Milwaukee County COVID-19 Data Summary

Milwaukee County COVID-19 Epidemiology Intel Team

This report was updated on May 13, 2021 and includes data through May 11, 2021. Note that data for recent weeks may be under-reported due to pending test results.

Milwaukee County COVID-19 Summary Statistics

Overall Milwaukee County COVID-19 Summary Statistics March 5, 2020 - May 11, 2021			
	Milwaukee County	**City of Milwaukee**	**Suburbs**
Total tests performed	1,381,354	871,084	510,270
Percent positive of all tests performed	8.5%	8.6%	8.5%
Number of confirmed cases	105,091	66,701	38,390
Number of hospitalizations	6,618	4,311	2,307
Number of deaths	1,314	698	616
Case fatality rate	1.3%	1.0%	1.6%

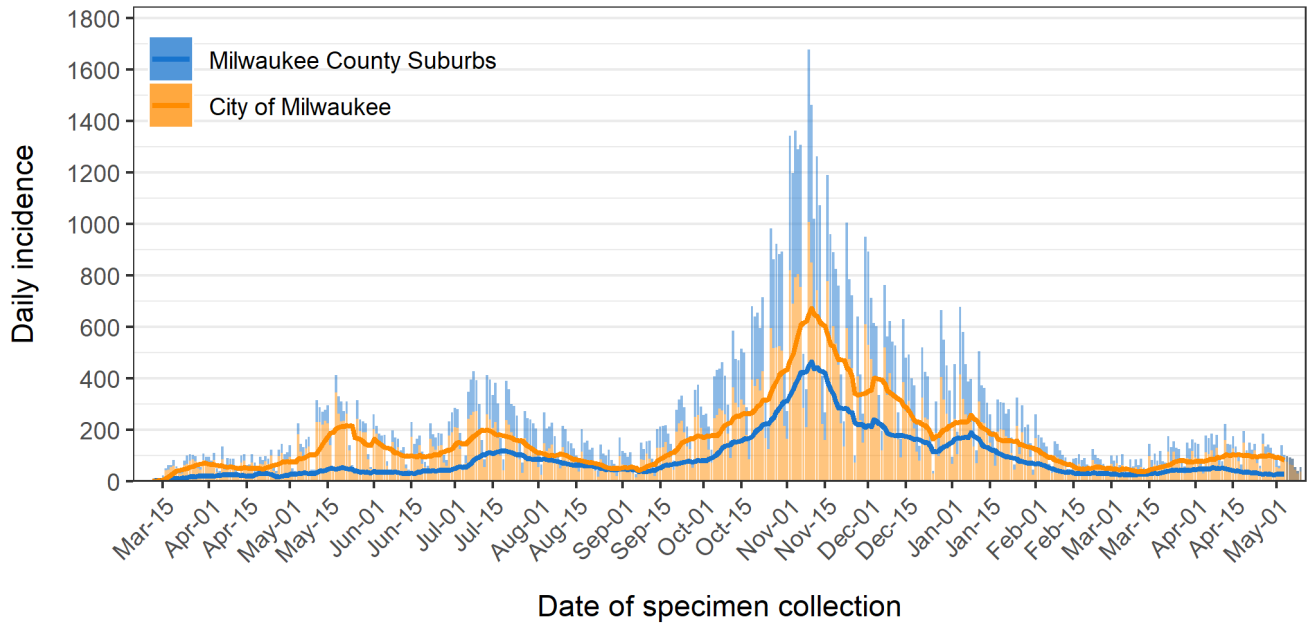
Weekly Milwaukee County COVID-19 Summary Statistics May 5, 2021 - May 11, 2021			
	Milwaukee County	**City of Milwaukee**	**Suburbs**
Total tests performed	14,469	9,306	5,163
Percent positive of all tests performed	3.5%	3.9%	2.8%
Number of confirmed cases	431	319	112
Number of hospitalizations	74	58	16
Number of deaths	1	0	1

Total Cases and New Cases

There are now a total of 105091 cases in Milwaukee County, since the first confirmed case on March 6th, 2020. Over the last week, we observed 431 new confirmed cases in Milwaukee County, including 319 new cases in the city of Milwaukee. **Figure 1** shows 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 seven 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, with a slight decline in the suburbs. The highest daily case count since the beginning of the epidemic occurred on November 9, 2020, with 1678 cases in the county overall. The highest daily case count over the entire epidemic in the suburbs occurred on November 9, 2020, with a total of 670 cases confirmed. The highest case count in the city occurred on November 9, 2020, with a total of 1008 cases confirmed.

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

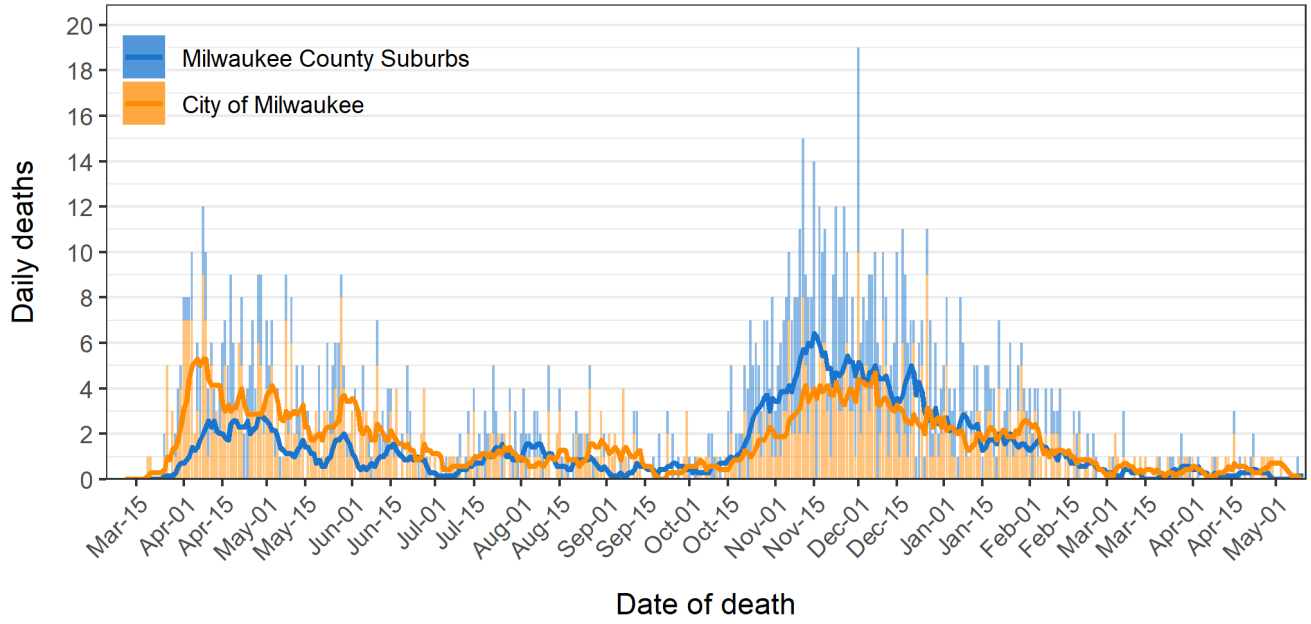


Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County COVID-19 Epidemiology Intel Team

Total Deaths and New Deaths

There are a total of 1314 COVID-19 related deaths in Milwaukee County. Over the last week, we observed 1 deaths, with 0 from the City of Milwaukee. **Figure 2** shows 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. Over the last few months, the number of deaths in the suburbs rose to the highest level since the beginning of the epidemic, outpacing deaths in the city.

Figure 2: Milwaukee County COVID-19 daily deaths

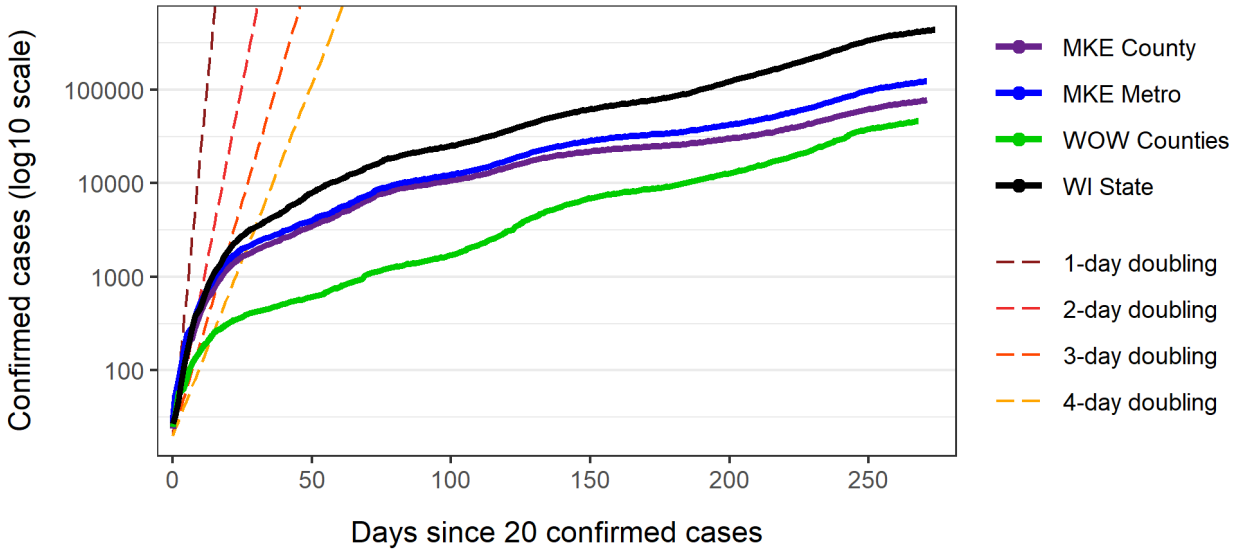


Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County COVID-19 Epidemiology Intel Team

The COVID-19 Growth Rate

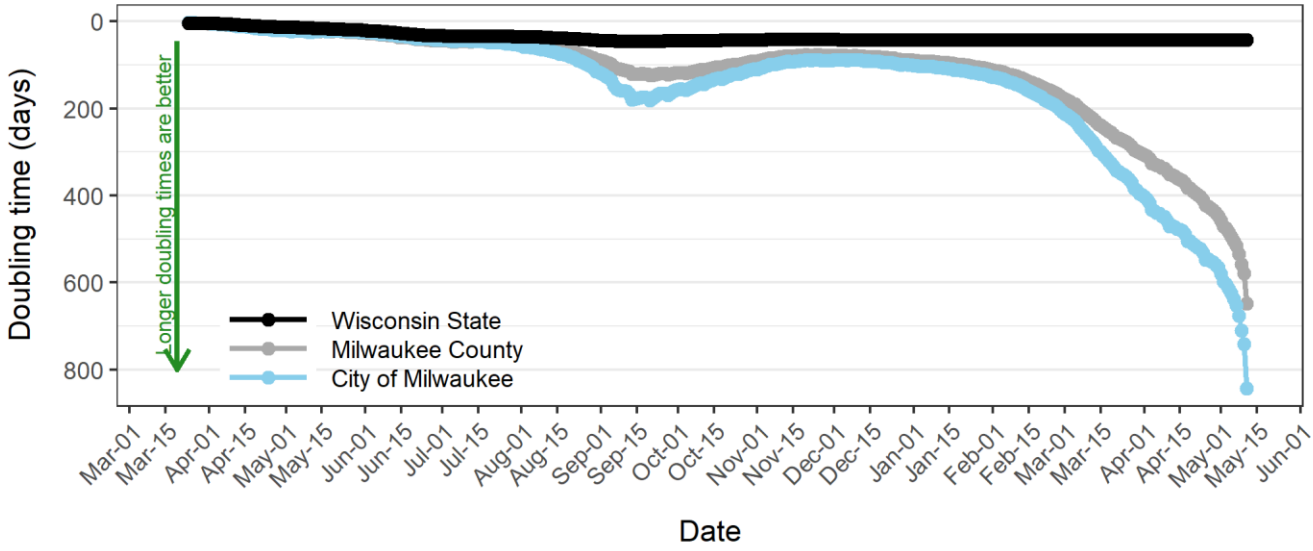
The time it takes for the number of cases to double is called the doubling time. **Figure 3** shows doubling times for Milwaukee County, the surrounding Waukesha, Ozaukee and Walworth (WOW) counties, the M7 (7-county) metropolitan area, and the state of Wisconsin. Dotted lines indicate doubling times of 1, 2 3 and 4 days, which are generally associated with a condition of exponential growth. The current doubling time in Milwaukee County is 649.06 days. The current doubling time for WOW counties is 54.39 days. The current doubling time for the state of Wisconsin is 42.95 days. **Figure 4** shows the trend in doubling times for Milwaukee County and the City of Milwaukee as compared to the state, over the course of the epidemic. As illustrated, the epidemic initially doubled more quickly in Milwaukee County and the city, but has since slowed (improved) more in the city and county than in the state as a whole.

Figure 3: Cumulative cases after 20 confirmed



Data source: Wisconsin Department of Health Services
Created by the Milwaukee County COVID-19 Epidemiology Intel Team

Figure 4: Trend in doubling times



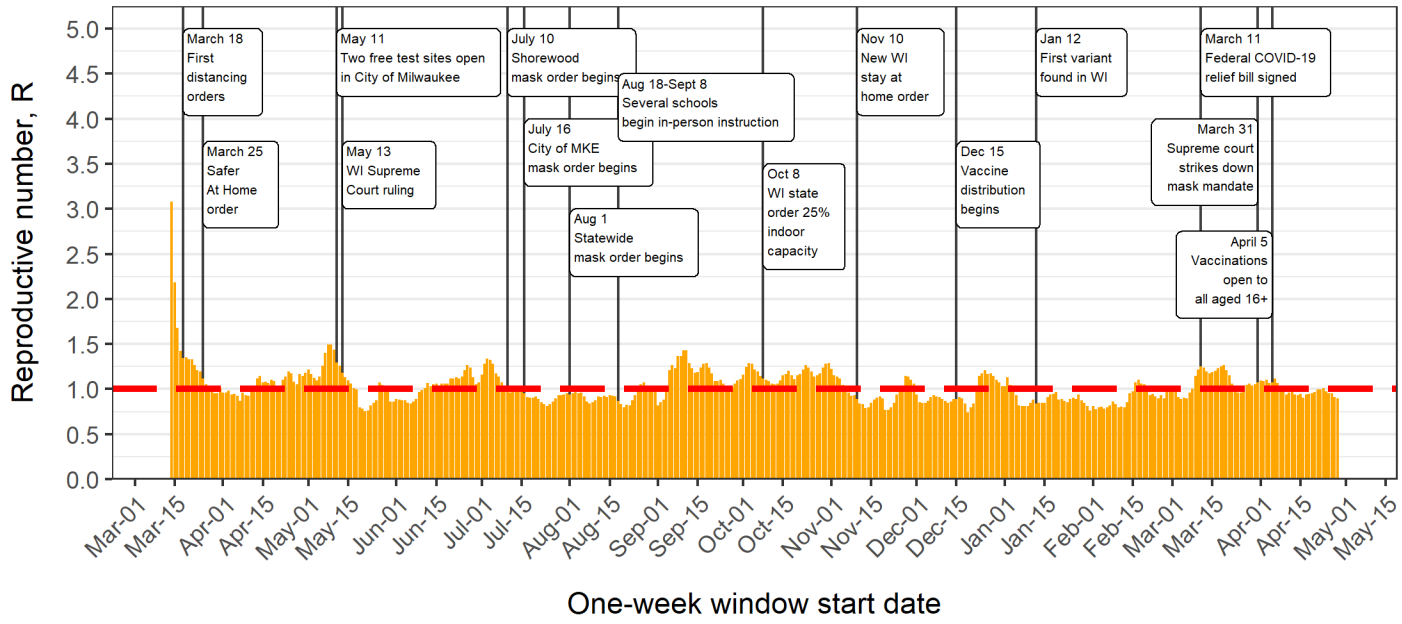
Data sources: WI Department of Health Services & WI Electronic Disease Surveillance System
Created by the Milwaukee County COVID-19 Epidemiology Intel Team

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 5**, the City of Milwaukee, **Figure 6a**, and Milwaukee County suburbs, **Figure 6b**. 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.

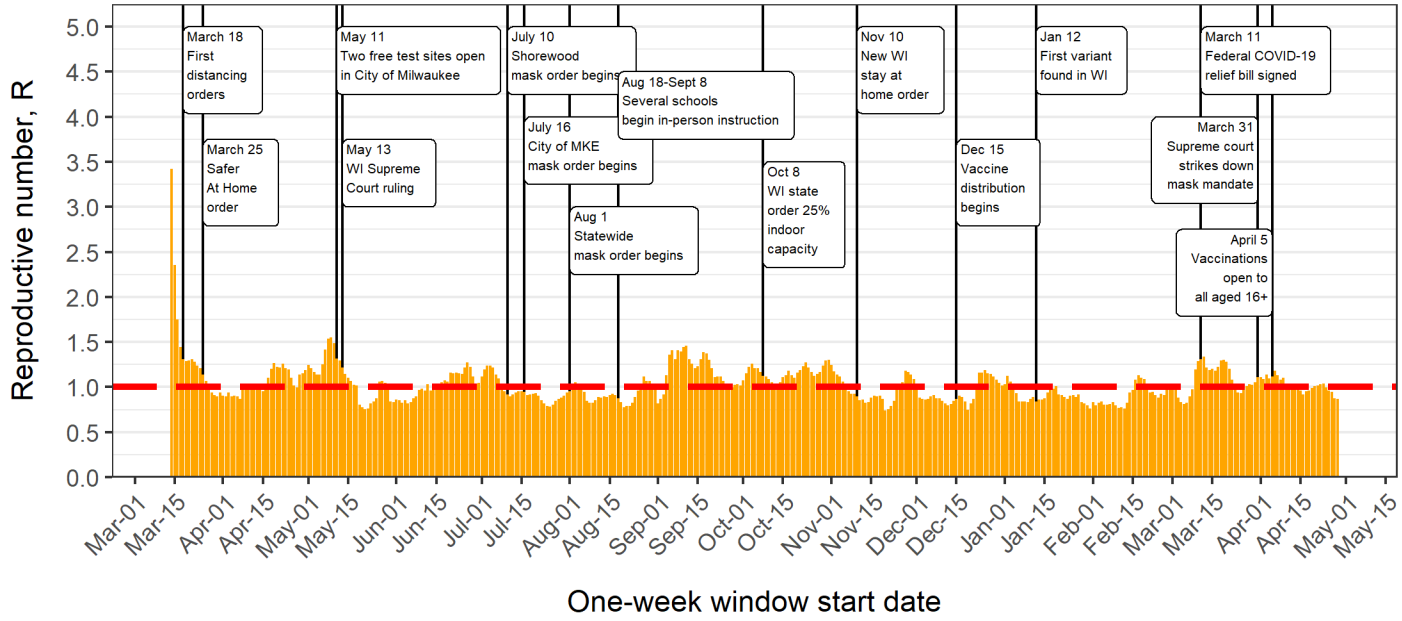
After the first minimum R value in Milwaukee County observed (R = 0.82 on April 30, 2021), we observed an increase in R to a high of 1.49 on May 8, 2020 and then a decrease to a low of 0.75 in the county on May 21, 2020. The R increased again to a more recent high of 1.43 on September 10, 2020. Patterns 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 April 28, 2021 through May 4, 2021 are 0.895 for the county, 0.866 in the city, and 1.006 in the suburbs.

Figure 5: One week reproductive number for Milwaukee County



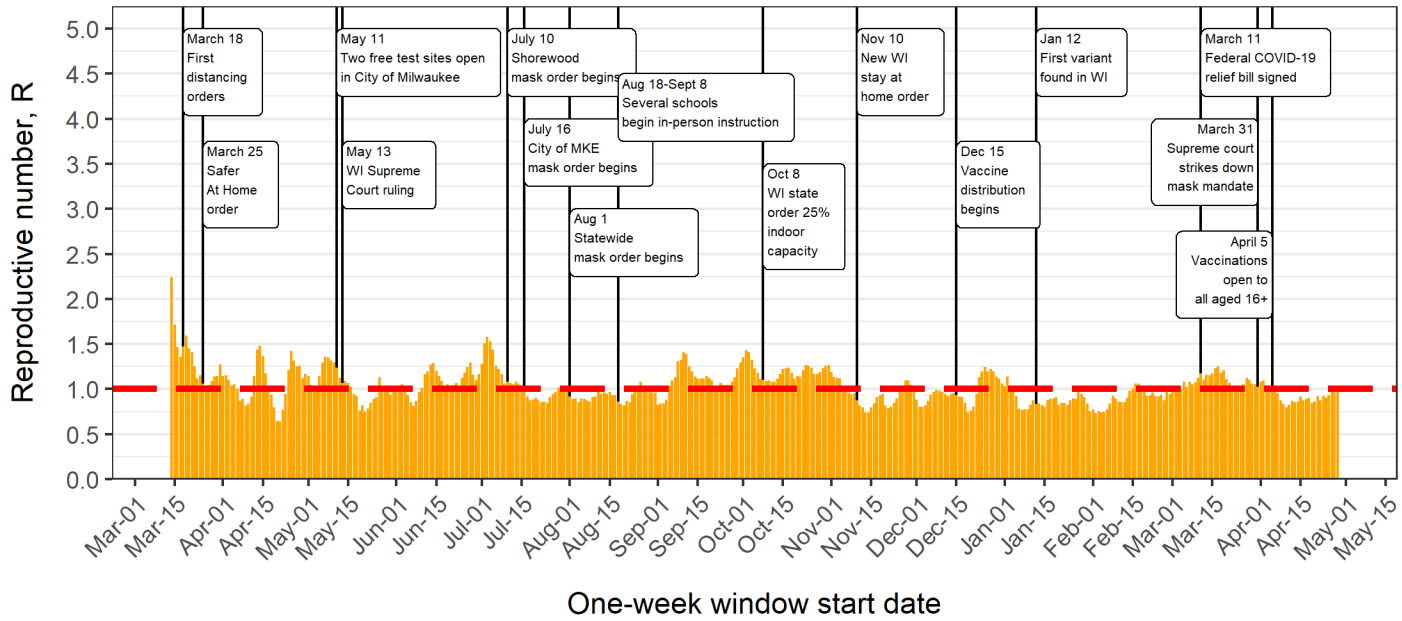
Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County COVID-19 Epidemiology Intel Team

Figure 6a: 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 6b: One week reproductive number for Milwaukee County suburbs



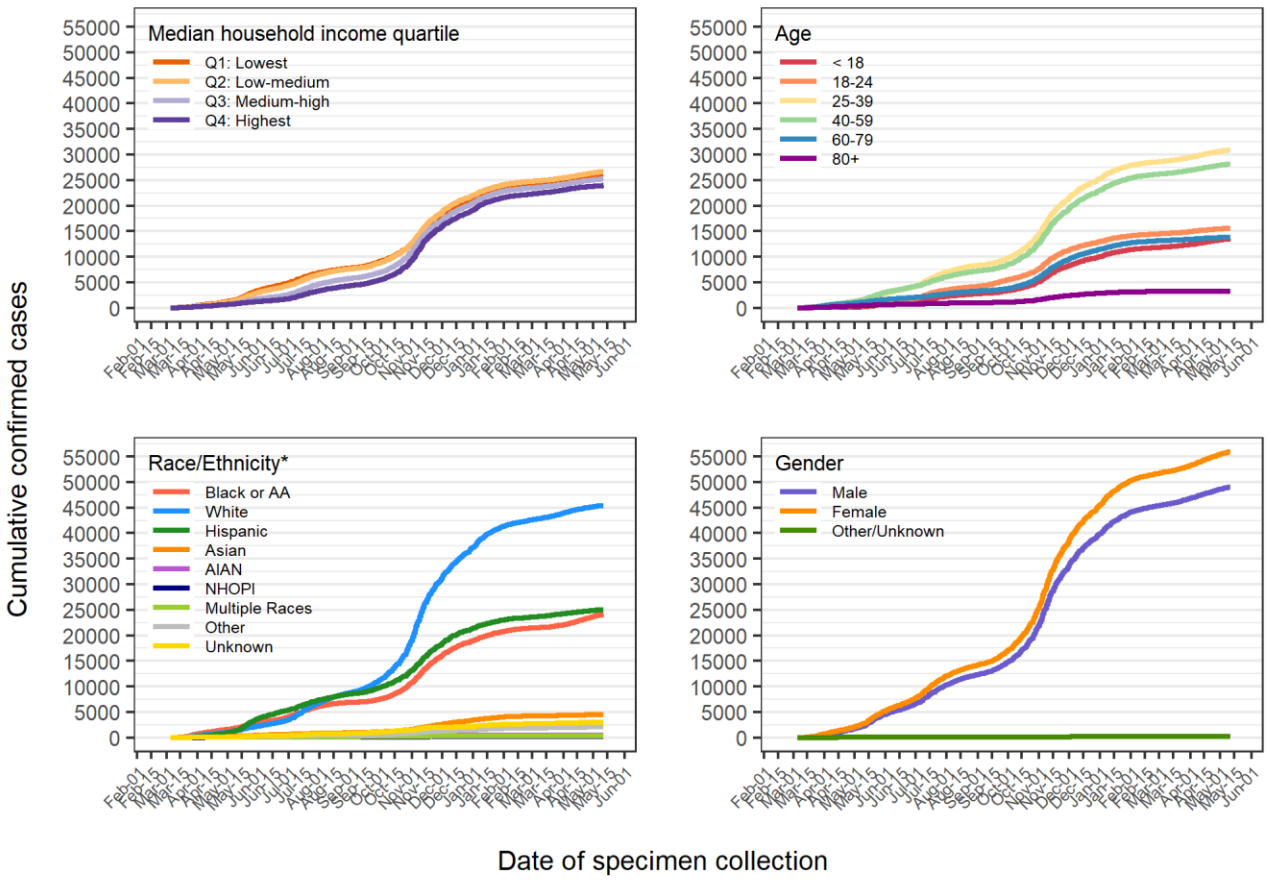
Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County COVID-19 Epidemiology Intel Team

Demographic Patterns – Age, Sex, Race and Ethnicity

Confirmed cases

COVID-19 cases vary by demographic characteristics. **Figure 7** 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. Most diagnosed cases fall within the ages of 18-79. The cumulative number of cases among those aged 25-39 (N = 30880) still exceeds the number among the next highest group, those aged 40-59 (N = 28117). The number of cases under age 18 (N = 13476) approaches the number diagnosed among those 60-79 (N = 13802). Of all confirmed cases, 47% are male and 53% are female. The largest number of cases have been identified among the non-Hispanic White population (N = 45390), followed by the Hispanic population (N = 25022), and the Black/AA population (N = 24061). 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.

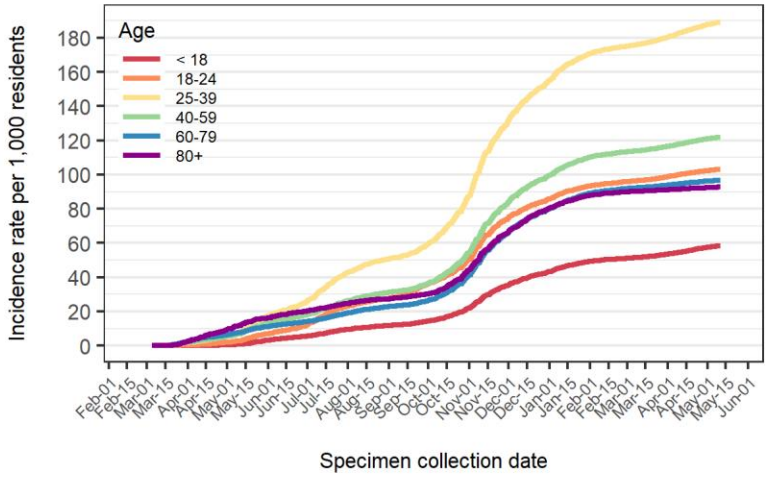
Figure 7: Cumulative confirmed cases in Milwaukee County



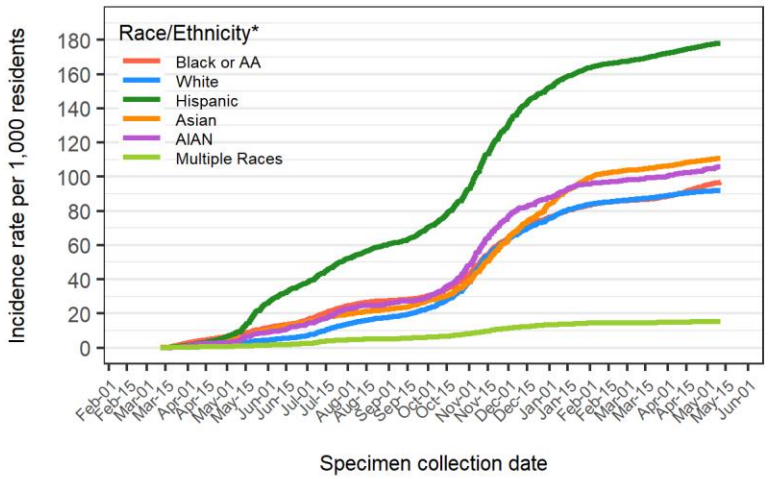
Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County COVID-19 Epidemiology Intel Team
**Race and ethnicity were combined into one variable where the Hispanic category includes Hispanics of any race.*
AIAN stands for American Indian or Alaska Native and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

When examined as population-based rates in **Figure 8**, 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, in the last months, we have seen rates among the younger, working age groups (18-24, 25-39, and 40-59) exceed the rate of those aged 80+. The rate among those 60-79 (96.66 per 1,000) now exceeds that of those aged 80+ (92.67 per 1,000) and the rate among those 40-59 (121.78 per 1,000) exceeds that among those 18-24 (103.03 per 1,000). 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 (178 per 1,000 people) exceeding that among all other racial and ethnic groups. The rates among Asians (110.55 per 1,000 people) and AIANs (105.66 per 1,000 people) come next. Rates among Black/AAs and Non-Hispanic Whites are similar, with a recent increase in the Black/AA rate to (96.63 per 1,000) as compared to the Non-Hispanic White rate (91.93 per 1,000). The rate among females (113.5 per 1,000 people) exceeds the rate among males (106.11 per 1,000 people).

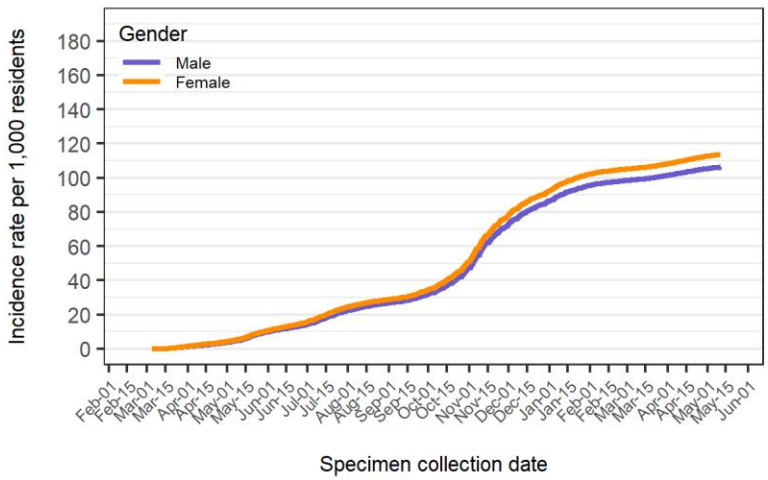
Figure 8: Population based incidence rates in Milwaukee County



Age	N Cases	Population	Rate per 1,000 residents
< 18	13476	231111	58.31
18-24	15546	150895	103.03
25-39	30880	163246	189.16
40-59	28117	230887	121.78
60-79	13802	142783	96.66
80+	3270	35287	92.67



Race/Ethnicity*	N Cases	Population	Rate per 1,000 residents
Black or AA	24061	249011	96.63
White	45390	493723	91.93
Hispanic	25022	140575	178.00
Asian	4471	40443	110.55
AIAN	491	4647	105.66
Multiple Races	373	24224	15.40



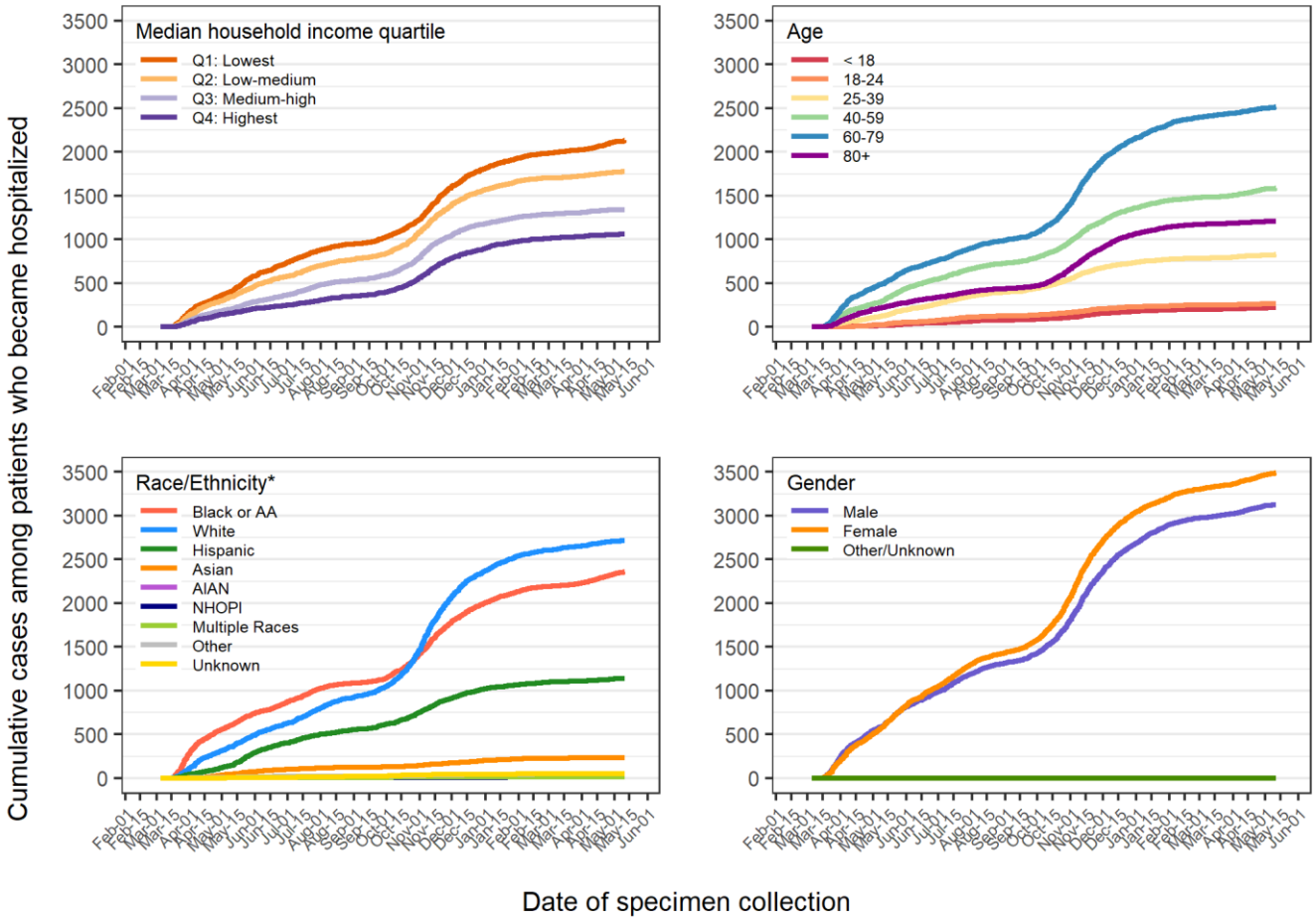
Gender	N Cases	Population	Rate per 1,000 residents
Male	48988	461670	106.11
Female	55905	492539	113.50

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 6618 Milwaukee County residents have been hospitalized due to COVID-19. **Figure 9** 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 = 2514). The highest number of hospitalizations have now occurred among Non-Hispanic White community (N = 2715), followed by the Black/AA community (N = 2360), and then the Hispanic community (N = 1137). Overall, counts are lower among other racial and ethnic groups. Females outnumber males, comprising 52.8% of all hospitalized cases. More individuals among lower income than higher income groups have been hospitalized, with a clear income gradient observed.

Figure 9: Cumulative hospitalizations in Milwaukee County



Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
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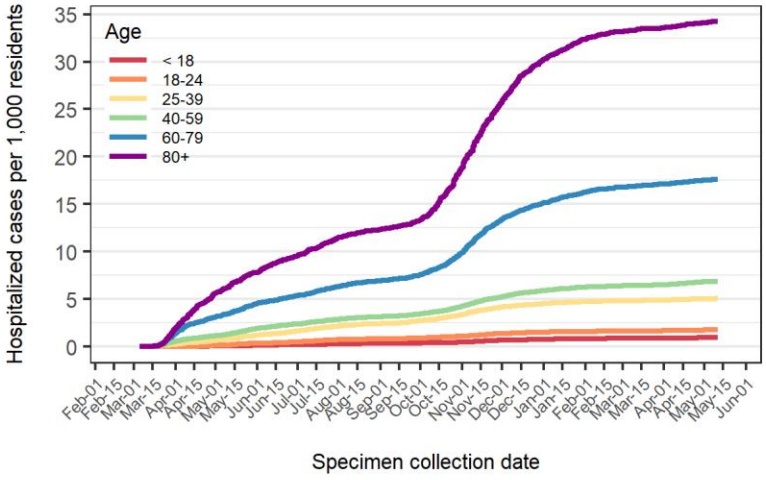
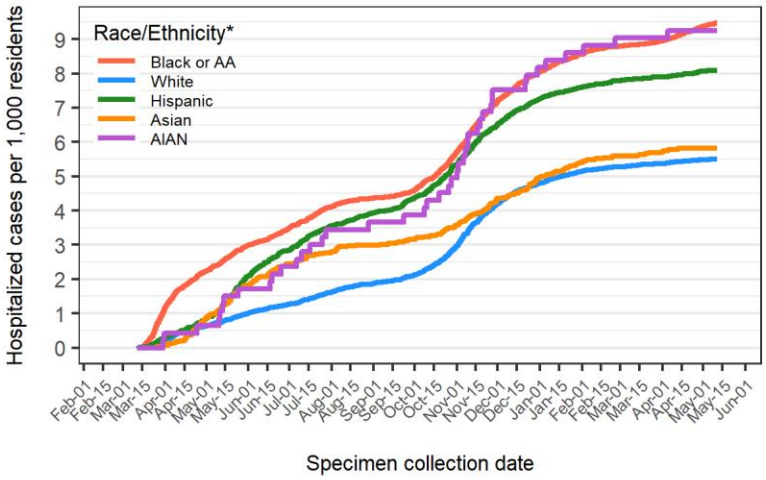
When examined as population-based rates and case-based rates in **Figure 10**, hospitalization patterns are also apparent by demographic characteristics. Both population- and case-based hospitalization rates exhibit a clear age group gradient, with older age groups experiencing higher rates. For race and ethnicity and gender plots, note that the vertical axis has been adjusted this week to reveal variation and the scales are no longer 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 rate is lowest for 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.

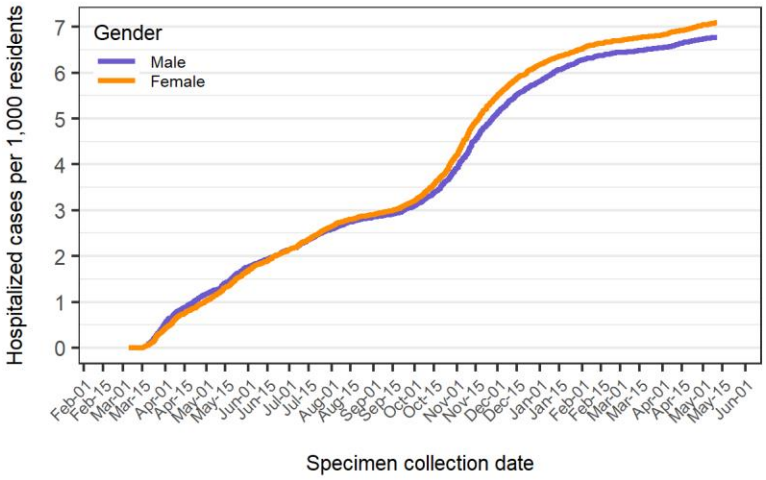
Figure 10: Population and case based hospitalization rates in Milwaukee County



Age	N Hospitalized Cases	Rate per 1,000 residents	Rate per 100 cases
< 18	221	0.96	1.64
18-24	265	1.76	1.70
25-39	826	5.06	2.67
40-59	1585	6.86	5.64
60-79	2514	17.61	18.21
80+	1207	34.21	36.91



Race/Ethnicity*	N Hospitalized Cases	Rate per 1,000 residents	Rate per 100 cases
Black or AA	2360	9.48	9.81
White	2715	5.50	5.98
Hispanic	1137	8.09	4.54
Asian	235	5.81	5.26
AIAN	43	9.25	8.76



Gender	N Hospitalized Cases	Rate per 1,000 residents	Rate per 100 cases
Male	3124	6.77	6.38
Female	3492	7.09	6.25

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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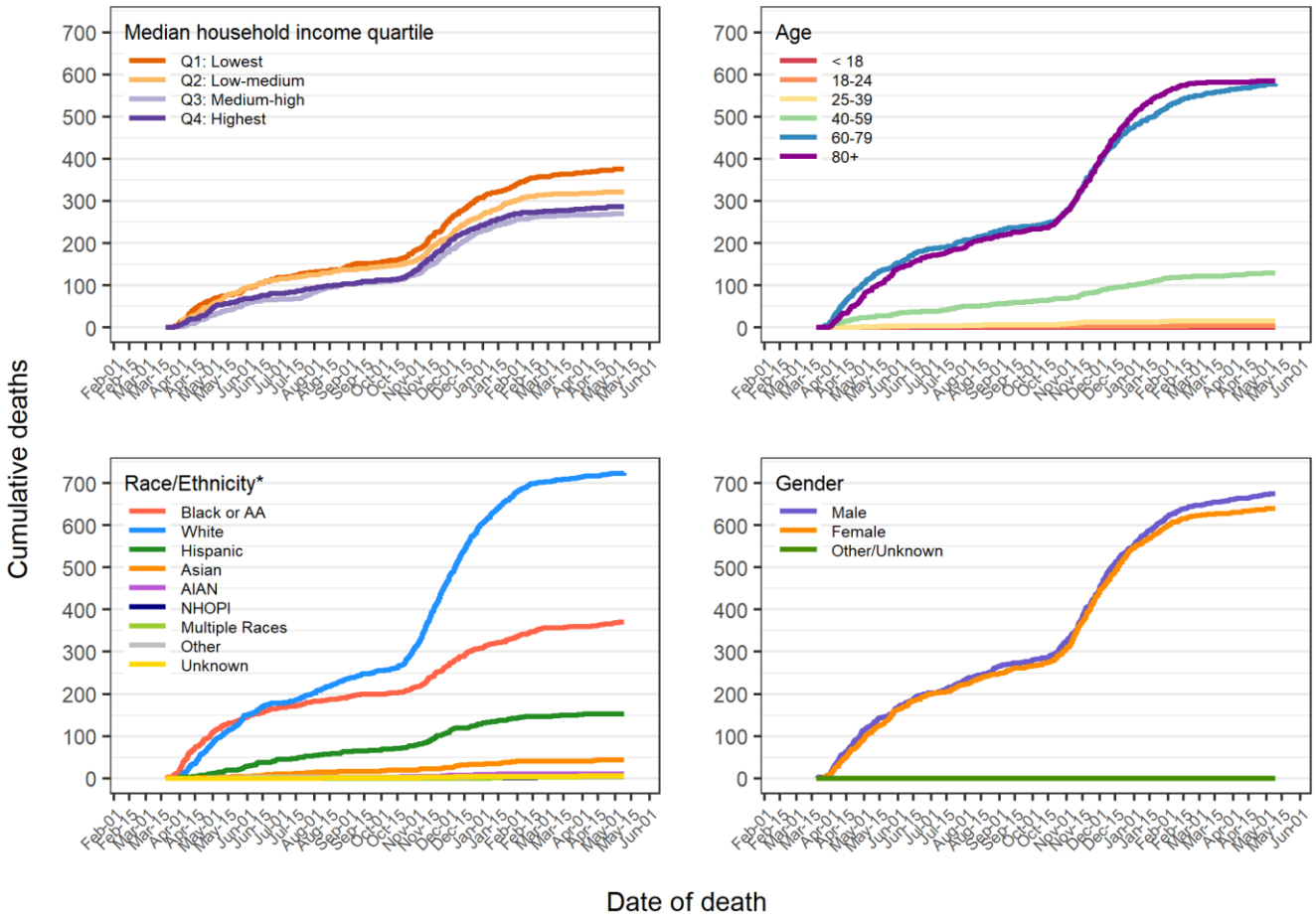
Deaths

There are now a total of 1314 confirmed deaths in Milwaukee County, representing a case fatality rate of 1.3%. We observed 1 new death over the past week in the county. Mortality patterns differ by demographic characteristics, as shown in **Figure 11**. The largest number of deaths are recorded among those age 60 or older. The largest number of deaths are recorded for males (N = 675) and for non-Hispanic Whites (N = 724) followed by Black/AA residents (N = 370). 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 11: Cumulative deaths in Milwaukee County



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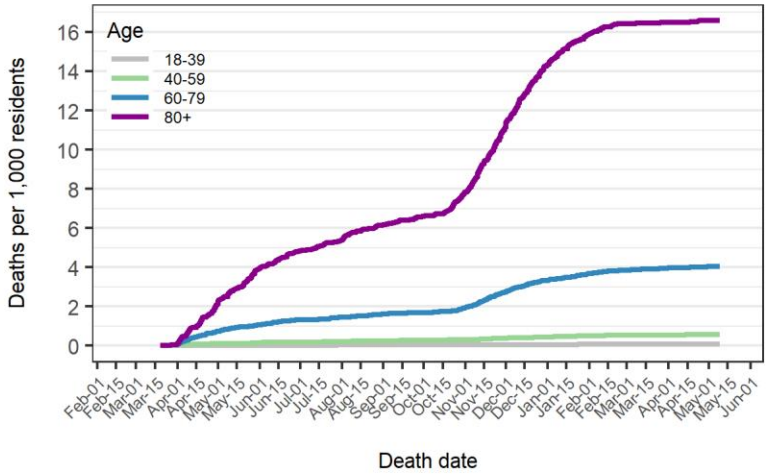
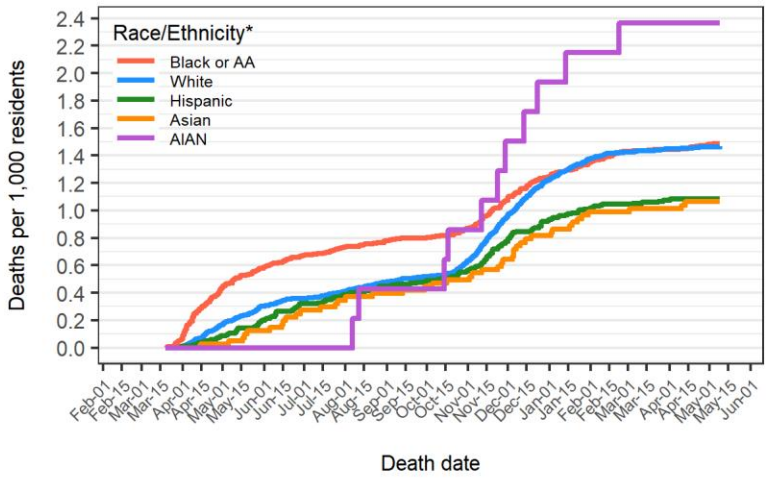
In terms of population- and case-based rates shown in **Figure 12**, there is a clear age category gradient, with higher death rates among older populations. For race and ethnicity and gender plots, note that the vertical axis has been adjusted this week to reveal variation and the scales are no longer 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.

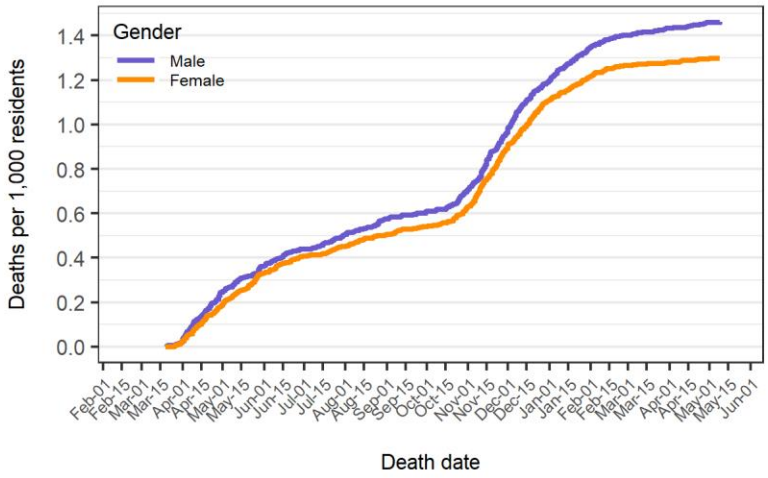
Figure 12: Population and case based death rates in Milwaukee County



Age	N Deaths	Rate per 1,000 residents	Rate per 100 cases
18-39	21	0.07	0.05
40-59	129	0.56	0.46
60-79	578	4.05	4.19
80+	585	16.58	17.89



Race/Ethnicity*	N Deaths	Rate per 1,000 residents	Rate per 100 cases
Black or AA	370	1.49	1.54
White	724	1.47	1.60
Hispanic	152	1.08	0.61
Asian	43	1.06	0.96
AIAN	11	2.37	2.24



Gender	N Deaths	Rate per 1,000 residents	Rate per 100 cases
Male	675	1.46	1.38
Female	639	1.30	1.14

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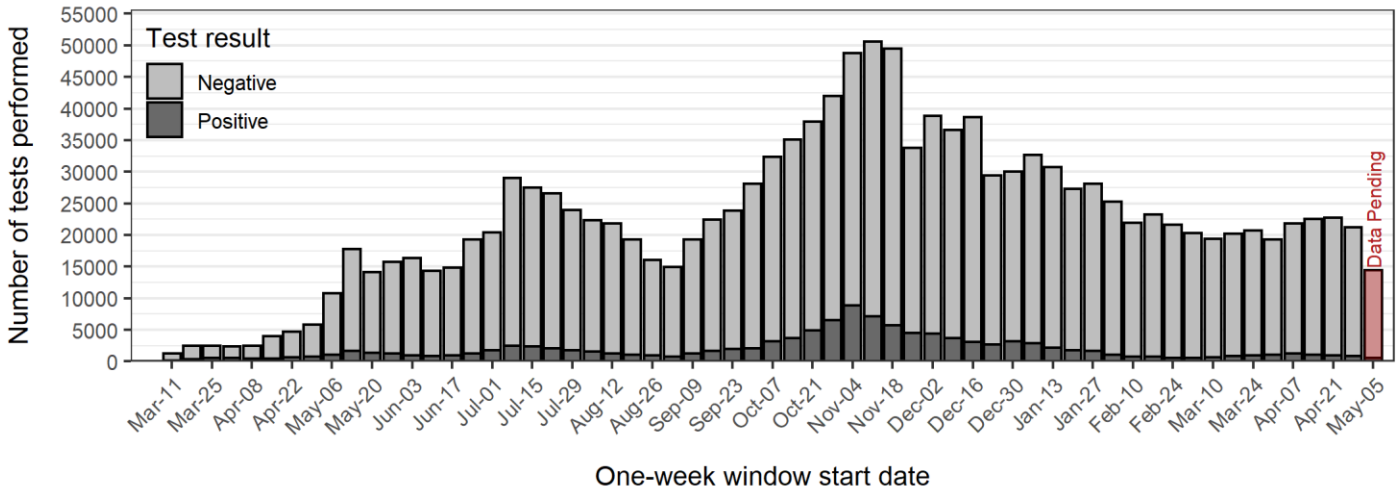
Testing Coverage

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 1381354 COVID-19 tests have been performed, with 1263454 negative results and 117900 positive results. This represents a positive test rate of 8.5% since the beginning of the epidemic.

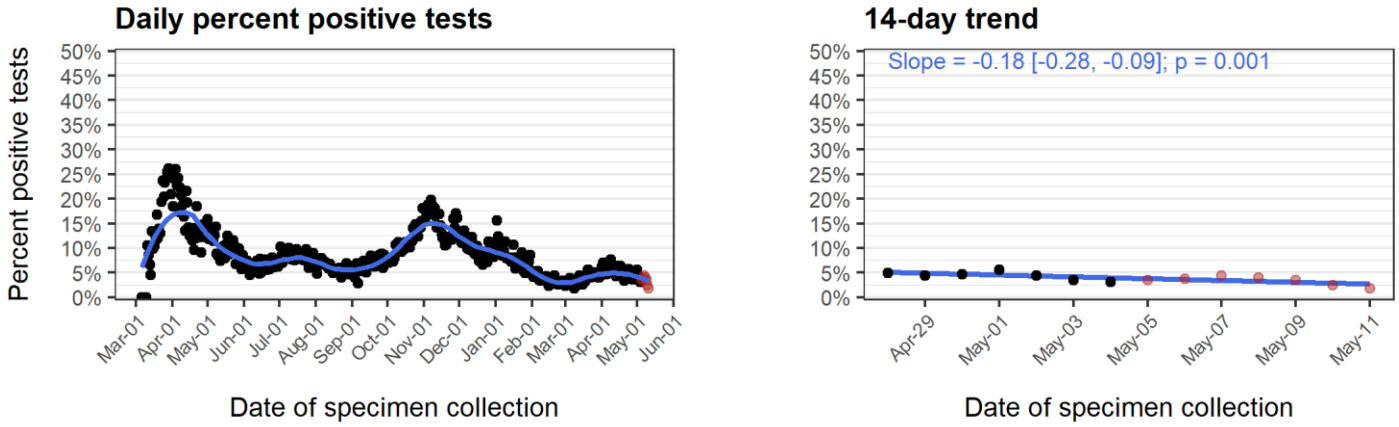
As shown in **Figure 13**, total tests per week increased until early July and then declined, with another increase starting in early September and peaking in early November, followed by a decline. Testing markedly decreased the weeks of Thanksgiving, Christmas, and the New Year. As shown in **Figure 14**, the percentage of positive tests varied over the course of the epidemic, with a high of 25-30% in early April. The percentage of positive tests was 3.5% over the past week compared to 4.2% the previous week. **Figure 14** also illustrates the 14-day trend in the percent positive tests, showing a significant decrease. 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 13: 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 14: Milwaukee County percent positive tests



Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
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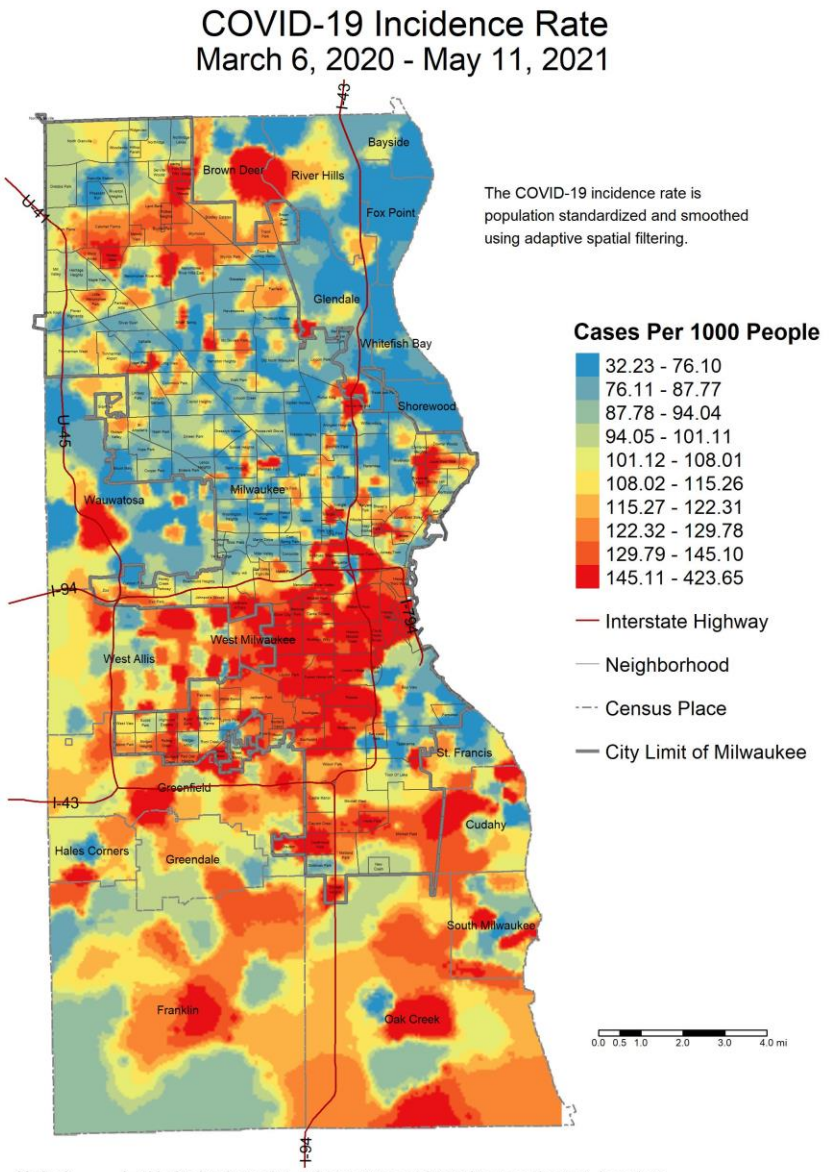
Spatial Patterns of Cases and Testing

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

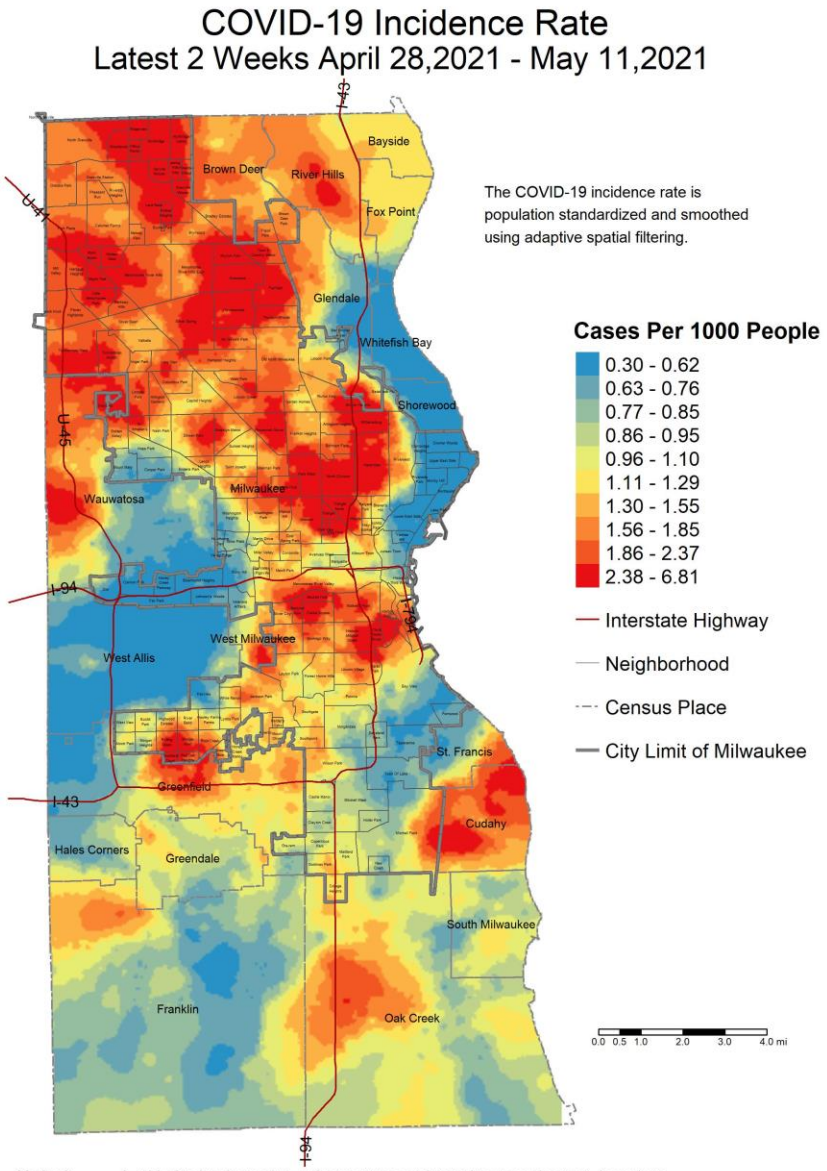


Method: A grid of points is used to estimate rates continuously across the map, based on the nearest cases with a minimum of 15 confirmed cases included.

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



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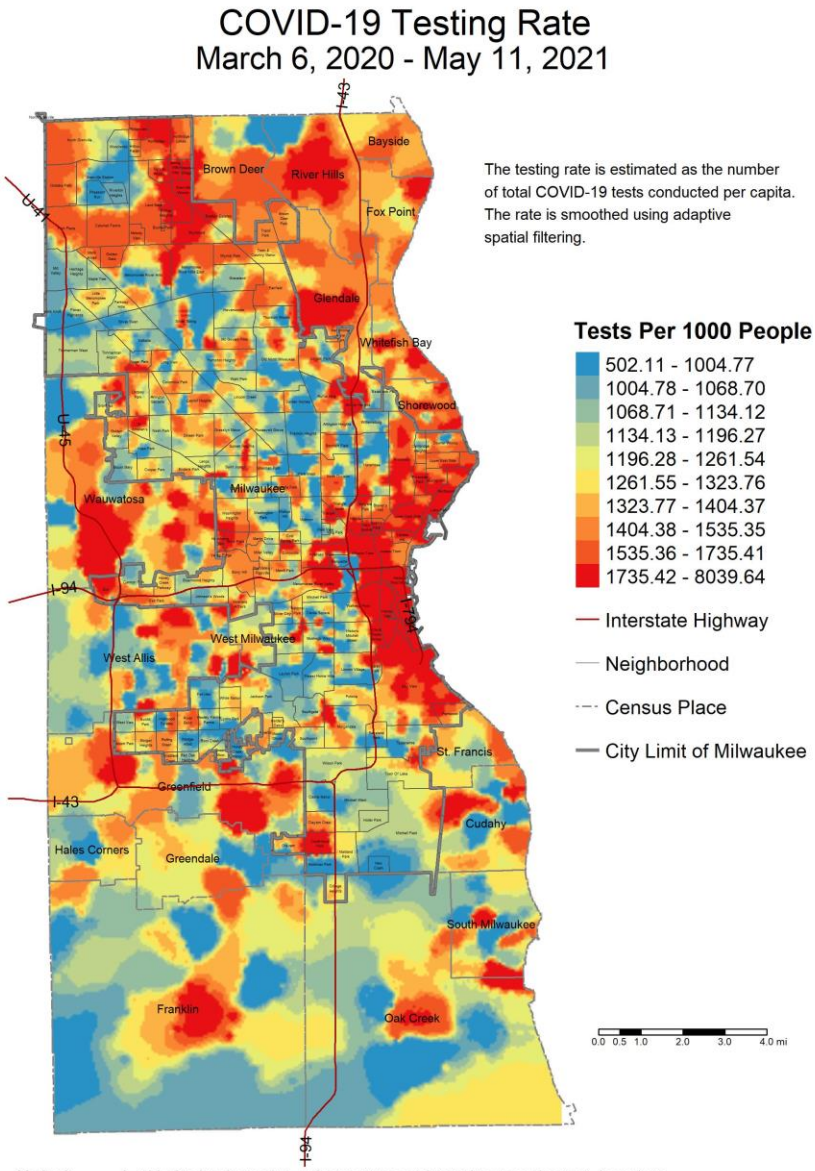
City of Milwaukee Map Milwaukee Portal (neighborhood boundaries)
Census Bureau TIGER/Line Shapefiles (census place boundaries)
Created by the Milwaukee County Covid-19 Epidemiology Intel Team

Decile Map 3: Overall testing rate

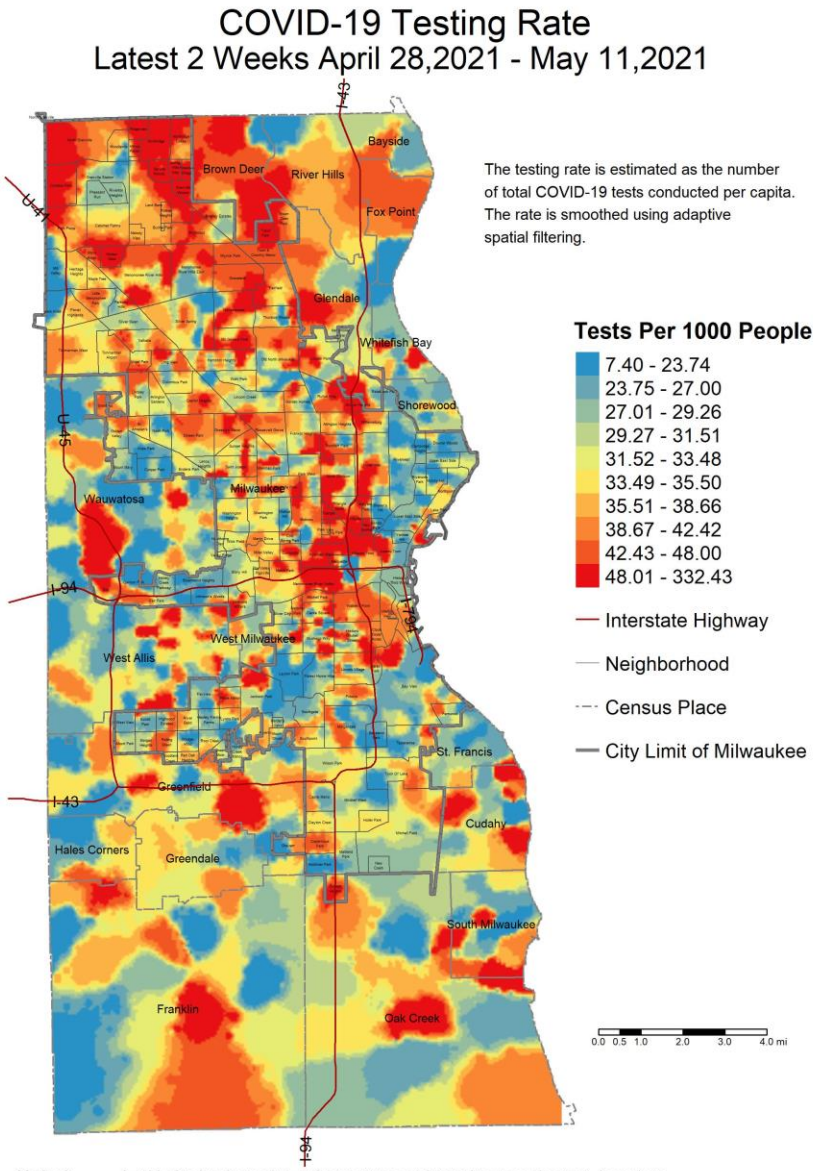


Method: A grid of points is used to estimate rates continuously across the map, based on the nearest cases with a minimum of 15 tests included.

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)
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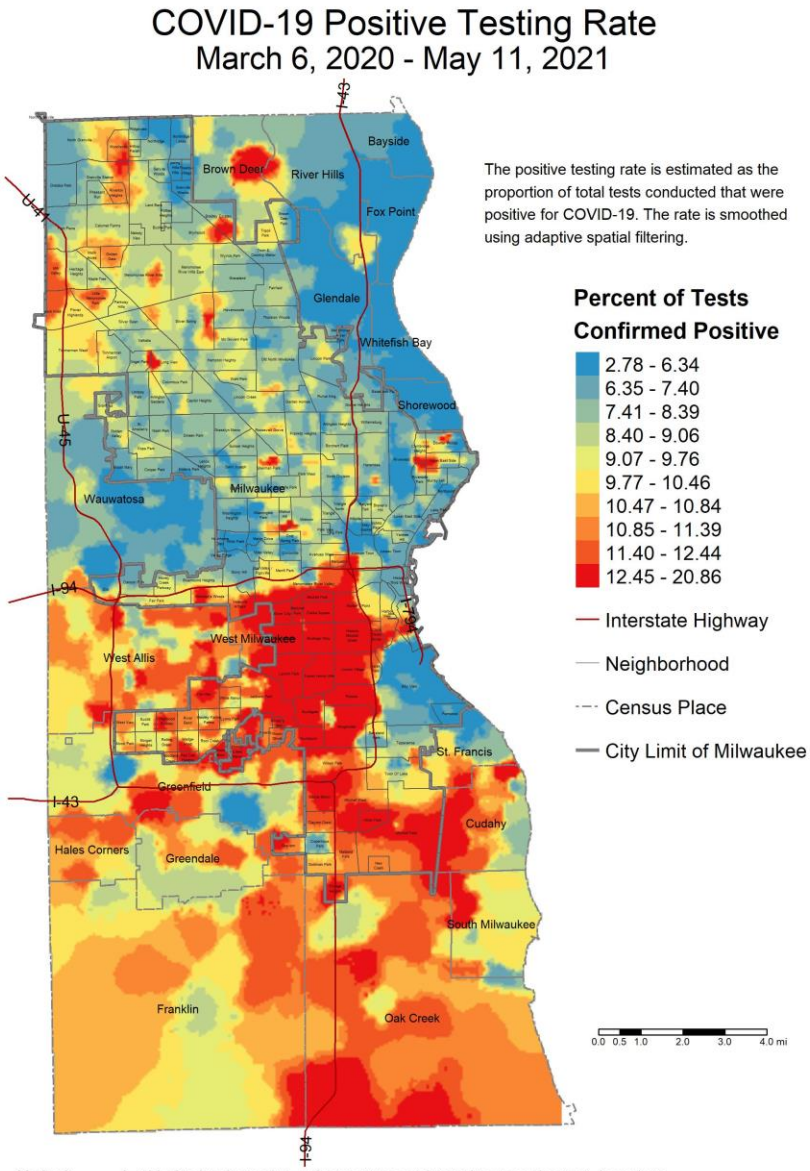
Decile Map 5: Percentage of tests that were confirmed positive



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)
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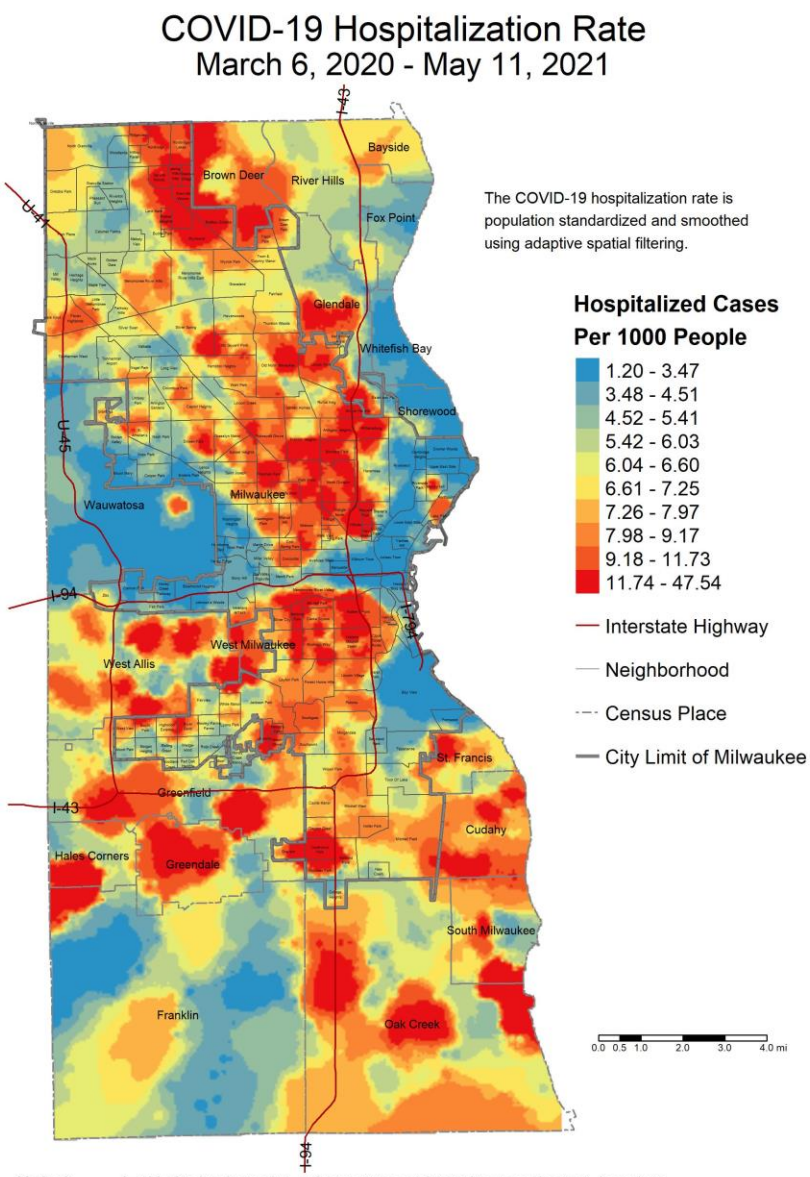
Decile Map 6: COVID-19 related hospitalizations



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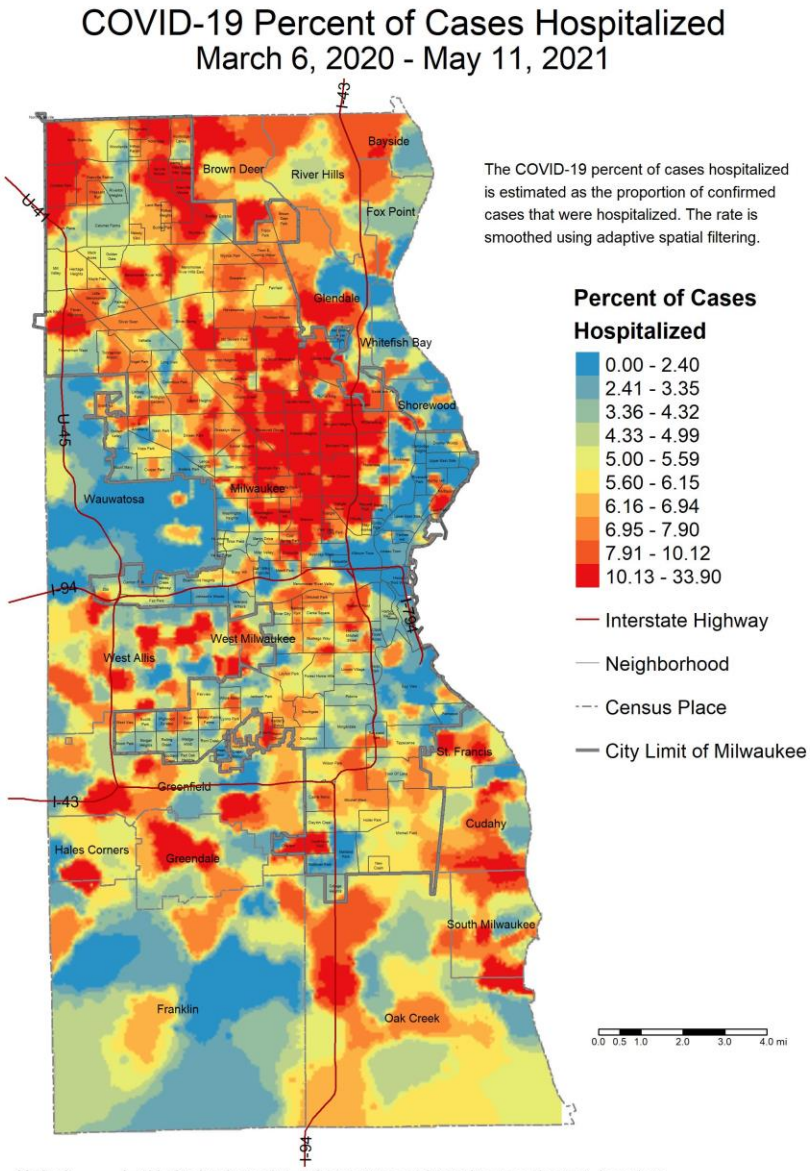
Decile Map 7: Percentage of COVID-19 cases that were hospitalized



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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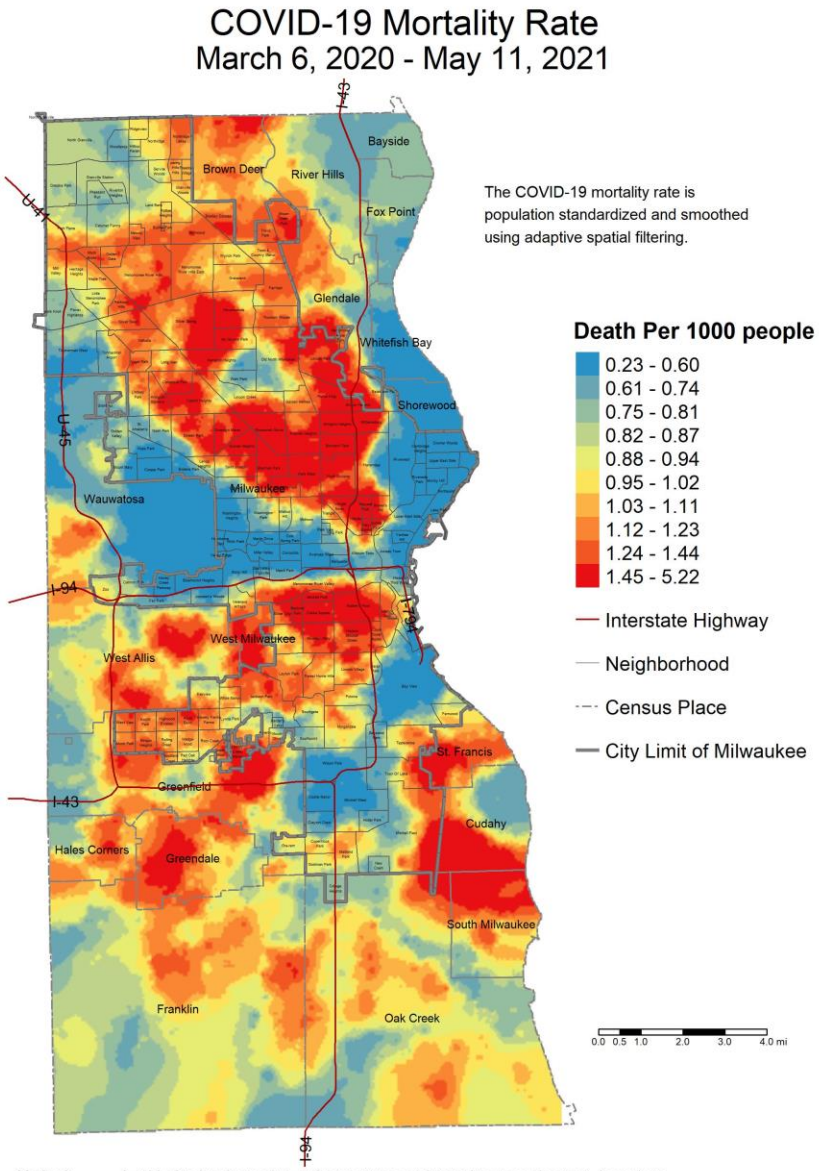
Decile Map 8: COVID-19 mortality rate (group-quarter cases excluded)



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 May 5, 2021 through May 11, 2021. This work was funded by the Advancing a Healthier Wisconsin Endowment at the Medical College of Wisconsin.

Contact Information

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