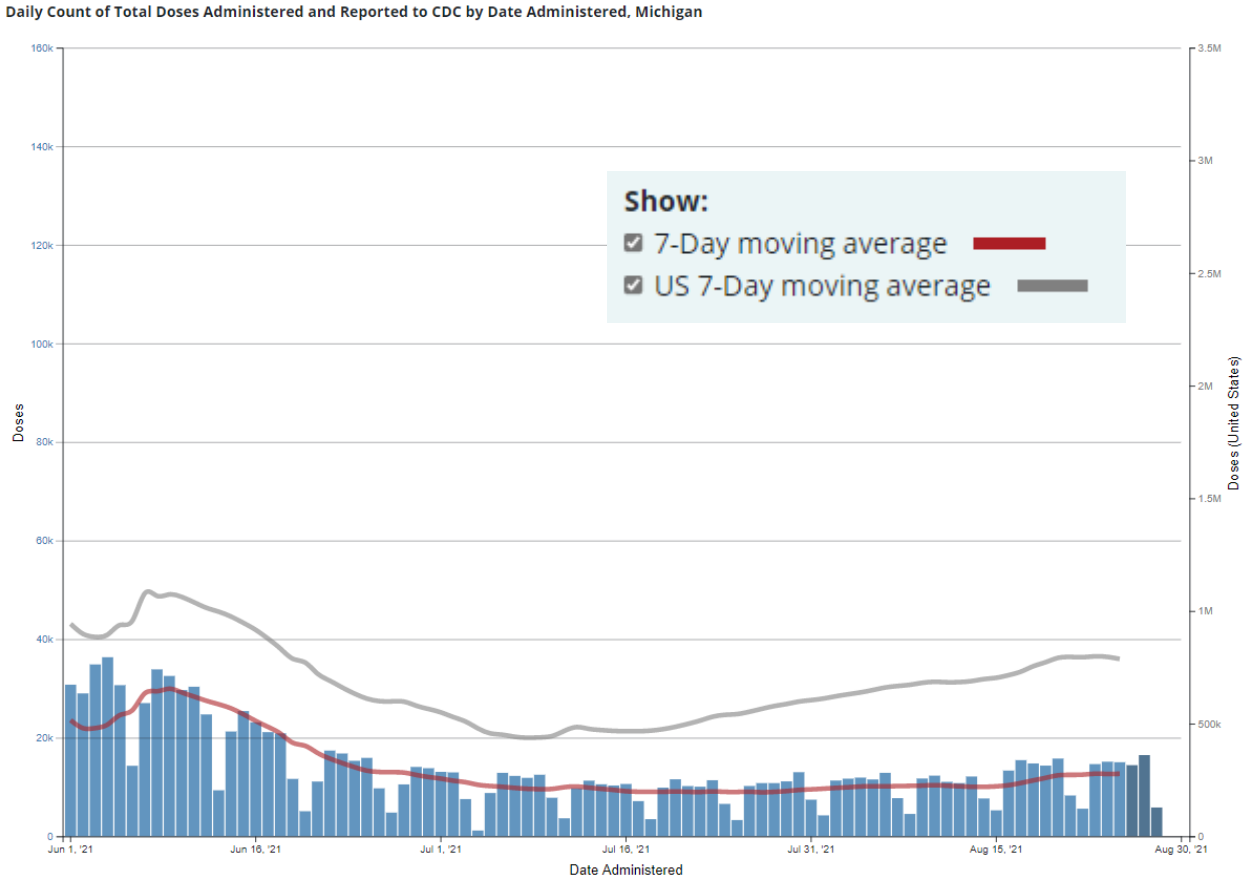
*https://covid.cdc.gov/covid-data-tracker/#vaccination-trends_vacctrends-onedose-daily

Doses administered in Michigan remains steady as national administration is slightly increasing (data through 8/30/2021)

12,860,840 doses delivered to providers and 10,179,797 doses administered (CDC tracker)

7 days ending August 25th (CDC tracker)
- 42,311 first doses administered
- 12,700 total doses/day on average
- 5,700 first doses/day on average (graphic)

Total doses were most frequently administered by (MCIR)
- Pharmacies (55.4K)
- LHD (3.9K) and hospitals (6.2K)
- Family practice (3.1K), FQHCs (3.1K), and Pediatric (1.1)



CDC COVID Data Tracker

Over 5 Million Michiganders fully vaccinated and 50.5% of total population fully vaccinated

5.04 million people in the state are fully vaccinated

82.7% of people aged 65 and older have completed the series (+.3%)

55.2% of total population initiated (+.5%)

28,859 additional doses

Race/Ethnicity for those 12 years and older:

- Initiation coverage highest among those of Non-Hispanic (NH) Asian, Native Hawaiian or Pacific Islander Race (54.4%), then NH American Indian (51.4%), NH White (47.3%), NH Black or African American Races (36.6%).
- Initiation is at 48.6% for those of Hispanic ethnicity
- Completion follows the same pattern
- 20.1% data missing or unknown

Vaccination Coverage in Michigan as of 8/30/21

Age Group	% At Least One Dose	% Fully Vaccinated	Number Fully Vaccinated
Total Population	55.2	**50.5**	5,040,341
≥ 12 years	64.1	58.7	5,040,237
≥ 18 years	66.4	61.0	4,783,082
≥ 65 years	87.1	82.7	1,459,715

Potential COVID-19 Vaccination Breakthrough Cases

Michigan part of CDC's nationwide investigation (COVID-19 Breakthrough Case Investigations and Reporting | CDC)

Michigan Data (1/1/21 through 8/24/21):

- **17,181 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 279 deaths (247 in persons ages 65 years or older)**
  - **836 cases were hospitalized**

- Vaccine breakthrough cases are expected. COVID-19 vaccines are effective and are a critical tool to bring the pandemic under control. However, no vaccines are 100% effective at preventing illness. Some fully vaccinated people will get sick, and some will even be hospitalized or die from COVID-19. However, there is evidence that vaccination may make illness less severe for those who are vaccinated and still get sick. The risk of infection, hospitalization, and death are all much lower in vaccinated compared to unvaccinated people.
- More than 171 million people in the United States have been fully vaccinated as of August 23, 2021. Like with other vaccines, vaccine breakthrough cases will occur, even though the vaccines are working as expected. Asymptomatic infections among vaccinated people will also occur.
- Current data suggest that COVID-19 vaccines authorized for use in the United States offer protection against most SARS-CoV-2 variants circulating in the United States. However, variants will cause some vaccine breakthrough cases.

Science Round Up

Wastewater Surveillance: new system for understanding spread of the virus

Deeper look at trends: What happening in other states and comparison to past surges

- Average daily incidence per 100,000 cases in Michigan is currently lower than other states experiencing a surge in delta cases
- Cases and deaths are projected to continue increasing across the Midwest
- CDC models project continued increases in cases, hospitalizations, and deaths for Michigan
- Effective reproduction number (Rt) in Michigan remains >1, suggesting continued growth

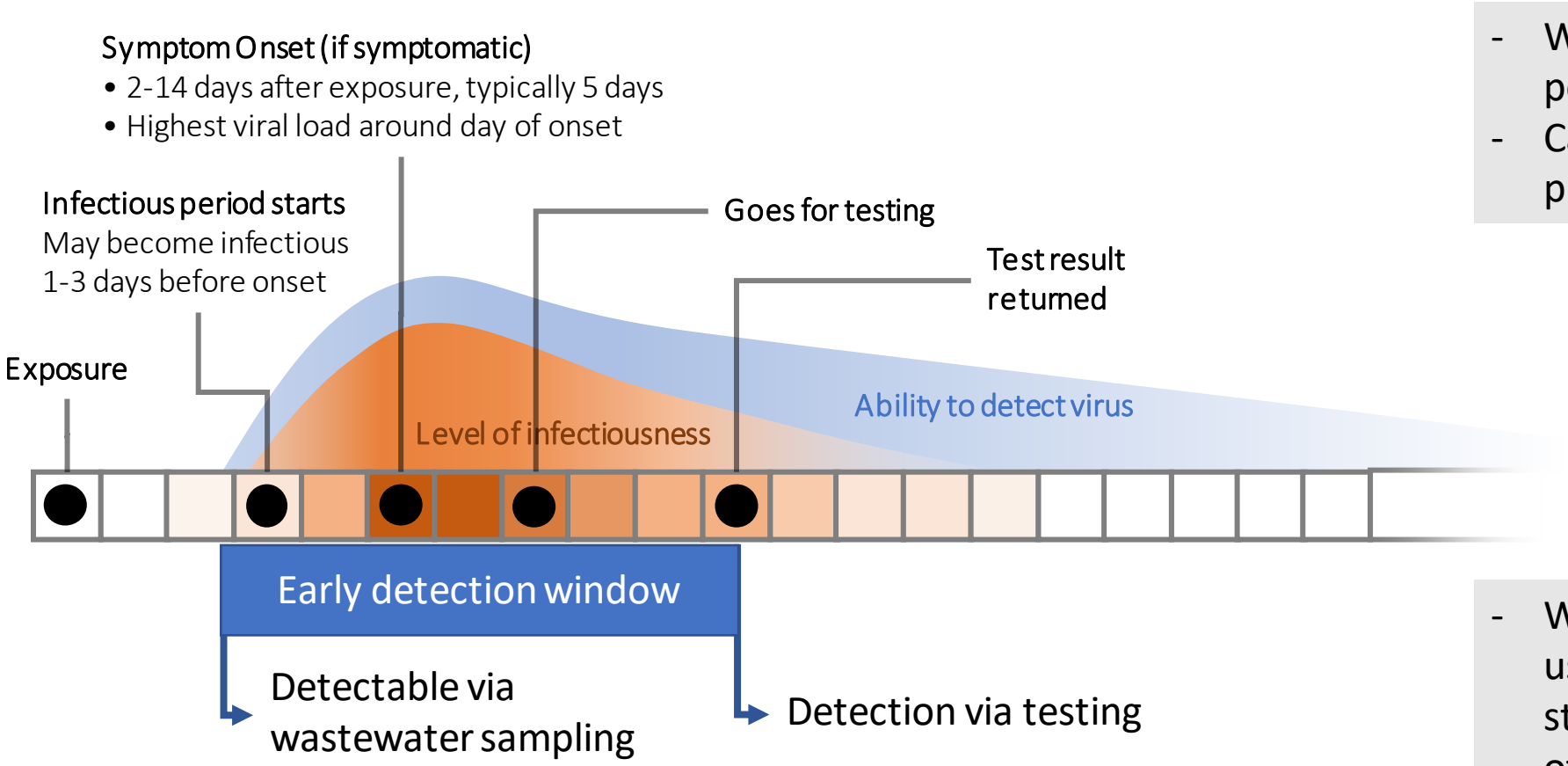
What do we know about schools

- 40% of school districts have some mask policy, and 57% of students* are covered by some mask policy
- Number of reported school outbreaks this week is 11, including outbreaks seen in High Schools (7), Pre K-Elementary (3), and Administrative (1). No outbreaks were seen in Middle/Jr High.

Update on breakthrough cases and boosters

- 50.5% of the population is fully vaccinated yet only account for ~20% of cases, hospitalizations, and deaths
- Post Delta: mRNA vaccines are 39-84% against infection and 75-95% against hospitalization

Wastewater can provide early warnings and a monitoring system for COVID in communities when testing is low

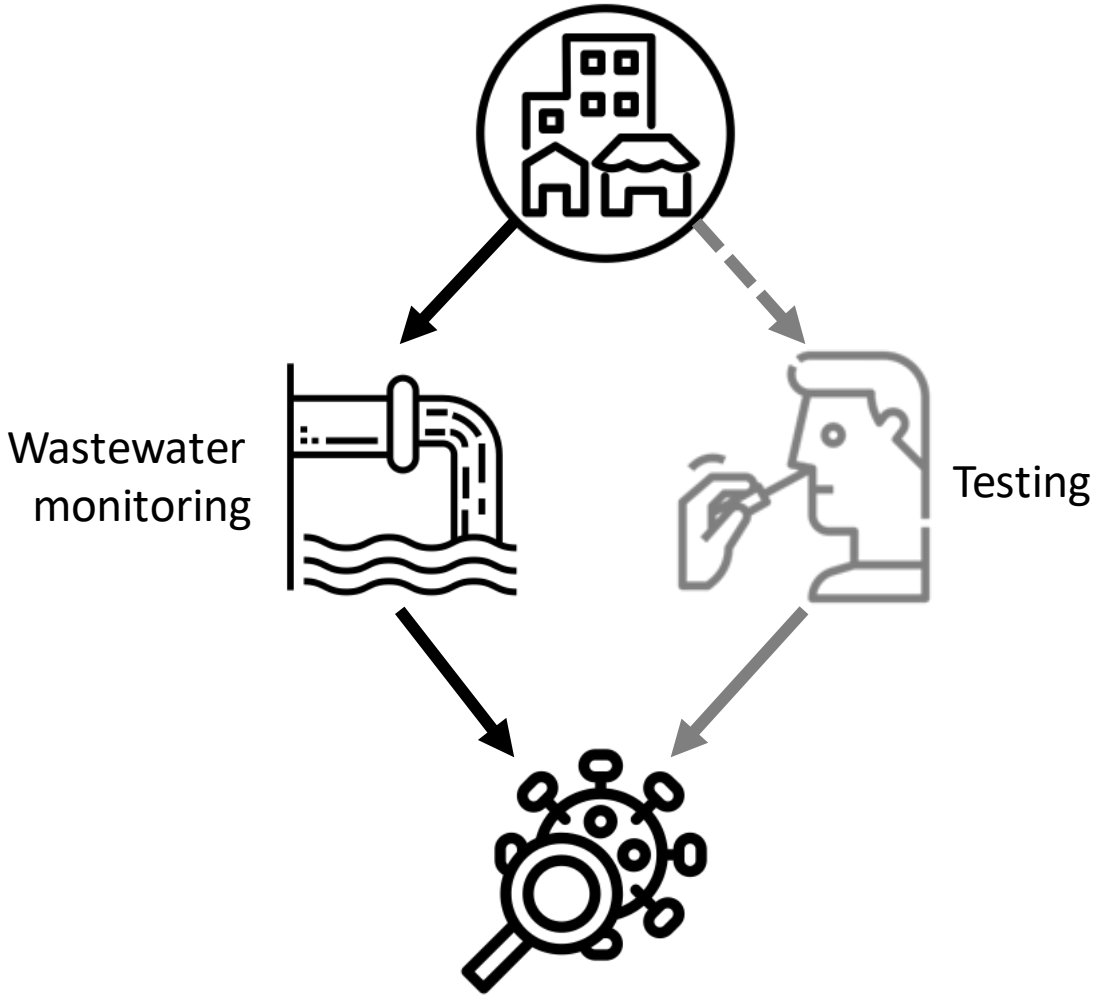


- Wastewater sampling has the potential to detect clusters early
- Can detect asymptomatic and presymptomatic individuals

- Wastewater sampling has been used to detect, intervene and stop transmission—e.g. University of Arizona [1]

Sources: WHO transmission overview, WHO isolation guidelines, CDC isolation guidelines, [1] Science 2020

Wastewater can provide early warnings and a monitoring system for COVID in communities when testing is low

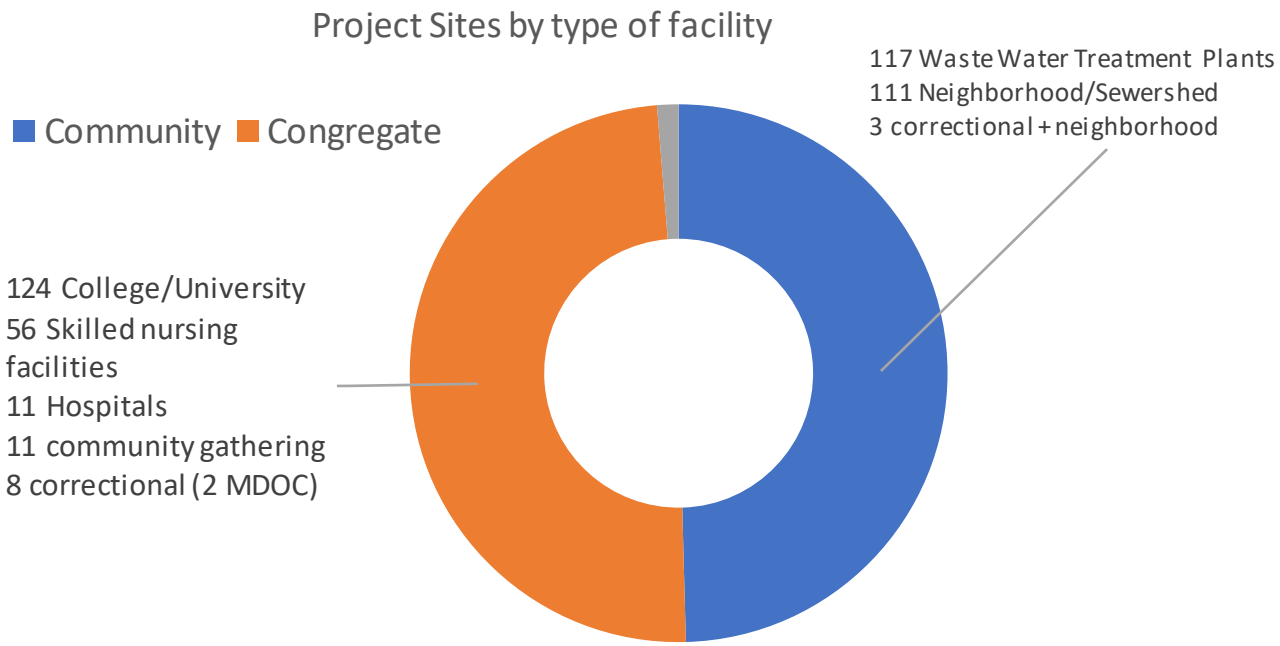


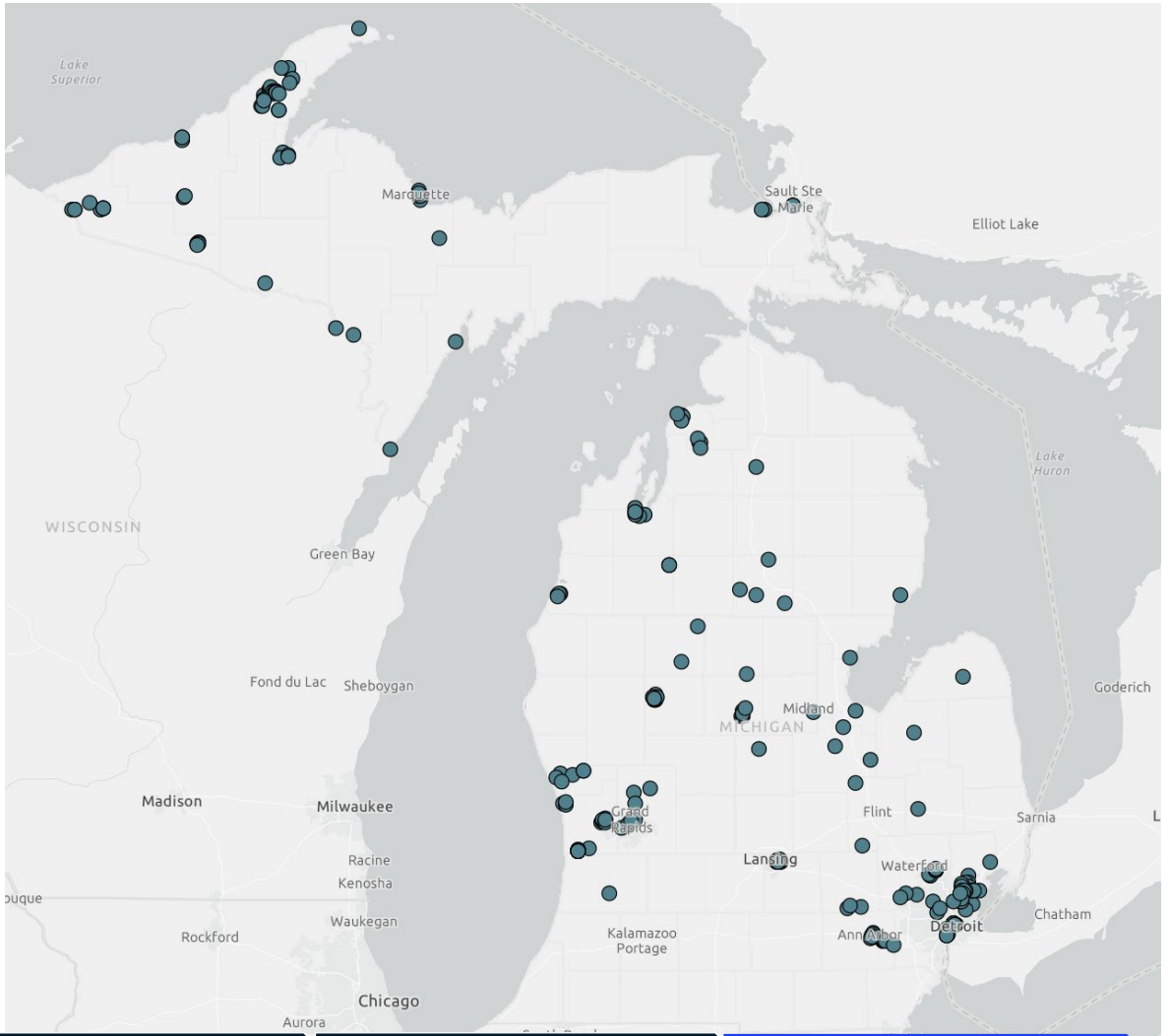
- When testing is reduced, wastewater provides an alternative way to monitor communities and/or facilities
- Wastewater can be used at the building or community level

- Wastewater sampling has been used to detect, intervene and stop transmission—e.g. University of Arizona [1]

Sources: WHO transmission overview, WHO isolation guidelines, CDC isolation guidelines, [1] Science 2020. Icons from the Noun Project.

Michigan Wastewater Surveillance Network – All Sites





460 sites identified across 19 projects, 55 counties + City of Detroit

- 278 (60%) composite (pooling multiple grab samples) sampling sites
- 209 (45%) sites sampling 2x or more per week
- Projects are ramping up sampling, reporting, and variant testing as of 7/24

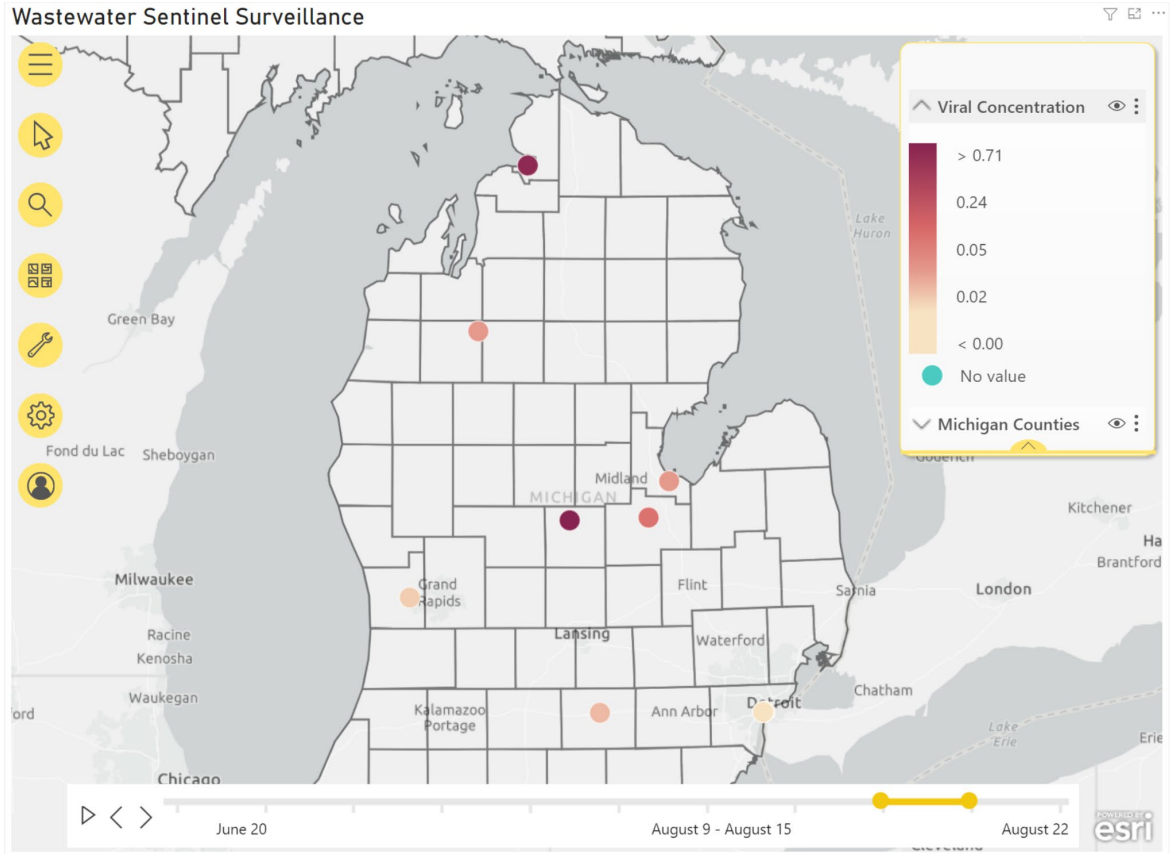
Michigan Wastewater Surveillance: Sentinel Network

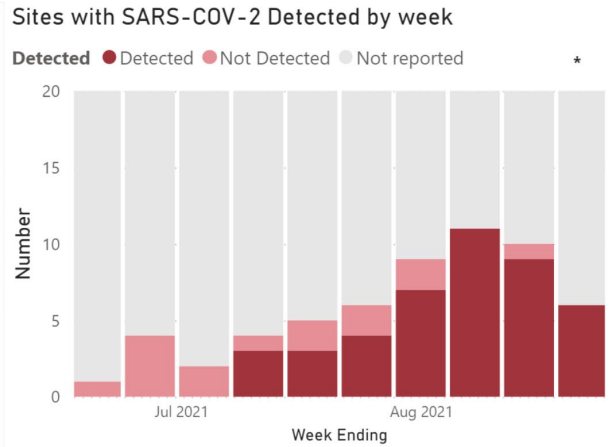
Sentinel sites located in communities across the Lower Peninsula

3.6 million people served

Composite samples or equivalent

Shading represents viral levels
Number of sites reporting
Dark red is number of sites with detection





* Data reporting is not complete for week ending August 22, 2021

Sentinel Site	Most Recent Positive Sample	Consecutive Weeks Positive	Population Served
Grand Rapids WWTP	August 19	4	265000
Traverse City WWTP	August 18	3	45000
Alma WWTP	August 16	3	8976
GLWA Detroit River Interceptor	August 16	7	492000
GLWA North Interceptor-East Arm	August 16	6	1482000
GLWA Oakwood-Northwest-Wayne County Interceptor	August 16	7	840600
Petoskey WWTP	August 12	4	7900
Saginaw WWTP	August 9	2	40000
Jackson WWTP	August 8	3	90000
Ypsilanti WWTP	August 7	2	330000
Bay City WWTP	August 5	0	34000

Viral concentrations. We calculated viral concentrations by dividing the gene copies in a given sample by the population served. Viral concentrations are averaged over a week. Gene copies at or below the limit of detection were considered half the assay detection limit. **Variability of samples and analysis.** The laboratories analyzing results from the sampled sites work closely with the MDHHS to ensure best methods are used. However, because these methods are not uniform across sites and because each community is different viral concentration should not be compared between locations. These data are best used to examine trends over time for each individual site.

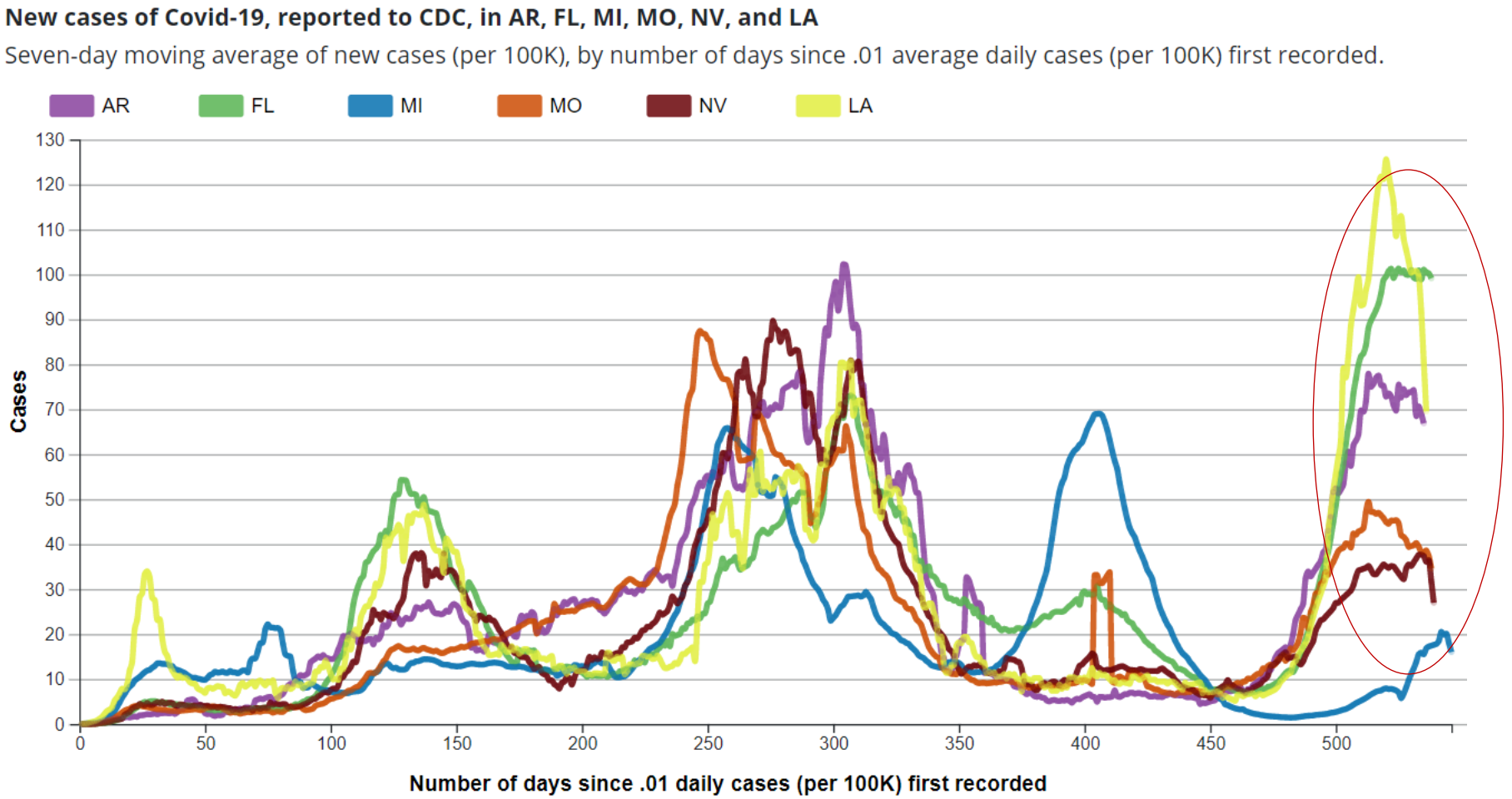
Deeper look at trends: What happening in other states and comparison to past surges

Cumulative COVID-19 Case Rates: States with High Delta Comparison

Average daily incidence per 100,000 cases in Michigan is currently lower than other states experiencing a surge in delta cases

Louisiana reporting may be impacted by weather events

Testing capacity may be limited for states experiencing high case

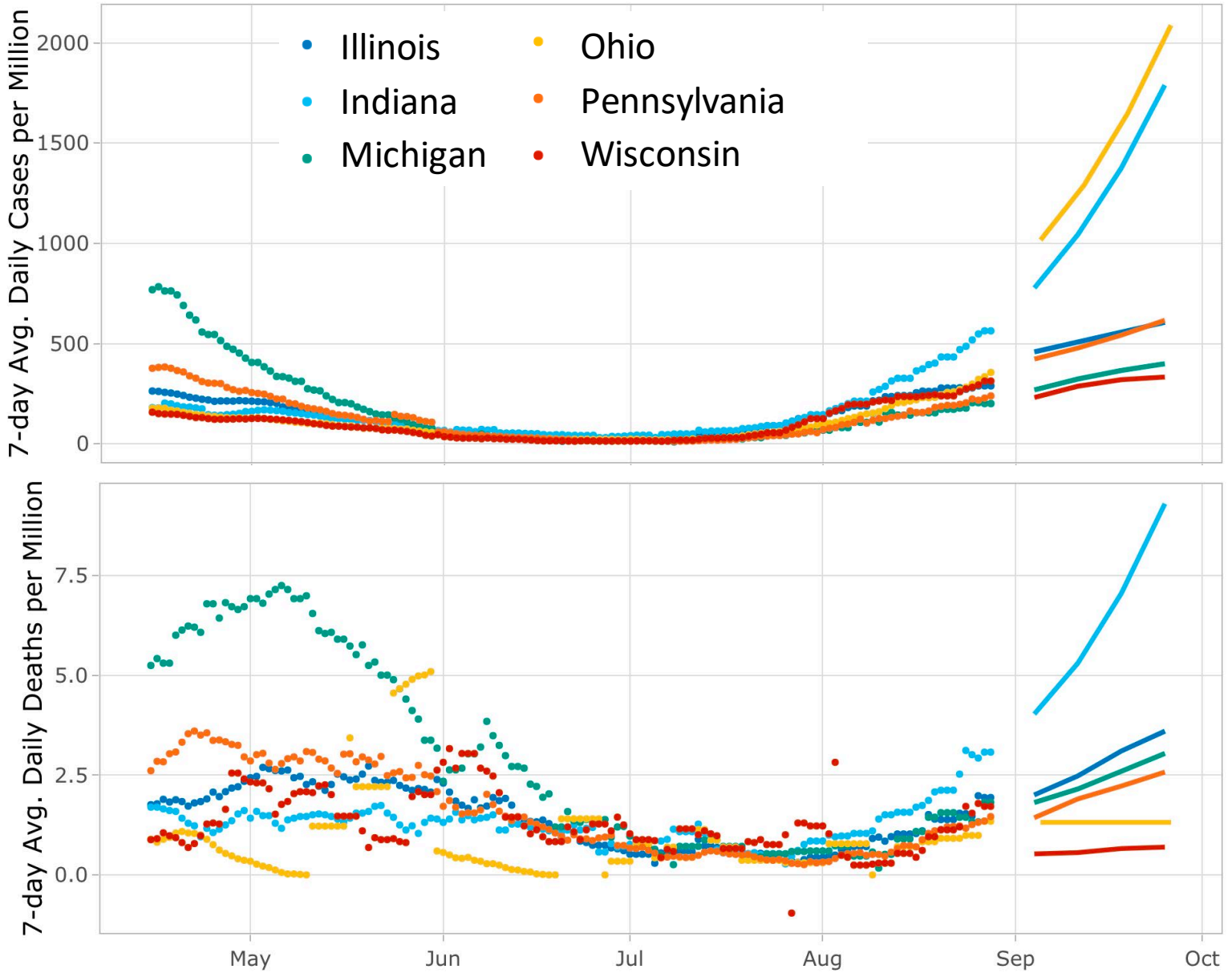


Source: CDC COVID Data Tracker – State Trend Comparison

Ridge regression model projects continued increases for Michigan and neighboring states

- Cases and deaths are projected to continue increasing across the Midwest
- Uncertainty range includes potential for sustained or slowed growth (not shown)

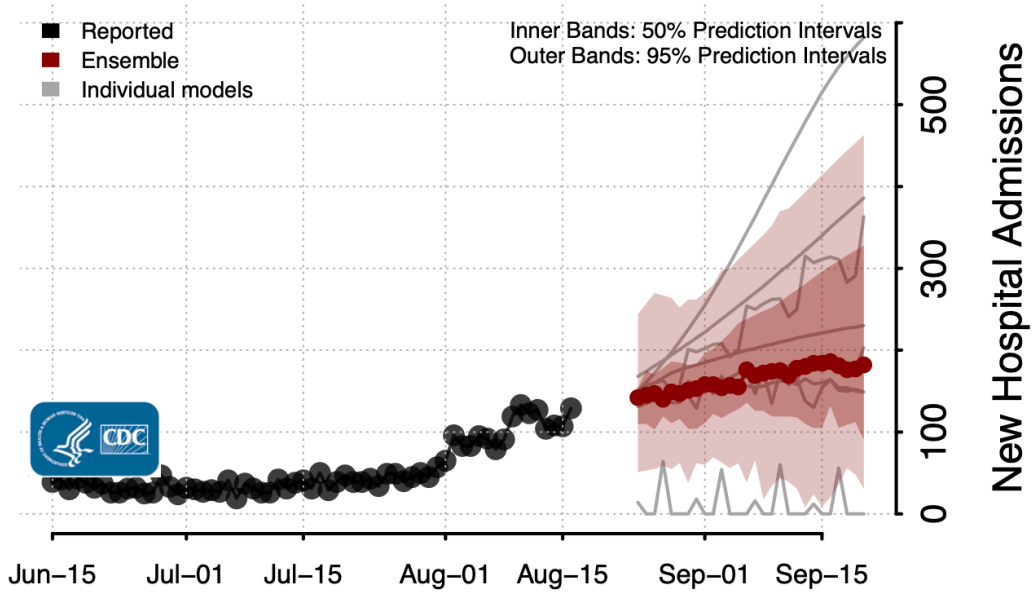
- Line is the ridge regression model projection, and the shaded region represents the 95% confidence region (2.5% and 97.5% quantiles).
- Projections are based on previous data on cases, hospitalizations, and deaths, as well as data on mobility and vaccinations.
- Cases are plotted by report date.
- For full projections, see dataepi.org

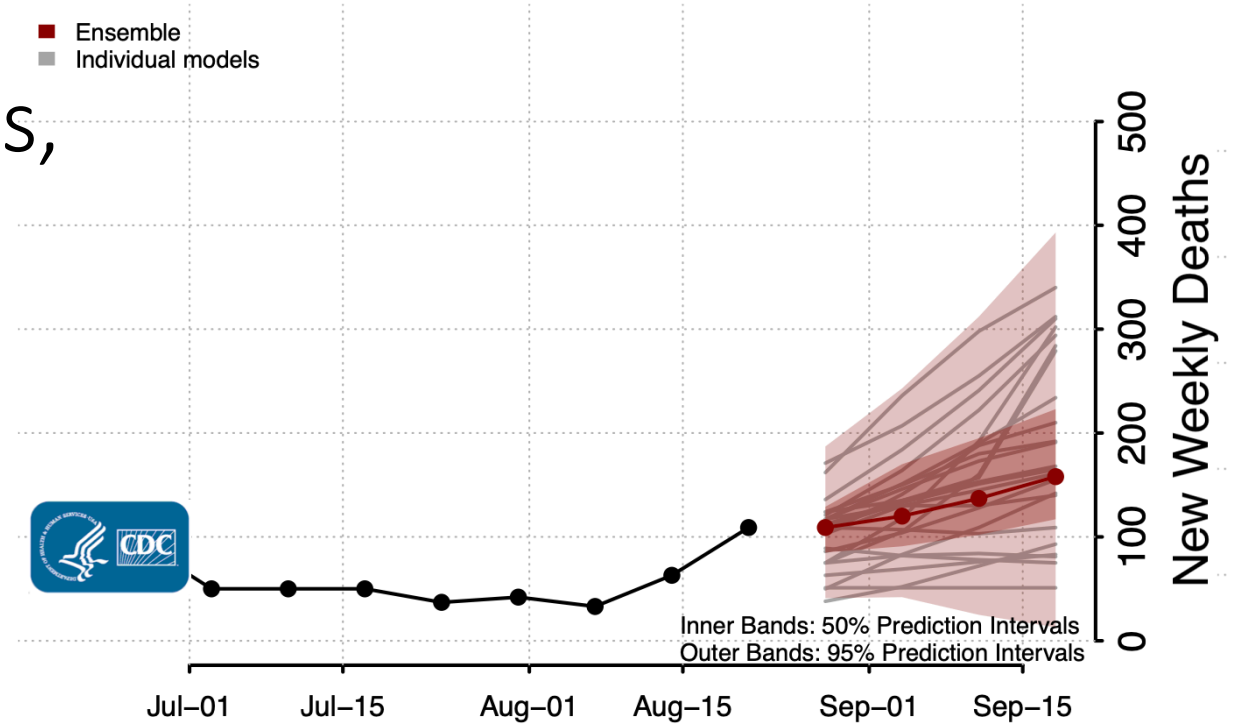


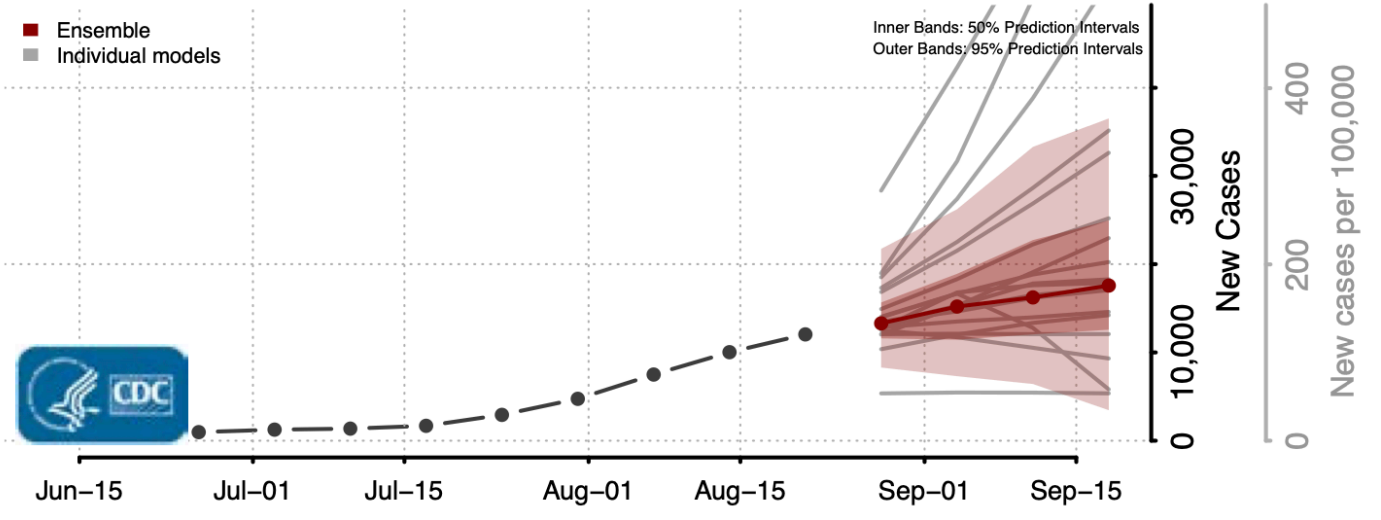
Sources: Data from MDHHS/JHU, [UM Ridge Regression Model]

CDC models project continued increases in cases, hospitalizations, and deaths for Michigan

Uncertainty ranges from flat to increasing—suggests slowing but still increasing



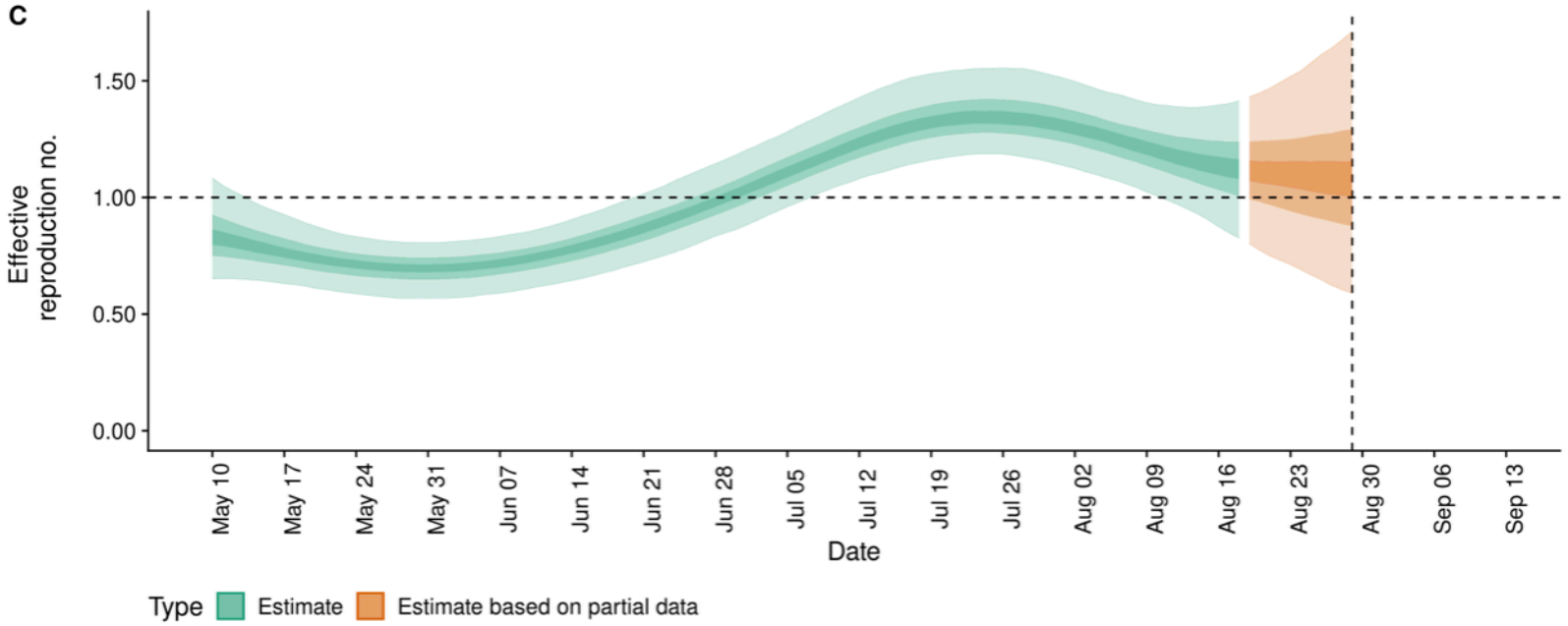




Data Sources: [CDC mathematical model forecasting](), [CovidComplete Data Center]() model forecast evaluations. Individual models shown as grey lines, ensemble shown in red

The effective reproduction number (Rt) in Michigan remains >1, suggesting continued growth

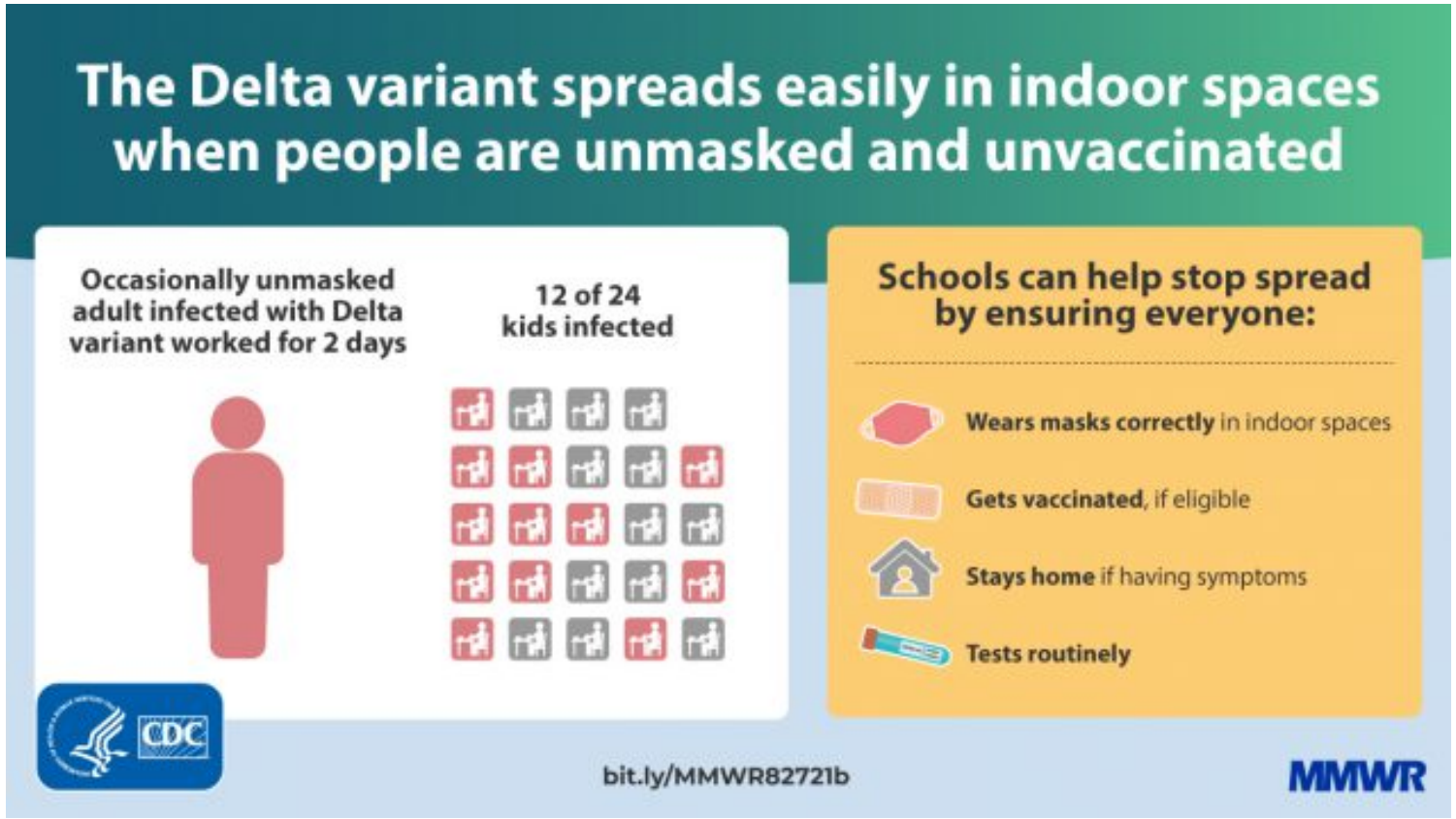
- However, uncertainty ranges from below 1 (decline) to above 1 (increase)
- Suggests potentially slowed but continued growth

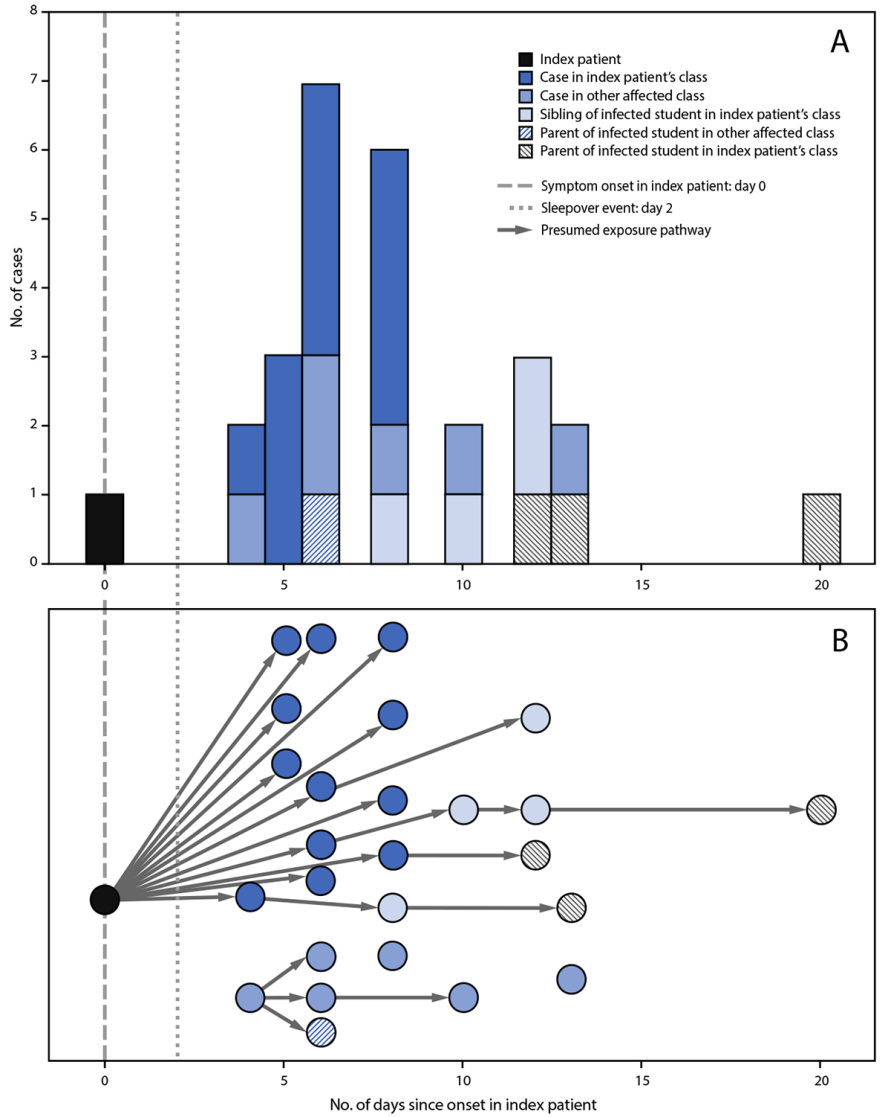


Data Sources: epiforecasts.io

What do we know about COVID impact on schools

Outbreak Associated with SARS-CoV-2 B.1.617.2 (Delta) Variant in an Elementary School





- 22 of the 24 students were ineligible for vaccine due to age
- Students in the first two rows were more likely be infected
- In addition to vaccination, strict adherence to multiple nonpharmaceutical prevention strategies, including masking, are important to ensure safe school instruction

Examples of COVID impacts so far for Midwest Schools: beginning to see closures, case increases, and increases in quarantined students

Patch *Ohio* – "COVID-19 Spread Up 800 Percent Among Ohio School Children"

yahoo!news Dayton, Ohio – "New Lebanon elementary school closed today, Wednesday due to COVID-19"

PBS Wisconsin *Wisconsin* – "Wisconsin's COVID Condition: The Delta Surge Disrupts a Third School Year"

13 WTHR Anderson, IN – "Anderson schools quarantine more than 100 students because of COVID cases"

K-12 school outbreaks, recent and ongoing, week ending Aug 26

Number of reported outbreaks this week is 11, including outbreaks seen in High Schools (7), Pre K-Elementary (3), and Administrative (1). No outbreaks were seen in Middle/Jr High (0).

Region	# Ongoing - Excluding New	# New	Number of outbreaks	Range of cases per outbreak
Region 1	0	25	5	2-14
Region 2n	0	2	1	2-2
Region 2s	-	0	0	0-0
Region 3	5	0	1	5-5
Region 5	6	0	2	2-4
Region 6	0	0	0	0-0
Region 7	0	0	0	0-0
Region 8	0	4	2	2-2
Total	11	31	**11**	**2-14**

Grade level	# Ongoing - Excluding New	# New	Number of outbreaks	Range of cases per outbreak
Pre-school - elem.	6	2	3	2-6
Jr. high/middle school	0	0	0	0-0
High school	5	27	7	2-14
Administrative	0	2	1	2-2
Total	11	31	**11**	**2-14**

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 (as of 8/26/21)

10 outbreaks in 9 schools; 7 high schools; 2 sports focused

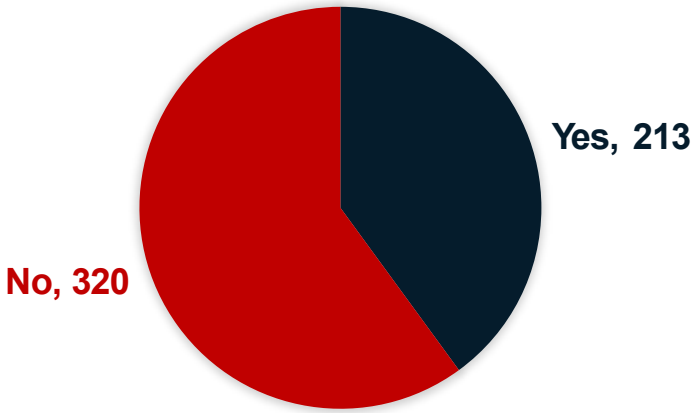
School Name	County	Known Cases	Staff or Students	First Reported
Hunt Elementary	Jackson	2	Both	8/26
Tecumseh HS Girls Cross Country	Lenawee	3	Students	8/26
Tecumseh HS Freshman Football	Lenawee	2	Both	8/26
Negaunee High School	Marquette	2	Both	8/26
Fulton High School	Gratiot	4	Students	8/26
Troy Athens High School	Oakland	2	Both	8/26
Howell High School	Livingston	14	Both	8/19
Greenwood Kindergarten	Kalamazoo	4	Both	8/15
Parkwood 4th grade	Kalamazoo	2	Students	8/12
Lapeer High School	Lapeer	5	Both	8/19

MI School Districts and Mask Policy as of August 30, 2021

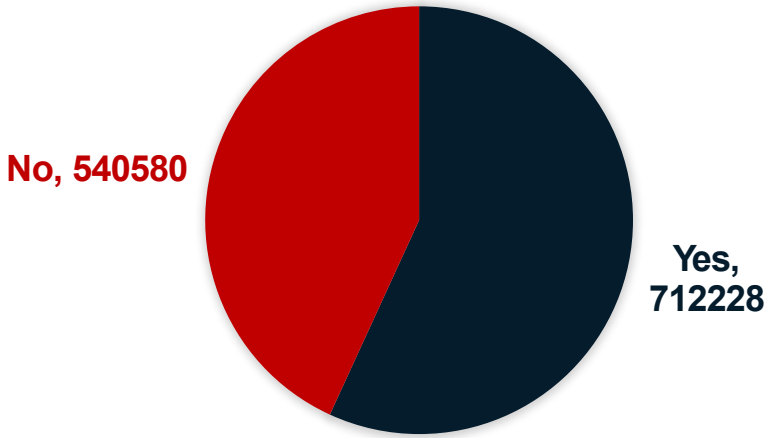
Yes – Any masking policy in some subset of school grades

No – No mask policies (includes unknown)

NUMBER OF SCHOOL DISTRICTS WITH MASK MANDATES IN K-12 SETTING



NUMBER OF STUDENTS* IN K-12 SCHOOLS WITH MASK MANDATES



- 40% (213/533) of school districts have mandatory mask policy for students in all K-12 grades
- School districts with mandatory mask policies for all grades K-12 cover 57% (712,228/1,252,808) of all students*

*** Student size based on school enrollment numbers; Buses and public transportation are federally required to enforce mask mandates**

Source: Executive Office of Governor School District Mask Policy

Update on breakthrough cases and boosters

Cumulative COVID-19 Cases by Vaccination Status, Michigan, Jan 15 – Aug 24

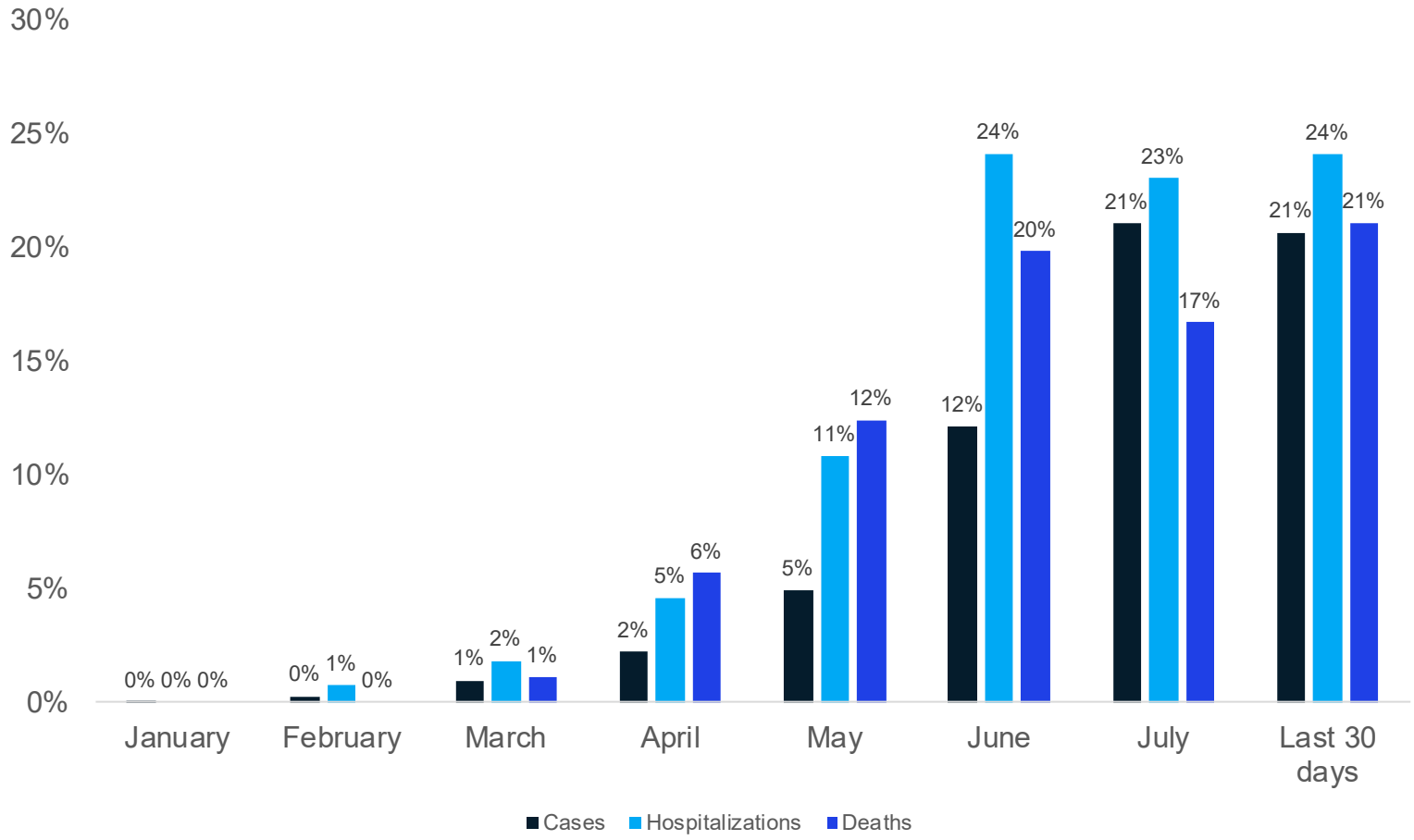
Fully Vaccinated People (4,688,381)		
Cases	**Hospitalization**	**Deaths**
Percent of Cases In People Not Fully Vaccinated (416,707 / 433,888) **96.0%**	Percent of Hospitalizations In People Not Fully Vaccinated (11,860 / 12,696) **93.4%**	Percent of Deaths In People Not Fully Vaccinated (4,876 / 5,155) **94.6%**
416,707 Total Cases Not Fully Vaccinated	**11,860** Total Hospitalized Not Fully Vaccinated	**4,876** Total Deaths Not Fully Vaccinated
Total Breakthrough Cases **17,181**	Total Breakthrough Hospitalizations **836**	Total Breakthrough Deaths **279**
0.366% Percent of Fully Vaccinated People who Developed COVID-19 (17,181 / 4,688,381)	**0.018%** Percent of Fully Vaccinated People Who Were Hospitalized for COVID-19 (836 / 4,688,381)	**0.006%** Percent of Fully Vaccinated People Who Died of COVID-19 (279 / 4,688,381)
4.0% Percent of Cases Who Were Fully Vaccinated (17,181 / 433,888)	**6.6%** Percent of Hospitalizations Who Were Fully Vaccinated (836 / 12,696)	**5.4%** Percent of Deaths Who Were Fully Vaccinated (279 / 5,155)
Total Cases: **433,888**	Total Hospitalizations: **12,696**	Total Deaths: **5,155**

Michigan Disease Surveillance System may underestimate the frequency of COVID-19 hospitalizations:
- Case investigation and follow-up is more difficult for individuals who get vaccinated (e.g., they are too ill to speak to investigators, don't answer their phone, or otherwise).
- These hospitalizations include individuals who are hospitalized for issues other than COVID19 (the same as breakthrough COVID-19).
- Individuals who get hospitalization will lag after infection and may occur after case investigation.

Trends in Breakthrough Cases, Hospitalizations, and Deaths

- 50.5% of the population is fully vaccinated yet only account for ~20% of cases, hospitalizations, and deaths
- As the fully vaccinated population has increased, so have the percent of breakthrough incident; but breakthrough burden remains lower

In the last 30 days (Jul 26 – Aug 24), 7,723 (21%) of 37,420 cases, 255 (24%) of 1,061 hospitalizations, and 40 (21%) of 190 deaths were among fully vaccinated individuals



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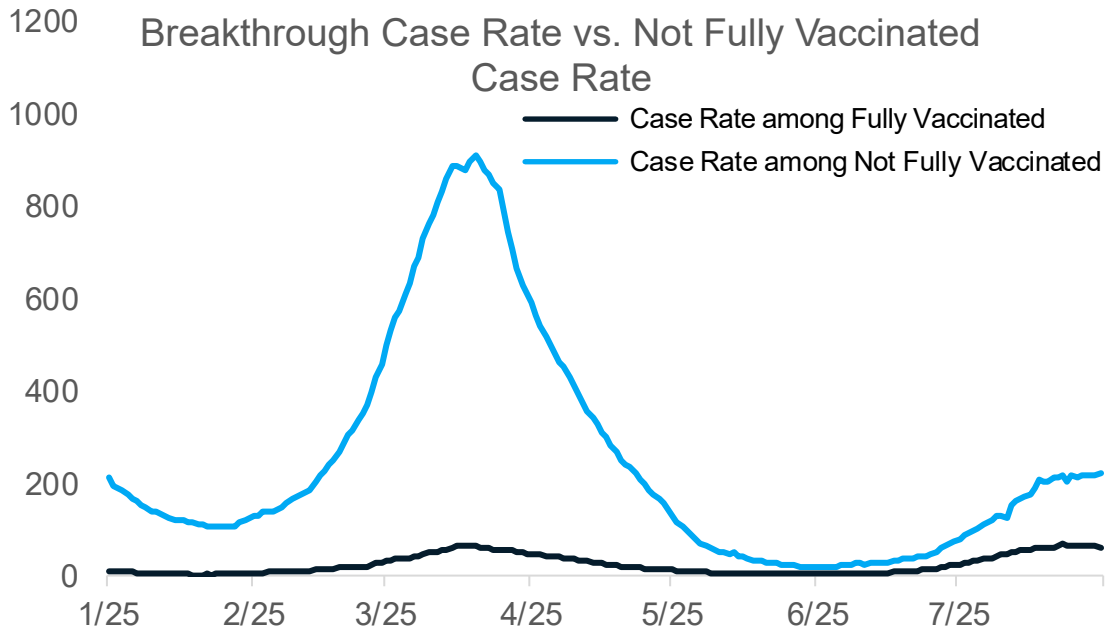
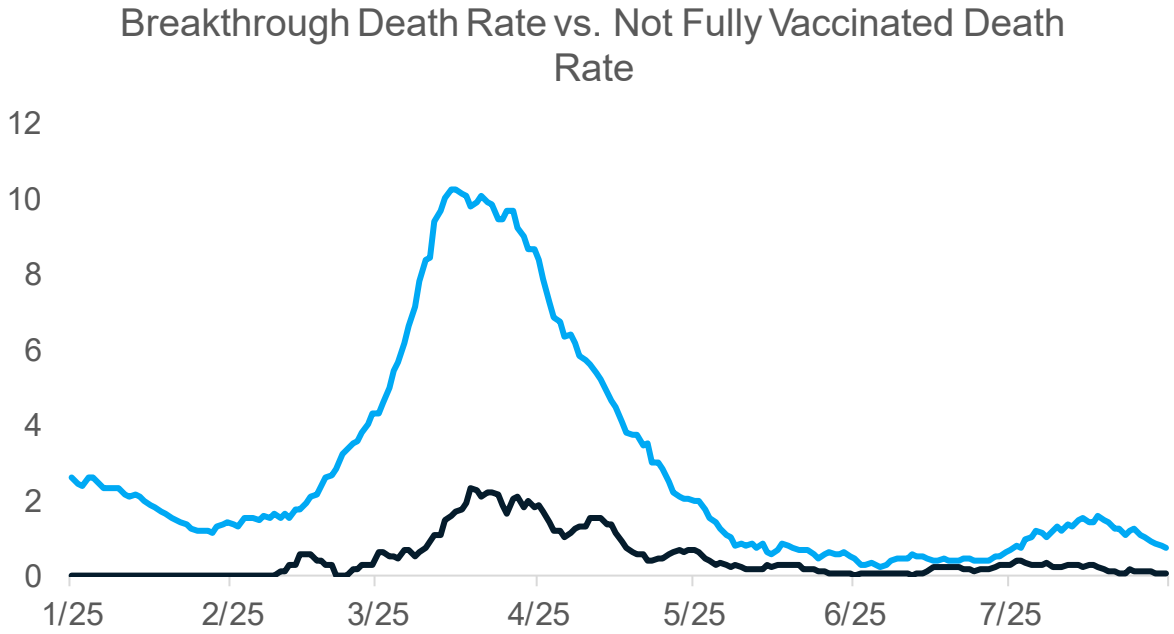
COVID-19 Vaccination Breakthrough Cases and Deaths





- Trends over time show that both case and death rates among the Fully Vaccinated are lower than the Not Fully vaccinated rates in Michigan
- The *proportion* of breakthrough cases and deaths among all cases and deaths has shown some increases as more people become fully vaccinated
  - However, the risk of infection and death remains significantly lower among the fully vaccinated

	Additional Doses for Immunocompromised	Booster Doses
Criteria	CDC recommends moderately to severely immunocompromised people consider receiving an additional (third) dose of an mRNA COVID-19 vaccine (Pfizer-BioNTech or Moderna)	PROJECTED: first people eligible would be those who were the first to receive a COVID-19 vaccination (those who are most at risk): healthcare providers, residents of long-term care facilities, and other older adults.
Timing	At least 28 days after the completion of the initial 2-dose mRNA COVID-19 vaccine series.	PROJECTED: 8 months after they received their second dose of an mRNA vaccine (either Pfizer-BioNTech or Moderna).
Trigger	Began 8/13/21	Subject to authorization by the U.S. Food and Drug Administration and recommendation by CDC's Advisory Committee on Immunization Practices (ACIP).

Advisory Committee on Immunization Practices (ACIP)

Booster doses of COVID-19 vaccines

What are the **key considerations** for decision making?

ACIP Meeting Aug 13: Framework for COVID-19 booster doses presented

What **data** are available for decision making?

ACIP Meeting Aug 30: Begin to provide data to inform booster dose policy

ACIP Meeting mid-September: Additional data to inform policy

Does ACIP **recommend** booster doses of COVID-19 vaccines in any populations?

ACIP Meeting after FDA authorization: Possible vote

ACIP 8/30/21 Meeting

- Members discussed data needed to create a framework for booster doses
  - 5 studies on waning immunity against infection but sustained VE against hospitalization and death. Data demonstrates increase in Delta variant decreases VE against infection:
    - VE ~60-90% effective in late May in 5 studies → 7% Delta variant in US
    - VE ~40-80% effective in Mid-July in 5 studies → 94% Delta variant in US
  - Is Delta affecting VE?
    - Globally, among studies assessing infections with Alpha vs Delta: mild decrease in Delta VE1-7
      - Pre-Delta: 87% or higher
      - Post Delta: 39-84% against infection and 75-95% against hospitalization
- ACIP meeting planned for mid-September