Milwaukee County COVID-19 Data Summary

Milwaukee County COVID-19 Epidemiology Intel Team

This report was updated on June 11, 2020 and includes data through June 9, 2020. Note that data for recent weeks may be under-reported due to pending test results.

Milwaukee County COVID-19 Summary Statistics

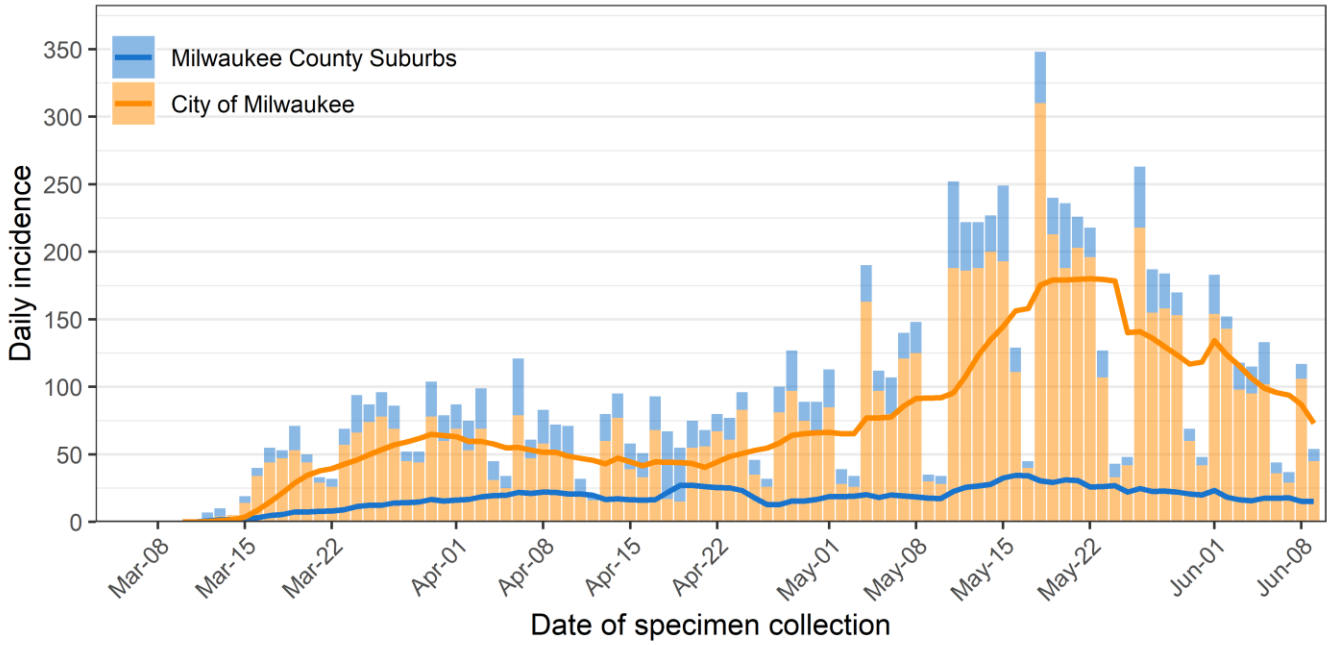
Overall Milwaukee County COVID-19 Summary Statistics March 4 - June 9	
Number of tests	71,141
Number of cases	8,931
Percentage of positive tests	12.6%
Number of hospitalizations	1,215
Number of deaths	322
Case fatality rate	3.6%

Weekly Milwaukee County COVID-19 Summary Statistics June 3 - June 9	
Number of tests	6,933
Number of cases	618
Percentage of positive tests	8.9%
Number of hospitalizations	130
Number of deaths	7

Total Cases and New Cases

There are now a total of 8931 cases in Milwaukee County, since the first case on March 11th, 2020. Over the last week, we observed 618 new confirmed cases in Milwaukee County, including 511 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. Over the last week, we have seen a decrease in confirmed cases. The highest daily case count since the beginning of the epidemic occurred on May 18, 2020, with 348 cases in the county overall and 310 cases in the city. Of note, two free testing sites opened to the public within the City of Milwaukee on May 11th, which may have resulted in the identification of a large number of new cases; one of these sites, on the north side of the city, closed as of May 24th.

Figure 1: Milwaukee Co. daily number of COVID-19 cases

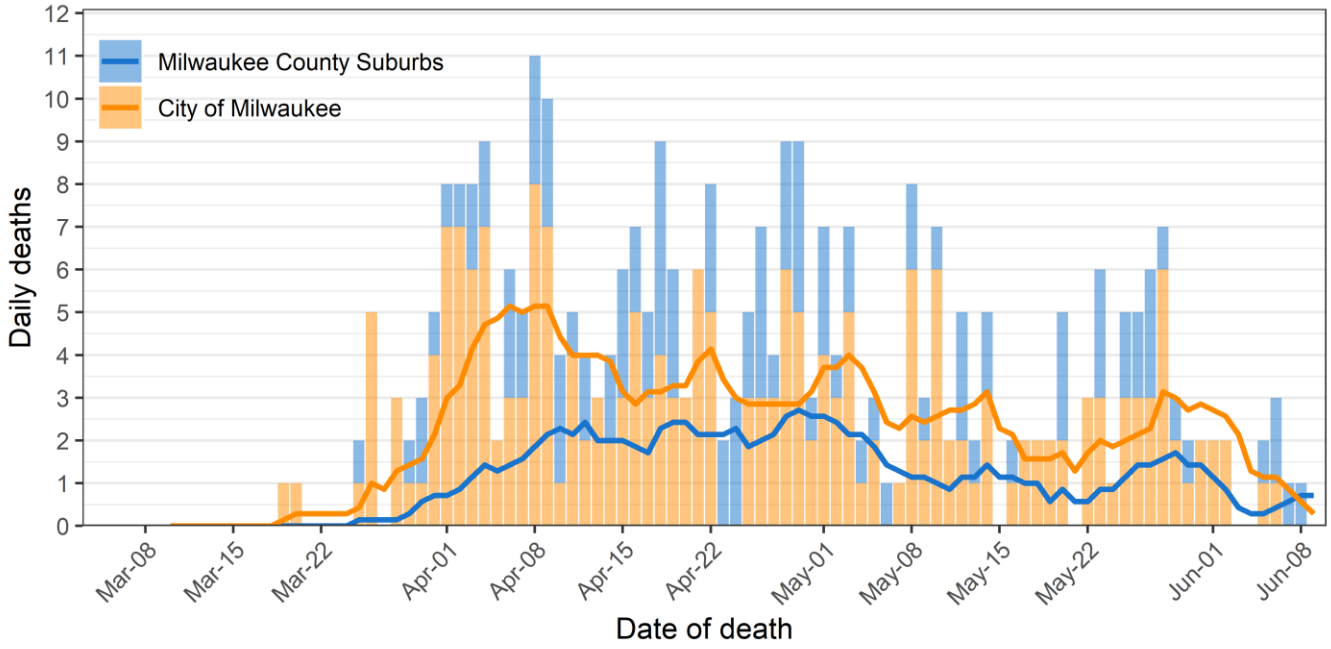


Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County COVID-19 Epidemiology Intel Team

Total Deaths and New Deaths

There are a total of 322 COVID-19 related deaths in Milwaukee County. Over the last week, we observed 7 deaths, including 2 in 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. Overall, there appears to be a decrease in the daily number of deaths observed, from a peak of 11 deaths on April 8, 2020. Several smaller peaks in deaths are notable since April 8th.

Figure 2: Milwaukee Co. COVID-19 daily deaths

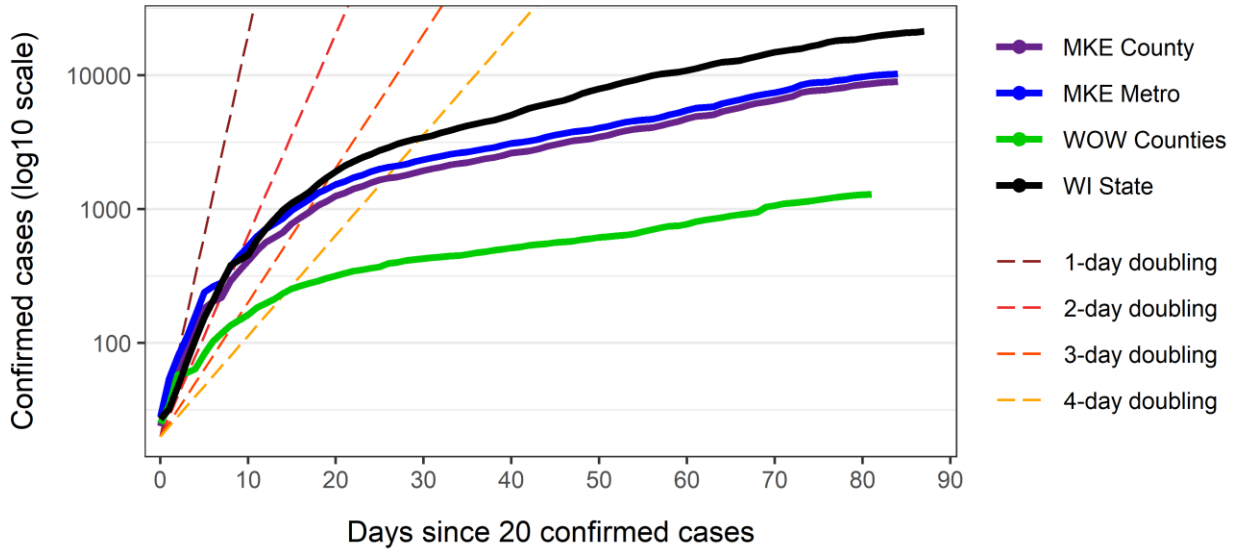


Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County COVID-19 Epidemiology Intel Team

The COVID-19 Growth Rate

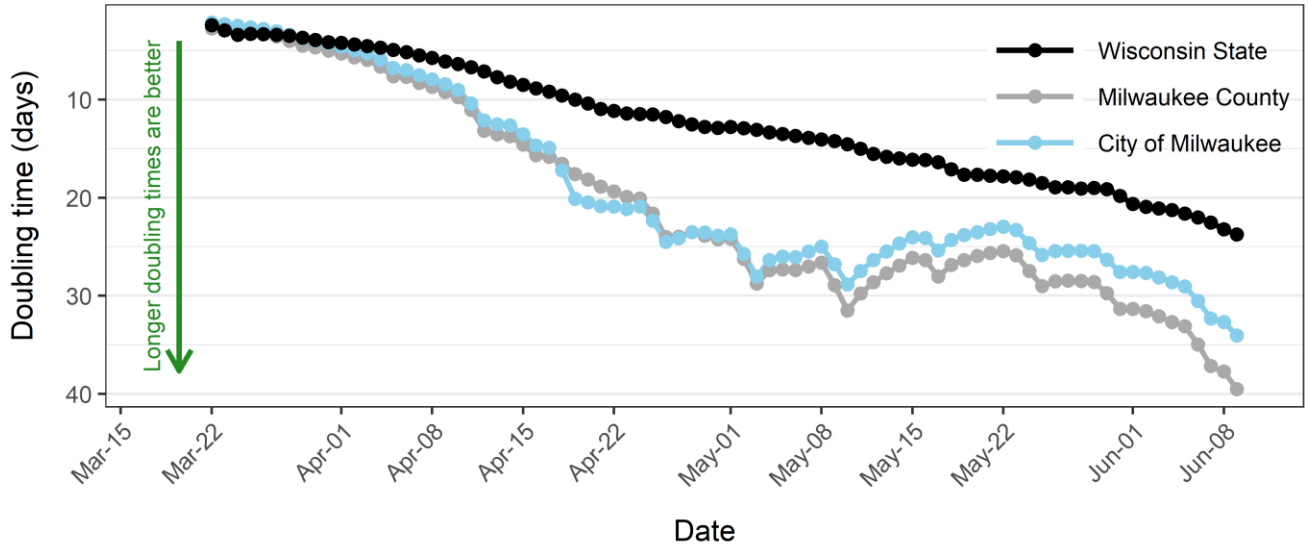
The time it takes for the number of cases to double is called the doubling time. **Figure 3** shows doubling times for Milwaukee County, the surrounding Waukesha, Ozaukee and Walworth (WOW) counties, the M7 (7-county) metropolitan area, and the state of Wisconsin. Dotted lines indicate doubling times 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 39.51 days. The current doubling time for WOW counties is 21.95 days. The current doubling time for the state of Wisconsin is 23.73 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

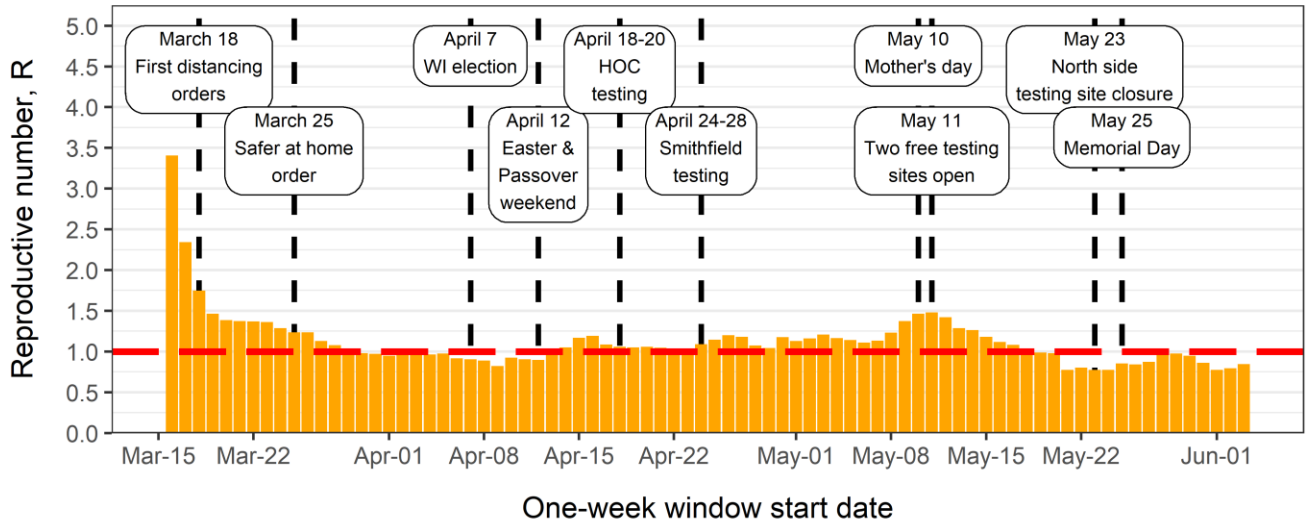


Data sources: WI Department of Health Services & WI Electronic Disease Surveillance System
Created by the Milwaukee County Covid-19 Epidemiology Intel Team

The COVID-19 Reproductive Number

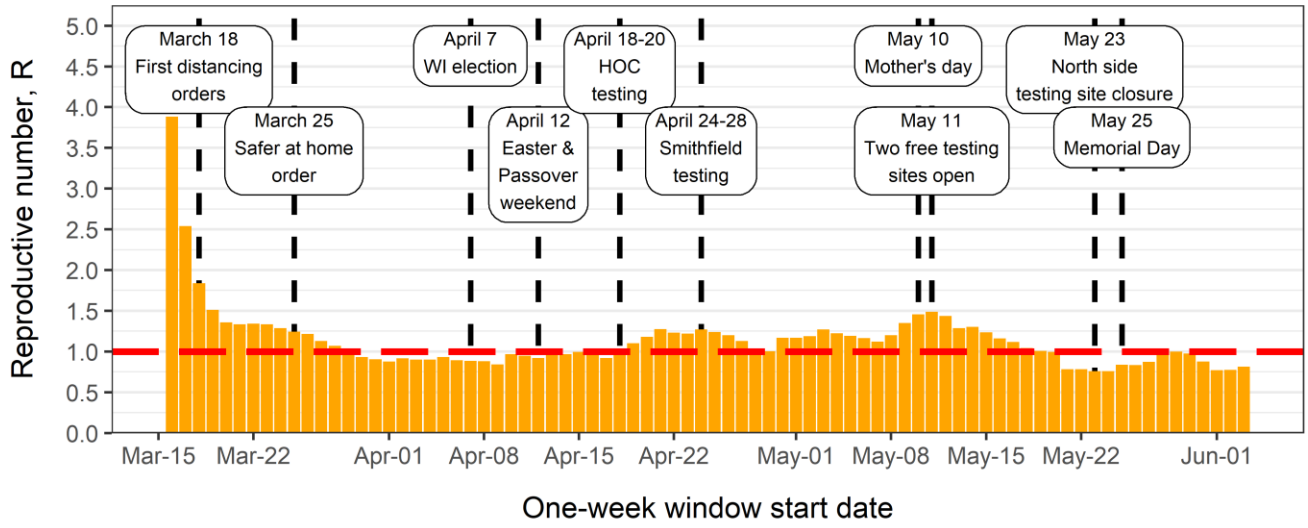
Another way of examining the growth rate of the infection is to examine the reproductive number (R). This number captures the number of new cases that are the result of an existing case. For example, an R of 2 would indicate that each infected person infects 2 new people. The following plots show the change in R over time for Milwaukee County, **Figure 5**, and the City of Milwaukee, **Figure 6**, including 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. After the previous lowest R value in Milwaukee County observed (R = 0.82 on April 9, 2020), we observed an increase in R to a high of 1.48 on May 11, 2020. Over the last two weeks, the R has decreased to a low of 0.77 in the county on May 23, 2020. Patterns in the City of Milwaukee are very similar to those in the county as a whole, with a recent low of 0.76 on May 24, 2020.

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 6: 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

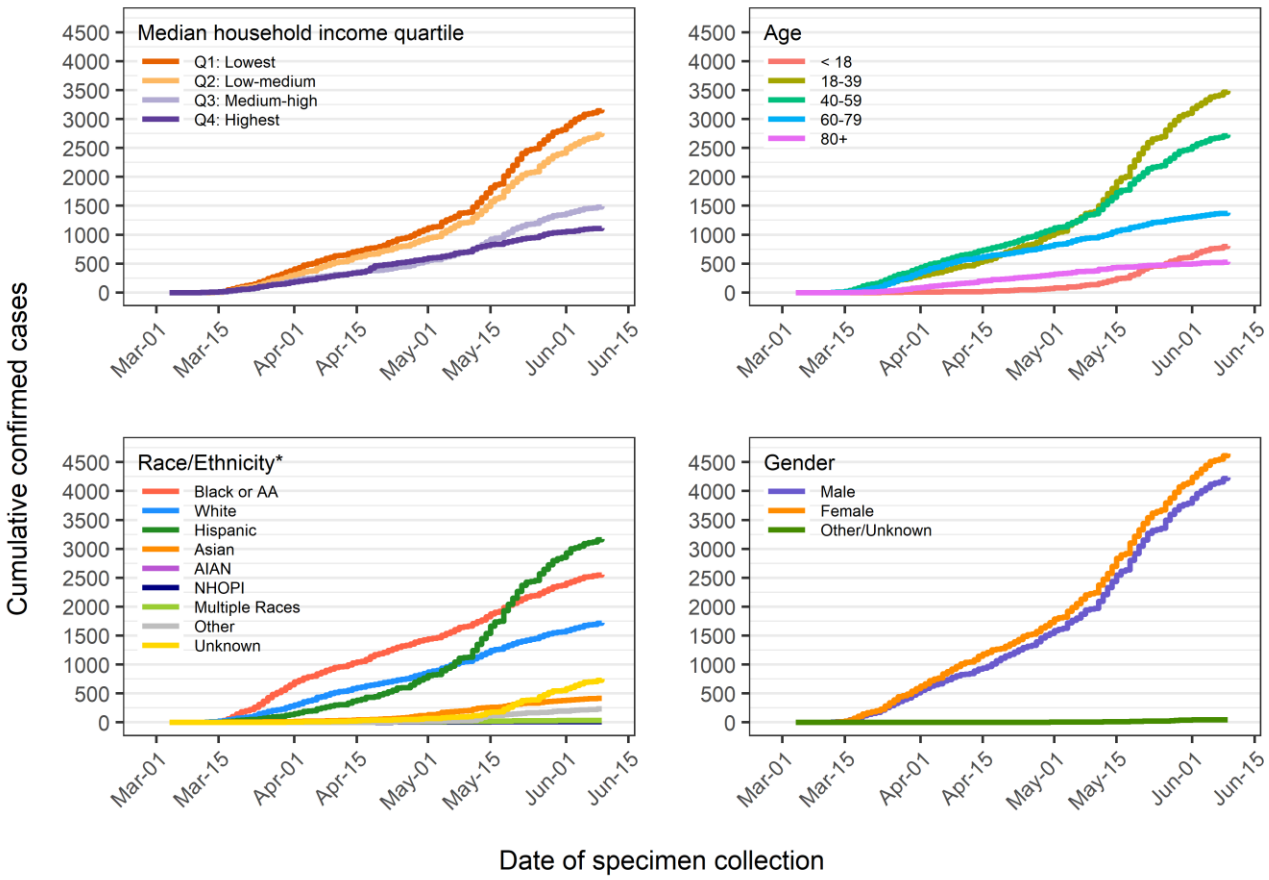
Demographic Patterns – Age, Sex, Race and Ethnicity

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. Of all confirmed cases, 47% are male and 52% are female. The largest number of cases have been diagnosed among the Hispanic population, followed by the Black/AA population. 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 fewest cases identified among the highest income group. Over the past week, we have seen a continued increase in cases among the Hispanic community (N = 3172), exceeding those among the Black/AA community (N = 2555). We have also seen an increase among those of unknown race or ethnicity.

Of note, the number of cases among Asians has increased slowly over the last few weeks, to a total of (N = 418). We have further observed increases among individuals in the two lowest income groups, and those ages 18-59, with similar increases for both sexes. The cumulative number of cases among those ages 18-39 (N = 3491) exceeds the number among those ages 40-59 (N = 2727). In the last two weeks, we saw the number of cases under age 18 (N = 801) increase to exceed the number of cases among those 80 or older (N = 533).

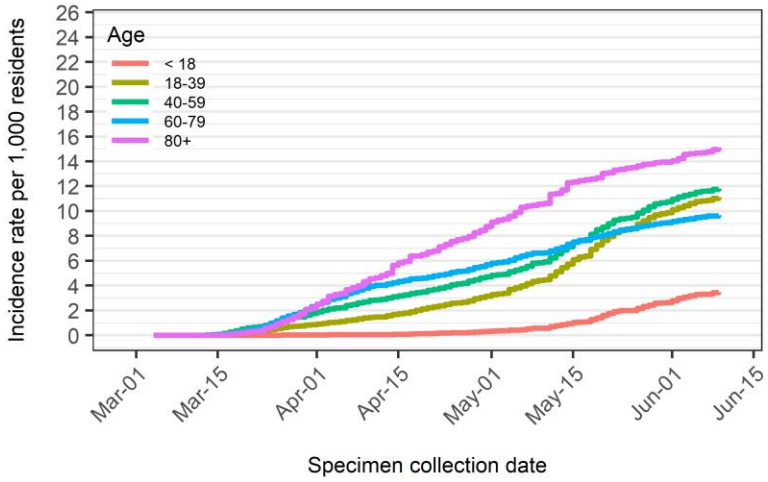
Figure 7: Cumulative confirmed cases in Milwaukee County



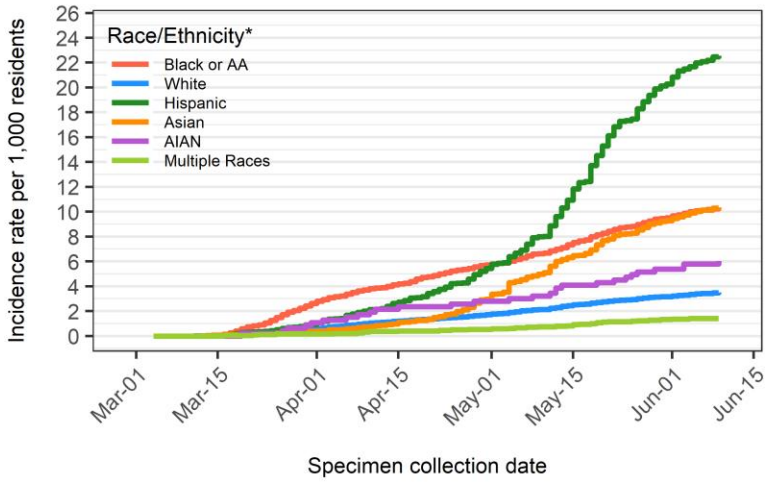
Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County COVID-19 Epidemiology Intel Team
**Race and ethnicity were combined into one variable where the Hispanic category includes Hispanics of any race.*
AIAN stands for American Indian or Alaska Native and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

When examined as population-based rates in **Figure 8**, demographic patterns are also apparent. For most of the epidemic, we saw a clear age gradient in population-based rates, with older populations experiencing greater rates. However, in the last weeks, we have seen a deviation from this pattern, with rates among two younger, working age groups (18-39, 40-59) exceeding the rate among the 60-79 age group. By race and ethnicity, the rate was highest among Black/AA populations until the beginning of May, when we observed a surge among Hispanics resulting in the Hispanic rate (22.56 per 1,000 people) exceeding that among all other racial and ethnic groups. The current population-based rate of COVID-19 diagnosis is similar among Black/AA and Asian populations, with lower rates among all other racial and ethnic groups. Rates are very similar among males and females.

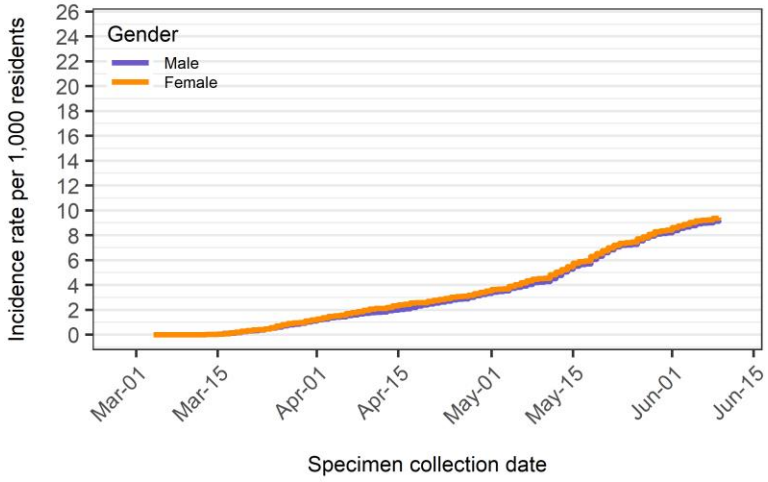
Figure 8: Population based incidence rates in Milwaukee County



Age	N Cases	Population	Rate per 1,000 residents
< 18	801	231111	3.47
18-39	3491	314141	11.11
40-59	2727	230887	11.81
60-79	1379	142783	9.66
80+	533	35287	15.10



Race/Ethnicity*	N Cases	Population	Rate per 1,000 residents
Black or AA	2555	249011	10.26
White	1723	493723	3.49
Hispanic	3172	140575	22.56
Asian	418	40443	10.34
AIAN	28	4647	6.03
Multiple Races	34	24224	1.40



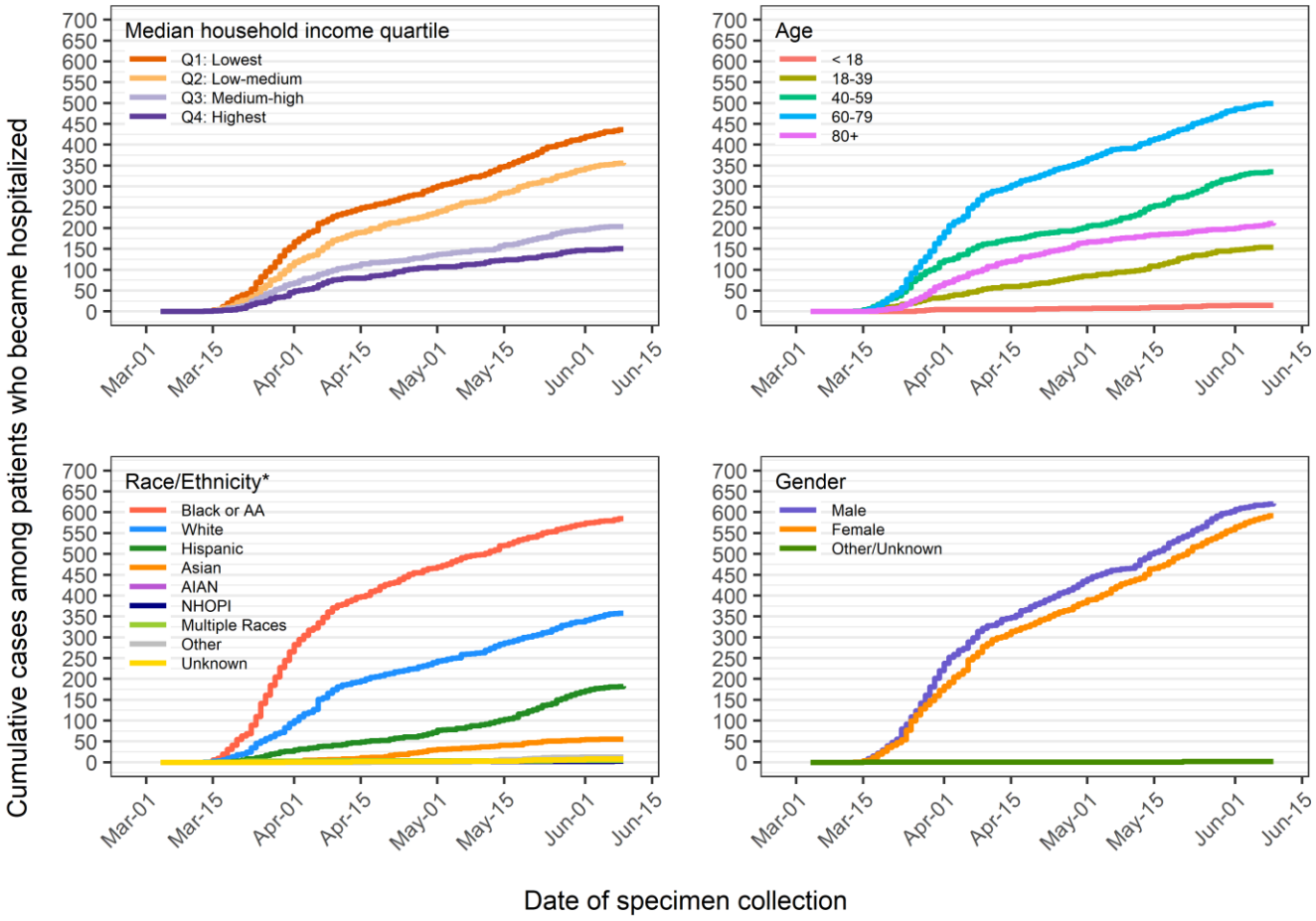
Gender	N Cases	Population	Rate per 1,000 residents
Male	4238	461670	9.18
Female	4646	492539	9.43

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 1215 individuals have been hospitalized due to COVID-19 in the county. **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 = 499). The highest number of hospitalizations have occurred among the Black/AA community (N = 585), followed by the Non-Hispanic White community (N = 358) and then the Hispanic community (N = 183) Overall, counts are lower among other racial and ethnic groups. By sex, males are hospitalized more often than females, comprising 51% of the total 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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**Race and ethnicity were combined into one variable where the Hispanic category includes Hispanics of any race.*
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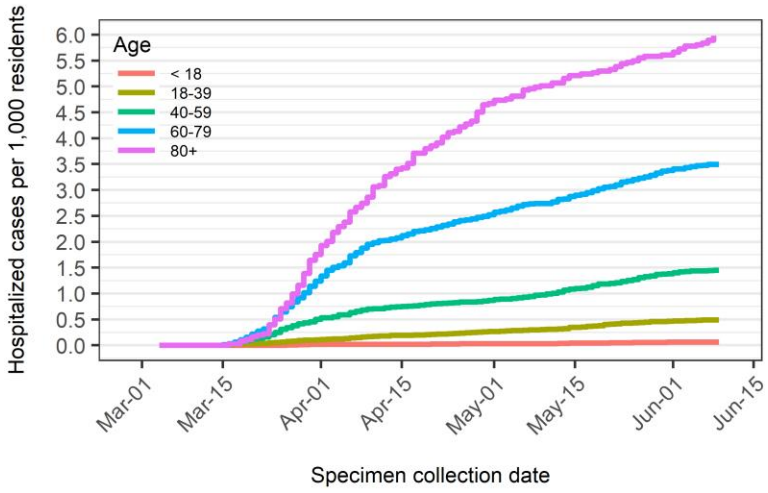
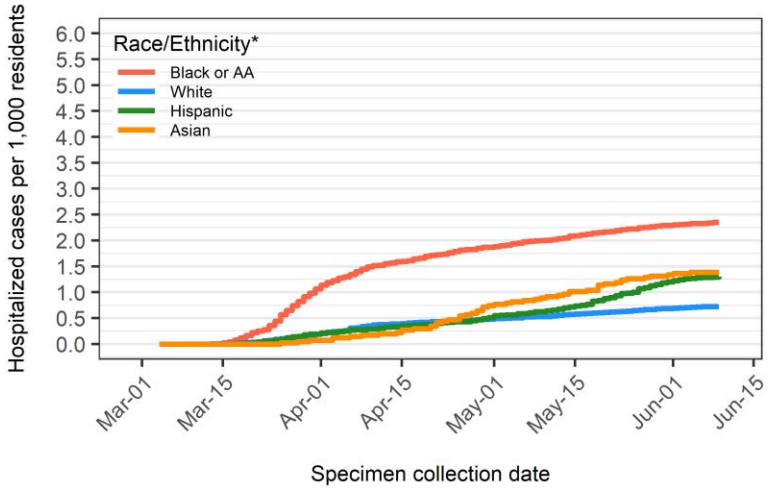
When examined as population-based rates and case-based rates in **Figure 10**, hospitalization patterns are also apparent by demographic characteristics. Both population- and case-based hospitalization rates exhibit a clear age group gradient, with older age groups experiencing higher rates. By race and ethnicity, population and case-based hospitalization rates are highest among the Black/AA population. For non-Hispanic whites, the case-based rate is the second highest, at 20.78 per 100 cases, whereas the population-based hospitalization rate is lowest (0.73 per 1,000 residents). Rates by gender are very similar, with higher hospitalization rates among males. All rates presented are crude rates and only groups with 10 or more total hospitalized cases are shown.

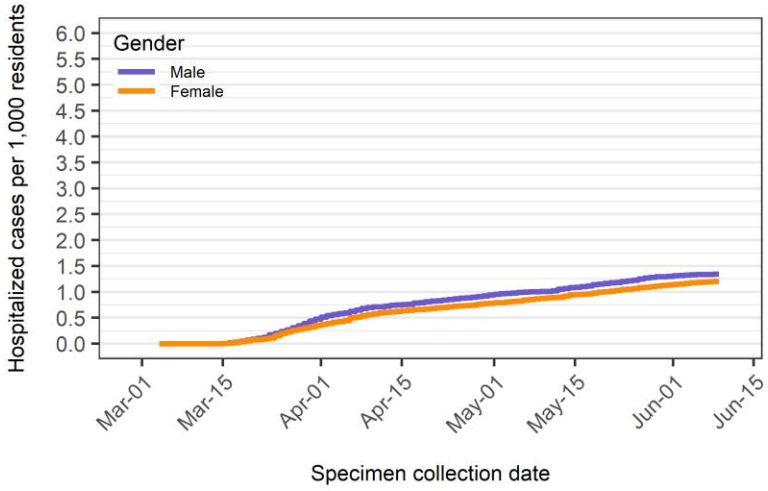
Figure 10: Population and case based hospitalization rates in Milwaukee County



Age	N Hospitalized Cases	Rate per 1,000 residents	Rate per 100 cases
< 18	15	0.06	1.87
18-39	154	0.49	4.41
40-59	335	1.45	12.28
60-79	499	3.49	36.19
80+	212	6.01	39.77



Race/Ethnicity*	N Hospitalized Cases	Rate per 1,000 residents	Rate per 100 cases
Black or AA	585	2.35	22.90
White	358	0.73	20.78
Hispanic	183	1.30	5.77
Asian	56	1.38	13.40



Gender	N Hospitalized Cases	Rate per 1,000 residents	Rate per 100 cases
Male	621	1.35	14.65
Female	592	1.20	12.74

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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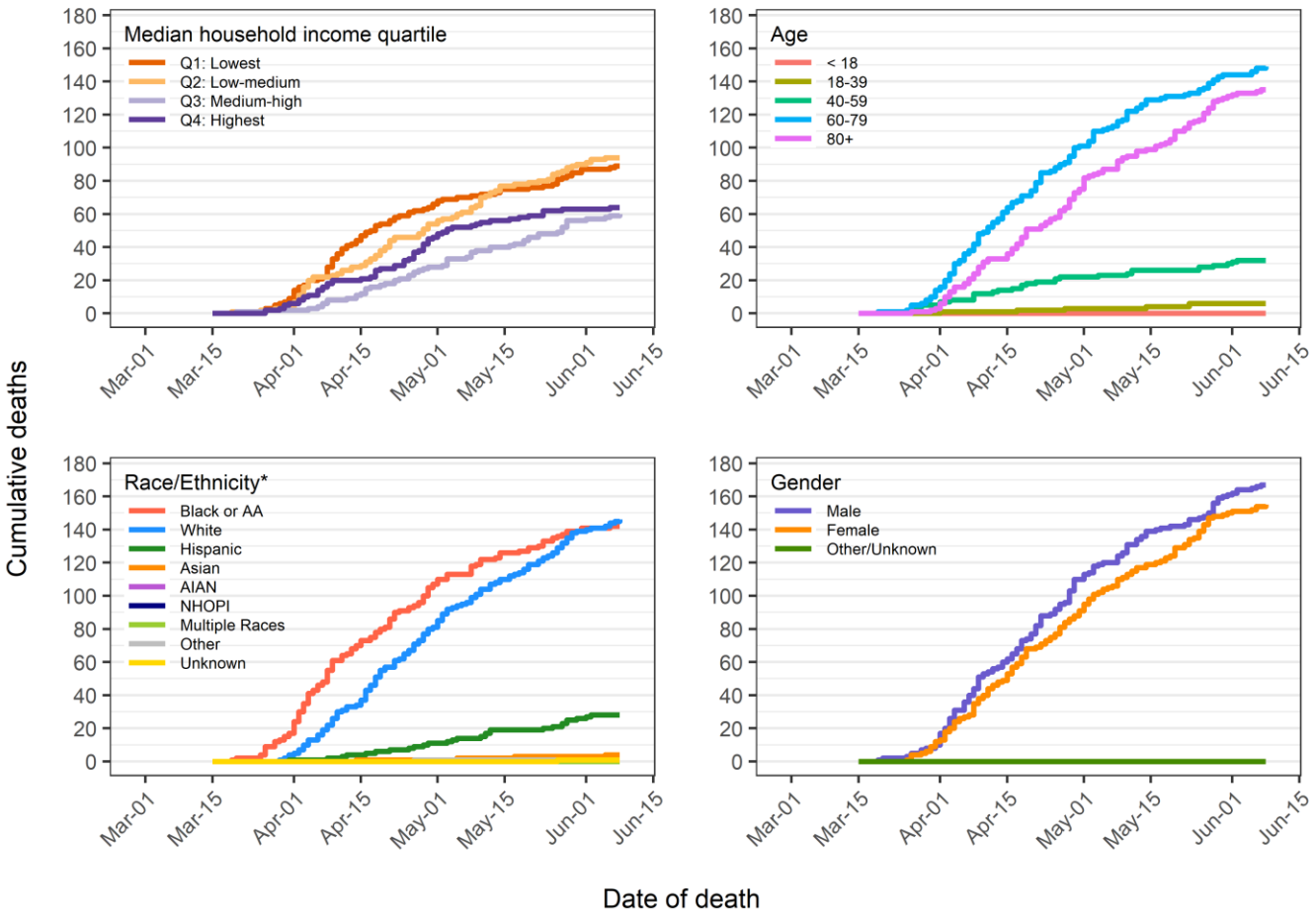
Deaths

There are now a total of 322 confirmed deaths in Milwaukee County, representing a case fatality rate of 3.6%. We observed 7 new deaths 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 = 167) and for non-Hispanic Whites (N = 146) followed closely by the Black/AA community (N = 142). 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 are relatively low, but a recent increase is notable.

Figure 11: Cumulative deaths in Milwaukee County



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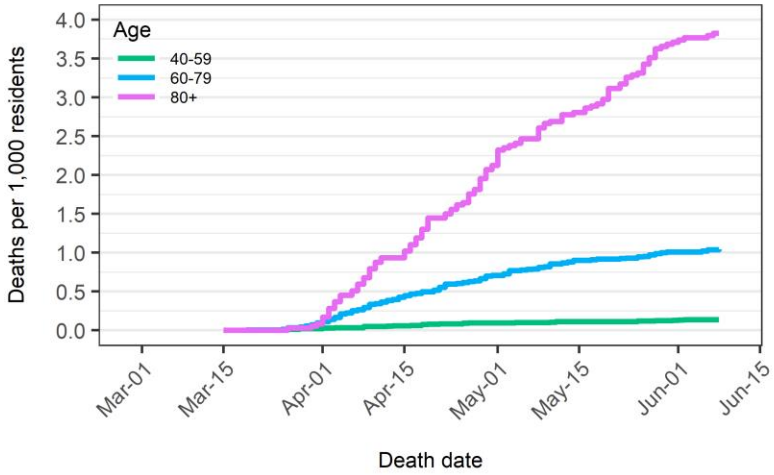
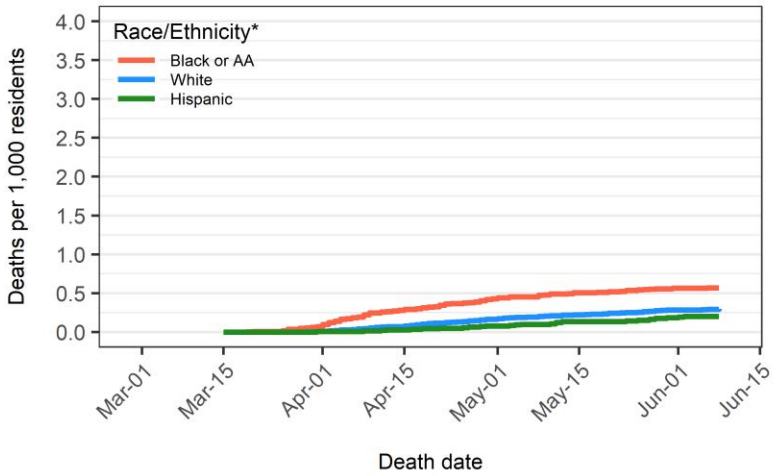
In terms of population- and case-based rates shown in **Figure 12**, there is a clear age category gradient, with higher death rates among older populations. Gender-based rates are very similar. Black/AA populations have the highest population-based death rates, and non-Hispanic Whites have the highest case-based death rates. All rates presented are crude rates and only groups with 10 or more total deaths are shown.

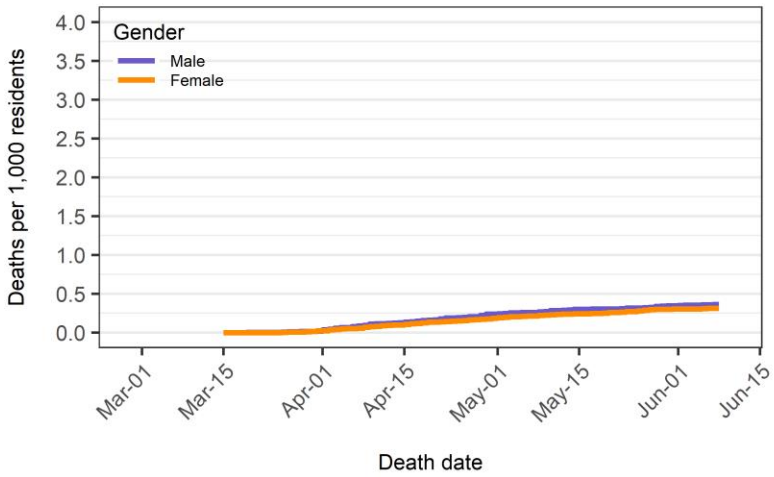
Figure 12: Population and case based death rates in Milwaukee County



Age	N Deaths	Rate per 1,000 residents	Rate per 100 cases
40-59	32	0.14	1.17
60-79	149	1.04	10.80
80+	135	3.83	25.33



Race/Ethnicity*	N Deaths	Rate per 1,000 residents	Rate per 100 cases
Black or AA	142	0.57	5.56
White	146	0.30	8.47
Hispanic	28	0.20	0.88



Gender	N Deaths	Rate per 1,000 residents	Rate per 100 cases
Male	167	0.36	3.94
Female	155	0.31	3.34

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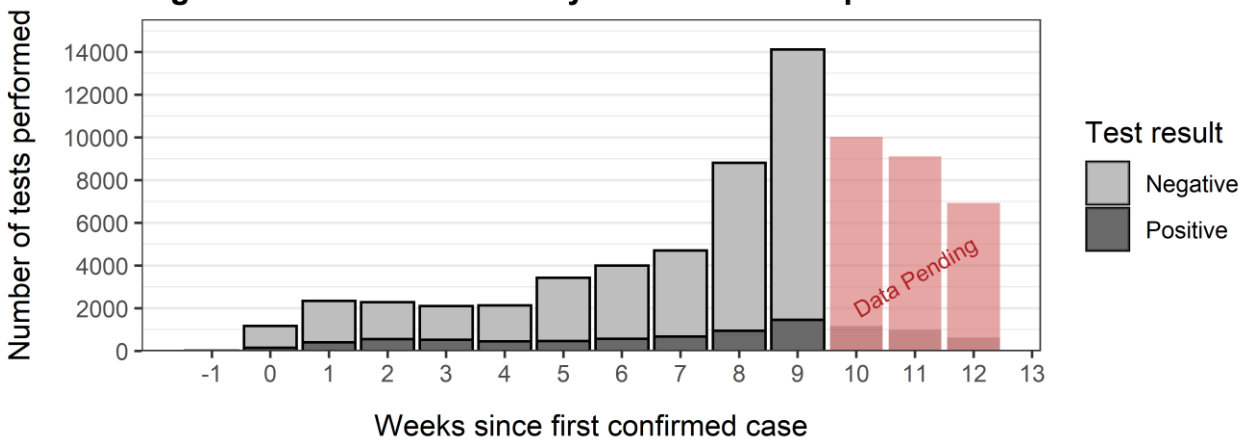
Testing Coverage

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 has increased. Since the first case of COVID-19 was diagnosed in Milwaukee County on March 11, 2020, a total of 71141 COVID-19 tests have been returned with a laboratory result, with 62210 returned negative and 8931 confirmed cases. This represents a positive test rate overall of 12.6% since the beginning of the epidemic.

As shown in **Figure 13** , the total number of tests performed per week has increased for several weeks, with the exception of the past two weeks which may be under-reported due to pending test results. As shown in **Figure 14**, the percentage of positive tests has varied over the course of the epidemic, with a high of 25-30% in early April. Since then, the percent positive has changed in tandem with expanded testing capacity. The percentage of positive tests was 8.9% over the past week compared to 10.9% the previous week. This figure should be interpreted with caution, as there are delays in the reporting of test results and there is a data entry preference for positive tests over negative tests. **Figure 14** also illustrates the 14-day trend in the percent positive tests, showing a slight decrease, which should be interpreted in the context of data entry delays, as noted above.

Figure 13: Milwaukee County number of tests per week



Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
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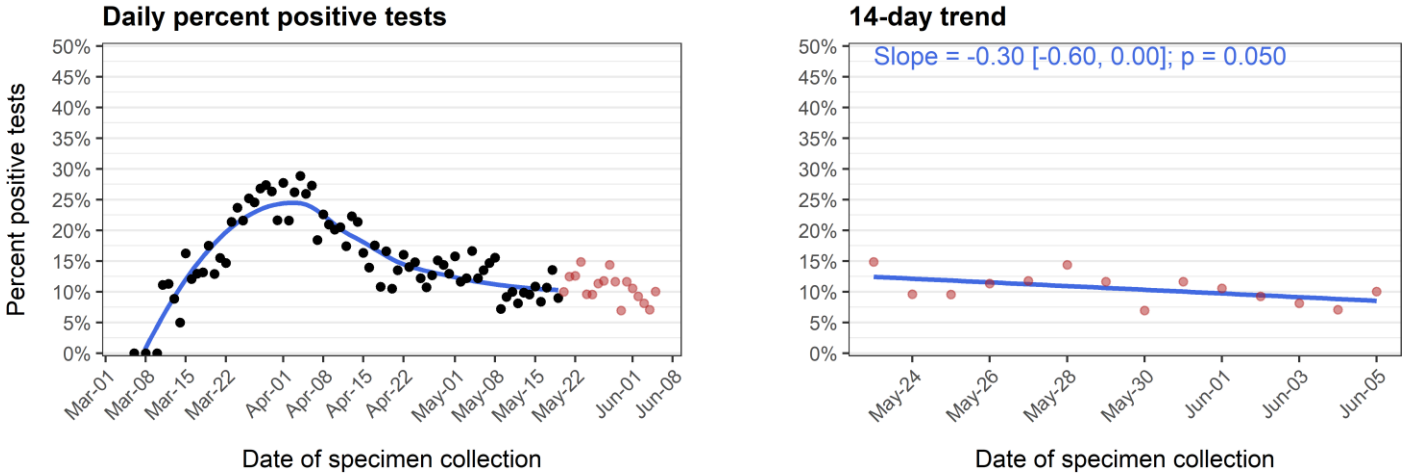
Figure 14: Milwaukee County percent positive tests (pending data shown in red)



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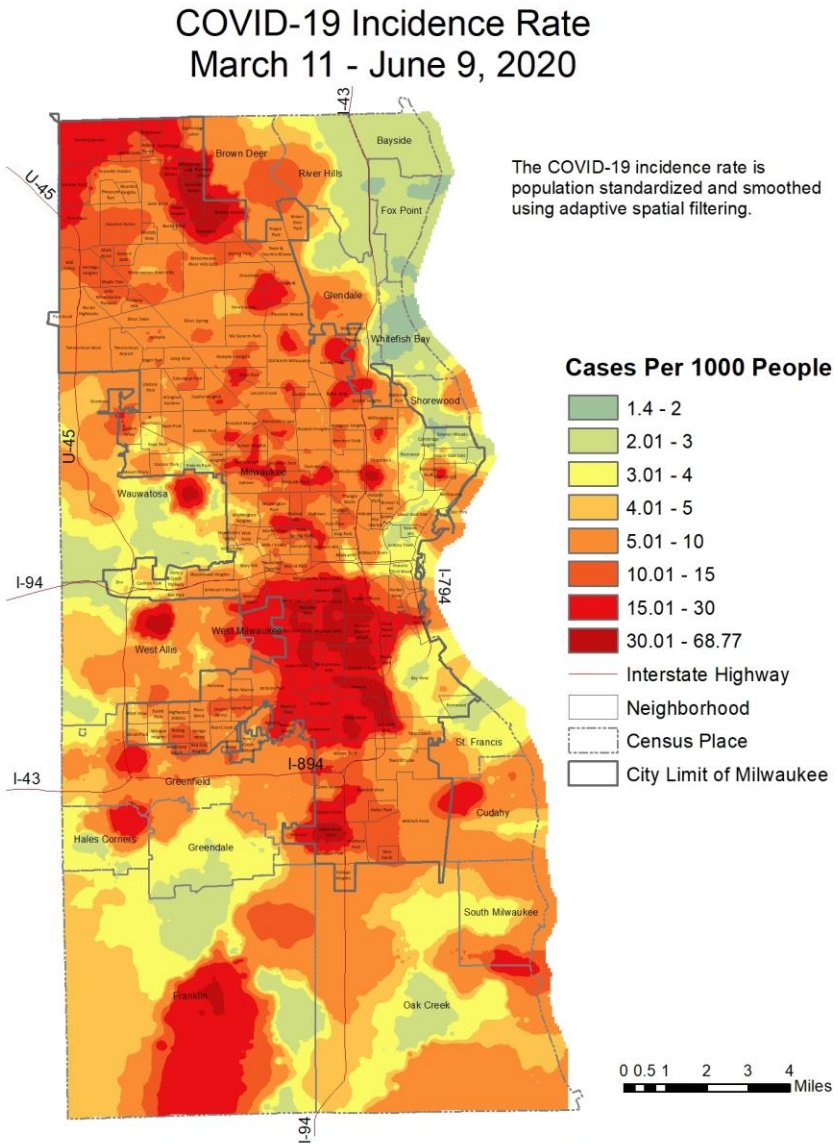
Spatial Patterns of Cases and Testing

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 only the cases confirmed over the last week. **Map 3** shows the testing rate across the population. **Map 4** depicts the proportion of total tests completed that were confirmed positive. **Map 5** shows cumulative COVID-19 related hospitalizations in Milwaukee County. All are crude rate maps created using residential addresses and census block level 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. 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.

Map 1: All confirmed cases of COVID-19

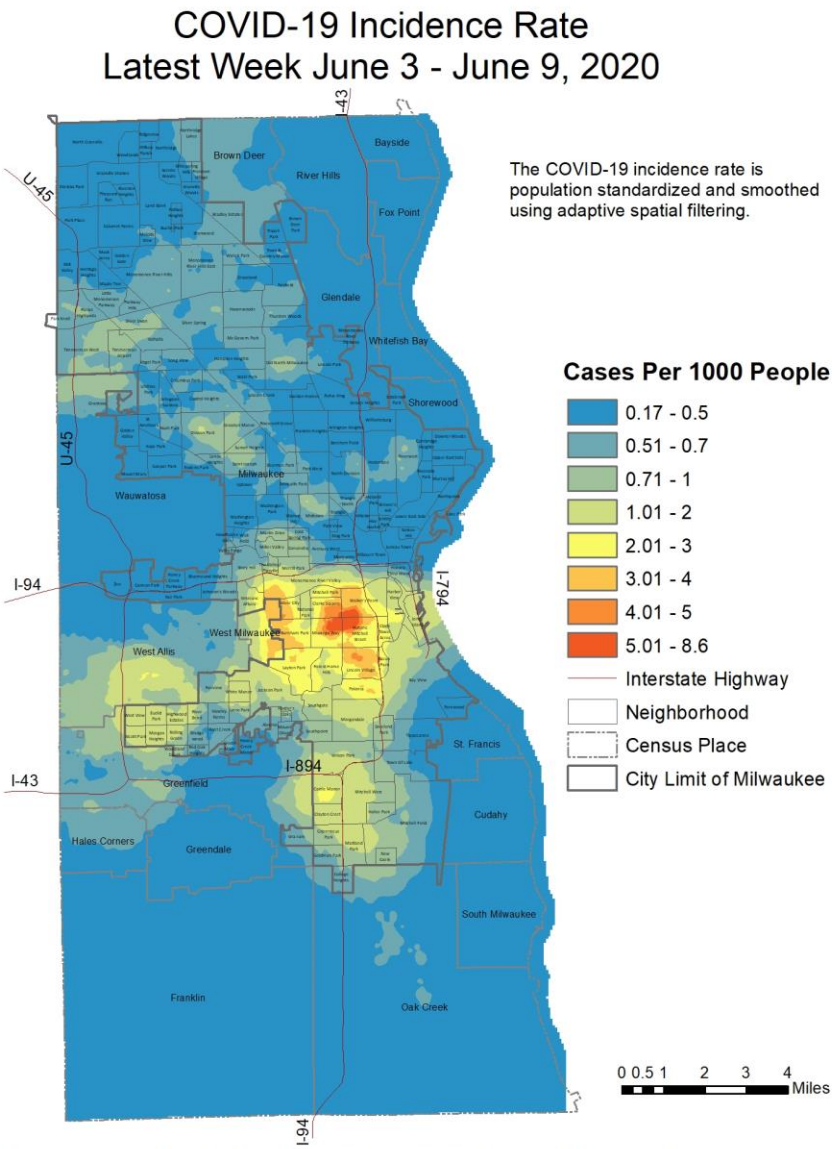


Method: A grid of points is used to estimate rates continuously across the map, based on the nearest cases with a minimum of 15 confirmed cases included.

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

Map 2: Confirmed cases of COVID-19 within the last week



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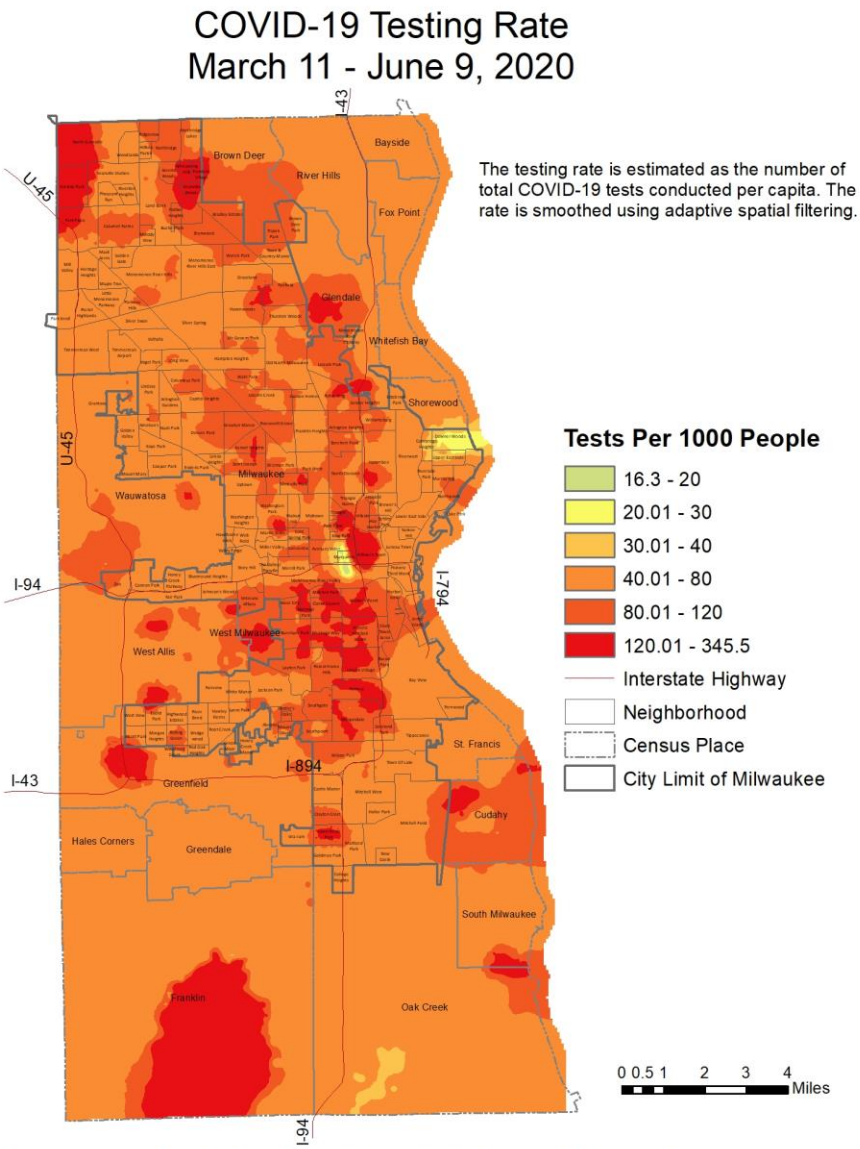
Map 3: Testing rate



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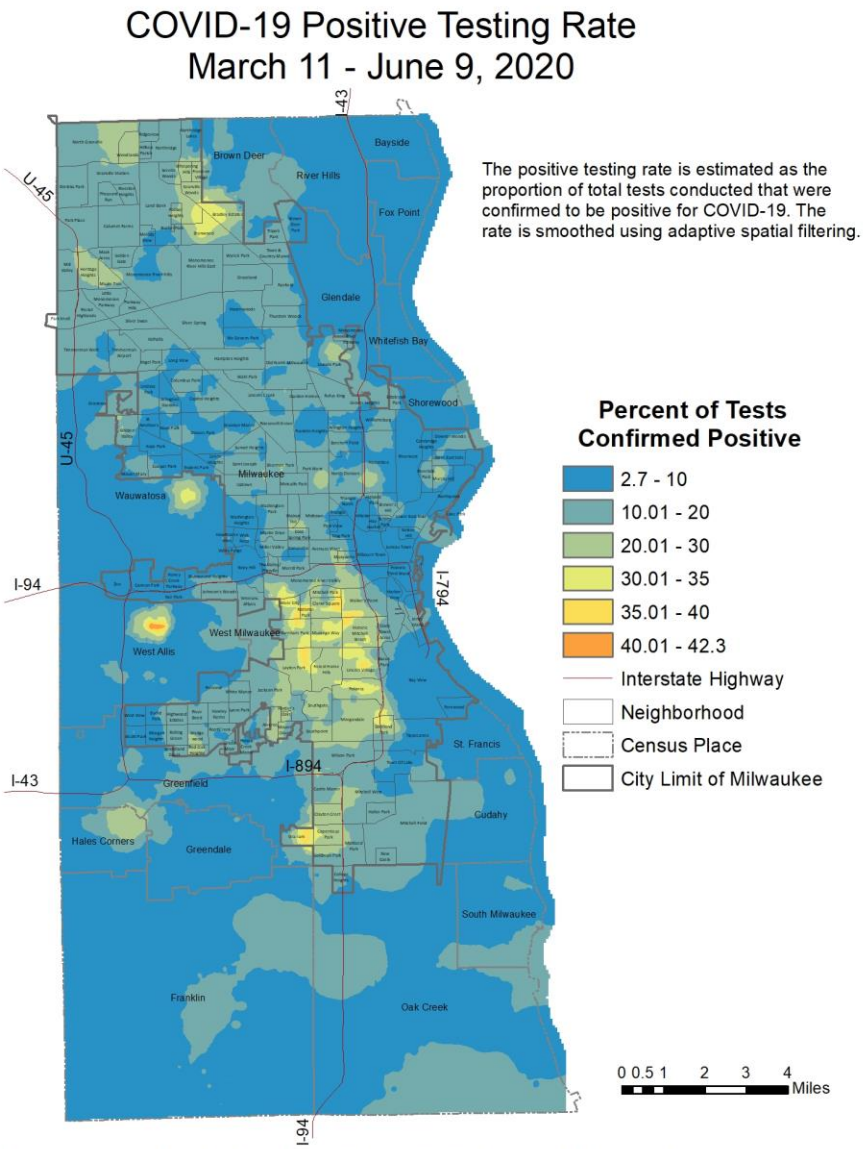
Map 4: Proportion of total tests completed that were confirmed positive



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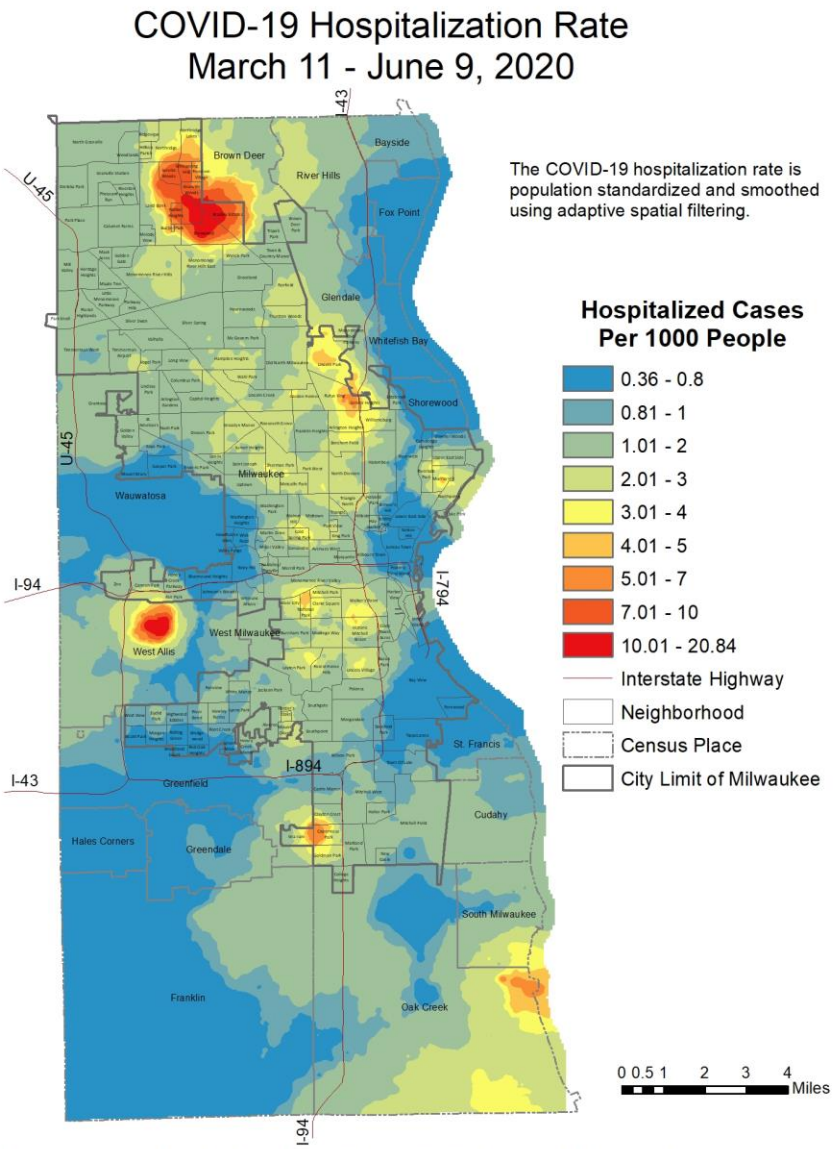
Map 5: COVID-19 related hospitalizations



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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 June 3, 2020 through June 9, 2020. This work was funded by the Advancing a Healthier Wisconsin Endowment at the Medical College of Wisconsin.

Contact Information

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