

Milwaukee County COVID-19 Data Summary

Milwaukee County COVID-19 Epidemiology Intel Team

This report was updated on May 21, 2020 and includes data through May 19, 2020. Note that data for the last week may be under-reported due to pending test results.

Milwaukee County COVID-19 Summary Statistics

Overall Milwaukee County COVID-19 Summary Statistics March 05 - May 19

Number of tests	32,937
Number of cases	5,307
Percentage of positive tests	16.1%
Number of hospitalizations	2,626
Number of deaths	252
Case fatality rate	4.7%

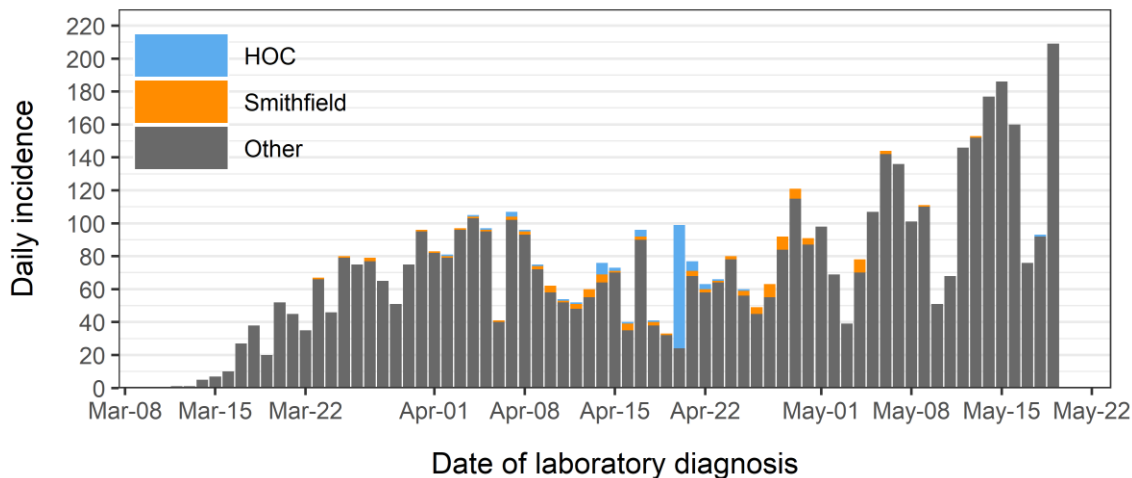
Weekly Milwaukee County COVID-19 Summary Statistics May 13 - May 19

Number of tests	6,134
Number of cases	1,054
Percentage of positive tests	17.2%
Number of hospitalizations	418
Number of deaths	8

Total Cases and New Cases

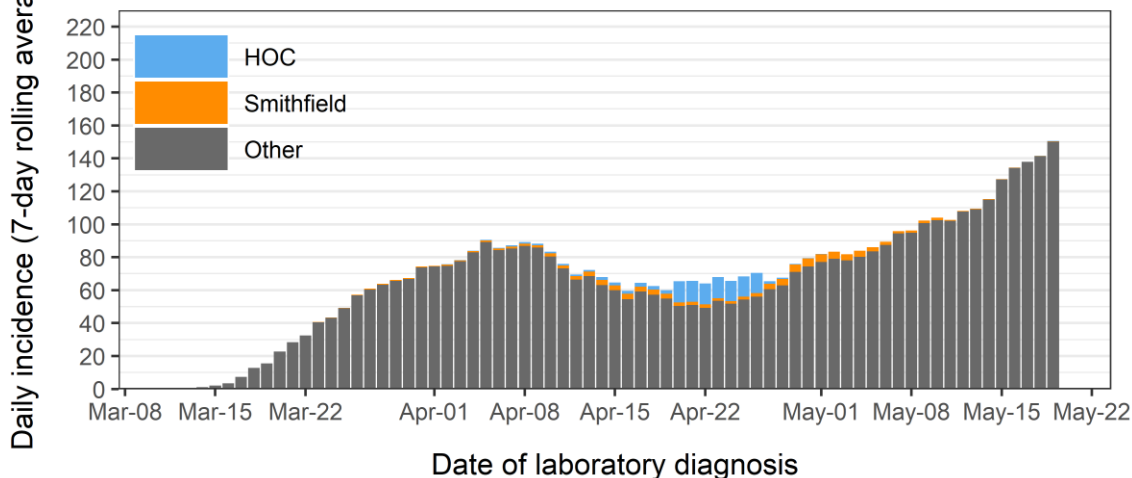
There are now a total of 5307 cases in Milwaukee County, since the first confirmed case on March 12, 2020. Over the last week, we observed 1054 new confirmed cases in Milwaukee County. **Figure 1** shows the daily incidence of new cases. **Figure 2** shows the average daily incidence within the last 7 days, which provides a smoothing effect to enhance visualization. Over the last week, we have continued to see an increase in confirmed cases, including the single highest daily case count since the beginning of the epidemic, on May 19, 2020. Of note, two free testing sites opened to the public on May 11th, which may have resulted in the identification of a large number of new cases. There have been concerted testing efforts at several facilities; the largest number of cases identified by these testing campaigns are associated with the Milwaukee County House of Corrections (HOC) and the Patrick Cudahy/Smithfield Foods meat packing plant. To acknowledge the influence of these campaigns on overall observed cases of COVID-19 in the county, we highlight them in the graphs.

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

Figure 2: Milwaukee Co. average daily number of COVID-19 cases

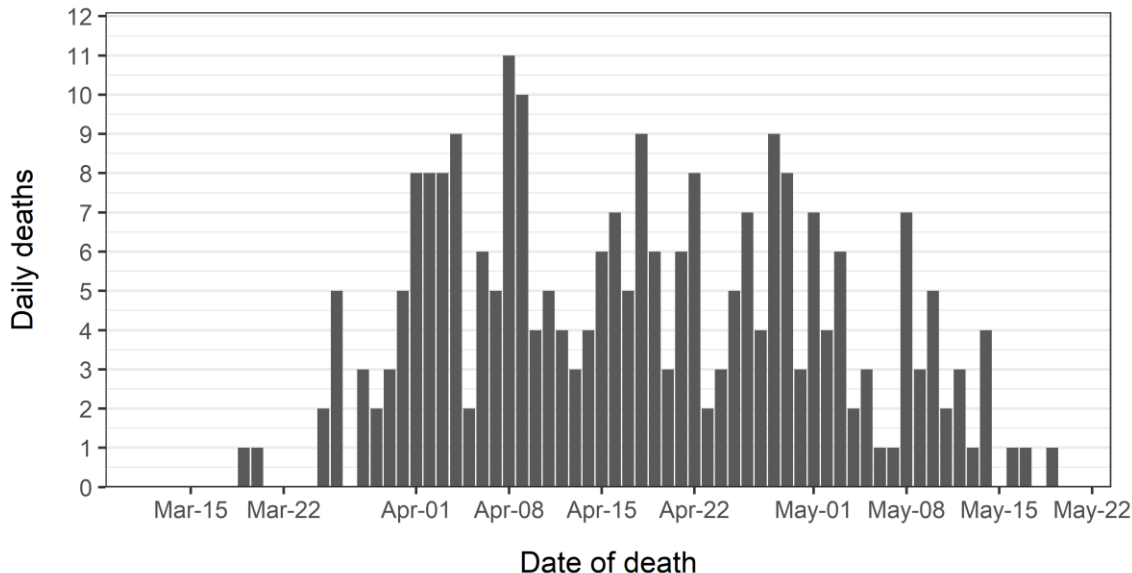


Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County Covid-19 Epidemiology Intel Team

Total Deaths and New Deaths

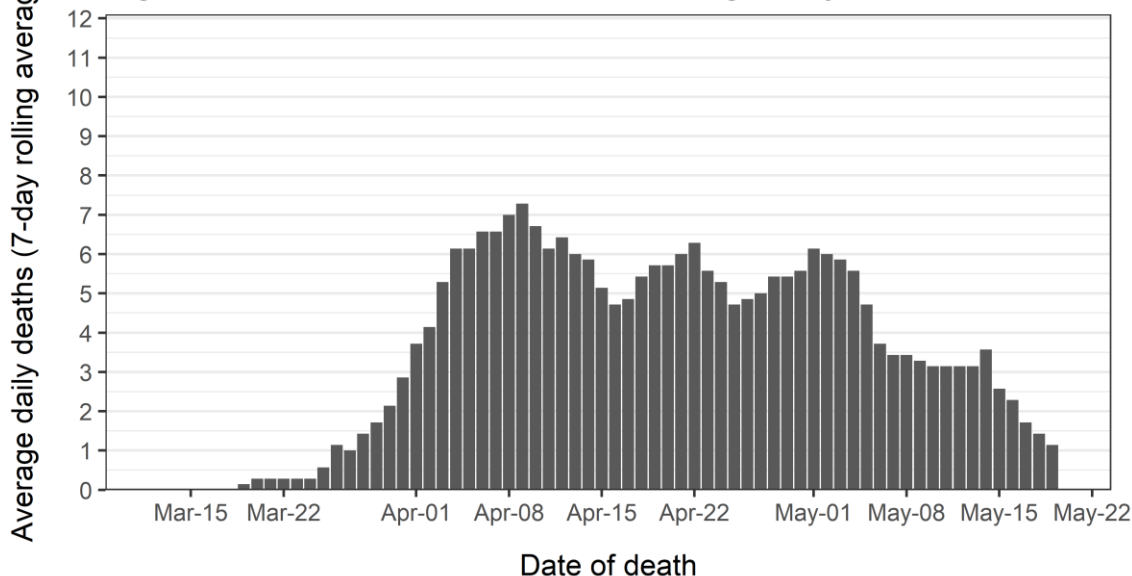
There are a total of 252 COVID-19 related deaths in Milwaukee County. Over the last week, we observed 8 deaths. **Figure 3** shows the number of daily COVID-19 related deaths among Milwaukee County residents. **Figure 4** shows the average daily death rate within the last 7 days. Overall, there appears to be a decrease in the daily number of deaths observed, from a peak of 11 deaths on April 08, 2020. Two smaller peaks in deaths are notable since April 8th.

Figure 3: Milwaukee Co. COVID-19 daily deaths



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

Figure 4: Milwaukee Co. COVID-19 average daily death rate

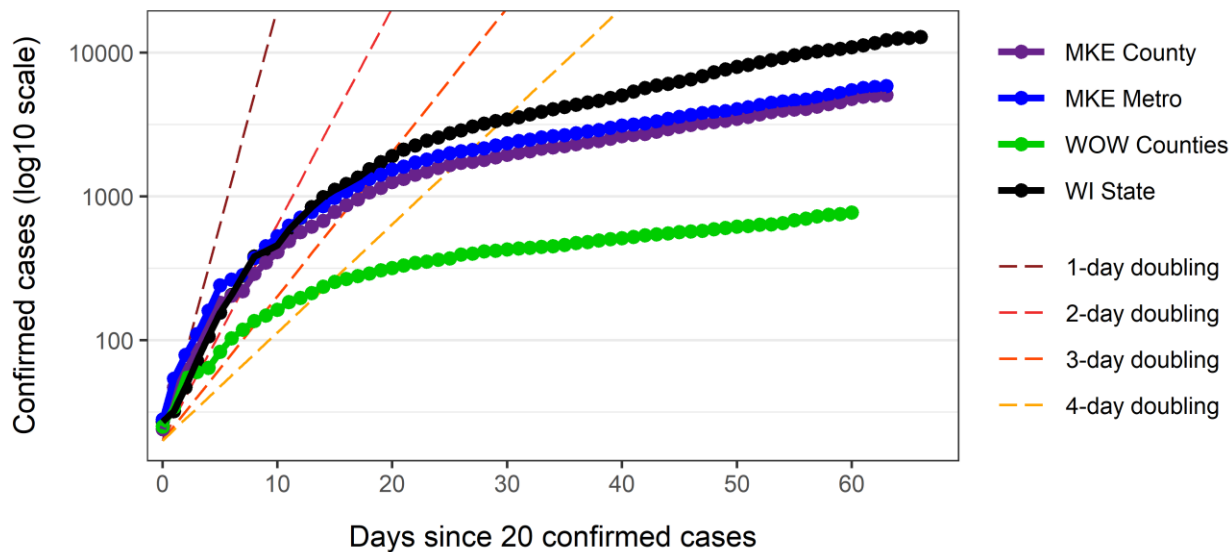


Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County Covid-19 Epidemiology Intel Team

The COVID-19 Growth Rate

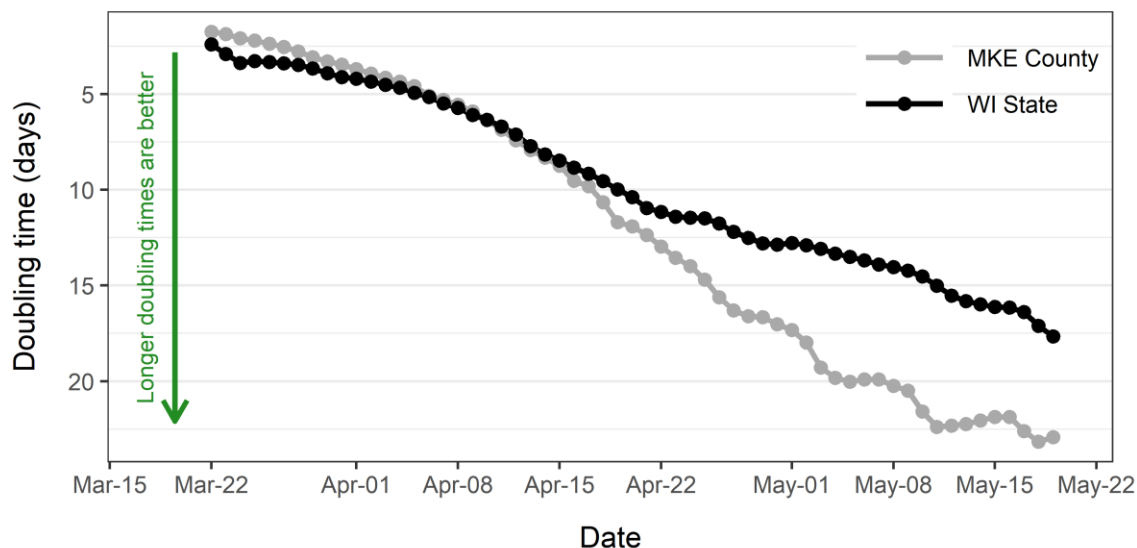
The time it takes for the number of cases to double is called the doubling time. **Figure 5** shows doubling times for Milwaukee County, the surrounding Waukesha, Ozaukee and Walworth (WOW) counties, the M7 (7-county) metropolitan area, and the state of Wisconsin. Dotted lines indicate doubling times 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 22.92 days. The current doubling time for WOW counties is 16.65 days. The current doubling time for the state of Wisconsin is 17.65 days. **Figure 6** shows the trend in doubling times for Milwaukee County as compared to the state, over the course of the epidemic. As illustrated, the epidemic initially doubled more quickly in Milwaukee County, but has since slowed (improved) more in Milwaukee County than in the state as a whole.

Figure 5: Cumulative cases after 20 confirmed



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

Figure 6: Trend in doubling times

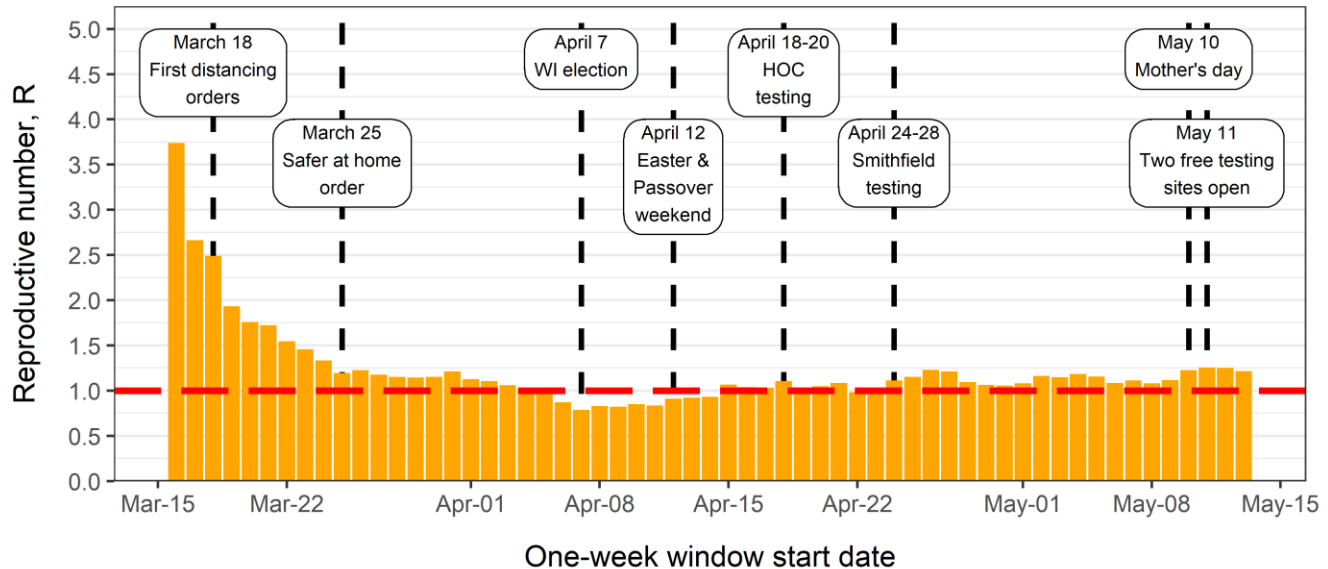


Data sources: WI Department of Health Services & WI Electronic Disease Surveillance System
Created by the Milwaukee County Covid-19 Epidemiology Intel Team

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. **Figure 7** shows the change in R over time along with key dates related to physical distancing or focused testing campaigns affecting Milwaukee County 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 lowest R value observed (R = 0.79 on April 07, 2020), we observed an increase in R to a high of 1.25 on May 11, 2020.

Figure 7: One week reproductive number for Milwaukee County



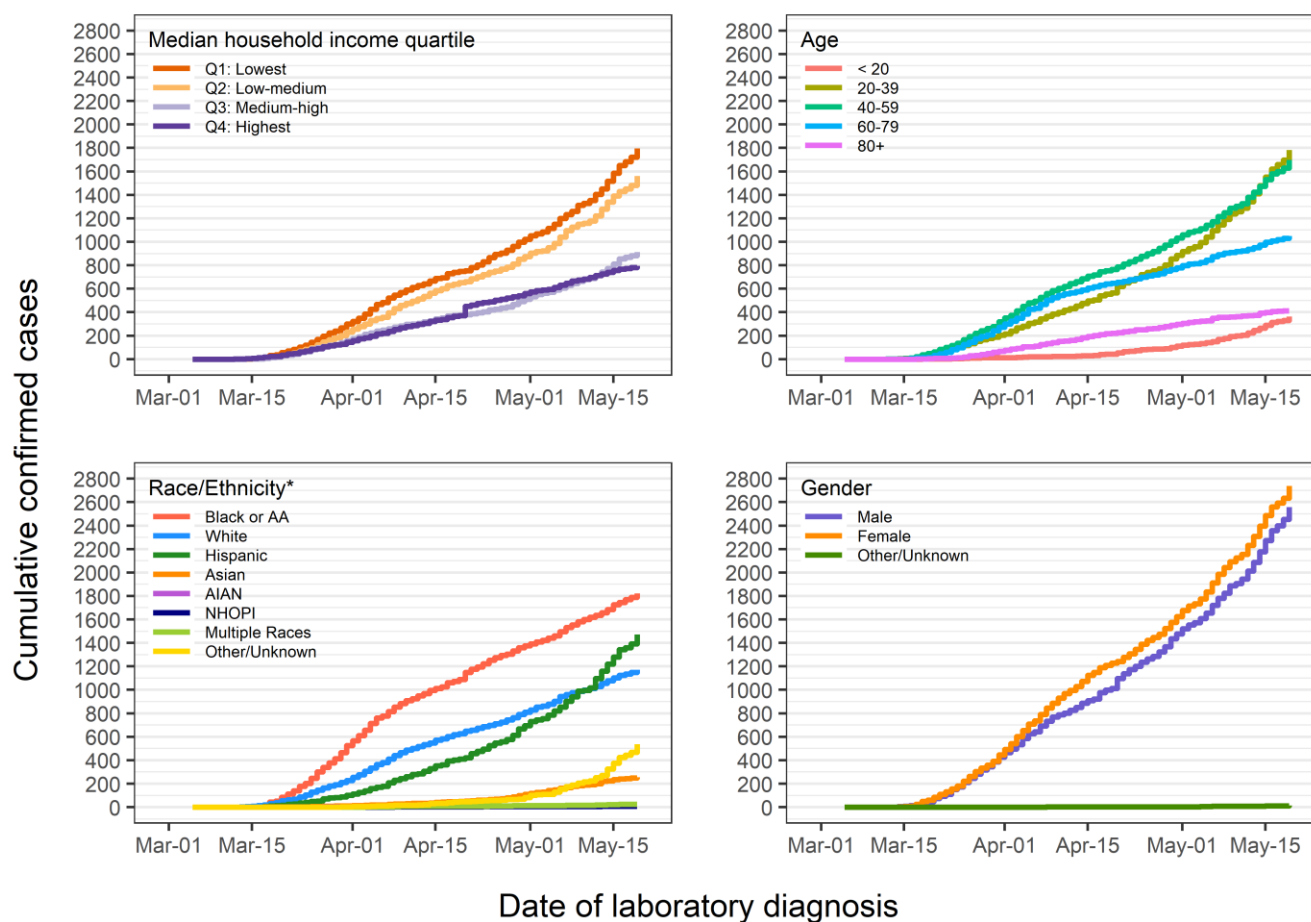
Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County Covid-19 Epidemiology Intel Team

Demographic Patterns – Age, Sex, Race and Ethnicity

Confirmed cases

COVID-19 cases vary by demographic characteristics. Figure 8 shows cumulative case plots including confirmed positive cases with an available laboratory confirmation date, plotted by census block group (CBG) median household income, sex, age, and race/ethnicity groups. Most diagnosed cases fall within the ages of 20-79. Of all confirmed cases, 48% are male and 52% are female. The largest number of cases have been diagnosed among the Black or African American (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 an increase in cases among the Hispanic community and those of unknown race or ethnicity, individuals in the two lowest income groups, and those ages 20-59, with similar increases for both sexes; the cumulative number of cases among those ages 20-39 (N = 1783) now exceeds the number among those ages 40-59 (N = 1697). The number of cases among Hispanics (N = 1473) now far exceeds the number identified among Whites (N = 1170). Of note, the number of cases among Asians has increased over the last few weeks, to a total of (N = 255).

Figure 8



Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)

Created by the Milwaukee County Covid-19 Epidemiology Intel Team

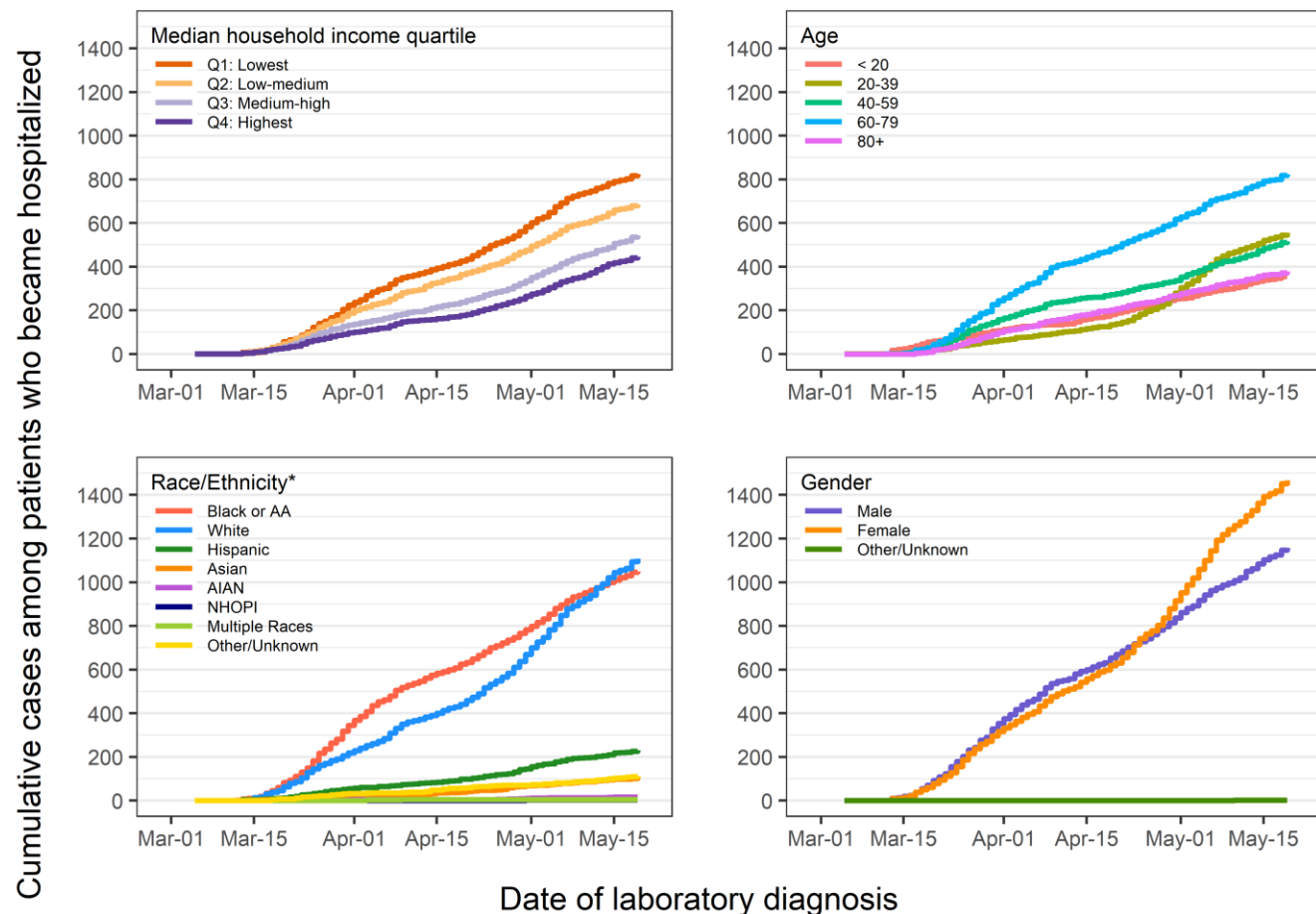
*Race and ethnicity were combined into one variable where the Hispanic category includes Hispanics of any race.

AIAN stands for American Indian or Alaska Native and NHOPI stands for Native Hawaiian or Other Pacific Islander.

Hospitalizations

A total of 2626 individuals have been hospitalized due to COVID-19 in the county. **Figure 9** shows cumulative hospitalizations based on lab report confirmation date (as admission dates are incomplete). Over the last several weeks, we have observed an increase in hospitalizations among those ages 20-39, such that the number of hospitalizations in this age group (N = 555) exceeds the number for those ages 80+ (N = 377) and the number for those ages 40-59 (N = 515). The highest number of hospitalizations continues to be among those ages 60-79 (N = 823). Of note, this week we saw the total number of hospitalizations among non-Hispanic White populations (N = 1108) meet and then slightly exceed the total number among Black/AA populations (N = 1049). Overall, counts are lower among other racial and ethnic groups, with hospitalizations among both Hispanics and Asians increasing slowly. By sex, females are hospitalized more often than males, comprising 56% of the total hospitalized cases; this is in contrast to the pattern of hospitalization we observed several weeks prior, when a larger proportion of hospitalized were males than females. More individuals among lower income than higher income groups have been hospitalized, with a clear income gradient observed.

Figure 9



Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)

Created by the Milwaukee County Covid-19 Epidemiology Intel Team

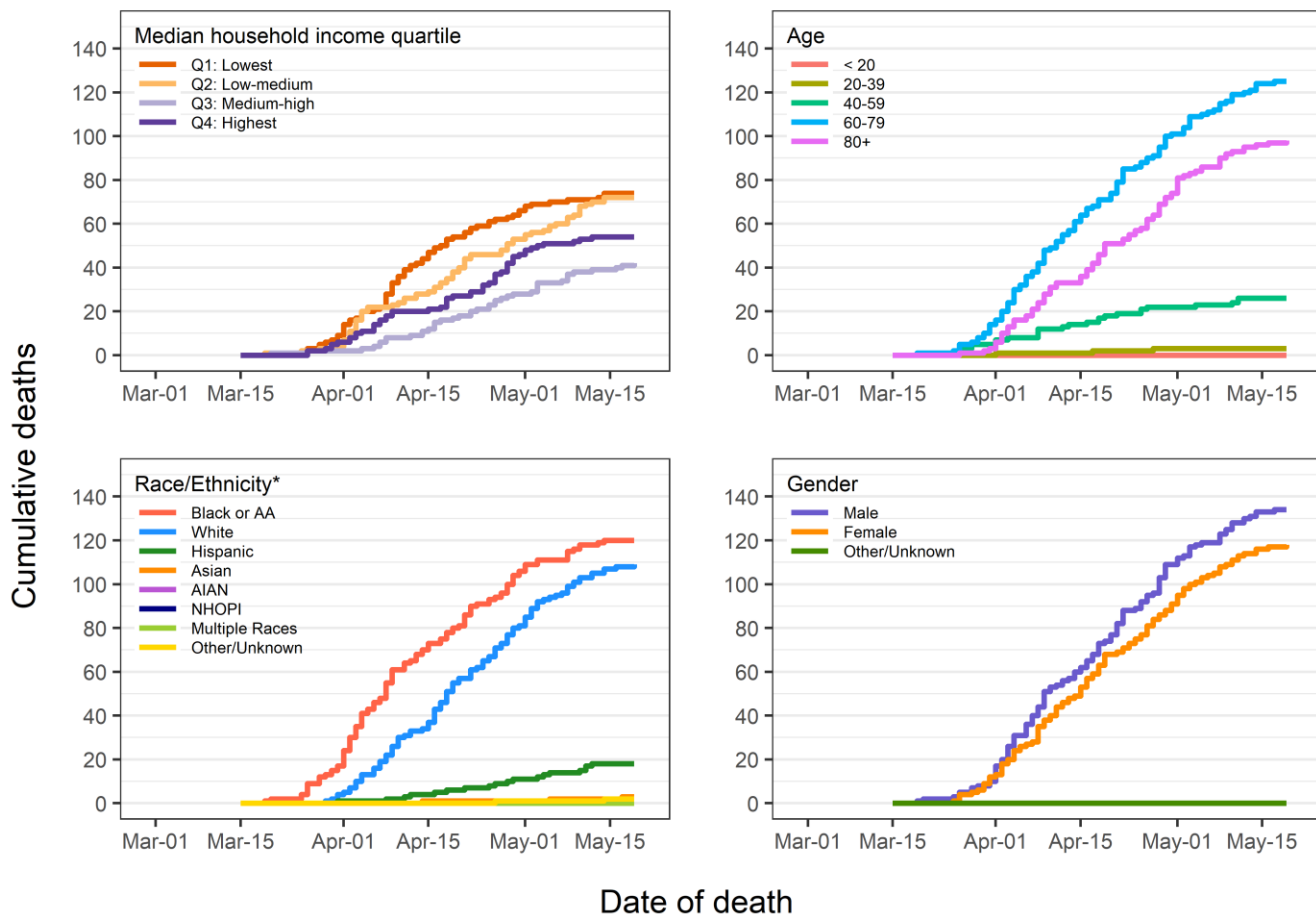
*Race and ethnicity were combined into one variable where the Hispanic category includes Hispanics of any race.

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 252 confirmed deaths in Milwaukee County, representing a case fatality rate of 4.7%. We observed 8 new deaths over the past week in the county. The current doubling rate in the county (the number of days it takes for the number of deaths to double) is 125.88 days. Mortality patterns differ by demographic characteristics, as shown in **Figure 10**. The largest number of deaths are recorded among those age 60 or older. The largest number of deaths are recorded for males and for the Black/AA community, followed by Whites. 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 increasing.

Figure 10



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.

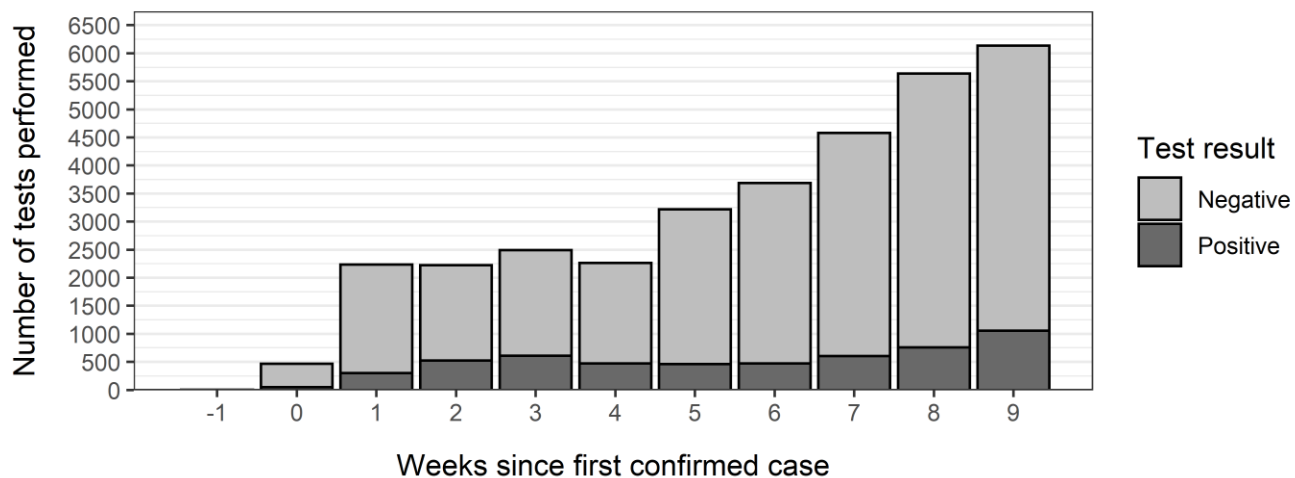
AIAN stands for American Indian or Alaska Native and NHOPI stands for Native Hawaiian or Other Pacific Islander.

Testing Coverage

Testing for the novel coronavirus is an important public health response to limiting the spread of the infection. Testing capacity has been limited in Milwaukee County and across the country. Since the first case of COVID-19 was diagnosed in Milwaukee County on March 12, 2020, a total of 32937 COVID-19 tests have been returned with a laboratory result, with 27630 returned negative and 5307 confirmed cases. This represents a positive test rate overall of 16.1% since the beginning of the epidemic.

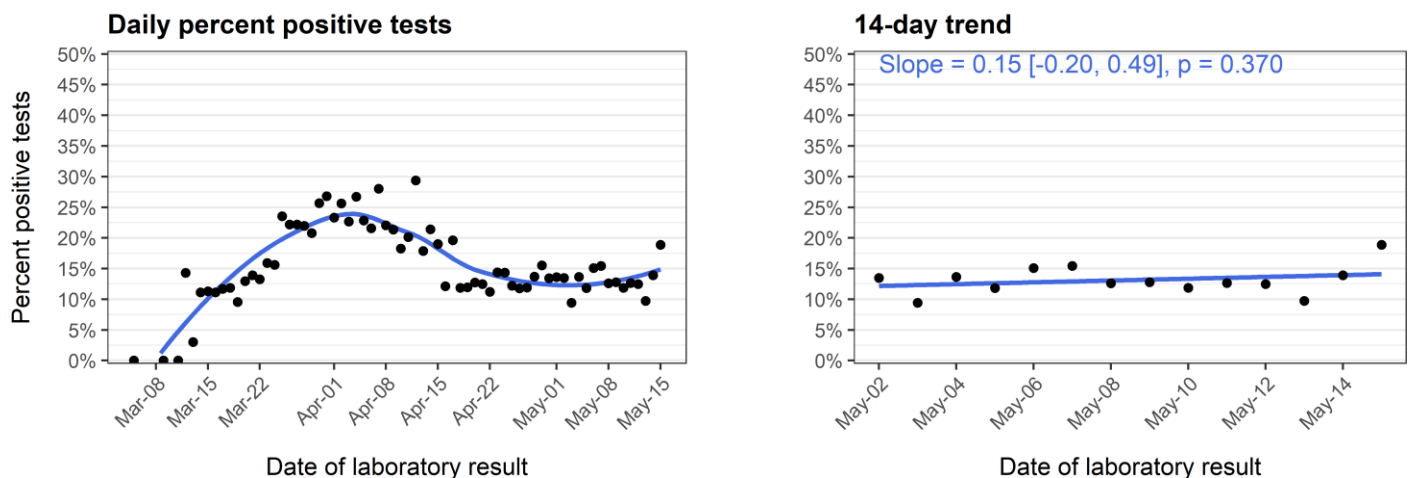
As shown in **Figure 11**, the total number of tests performed per week has increased for several weeks. As shown in **Figure 12**, the percentage of positive tests has varied over the course of the epidemic, with a high of 25-30% in early April. Since then, the percent positive has decreased recently in tandem with expanded testing capacity. The percentage of positive tests was 17.2% over the past week compared to 13.4% the previous week. **Figure 12** also illustrates the 14-day trend in the percent positive tests, showing a very slight, not statistically significant increase. Of note, data for the last week may be under-reported due to pending test results.

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

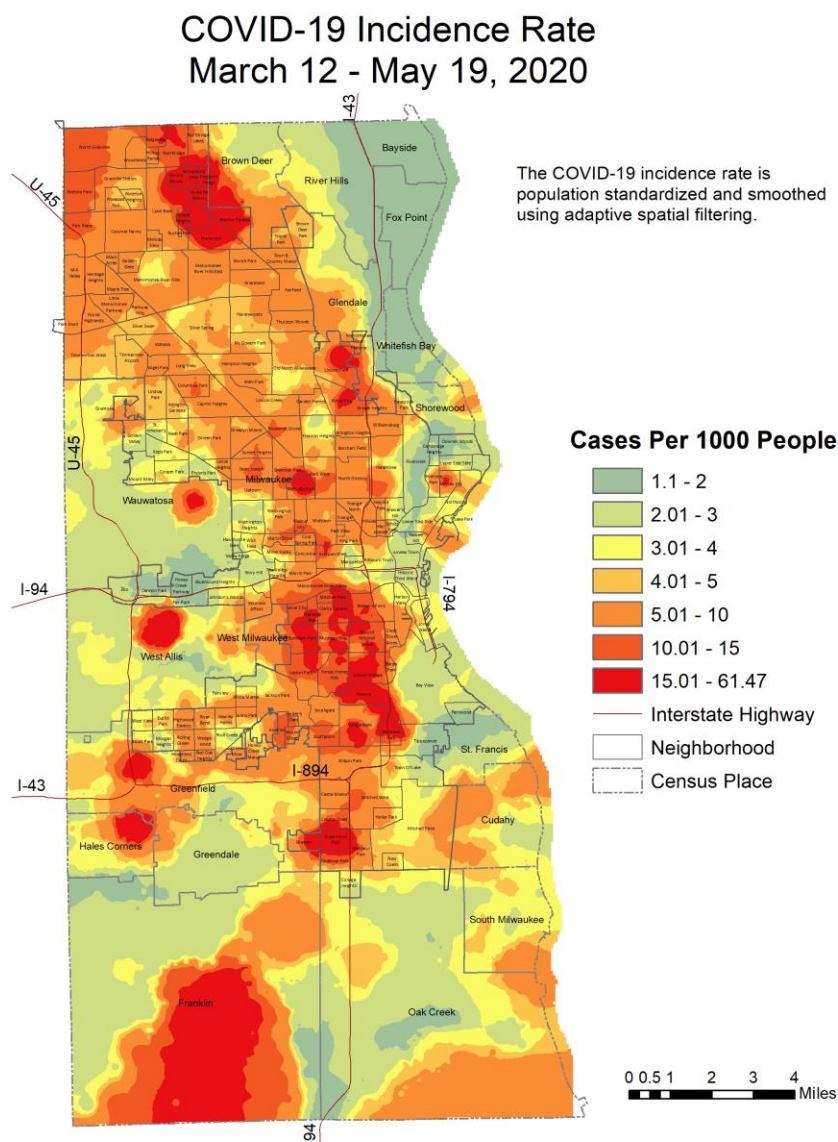


Data source: Wisconsin Electronic Disease Surveillance System (WEDSS)
Created by the Milwaukee County Covid-19 Epidemiology Intel Team

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 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



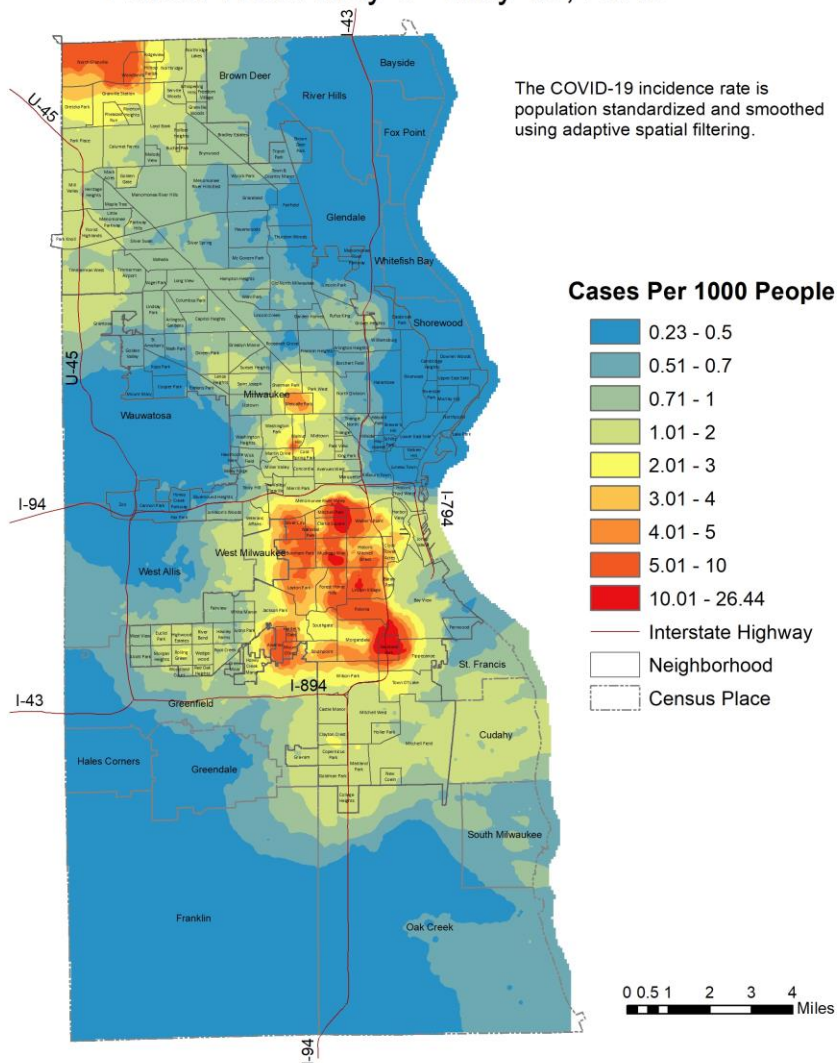
Method: A grid of points is used to estimate rates continuously across the map, based on the nearest cases with a minimum of 15 confirmed cases included.

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

COVID-19 Incidence Rate Latest Week May 6 - May 19, 2020



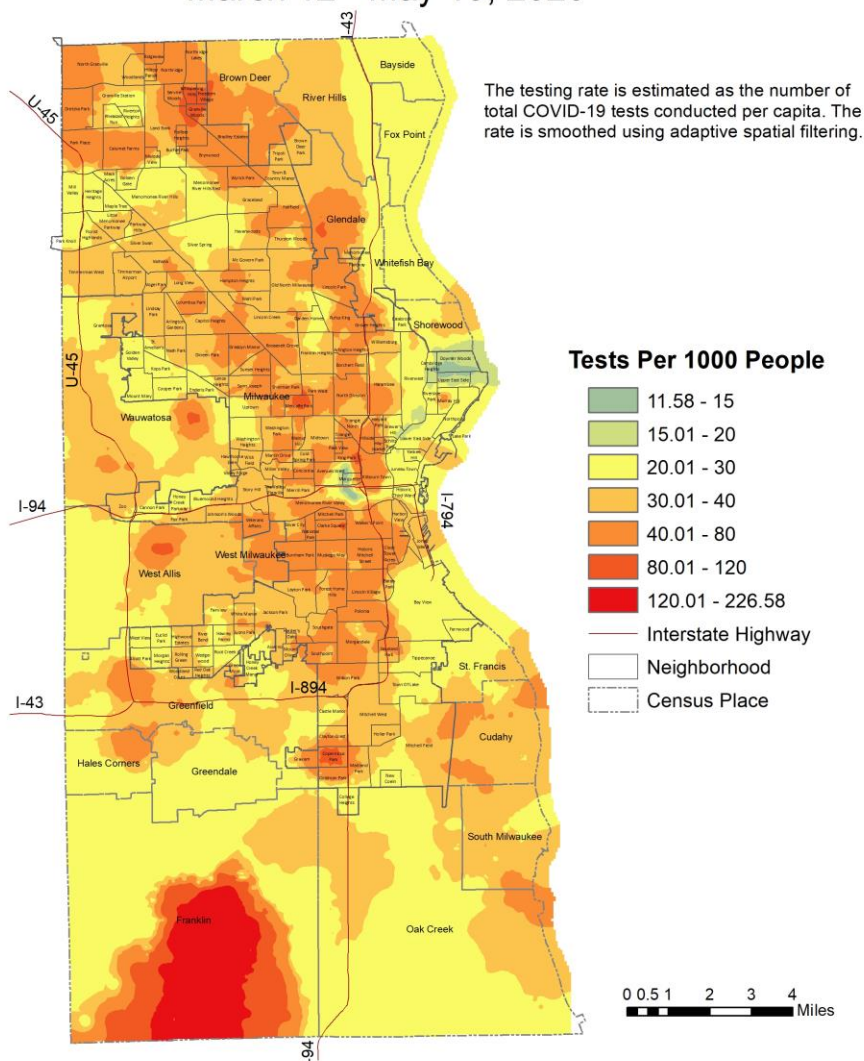
Method: A grid of points is used to estimate rates continuously across the map, based on the nearest cases with a minimum of 15 confirmed cases included.

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 3: Testing rate

COVID-19 Testing Rate March 12 - May 19, 2020



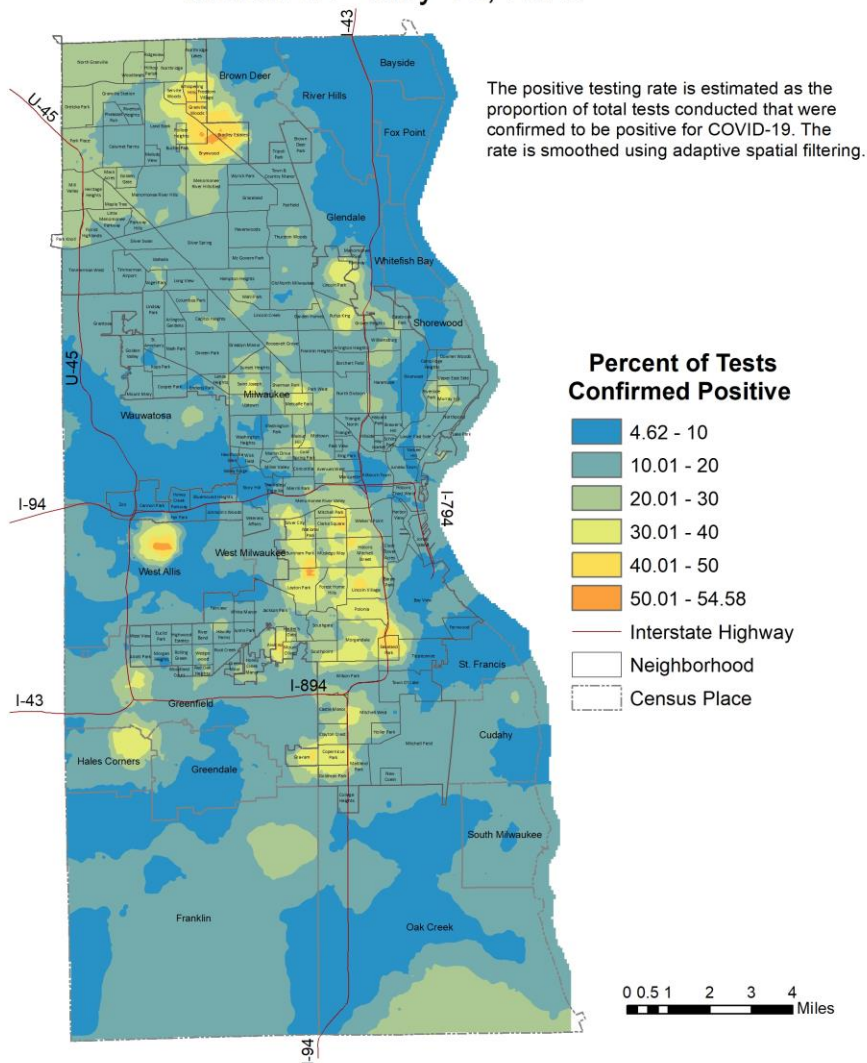
Method: A grid of points is used to estimate rates continuously across the map, based on the nearest cases with a minimum of 15 confirmed cases included.

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 4: Proportion of total tests completed that were confirmed positive

COVID-19 Positive Testing Rate March 12 - May 19, 2020



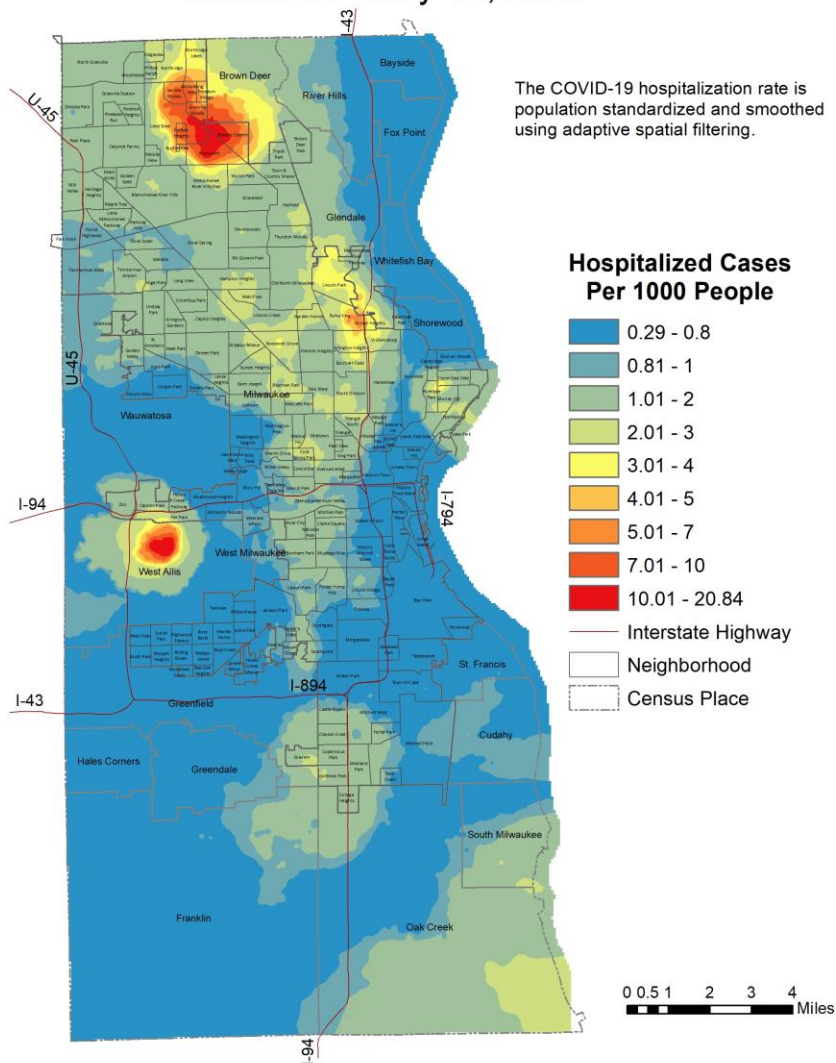
Method: A grid of points is used to estimate rates continuously across the map, based on the nearest cases with a minimum of 15 confirmed cases included.

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 5: COVID-19 related hospitalizations

COVID-19 Hospitalization Rate March 12 - May 19, 2020



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

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 13, 2020 through May 19, 2020. This work was funded by the Advancing a Healthier Wisconsin Endowment at the Medical College of Wisconsin.

Contact Information

For additional questions on this report, please contact Darren Rausch, Health Officer/Director, Greenfield Health Department, and Lead, Milwaukee County COVID-19 Epidemiology Intel Team:
Darren.Rausch@greenfieldwi.us or (414) 329-5275.