Burden of COVID-19 on Milwaukee County children

Milwaukee County COVID-19 Epidemiology Intel Team

This report was updated on December 9, 2021 and includes data through December 7, 2021. Note that case and testing data for recent weeks may be under-reported due to pending test results. Hospitalizations overall are thought to be an undercount. Deaths may lag by several days due to a process of death review and confirmation.

This report focuses on children ages 0-18; however, maps include only those 0-17 due to a lack of availability of population (denominator) data for those age 18 alone. We include individuals of age 18 as some of this age are enrolled in K-12 schools.

COVID-19 summary statistics for Milwaukee County children aged 18 and under

Overall Summary Statistics: Milwaukee County children aged 18 and under
March 1, 2020 - December 7, 2021

	Milwaukee County	City of Milwaukee	Suburbs
Total tests performed	197,314	116,336	80,978
Percent positive of all tests performed	11.3%	12.4%	9.6%
Number of confirmed cases	27,441	18,266	9,175
Percent under age 18 among all cases	18.5%	19.2%	17.4%
Number of hospitalizations	521	423	98
Number of deaths	1	1	0
Case fatality rate	0.0%	0.0%	0.0%

Weekly Summary Statistics: Milwaukee County children aged 18 and under
December 1, 2021 - December 7, 2021

	Milwaukee County	City of Milwaukee	Suburbs
Total tests performed	4,121	2,377	1,744
Percent positive of all tests performed	13.5%	13.8%	13.1%
Number of confirmed cases	439	256	183
Percent under age 18 among all cases	25.4%	25.1%	25.9%
Number of hospitalizations*	21	18	3
Number of deaths	0	0	0

*Total children hospitalized for COVID-19 with specimen collection date within the last 30 days

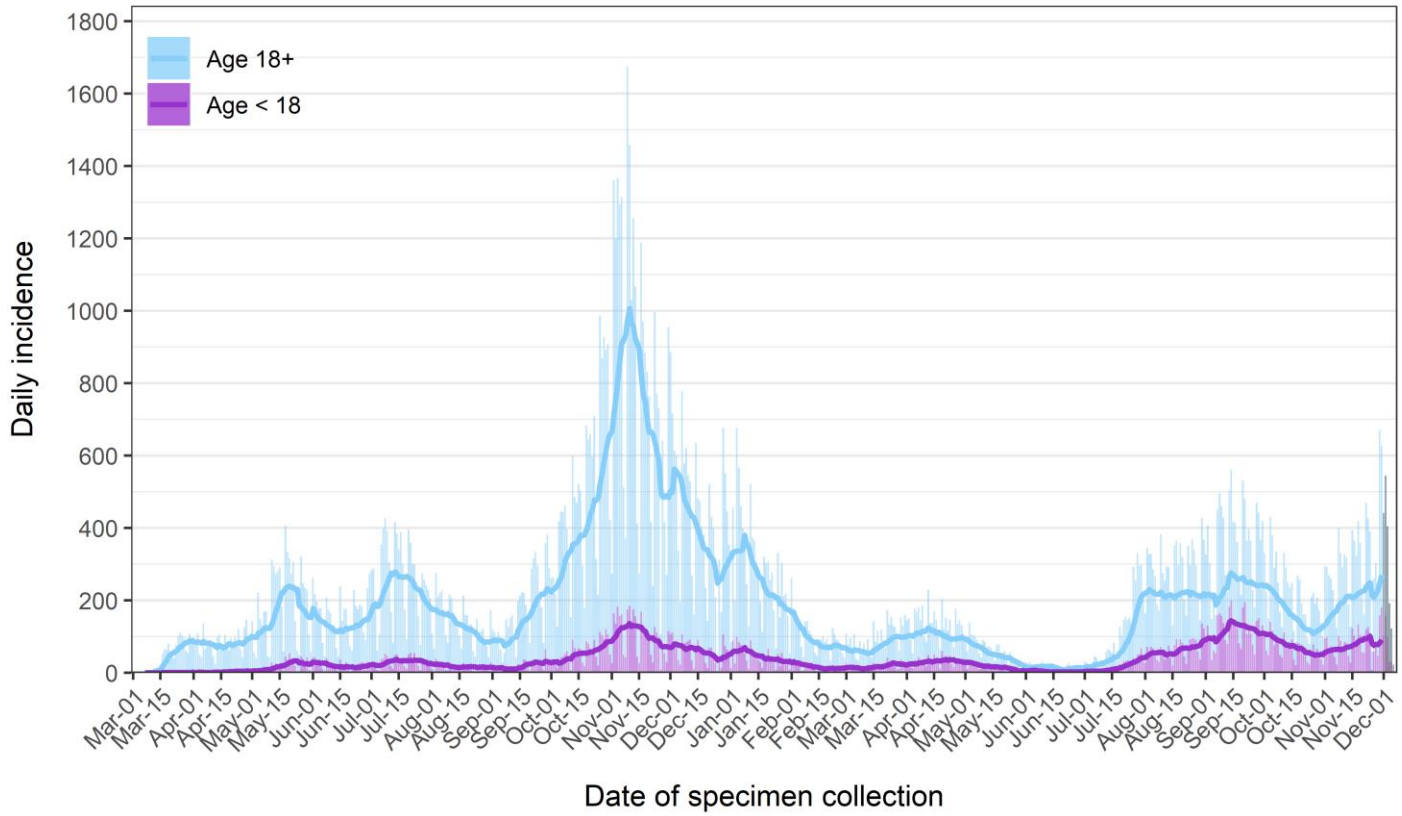
Cases over time for Milwaukee County children aged 18 and under

There are now a total of 27,441 cases among children ages 0-18 in Milwaukee County, with the first confirmed case on March 16, 2020. Over the last week, we observed 439 new confirmed cases, including 256 in the City of Milwaukee and 183 in the suburban jurisdictions.

Figure 1 shows the daily incidence of new cases in Milwaukee County (stacked bars) and average daily incidence within the last 7 days (lines) for children under 18, and adults 18 and older. **Figure 2a** shows the daily incidence and 7-day average daily incidence among Milwaukee County children aged 18 and under, where the color indicates cases in the city vs. the suburbs. This figure was re-produced for ages 17 and under, **Figure 2b**, to look at trends without the contribution of 18 year olds who are a mixture of current high school students and graduates. To indicate a potential reporting delay, we shade the last seven days of data and exclude those days from the trend line.

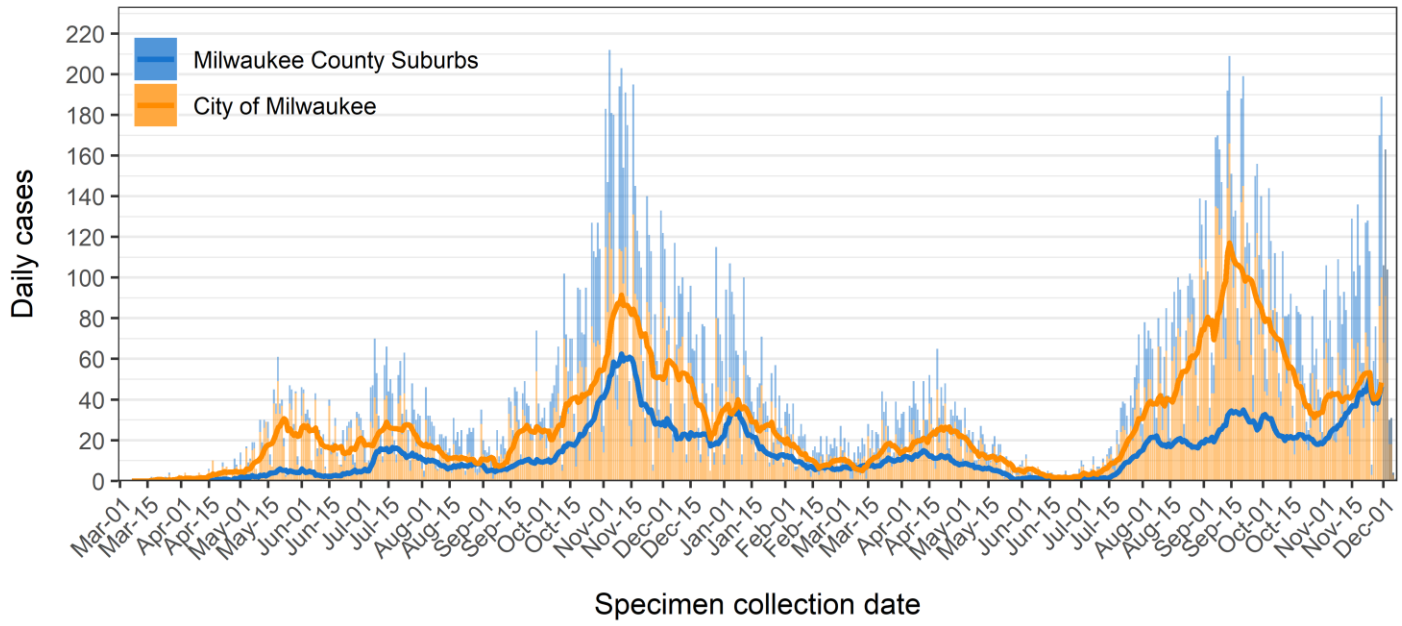
Over the last week we have seen an increase in the daily case count among children in Milwaukee County. The highest daily case count since the beginning of the epidemic occurred on November 4, 2020, with 212 cases in the county overall. The highest daily case count over the entire period in the city occurred on September 14, 2021 with 166 cases confirmed, while the highest daily case count in the suburbs occurred on November 10, 2020 with 90 cases confirmed.

Figure 1: Stacked bargraph of daily cases in Milwaukee County by age group



Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County COVID-19 Epidemiology Intel Team

Figure 2a: Daily cases in Milwaukee County children aged 18 and under



Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
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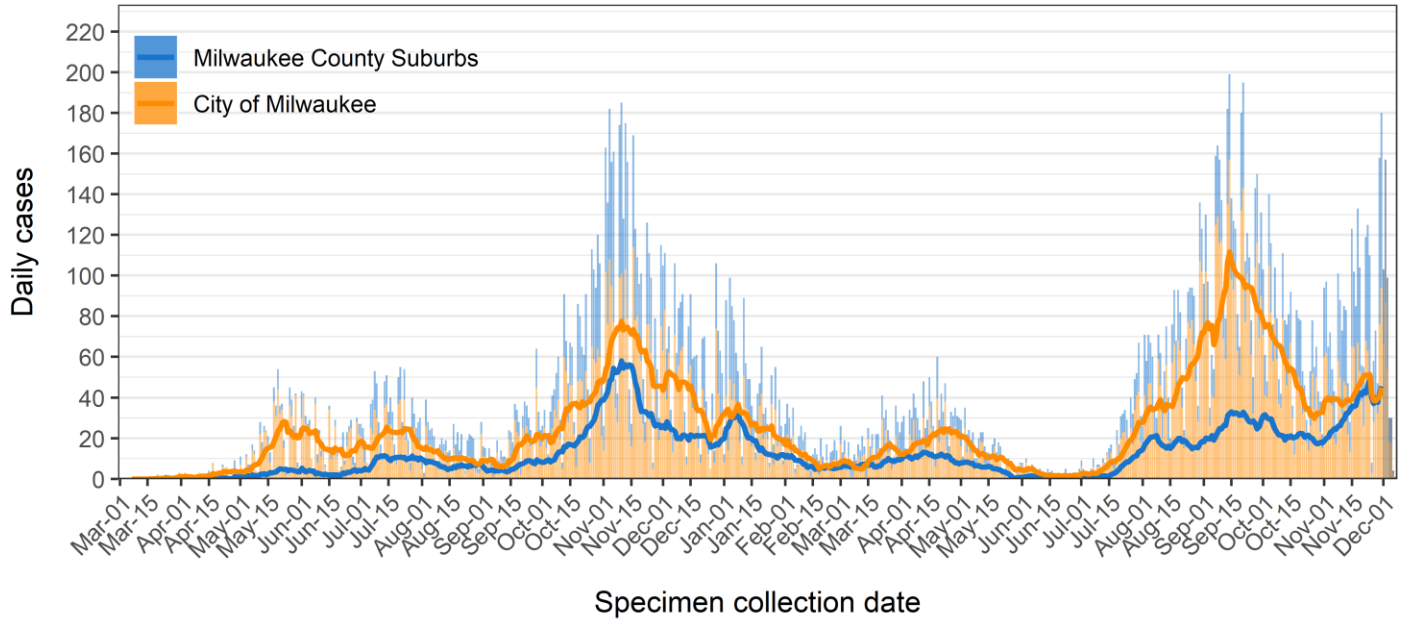
Figure 2b: Daily cases in Milwaukee County children aged 17 and under

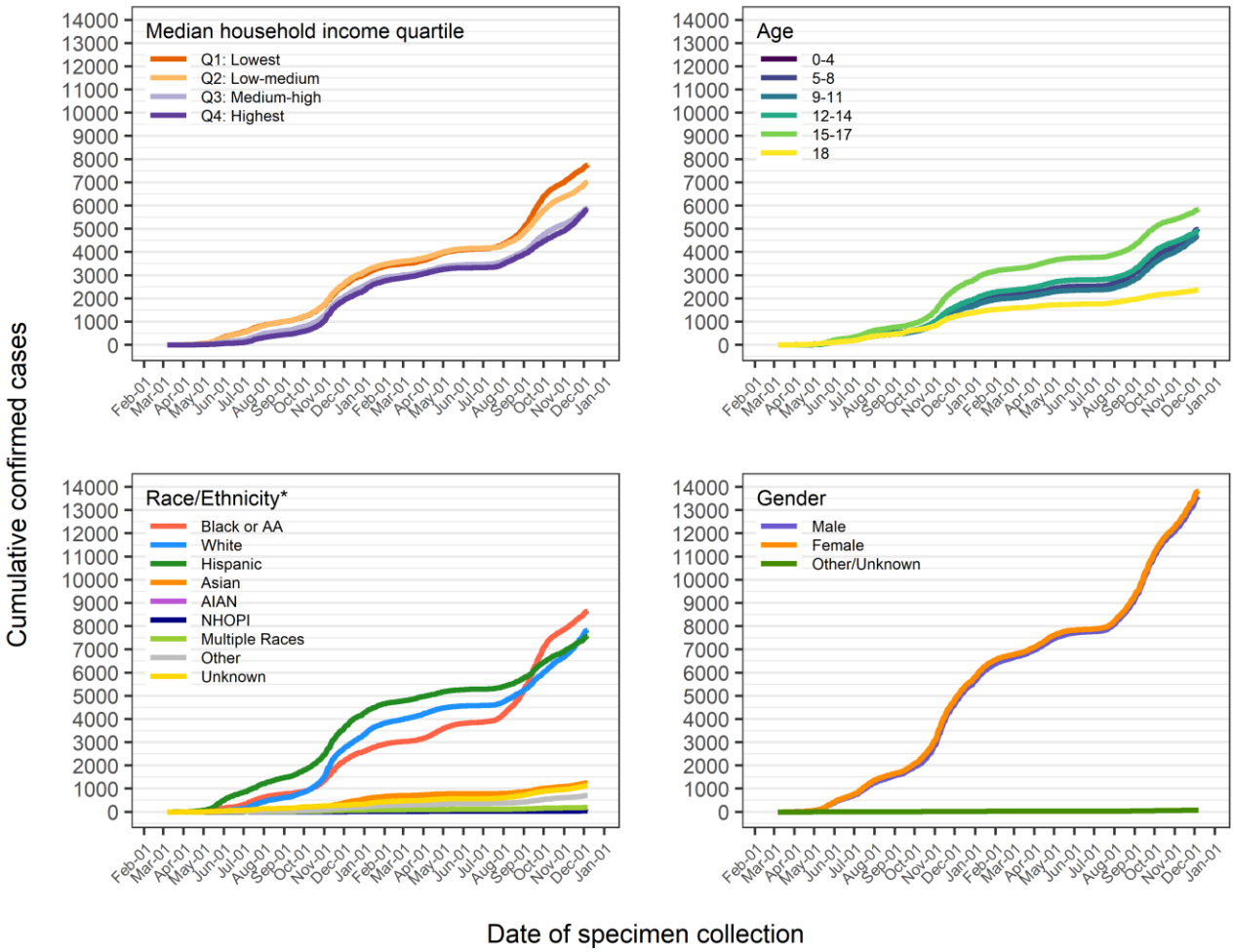


Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County COVID-19 Epidemiology Intel Team

Demographic patterns in Milwaukee County cases aged 18 and under

COVID-19 cases among children vary by demographic characteristics. **Figure 3** shows cumulative case plots including confirmed positive cases with an available specimen collection date, plotted by census block group (CBG) median household income, sex, age, and race/ethnicity groups. The highest number of diagnosed cases fall within the ages of 15-17 with 5821 cases, with confirmed cases among other age groups each much lower. Of all confirmed cases, 50.3% are female and 49.4% are male. The largest number of cases have been diagnosed among the Black/AA population (N = 8641), followed by the non-Hispanic White population (N = 7814), and then the Hispanic population (N = 7552). The lower two quartiles of median household income ($0 - $35,833, and $35,834 to $50,096) have a larger number of cases than the higher two quartiles ($50,097 to $68,393, and $68,394 to $250,001), with the most cases identified among the lowest income group. Over the last week, we have observed an increase among Black/AA and non-Hispanic White children and several income groups.

Figure 3: Cumulative confirmed cases in Milwaukee County children aged 18 and under

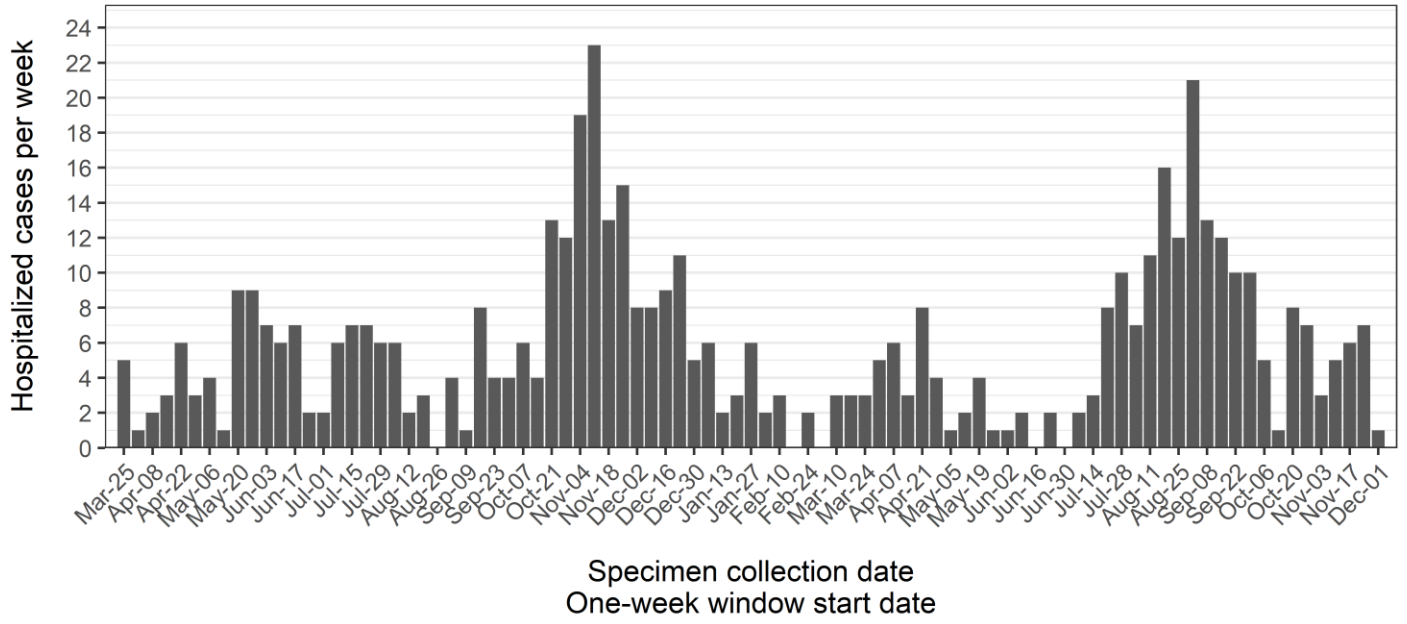


Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County COVID-19 Epidemiology Intel Team
**Race and ethnicity were combined into one variable where the Hispanic category includes Hispanics of any race.*
AIAN stands for American Indian or Alaska Native and NHOPI stands for Native Hawaiian or Other Pacific Islander.

Hospitalized cases in Milwaukee County children aged 18 and under

A total of 521 children aged 18 and younger have been hospitalized due to COVID-19 in Milwaukee County. **Figure 4** illustrates the weekly count of hospitalizations among children aged 18 and under. As shown in **Table 1**, the average age of hospitalized children is 9.2, ranging from infants through 18-year-olds. Among hospitalized children, 47.8% are male and 52.2% are female. Notably, 33.6% of hospitalizations are among children ages 0-4. Fully 52.2% of hospitalizations have occurred among Black/AA children, with 22.3% among Hispanic/Latinx children. Only 16.3% of hospitalizations are among non-Hispanic Whites. These percentages contrast with the distribution of cases by race and ethnicity, with 28.5% non-Hispanic White, 27.5% Hispanic, and 31.5% Black/AA among all cases aged 18 and younger.

Figure 4: Weekly hospitalized cases in Milwaukee County children aged 18 and under



Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County COVID-19 Epidemiology Intel Team

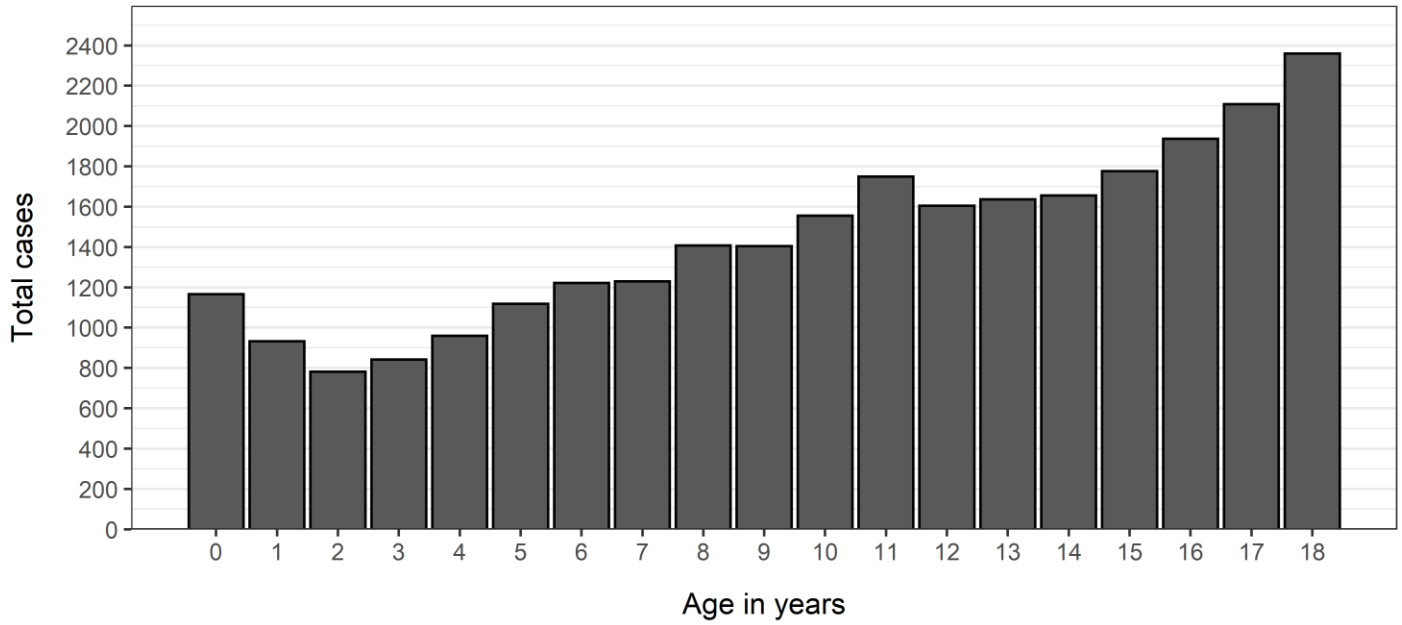
Table 1: Summary of children hospitalized for COVID-19 in Milwaukee County

Variable	Hospitalized children 18 and under (N = 521)
Age	
Mean (SD)	9.22 (6.67)
Median [Q1, Q3]	10.00 [2.00, 16.00]
Min, Max	0.00, 18.00
Age categories	
0-4	175 (33.6 %)
5-8	55 (10.6 %)
9-11	49 (9.4 %)
12-14	76 (14.6 %)
15-17	120 (23.0 %)
18	46 (8.8 %)
Gender	
Female	272 (52.2 %)
Male	249 (47.8 %)
Race/Ethnicity	
Black or AA	272 (52.2 %)
White	85 (16.3 %)
Hispanic	116 (22.3 %)
Asian	26 (5.0 %)
AIAN	<10
Multiple Races	<10
Other	<10
Unknown	12 (2.3 %)

Total cases and tested individuals through December 7, 2021 by year of age

Age is a considerable factor in confirmed cases among children. As shown in **Figure 5**, overall, confirmed cases increase with age. It is notable that 1166 cases have been diagnosed among those less than 1 year old. As shown in **Figure 6**, the distribution of confirmed cases mirrors the distribution of testing among children, with many more tests conducted among older teenagers, particularly those aged 18, as compared to the younger age groups.

Figure 5: Total confirmed cases by age among Milwaukee County children



Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
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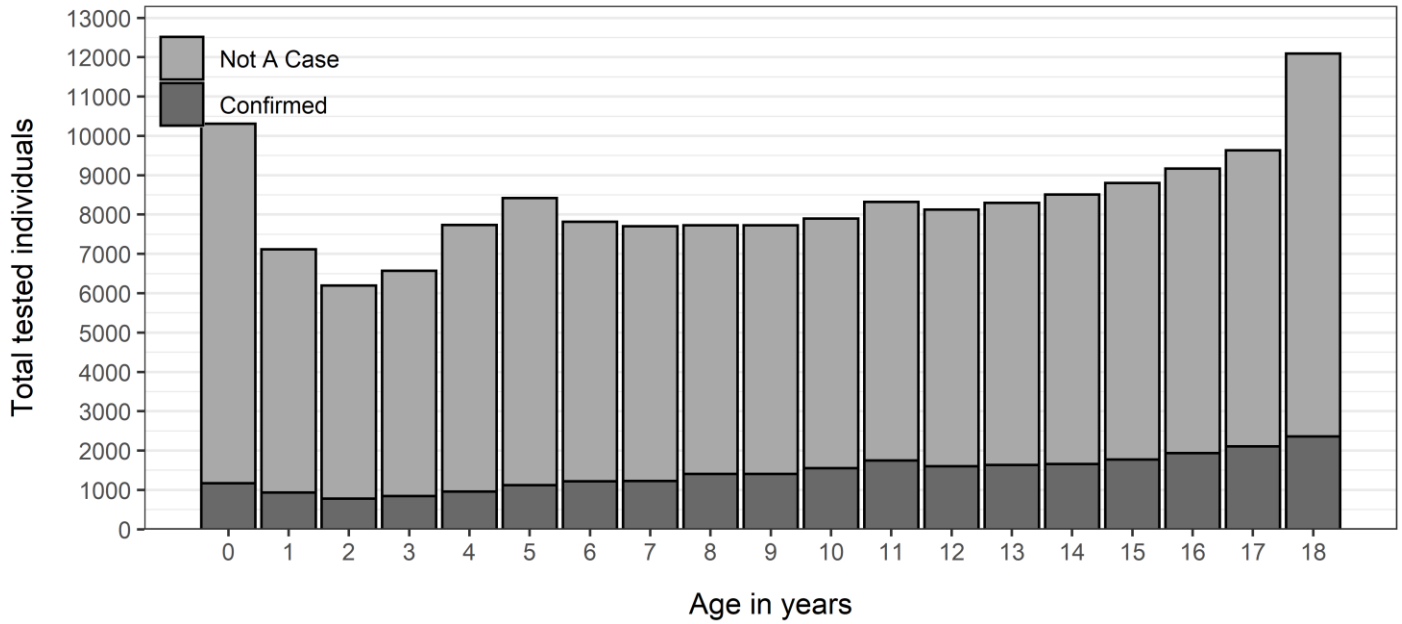
Figure 6: Total tested children by age in Milwaukee County



Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
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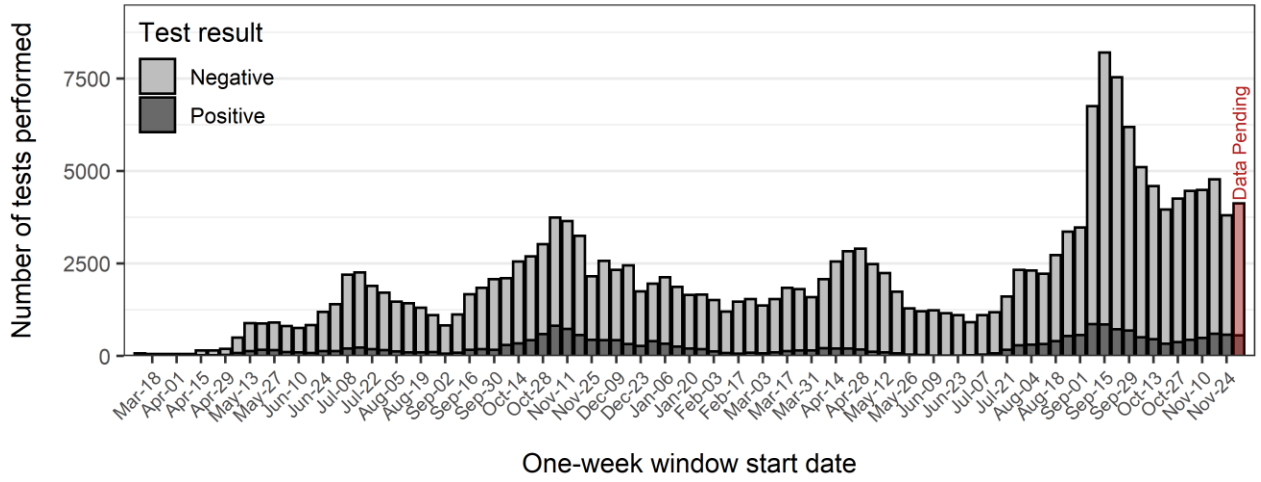
Total tests through December 7, 2021 for children aged 18 and under

Testing for the novel coronavirus is an important public health response to limiting the spread of the infection. Testing capacity was limited in Milwaukee County and across the country earlier in the epidemic, but then increased. Since the first case of COVID-19 was diagnosed in a child in Milwaukee County on March 16, 2020, a total of 197,314 COVID-19 tests have been performed among children ages 0-18, with 175,105 negative results and 22,209 positive results. This represents a positive test rate of 11.3% since the beginning of the epidemic.

As shown in **Figure 7**, few tests were conducted among children early in the epidemic; it is likely that COVID-19 cases among children were not identified. Testing among children increased until early July and then declined, with another increase beginning in September 2020 and peaking in early November, followed by a decline. Testing was low during the weeks of Thanksgiving and Christmas 2020, and the 2021 New Year. Testing declined until the summer 2021 surge in cases beginning in late June. Testing peaked in mid-September 2021 and declined until mid-October, then increased again. As shown in **Figure 8**, the 14-day trend in percent positive tests among children shows no significant change. Percent positive should be interpreted in the context of potential data delays given the large numbers of tests conducted in recent weeks, and considering that data entry for positive tests is prioritized.

Figure 7: Number of tests per week among Milwaukee Co. children 18 and under



Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
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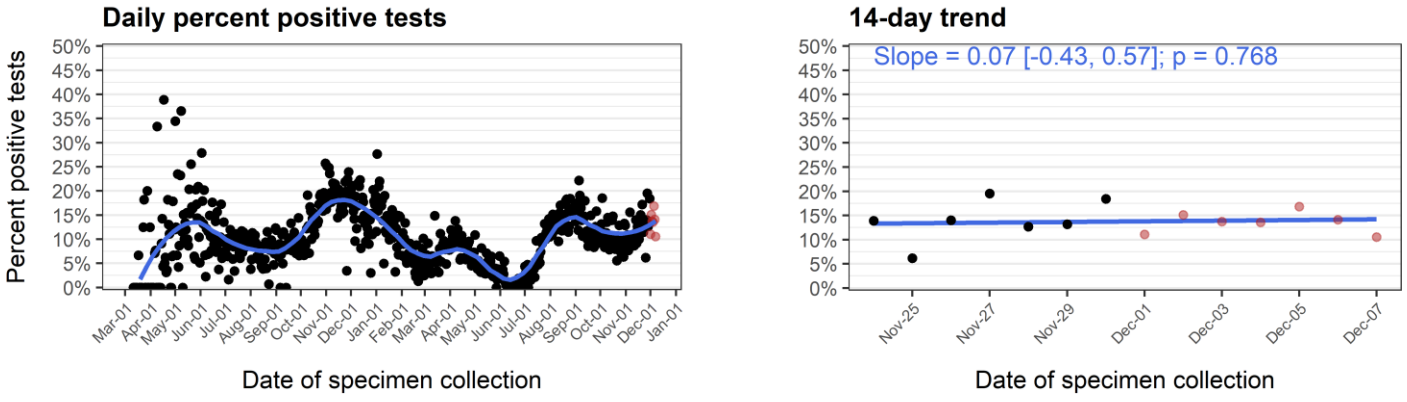
Figure 8: Percent positive tests among Milwaukee County children aged 18 and under



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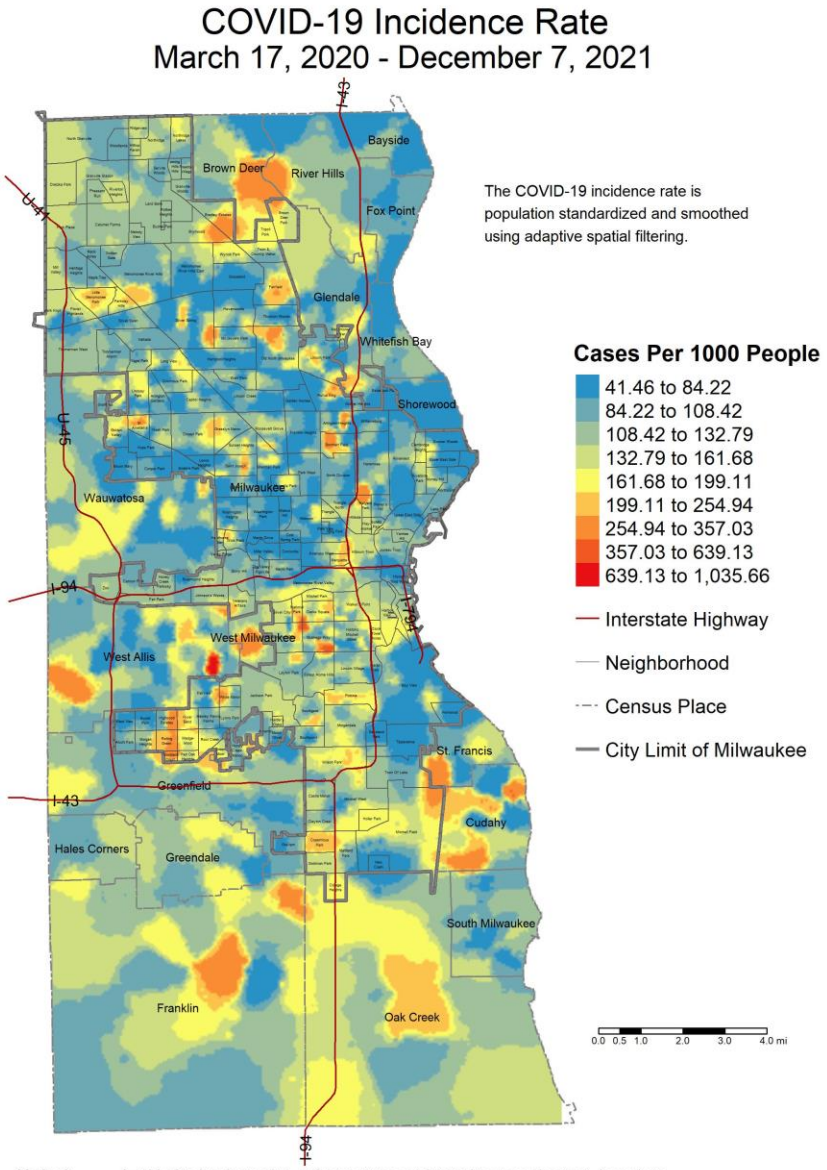
Spatial patterns of COVID-19 in Milwaukee County children

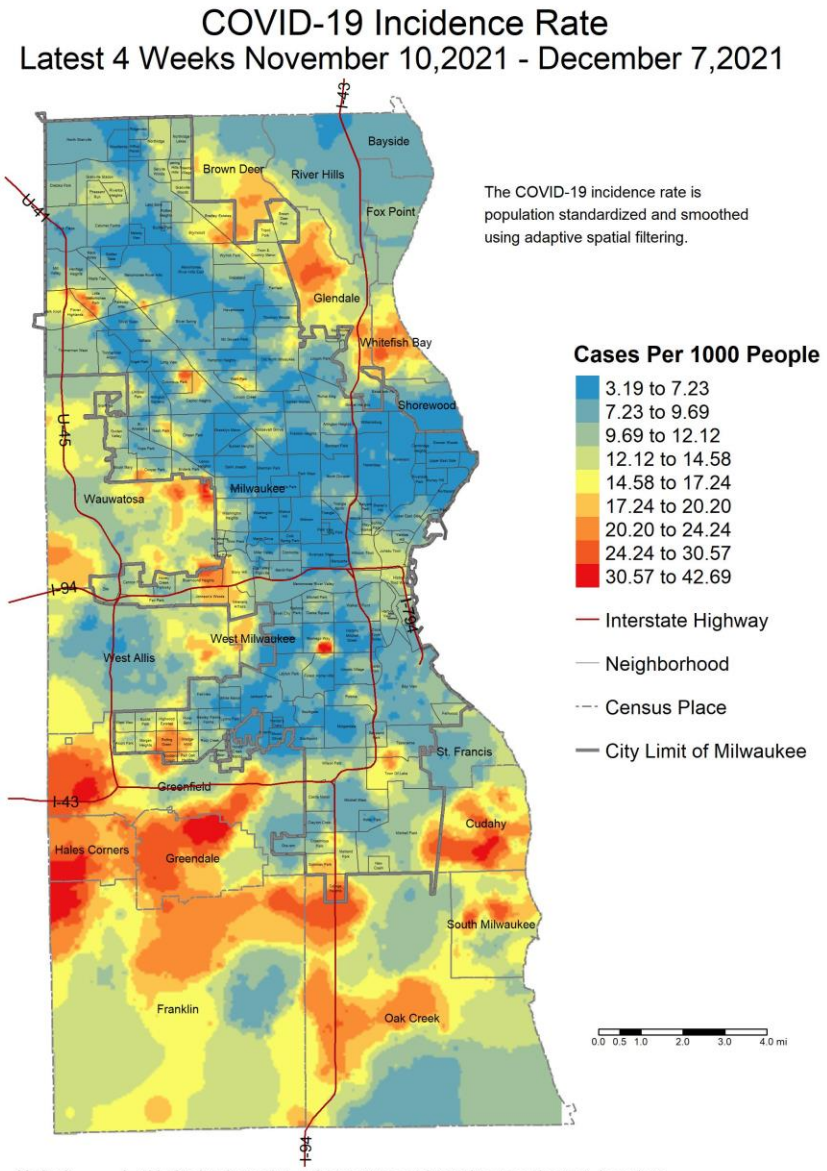
COVID-19 spread is spatially patterned. **Map 1** below illustrates the cumulative burden (all confirmed cases) of COVID-19 in Milwaukee County children. **Map 2** shows cases confirmed in children over the last four weeks. **Map 3** depicts the percentage of tests that were confirmed positive. **Map 4** shows cumulative COVID-19 related hospitalizations among children. All are crude rate maps created using census block group level COVID-19 data from WEDSS and population data from the US Census. The maps are smoothed to protect confidentiality and ensure that rates are stable while still providing geographic detail. High rates are depicted in red with lower rates depicted in blue.

Map 1: All confirmed cases of COVID-19 in children aged 0-17



Method: A grid of points is used to estimate rates continuously across the map, based on the nearest cases with a minimum of 24 confirmed cases included.
Data Sources: Wisconsin Electronic Disease Surveillance System (WEDSS) (incidence data)
2018 American Community Survey (population data)
City of Milwaukee Map Milwaukee Portal (neighborhood boundaries)
Census Bureau TIGER/Line Shapefiles (census place boundaries)
Created by the Milwaukee County Covid-19 Epidemiology Intel Team

Map 2: Confirmed cases of COVID-19 over the last four weeks in children aged 0-17



Method: A grid of points is used to estimate rates continuously across the map, based on the nearest cases with a minimum of 15 confirmed cases included.
Data Sources: Wisconsin Electronic Disease Surveillance System (WEDSS) (incidence data)
2018 American Community Survey (population data)
City of Milwaukee Map Milwaukee Portal (neighborhood boundaries)
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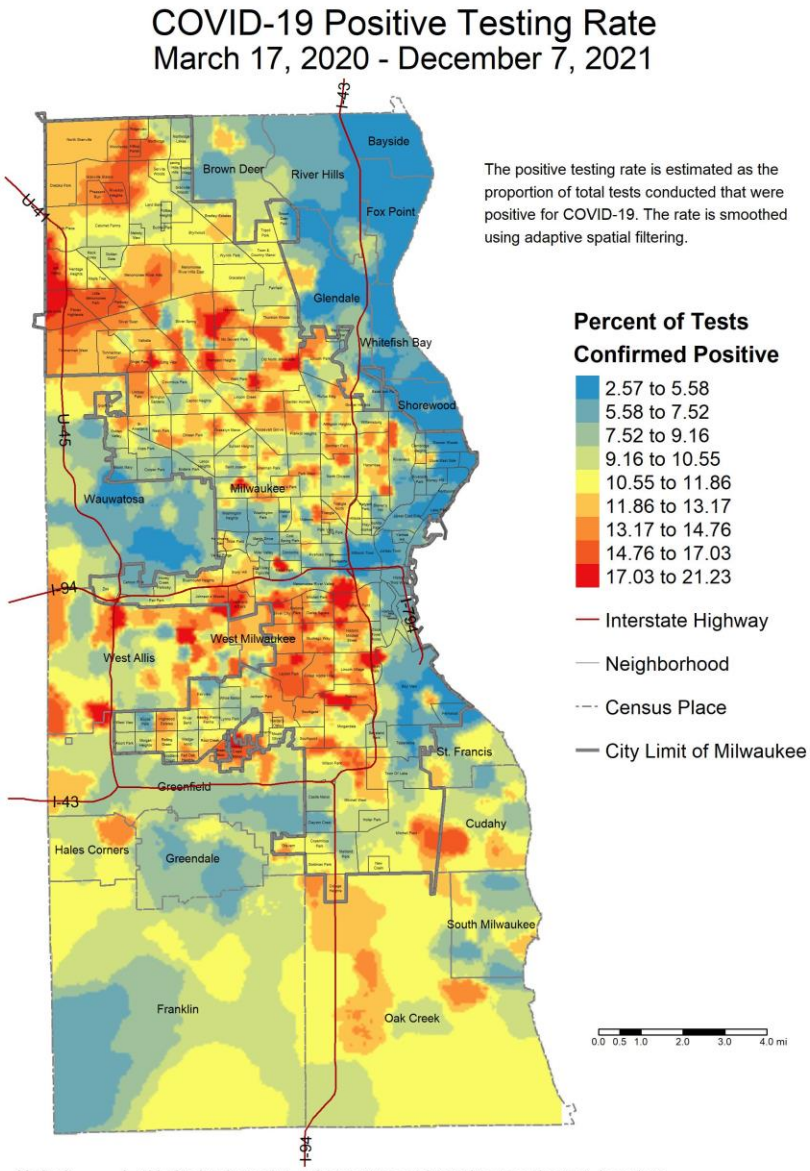
Map 3: Percentage of tests that were confirmed positive in children aged 0-17



Method: A grid of points is used to estimate rates continuously across the map, based on the nearest cases with a minimum of 15 positive tests included.
Data Sources: Wisconsin Electronic Disease Surveillance System (WEDSS) (incidence data)
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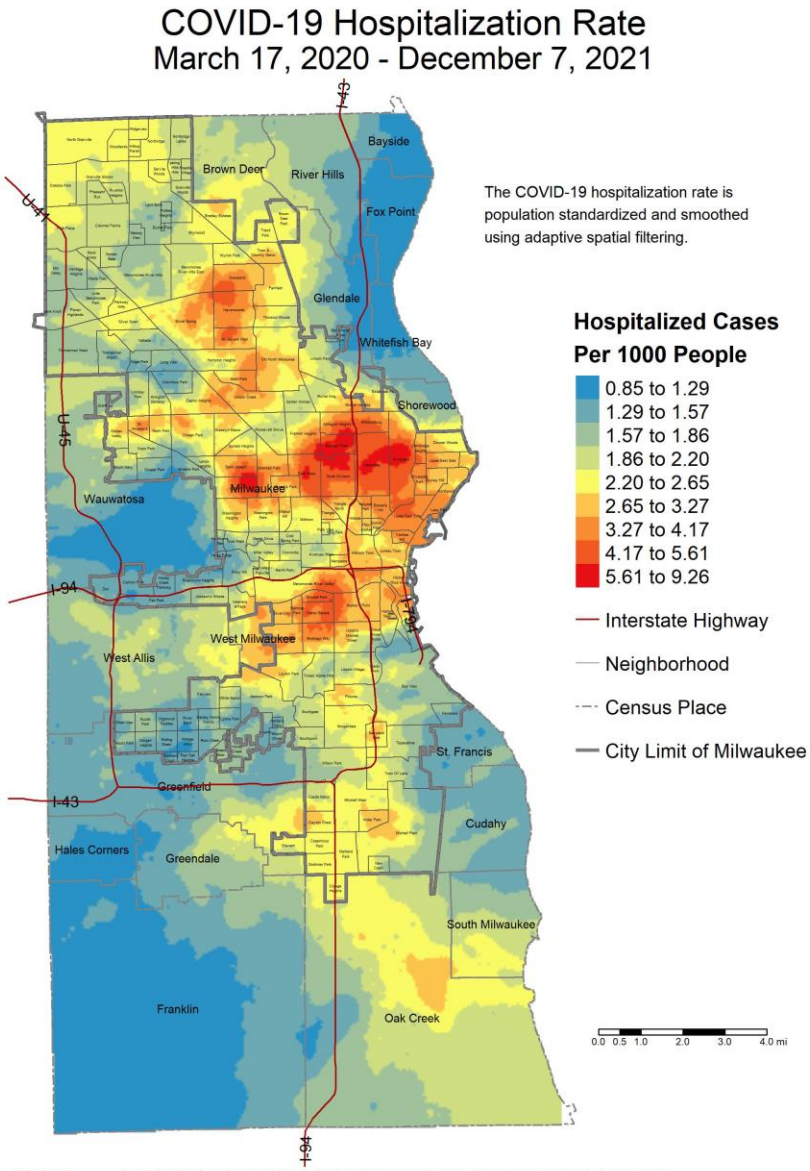
Map 4: COVID-19 related hospitalizations in children aged 0-17



Method: A grid of points is used to estimate rates continuously across the map, based on the nearest cases with a minimum of 15 hospitalized cases included.
Data Sources: Wisconsin Electronic Disease Surveillance System (WEDSS) (incidence data)
2018 American Community Survey (population data)
City of Milwaukee Map Milwaukee Portal (neighborhood boundaries)
Census Bureau TIGER/Line Shapefiles (census place boundaries)
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Data Sources & Acknowledgments

This report was created by faculty and staff in the Medical College of Wisconsin (MCW) Institute for Health and Equity (IHE) in partnership with representatives from local health departments and faculty from the University of Wisconsin-Milwaukee Zilber School of Public Health. Data sources include the Wisconsin Electronic Disease Surveillance System (WEDSS), the US Census Bureau, the Milwaukee County Medical Examiner's office, the Emergency Medicine Resource, and publicly available data obtained from local health and emergency response agencies. Data from the Wisconsin Electronic Data Surveillance System (WEDSS) summarized for the week includes data from December 1, 2021 through December 7, 2021.

Contact Information

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