Milwaukee County COVID-19 Data Summary

Milwaukee County COVID-19 Epidemiology Intel Team

This report was updated on March 23, 2023 and includes data through March 21, 2023. Note that case and testing data for recent weeks may be under-reported due to pending test results. In this report, confirmed case totals include individuals with a positive PCR test result, and do not include individuals with only a positive antigen/rapid/at-home test. Hospitalizations overall are thought to be an undercount. Deaths may lag by several days due to a process of death review and confirmation.

Milwaukee County COVID-19 Summary Statistics

Overall Milwaukee County COVID-19 Summary Statistics
March 1, 2020 - March 21, 2023

	Milwaukee County	City of Milwaukee	Suburbs
Total tests performed	3,230,976	2,006,152	1,224,824
Percent positive of all tests performed	10.6%	10.6%	10.5%
Number of confirmed cases	283,006	175,403	107,603
Number of hospitalizations	14,416	9,283	5,133
Number of deaths	2,371	1,340	1,031
Case fatality rate	0.8%	0.8%	1.0%

Weekly Milwaukee County COVID-19 Summary Statistics
March 15, 2023 - March 21, 2023

	Milwaukee County	City of Milwaukee	Suburbs
Total tests performed	4,732	3,059	1,673
Percent positive of all tests performed	9.8%	9.3%	10.7%
Number of confirmed cases	291	176	115
Number of hospitalizations*	71	43	28
Number of deaths	0	0	0

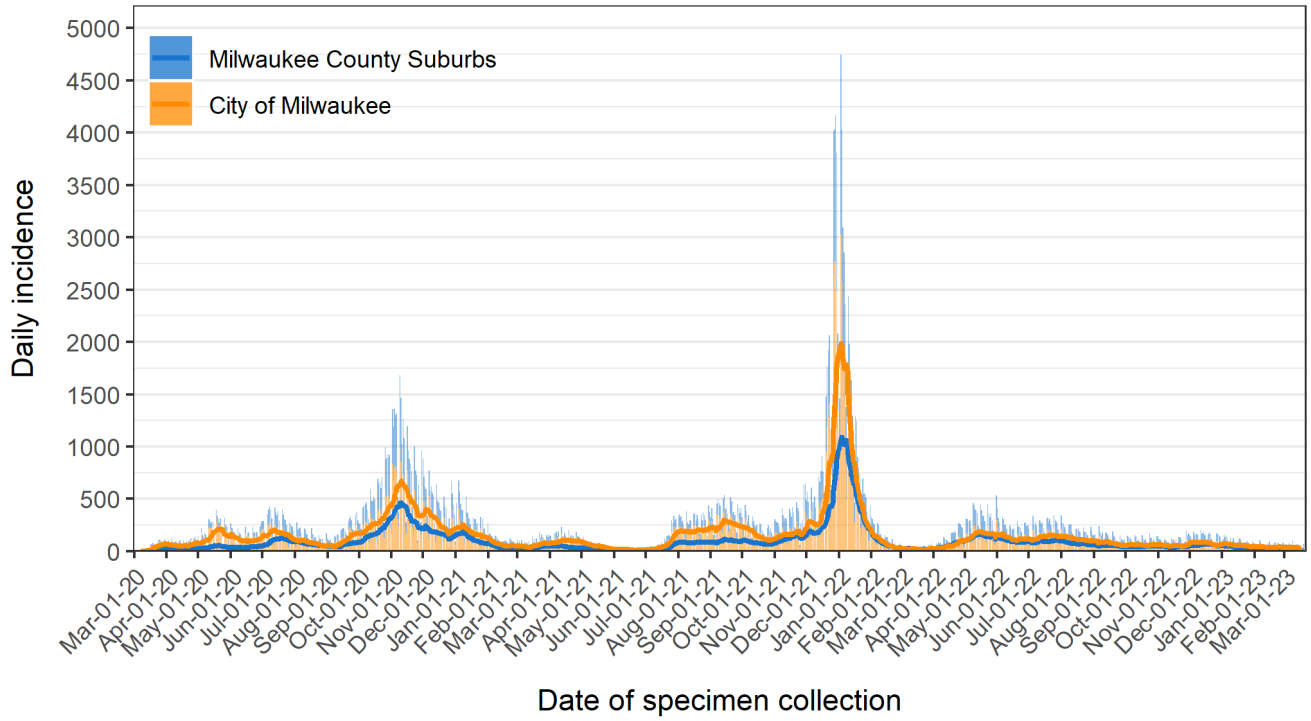
*Total patients hospitalized for COVID-19 with specimen collection date within the last 30 days

Total Cases and New Cases

There are now a total of 283,006 cases in Milwaukee County, since the first confirmed case on March 6th, 2020. Over the last week, we observed 291 new confirmed cases in Milwaukee County, including 176 new cases in the city of Milwaukee. **Figures 1a and 1b** show the daily incidence of new cases (bars) and the average daily incidence within the last 7 days (line), which provides a smoothing effect to enhance visualization, for both the city and the county. To indicate a potential reporting delay, we shade the last 4 days of data and exclude those days from the trend line.

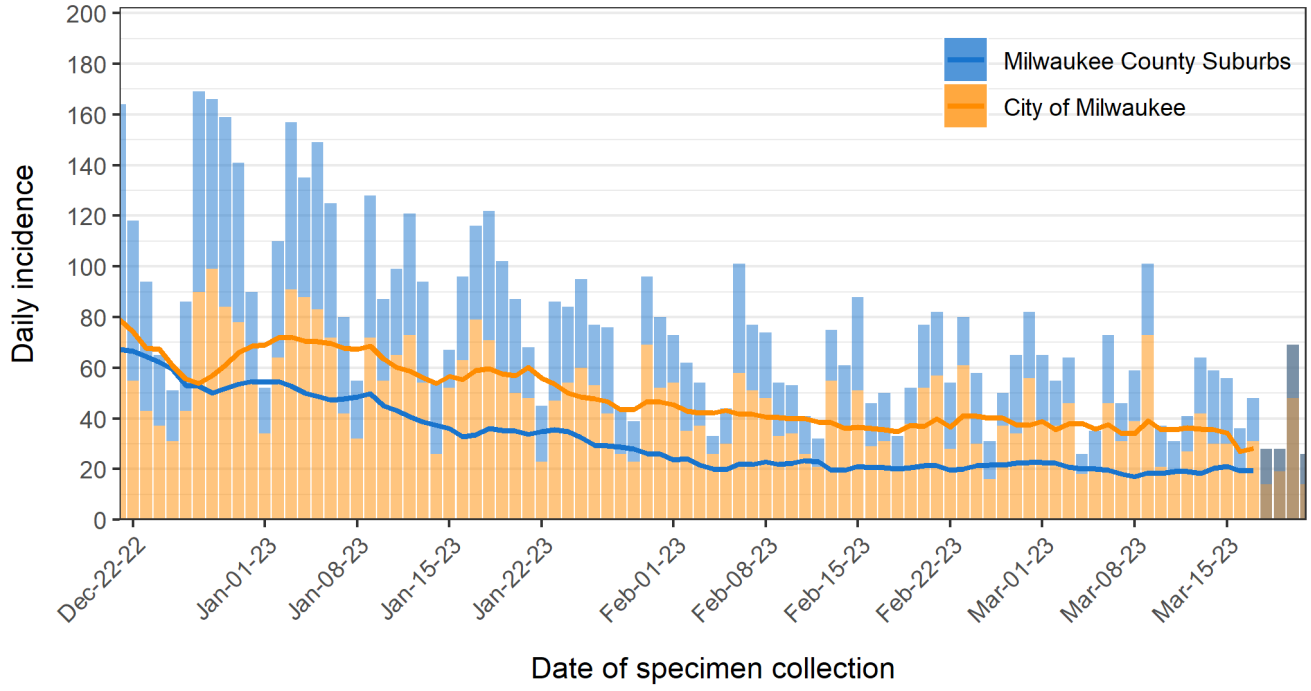
Over the last week, we have seen a plateau in confirmed cases in the county. The highest daily case count since the beginning of the epidemic occurred on January 3, 2022, with 4,744 cases in the county overall. The highest daily case count over the entire epidemic in the suburbs occurred on January 3, 2022, with a total of 1,720 cases confirmed. The highest case count in the city occurred on January 3, 2022, with a total of 3,024 cases confirmed.

Figure 1a: Milwaukee County daily number of COVID-19 cases



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

Figure 1b: Milwaukee County daily number of COVID-19 cases (most recent 90 days)

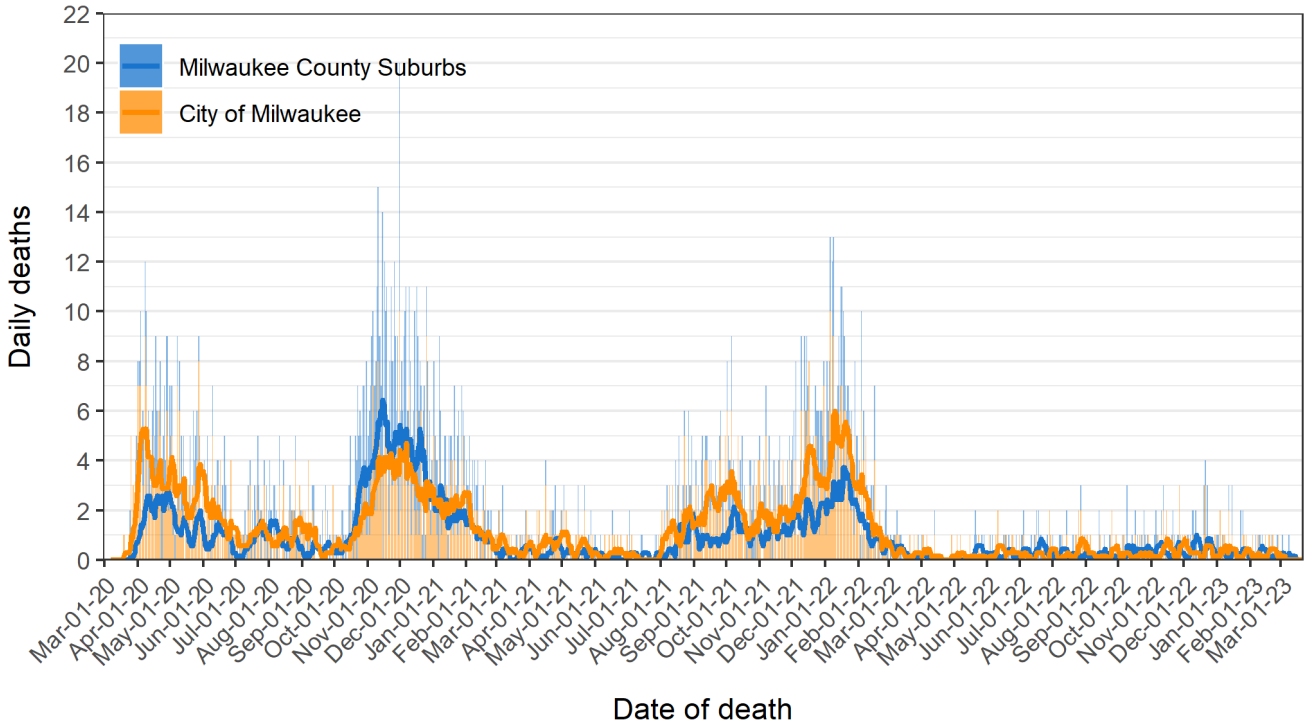


Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County COVID-19 Epidemiology Intel Team

Total Deaths and New Deaths

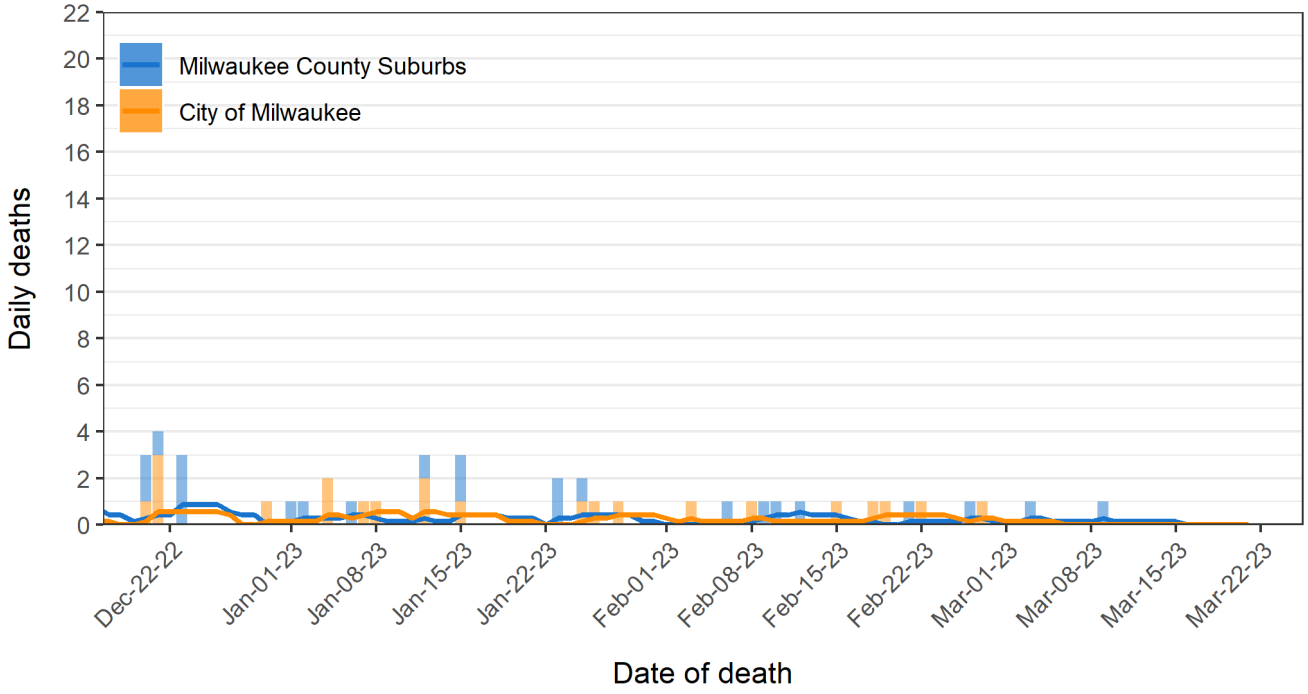
There are a total of 2,371 COVID-19 related deaths in Milwaukee County. Over the last week, we observed 0 deaths, with 0 from the City of Milwaukee. **Figures 2a and 2b** show the number of daily COVID-19 related deaths among Milwaukee County and City of Milwaukee residents. The overlaid lines show the average daily deaths within the last 7 days for each jurisdiction. Deaths in the county peaked on December 1, 2020. Deaths in the city peaked on December 1, 2020 with 10 deaths, and in the suburbs on November 15, 2020 with 10 deaths.

Figure 2a: Milwaukee County COVID-19 daily deaths



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

Figure 2b: Milwaukee County COVID-19 daily deaths (most recent 90 days)



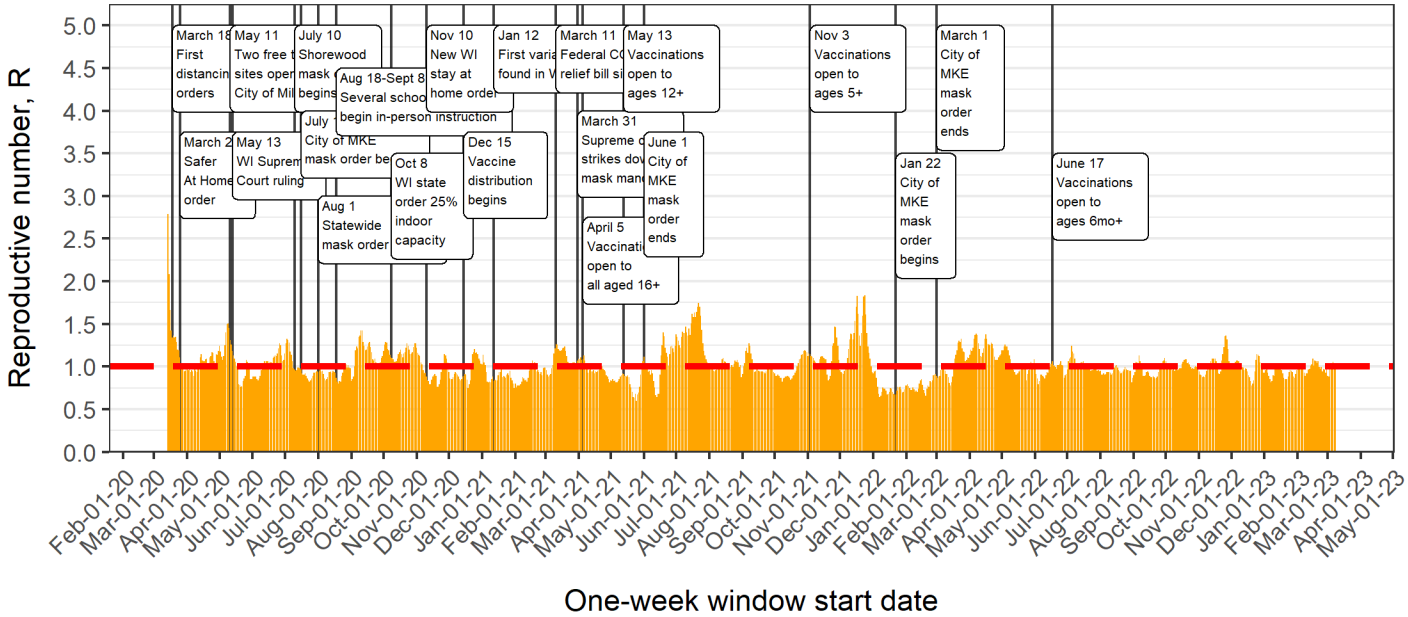
Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County COVID-19 Epidemiology Intel Team

The COVID-19 Reproductive Number

Another way of examining the growth rate of the infection is to examine the reproductive number (R). This number captures the number of new cases that are the result of an existing case. For example, an R of 2 would indicate that each infected person infects 2 new people. The following plots show the change in R over time for Milwaukee County, **Figure 3**, the City of Milwaukee, **Figure 4a**, and Milwaukee County suburbs, **Figure 4b**. Each plot includes key dates related to physical distancing or focused testing campaigns affecting residents. The R for each date is calculated to represent the R for a 7-day period with the start day of that 7-day period represented on the graph. We do not report estimates for the most recent seven days due to a potential data reporting delay. The highest R values observed over the course of the epidemic were 2.79 in the county, 2.95 in the city, and 2.36 in the suburbs, at the beginning of the epidemic in March 2020.

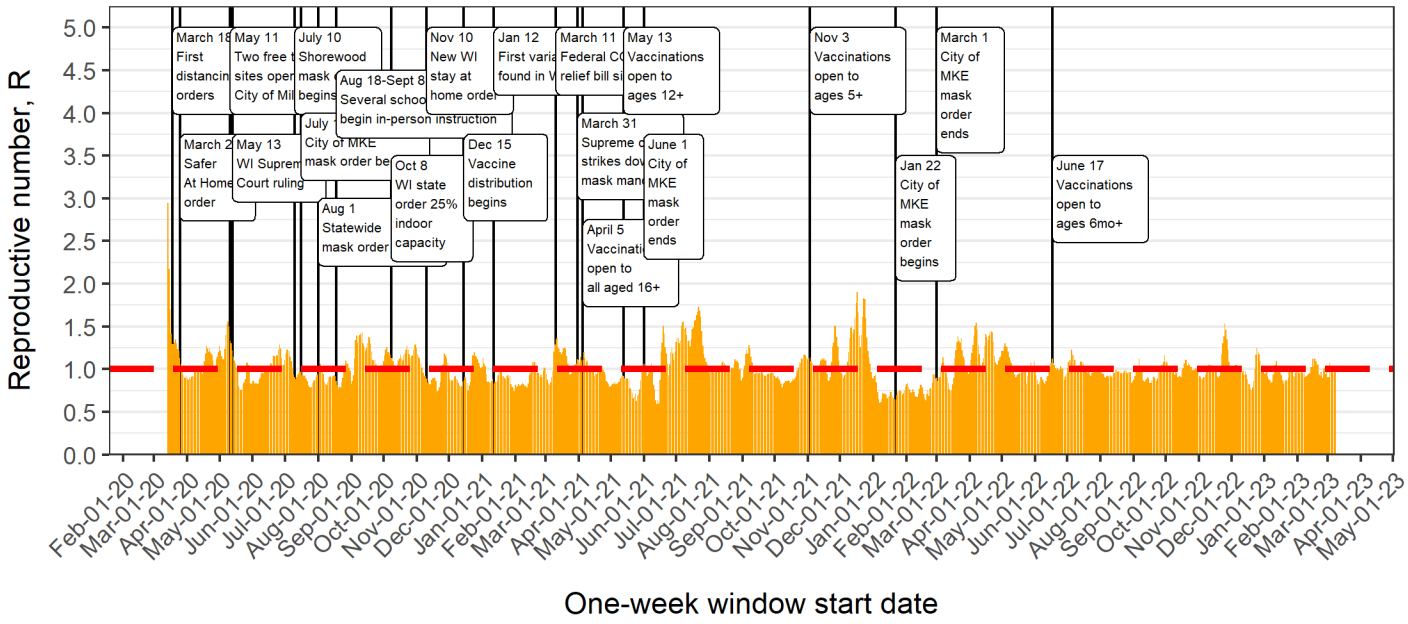
Patterns in the City of Milwaukee are very similar to those in the county overall. Patterns in the suburbs show more fluctuation. The R values for the week of March 8, 2023 through March 14, 2023 are 1.026 for the county, 0.989 in the city, and 1.104 in the suburbs.

Figure 3: One week reproductive number for Milwaukee County



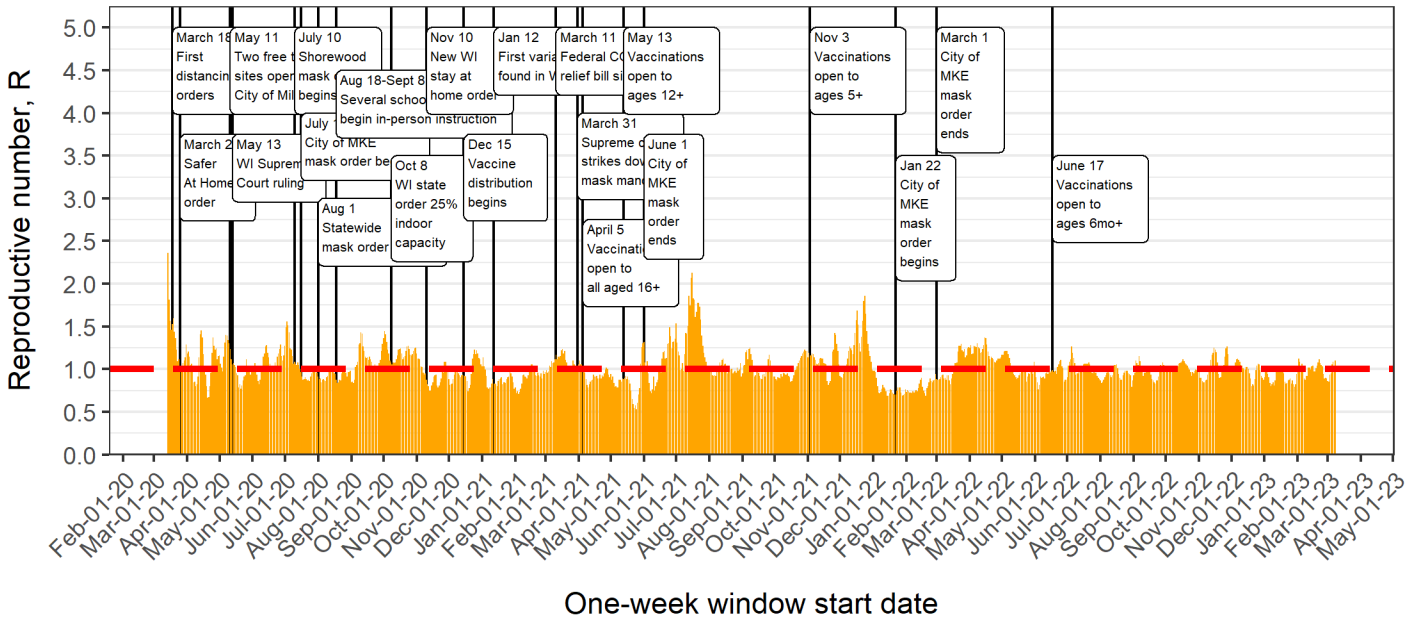
Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County COVID-19 Epidemiology Intel Team

Figure 4a: One week reproductive number for City of Milwaukee



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

Figure 4b: One week reproductive number for Milwaukee County suburbs



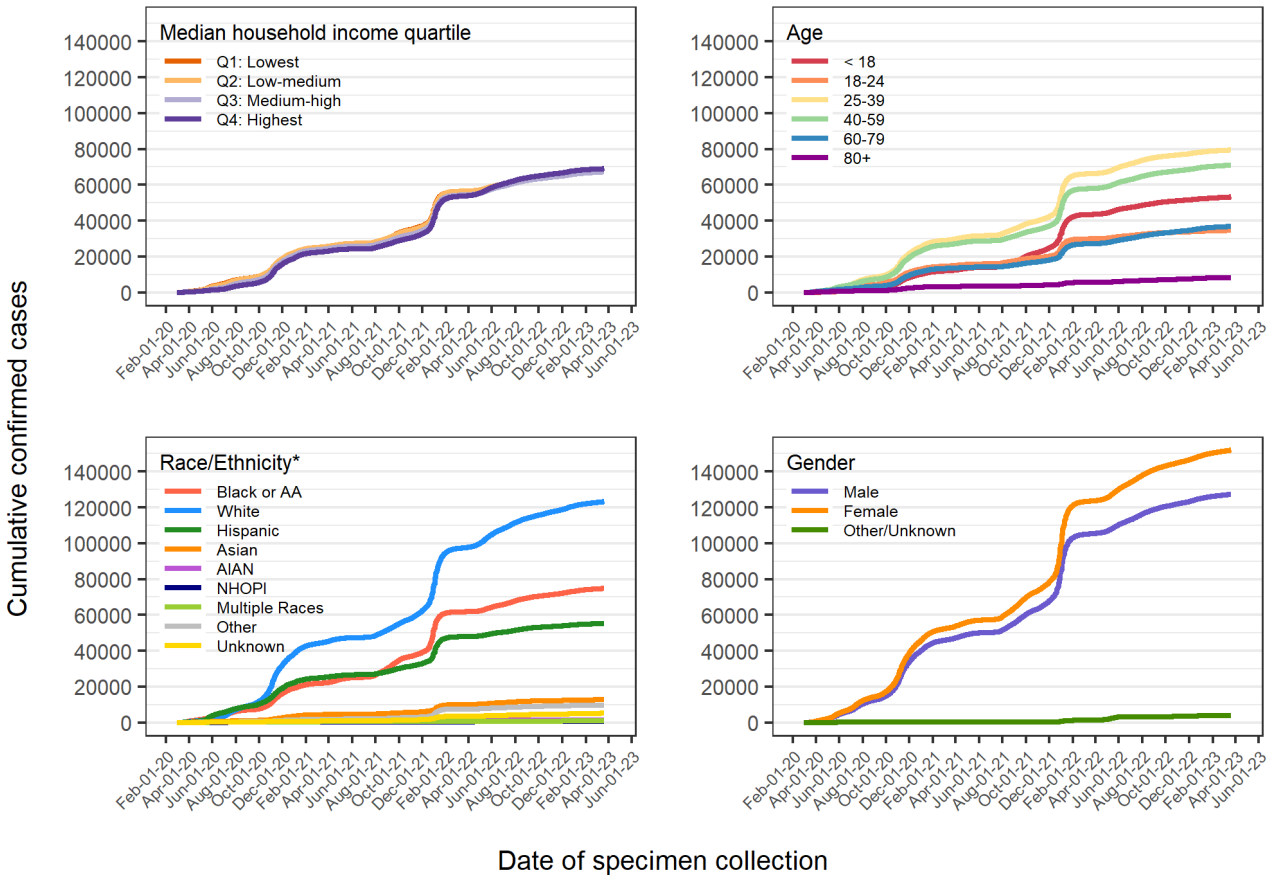
Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County COVID-19 Epidemiology Intel Team

Demographic Patterns – Age, Sex, Race and Ethnicity

Confirmed cases

COVID-19 cases vary by demographic characteristics. **Figure 5** 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 cumulative number of cases among those aged 25-39 (N = 79385) still exceeds the number among the next highest group, those aged 40-59 (N = 70940). The number of cases under age 18 (N = 53169) now exceeds the number diagnosed among those aged 18-24 (N = 34533) and 60-79 (N = 36772). Of all confirmed cases, 45% are male and 54% are female. The largest number of cases have been identified among the non-Hispanic White population (N = 123166), followed by the Black/AA population (N = 74753) and the Hispanic population (N = 55160). The lower two quartiles of median household income ($0 to $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 fewest cases identified among the highest income group.

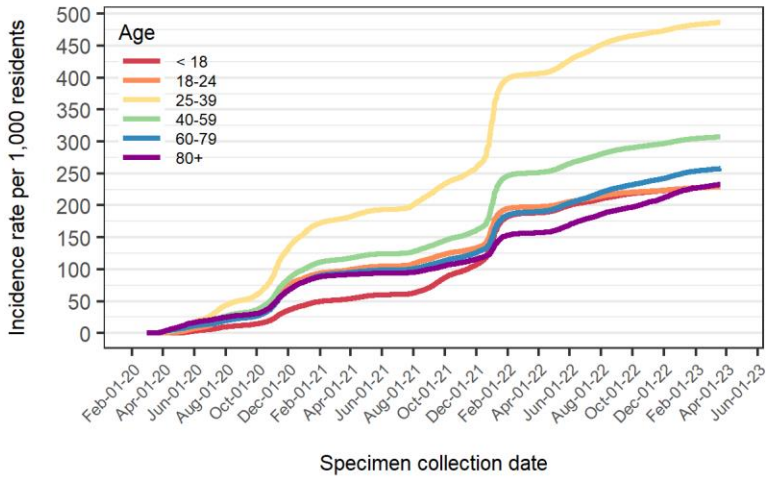
Figure 5: Cumulative confirmed cases in Milwaukee County



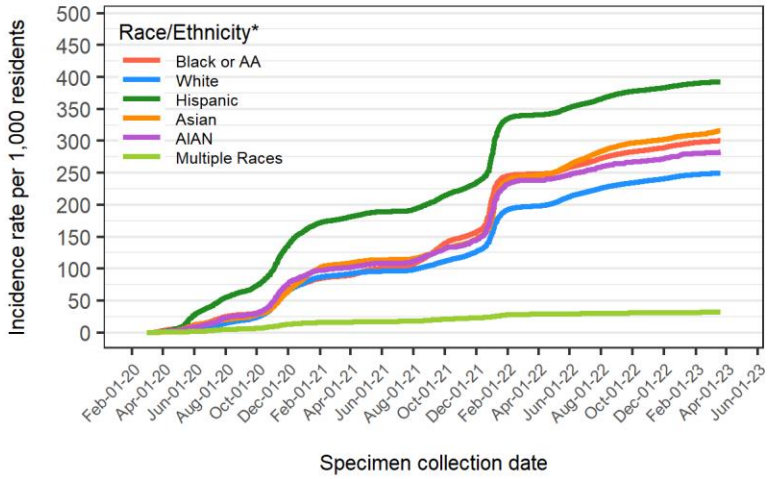
Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County COVID-19 Epidemiology Intel Team
**Race and ethnicity were combined into one variable where the Hispanic category includes Hispanics of any race.*
AIAN stands for American Indian or Alaska Native and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

When examined as population-based rates in **Figure 6**, demographic patterns are also apparent. Early in the epidemic, we saw a clear age gradient in population-based rates, with older populations experiencing greater rates. However, since then, we have seen higher rates among the younger, working age groups (18-24, 25-39, and 40-59) and most recently among children (0-17). By race and ethnicity, the rate was highest among Black/AA populations until the beginning of May 2020, when we observed a surge among Hispanics resulting in the Hispanic rate (392.39 per 1,000 people) exceeding that among all other racial and ethnic groups. The rates among Black/AAs (300.2 per 1,000), AIANs (282.12 per 1,000 people), and Asians (315.43 per 1,000 people) come next, followed by Non-Hispanic Whites (249.46 per 1,000). The rate among Black/AA residents increased with the summer 2021 surge in cases thought to be driven by the Delta variant. The rate among females (308.4 per 1,000 people) exceeds the rate among males (275.64 per 1,000 people).

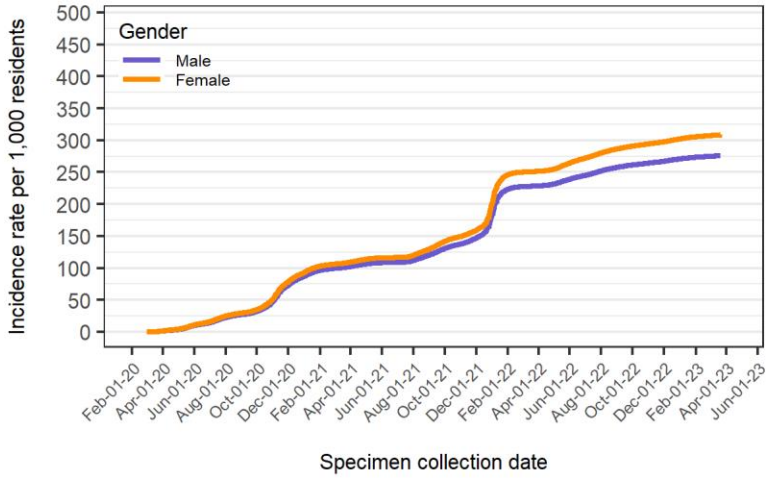
Figure 6: Population based incidence rates in Milwaukee County



Age	N Cases	Population	Rate per 1,000 residents
< 18	53169	231111	230.06
18-24	34533	150895	228.85
25-39	79385	163246	486.29
40-59	70940	230887	307.25
60-79	36772	142783	257.54
80+	8205	35287	232.52



Race/Ethnicity*	N Cases	Population	Rate per 1,000 residents
Black or AA	74753	249011	300.20
White	123166	493723	249.46
Hispanic	55160	140575	392.39
Asian	12757	40443	315.43
AIAN	1311	4647	282.12
Multiple Races	766	24224	31.62



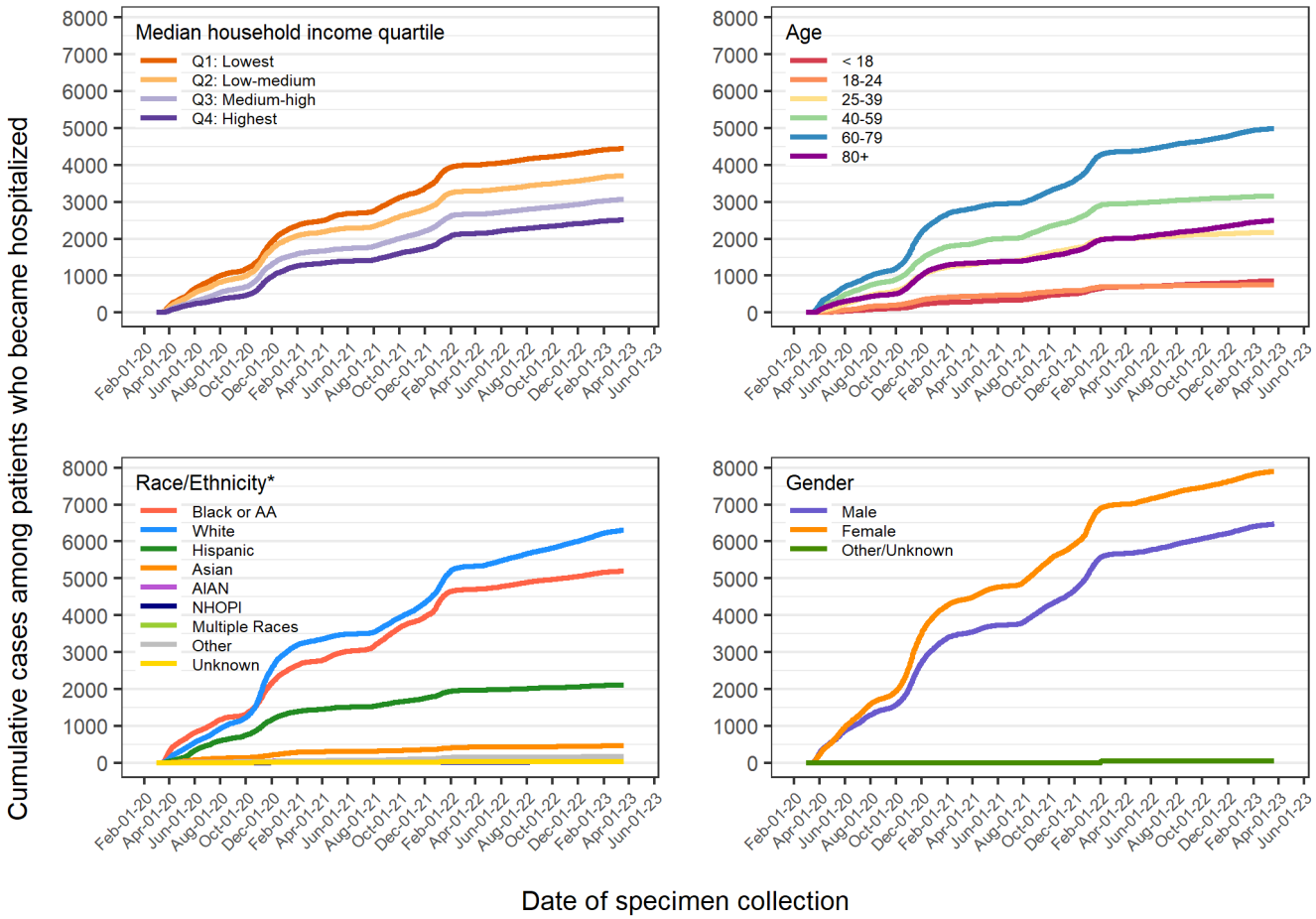
Gender	N Cases	Population	Rate per 1,000 residents
Male	127257	461670	275.64
Female	151899	492539	308.40

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.

Hospitalizations

A total of 14416 Milwaukee County residents have been hospitalized due to COVID-19. **Figure 7** shows cumulative hospitalizations based on lab specimen collection date (as admission dates are incomplete). The highest number of hospitalizations continues to be among those ages 60-79 (N = 4982). The highest number of hospitalizations have occurred among Non-Hispanic White community (N = 6308), followed by the Black/AA community (N = 5199), and then the Hispanic community (N = 2105). Overall, counts are lower among other racial and ethnic groups. Females outnumber males, comprising 54.8% of all hospitalized cases. More individuals among lower income than higher income groups have been hospitalized, with a clear income gradient observed.

Figure 7: Cumulative hospitalizations in Milwaukee County



Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
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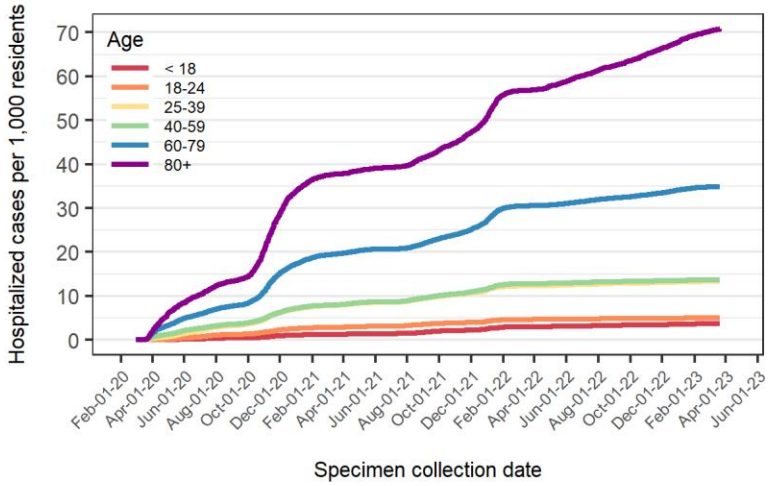
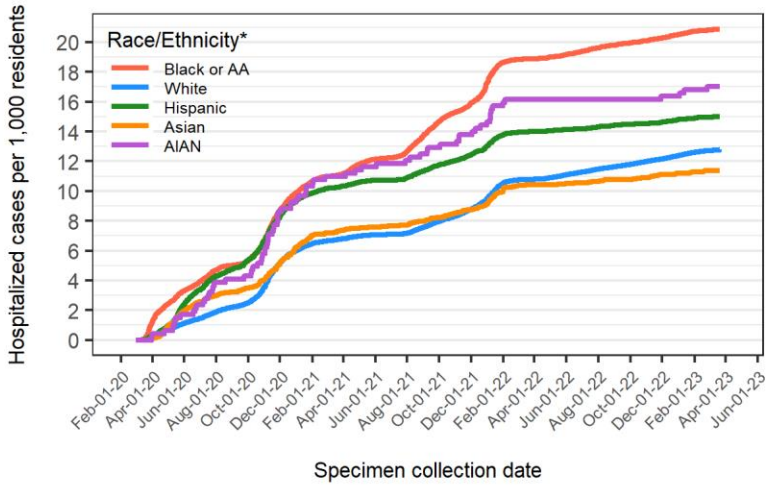
When examined as population-based rates and case-based rates in **Figure 8**, hospitalization patterns are also apparent by demographic characteristics. Both population- and case-based hospitalization rates exhibit a clear age group gradient, with older age groups experiencing higher rates. For race and ethnicity and gender plots, note that the vertical axis has been adjusted to reveal variation and the scales are not directly comparable across age, gender, and race/ethnicity plots. By race and ethnicity, population and case-based hospitalization rates are highest among the Black/AA and AIAN populations and the population-based rates are lowest for Asians and non-Hispanic Whites. Note the variation in the timing of

rate increases across racial and ethnic groups. Rates by gender are very similar. All rates presented are crude rates and only groups with 10 or more total hospitalized cases are shown.

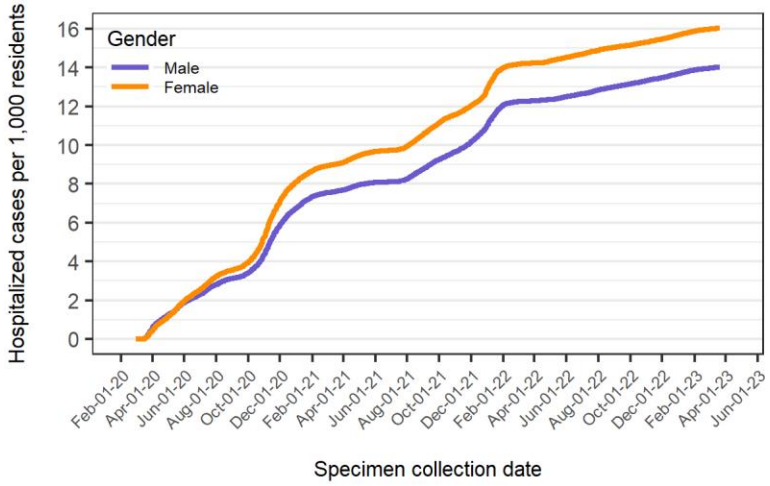
Figure 8: Population and case based hospitalization rates in Milwaukee County



Age	N Hospitalized Cases	Rate per 1,000 residents	Rate per 100 cases
< 18	860	3.72	1.62
18-24	752	4.98	2.18
25-39	2173	13.31	2.74
40-59	3152	13.65	4.44
60-79	4982	34.89	13.55
80+	2497	70.76	30.43



Race/Ethnicity*	N Hospitalized Cases	Rate per 1,000 residents	Rate per 100 cases
Black or AA	5199	20.88	6.95
White	6308	12.78	5.12
Hispanic	2105	14.97	3.82
Asian	460	11.37	3.61
AIAN	79	17.00	6.03



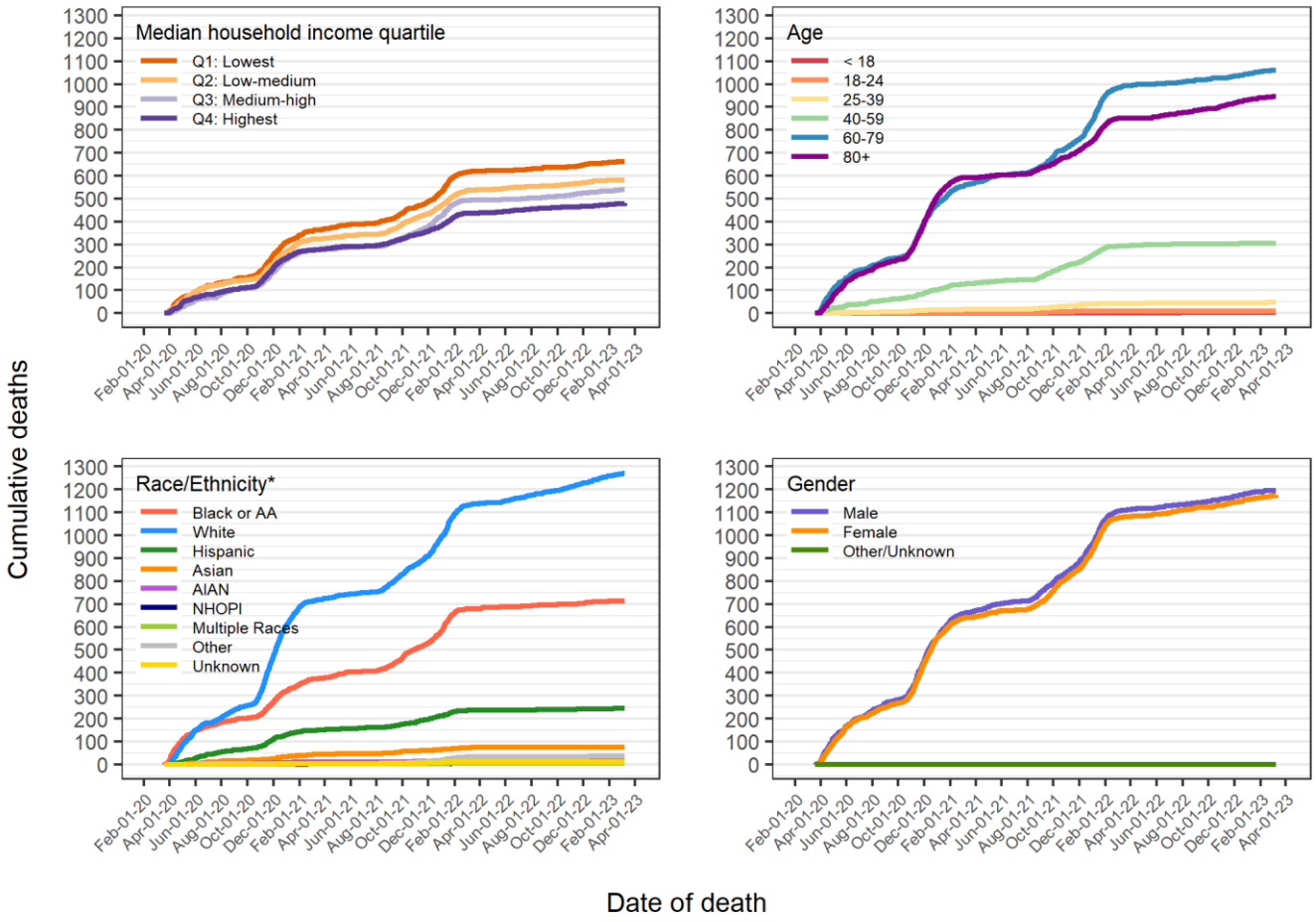
Gender	N Hospitalized Cases	Rate per 1,000 residents	Rate per 100 cases
Male	6470	14.01	5.08
Female	7897	16.03	5.20

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.

Deaths

There are now a total of 2371 confirmed deaths in Milwaukee County, representing a case fatality rate of 0.8%. We observed 0 new deaths over the past week in the county. Mortality patterns differ by demographic characteristics, as shown in **Figure 9**. The largest number of deaths are recorded among those age 60 or older. The largest number of deaths are recorded for males (N = 1196) and for non-Hispanic Whites (N = 1271) followed by Black/AA residents (N = 713). By income, there are a larger number of deaths among the two lower income groups as compared to the two higher income groups. Deaths among Hispanics remain relatively low.

Figure 9: Cumulative deaths in Milwaukee County



Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
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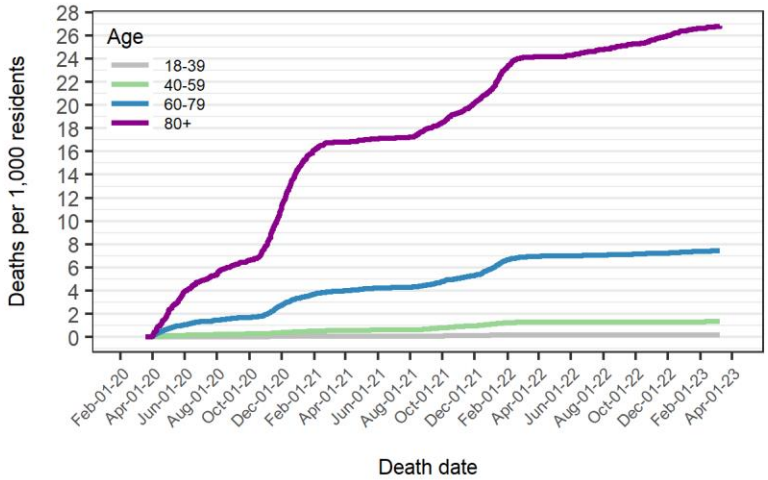
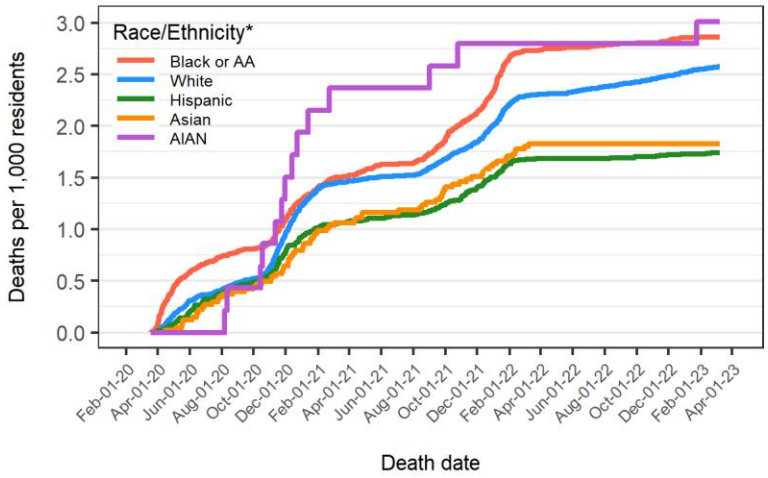
In terms of population- and case-based rates shown in **Figure 10**, there is a clear age category gradient, with higher death rates among older populations. For race and ethnicity and gender plots, note that the vertical axis has been adjusted to reveal variation and the scales are not directly comparable across age, gender, and race/ethnicity plots. Males have a higher death rate than females. The AIAN population has the highest population and case-based death rates, although the total number of deaths is small in comparison to other racial and ethnic groups. Black/AA populations and non-Hispanic Whites have the next highest population and case-based death rates. All rates presented are crude rates and only groups with 9 or more total deaths are shown.

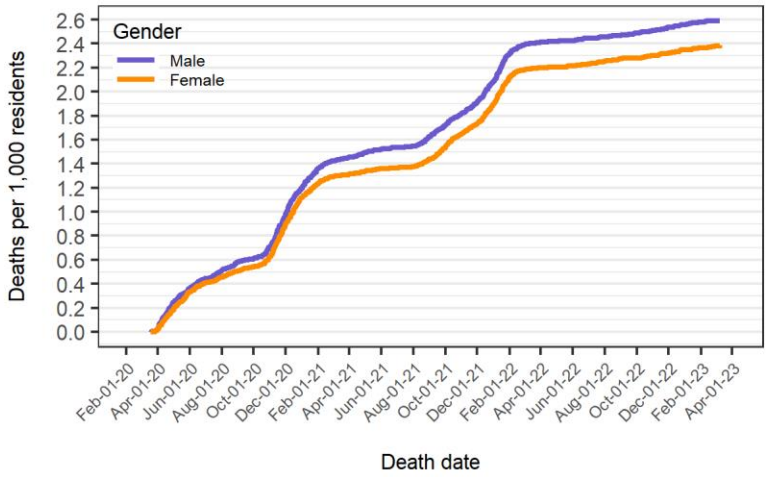
Figure 10: Population and case based death rates in Milwaukee County



Age	N Deaths	Rate per 1,000 residents	Rate per 100 cases
18-39	57	0.18	0.05
40-59	305	1.32	0.43
60-79	1060	7.42	2.88
80+	946	26.81	11.53



Race/Ethnicity*	N Deaths	Rate per 1,000 residents	Rate per 100 cases
Black or AA	713	2.86	0.95
White	1271	2.57	1.03
Hispanic	245	1.74	0.44
Asian	74	1.83	0.58
AIAN	14	3.01	1.07



Gender	N Deaths	Rate per 1,000 residents	Rate per 100 cases
Male	1196	2.59	0.94
Female	1175	2.39	0.77

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.*
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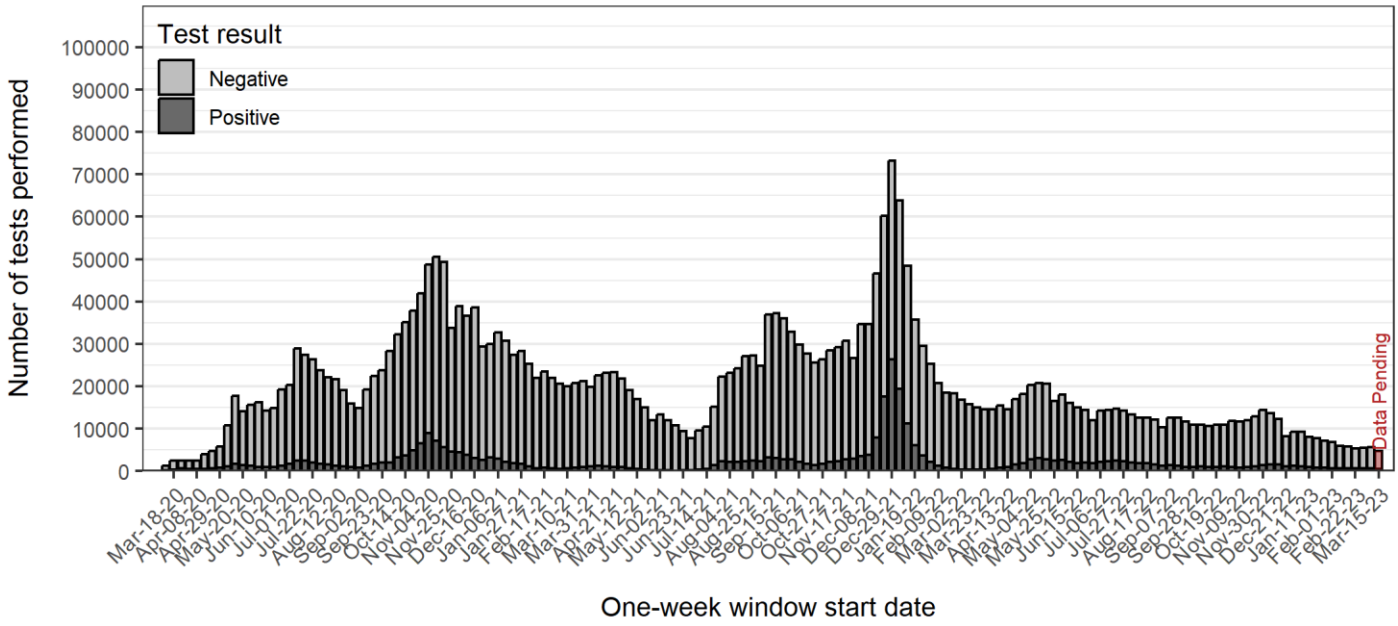
Testing Coverage

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 Milwaukee County on March 6, 2020, a total of 3,230,976 COVID-19 tests have been performed, with 2,888,802 negative results and 342,174 positive results. This represents a positive test rate of 10.6% since the beginning of the epidemic.

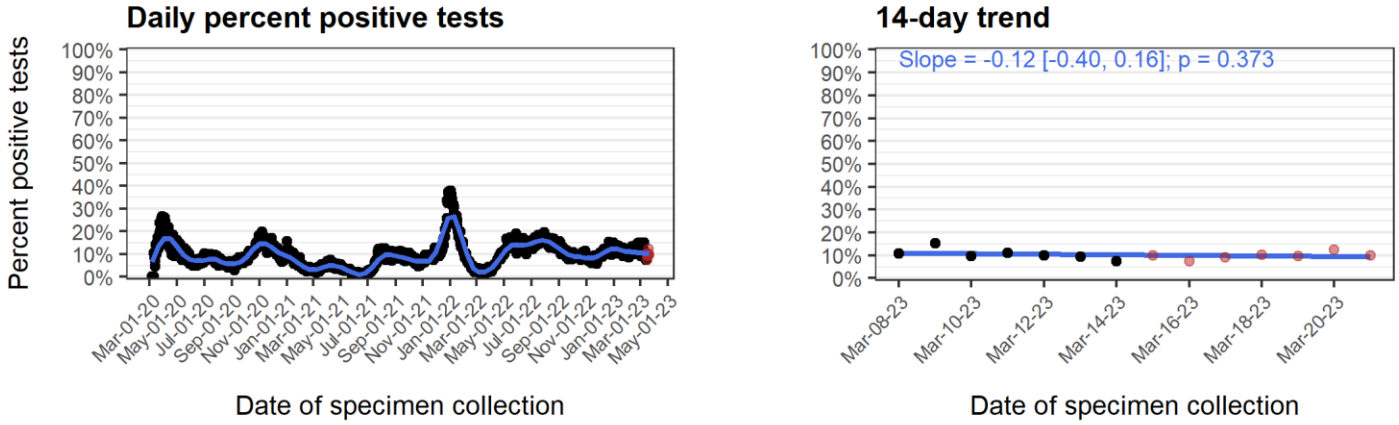
As shown in **Figure 11**, total tests per week increased until early July 2020 and then declined, with another increase starting in early September 2020 and peaking in early November, followed by a decline. Testing markedly decreased the weeks of Thanksgiving and Christmas 2020, and the 2021 New Year. Testing then decreased until the summer 2021 surge in cases beginning in late June, and remained relatively high until rising to the highest point of the pandemic in early January 2022 as the surge driven by the Omicron variant peaked. As shown in **Figure 12**, the percentage of positive tests varied over the course of the epidemic, with highs of 25-30% in early April of 2020 and 35-40% in early January of 2022. The percentage of positive tests was 9.8% over the past week compared to 10.3% the previous week. **Figure 12** also illustrates the 14-day trend in the percent positive tests, showing no significant change. Percent positive should be interpreted in the context of potential data delays, and considering that data entry for positive tests is prioritized.

Figure 11: Milwaukee County number of tests per week



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

Figure 12: Milwaukee County percent positive tests

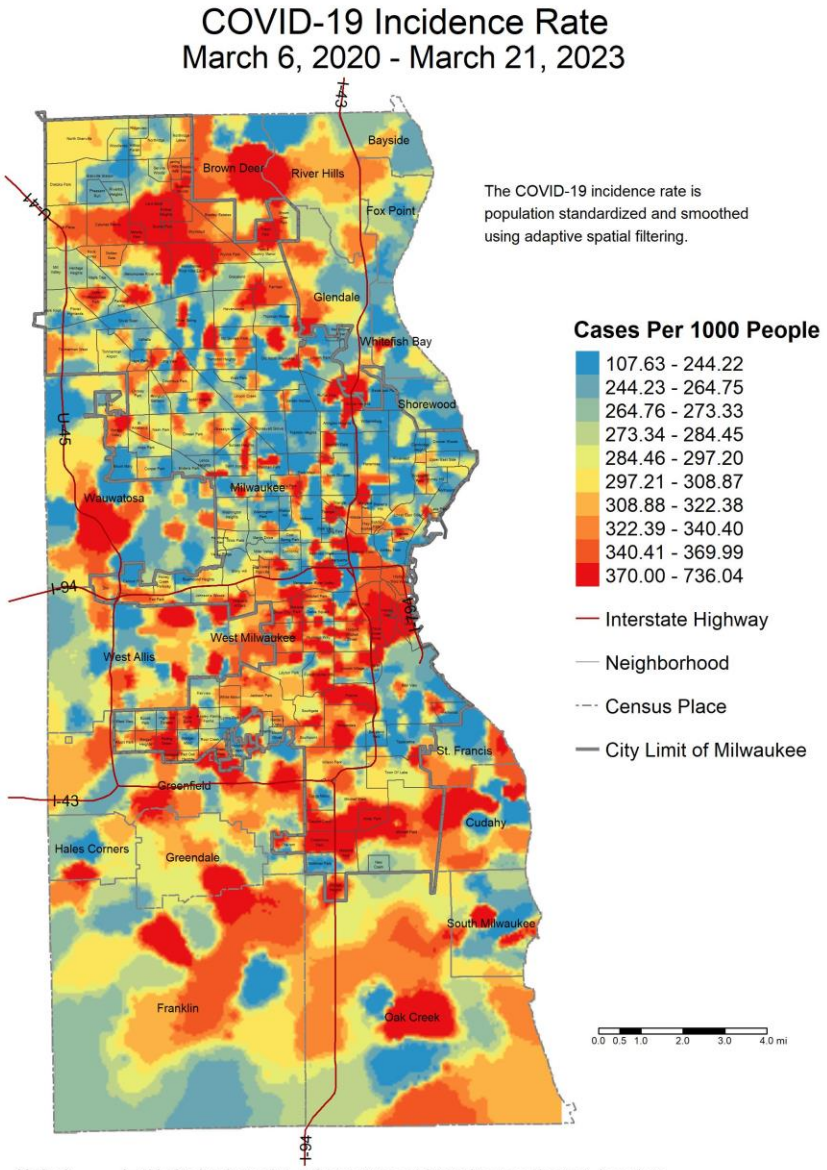


Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County COVID-19 Epidemiology Intel Team

Spatial Patterns of Cases and Testing

COVID-19 spread is spatially patterned. **Map 1** below illustrates the cumulative burden (all confirmed cases) of COVID-19 in Milwaukee County. **Map 2** shows cases confirmed over the last two weeks. **Map 3** shows the overall testing rate across the population. **Map 4** shows the testing rate over the last two weeks. **Map 5** depicts the percentage of tests that were confirmed positive. **Map 6** shows cumulative COVID-19 related hospitalizations. **Map 7** shows the percentage of cases who have been hospitalized. **Map 8** shows the overall COVID-19 mortality rate, excluding cases and corresponding population denominators residing in group quarters such as nursing homes and long-term care facilities. 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. Deciles are used to define categories. High rates are depicted in red with lower rates depicted in blue. Of note, some of the higher rates observed can be attributed to infections that have spread within group quarters, such as a nursing home, prison, or long-term care facility.

Decile Map 1: All confirmed cases of COVID-19

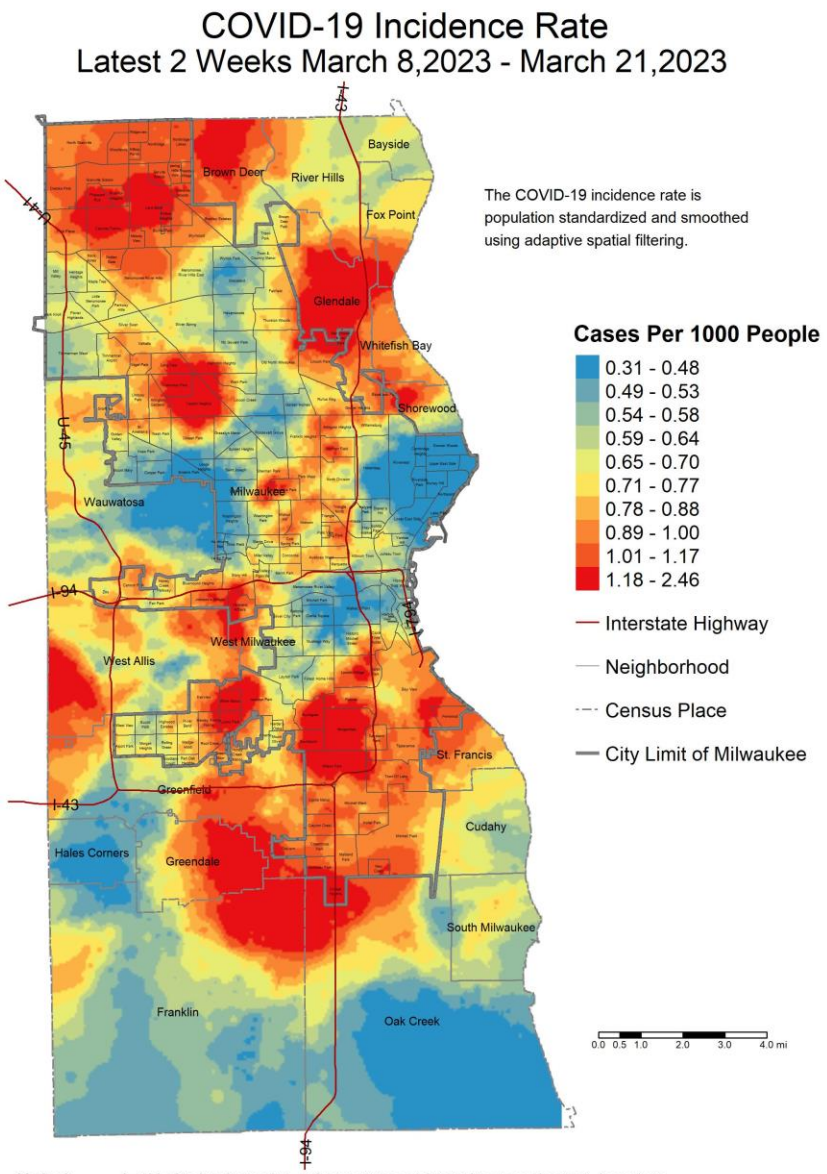


Method: A grid of points is used to estimate rates continuously across the map, based on the nearest cases with a minimum of 15 confirmed cases included.

Data Sources: Wisconsin Electronic Disease Surveillance System (WEDSS) (incidence data)
2018 American Community Survey (population data)
City of Milwaukee Map Milwaukee Portal (neighborhood boundaries)
Census Bureau TIGER/Line Shapefiles (census place boundaries)

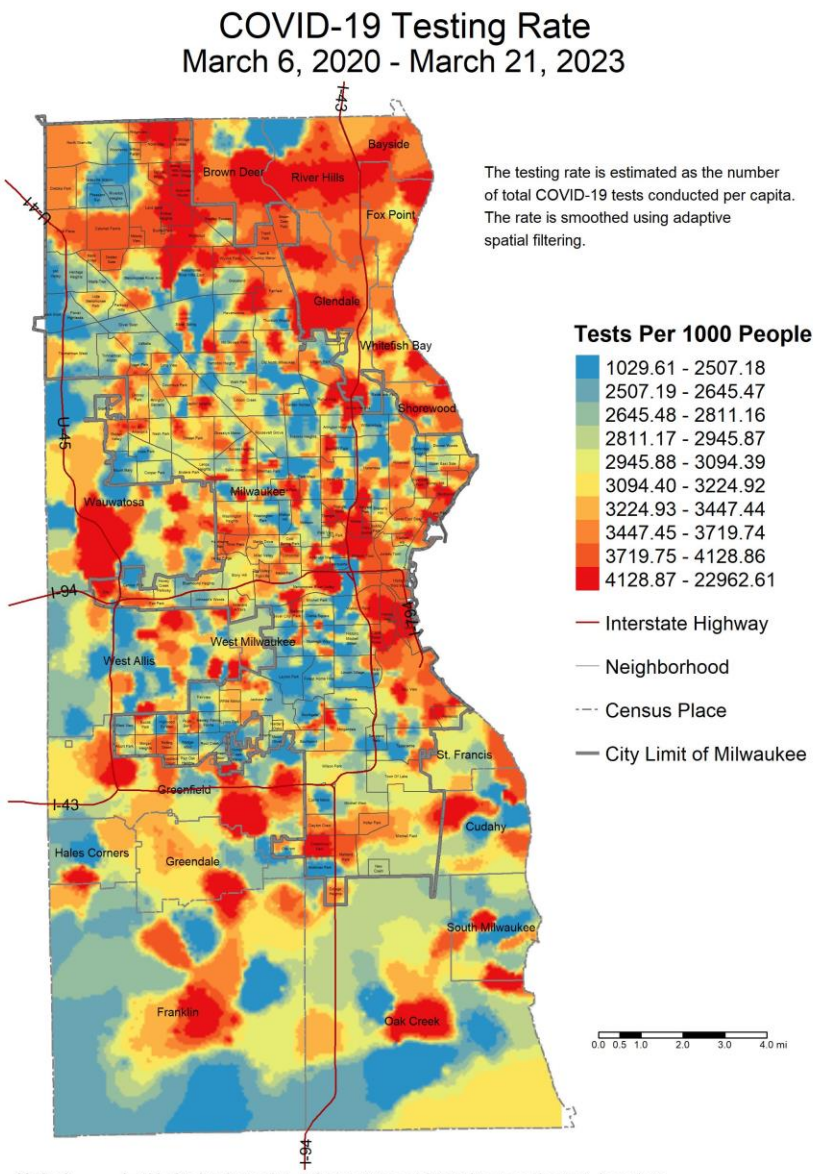
Created by the Milwaukee County Covid-19 Epidemiology Intel Team

Decile Map 2: Confirmed cases of COVID-19 within the last two weeks



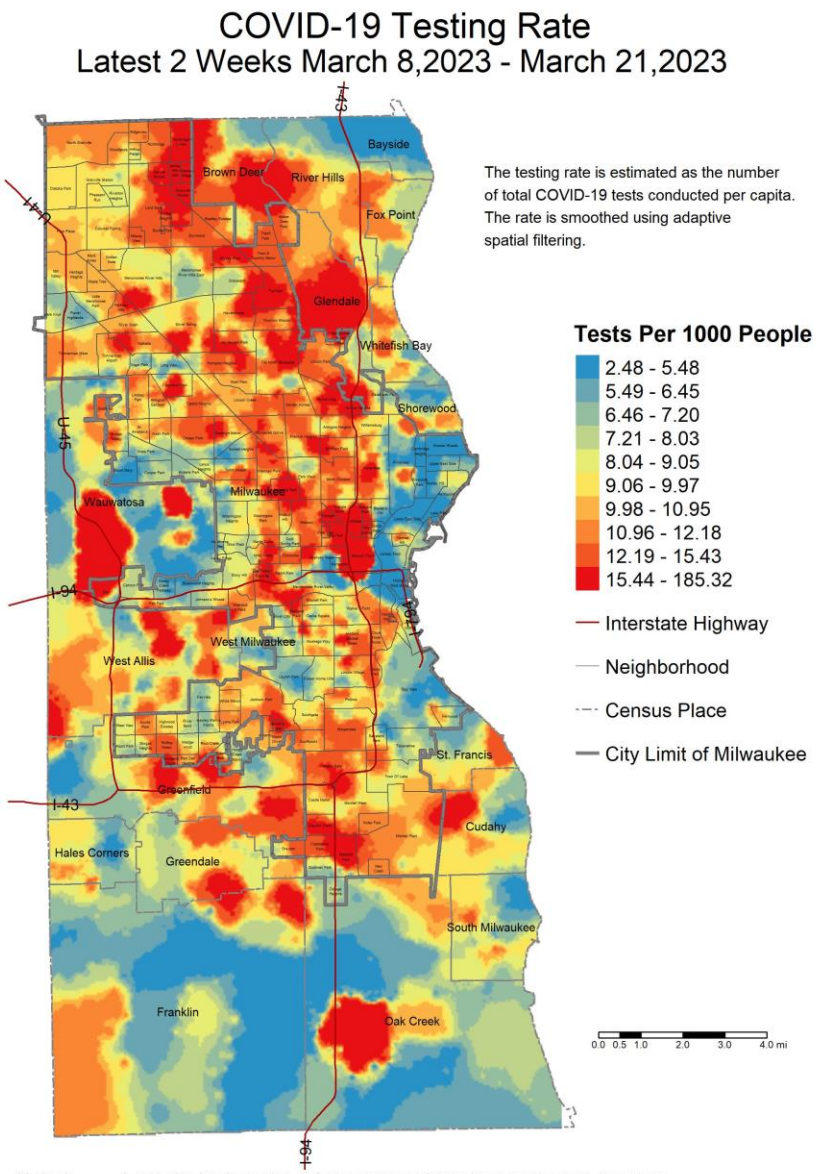
Method: A grid of points is used to estimate rates continuously across the map, based on the nearest cases with a minimum of 15 confirmed cases included.
Data Sources: Wisconsin Electronic Disease Surveillance System (WEDSS) (incidence data)
2018 American Community Survey (population data)
City of Milwaukee Map Milwaukee Portal (neighborhood boundaries)
Census Bureau TIGER/Line Shapefiles (census place boundaries)
Created by the Milwaukee County Covid-19 Epidemiology Intel Team

Decile Map 3: Overall testing rate



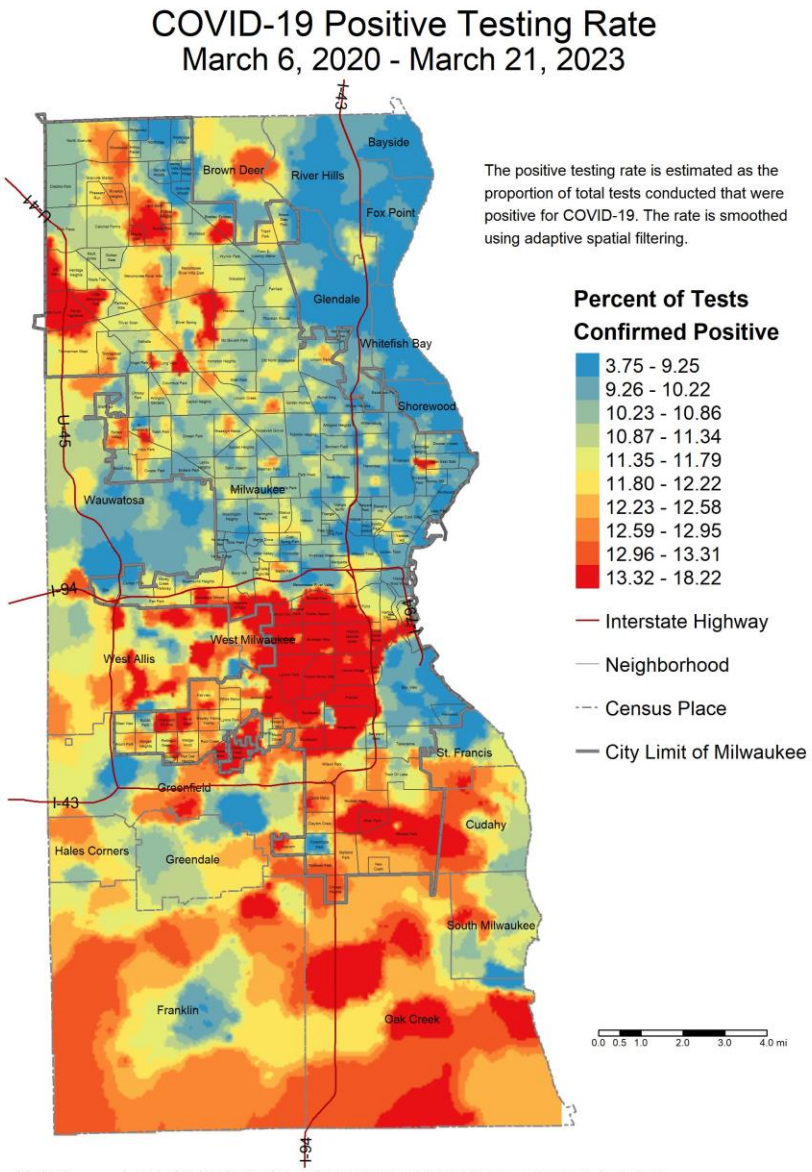
Method: A grid of points is used to estimate rates continuously across the map, based on the nearest cases with a minimum of 15 tests included.
Data Sources: Wisconsin Electronic Disease Surveillance System (WEDSS) (incidence data)
2018 American Community Survey (population data)
City of Milwaukee Map Milwaukee Portal (neighborhood boundaries)
Census Bureau TIGER/Line Shapefiles (census place boundaries)
Created by the Milwaukee County Covid-19 Epidemiology Intel Team

Decile Map 4: Testing rate within the last two weeks



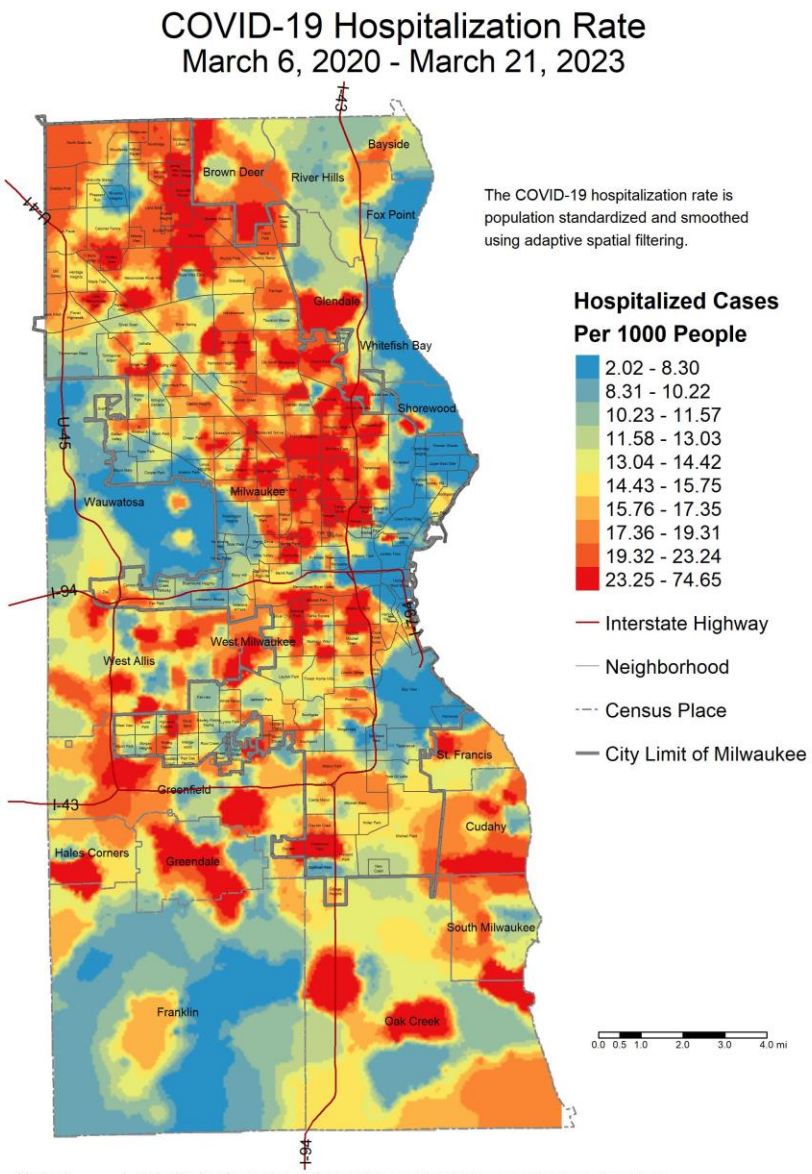
Method: A grid of points is used to estimate rates continuously across the map, based on the nearest cases with a minimum of 15 tests included.
Data Sources: Wisconsin Electronic Disease Surveillance System (WEDSS) (incidence data)
2018 American Community Survey (population data)
City of Milwaukee Map Milwaukee Portal (neighborhood boundaries)
Census Bureau TIGER/Line Shapefiles (census place boundaries)
Created by the Milwaukee County Covid-19 Epidemiology Intel Team

Decile Map 5: Percentage of tests that were confirmed positive



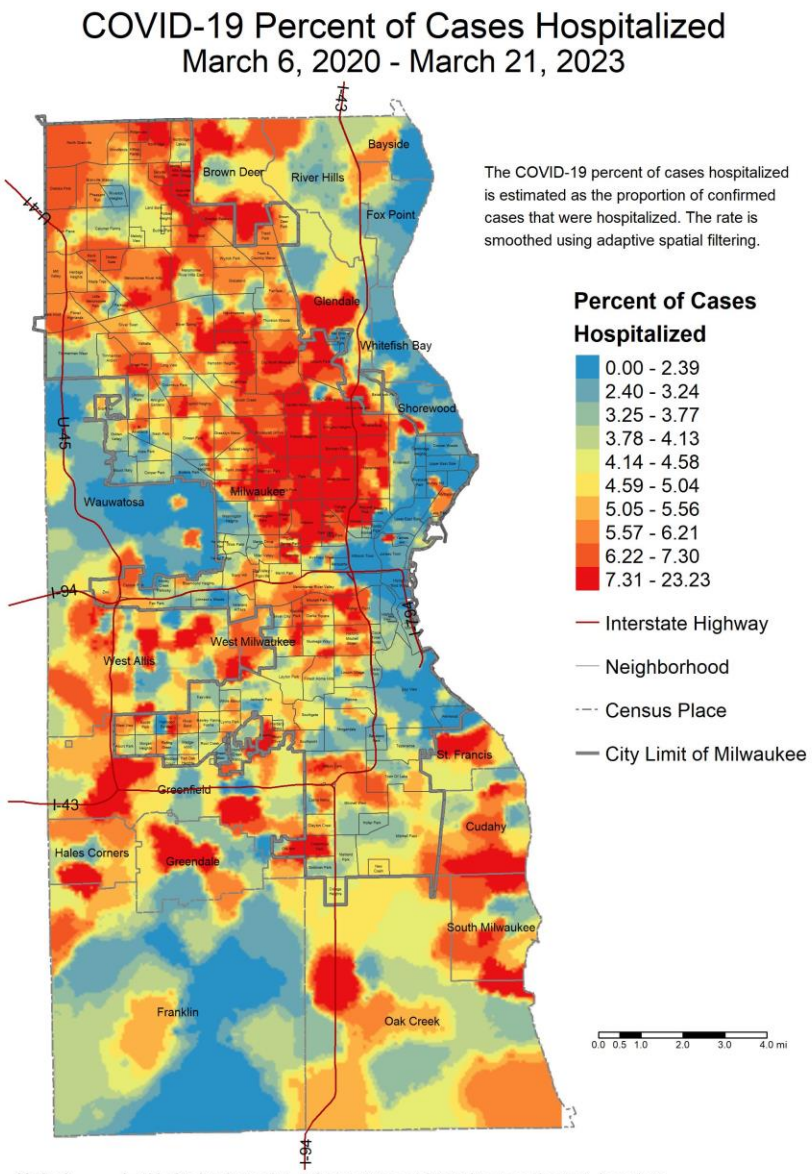
Method: A grid of points is used to estimate rates continuously across the map, based on the nearest cases with a minimum of 15 positive tests included.
Data Sources: Wisconsin Electronic Disease Surveillance System (WEDSS) (incidence data)
2018 American Community Survey (population data)
City of Milwaukee Map Milwaukee Portal (neighborhood boundaries)
Census Bureau TIGER/Line Shapefiles (census place boundaries)
Created by the Milwaukee County Covid-19 Epidemiology Intel Team

Decile Map 6: COVID-19 related hospitalizations



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)
Created by the Milwaukee County Covid-19 Epidemiology Intel Team

Decile Map 7: Percentage of COVID-19 cases that were hospitalized



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)
Census Bureau TIGER/Line Shapefiles (census place boundaries)
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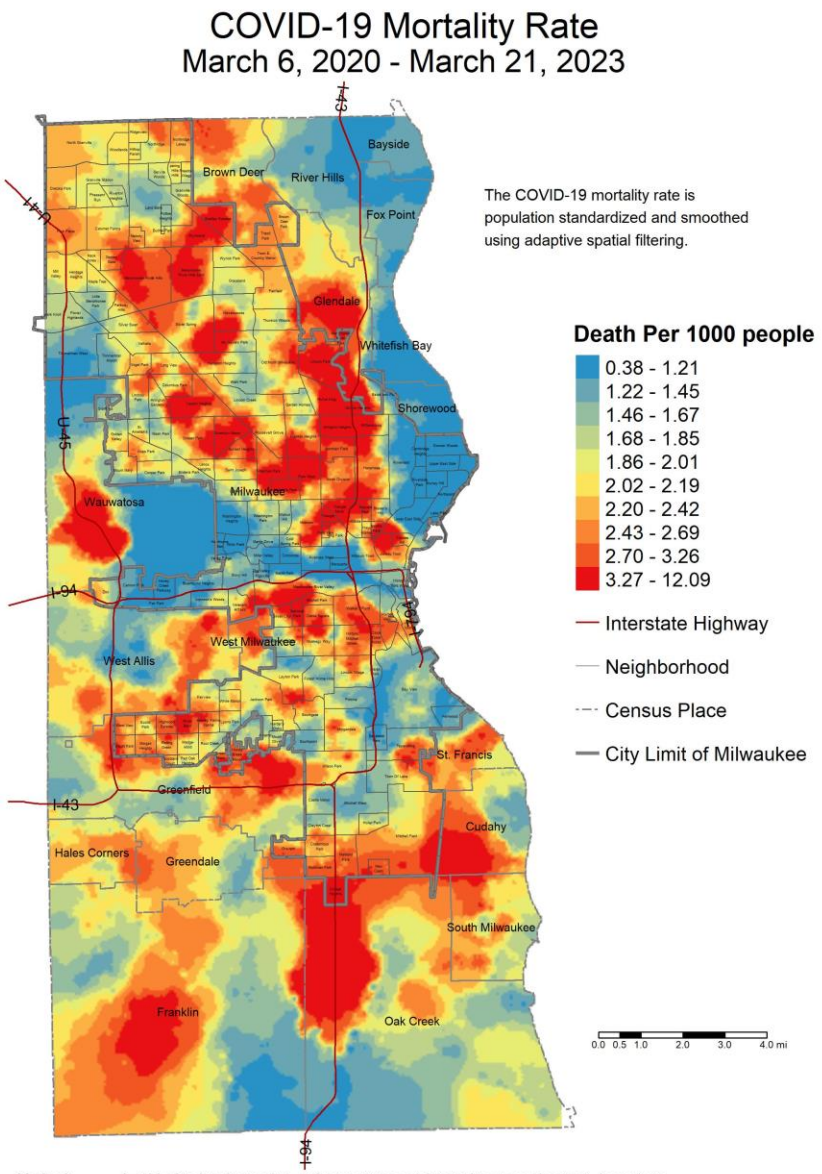
Decile Map 8: COVID-19 mortality rate (group-quarter cases excluded)



Method: A grid of points is used to estimate rates continuously across the map, based on the nearest cases with a minimum of 10 death 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

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 March 15, 2023 through March 21, 2023.

Contact Information

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