

COVID-19 and Mental Health: An Examination of 911 Calls for Service

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Abstract The purpose of this study was to explore the rate and geographic distribution of 911 calls for service related to mental health issues during the Coronavirus Disease 2019 (COVID-19) pandemic in the City of Detroit, MI, USA. The results suggest that the total number of calls for mental health issues was at the lowest level when compared with the same time period for the previous 3 years. Furthermore, as both the daily reported COVID-19 cases and related deaths increased over time, there was a significant decline in both suicide threats and suicides in progress. Significant hot spots were found for the total calls as well as for threats of suicide. These hot spots did not coincide with the spatial distribution of reported cases of COVID-19 by ZIP code. While higher and lower areas of reported cases were found, these differences by ZIP code were not found to be significant. When compared with the previous 3 years of data, the hot spot area was much smaller in 2020, implying that the mental health-related calls for service were more evenly spread throughout the city.

Introduction

The first case of a new coronavirus, COVID-19, was first reported in the USA on 21 January 2020. In just 3 months, there were over 1 million cases in the USA with more than 57,000 deaths attributed to the virus (Hauck *et al.*, 2020). Popular media outlets reported disturbing headlines linking the pandemic to a ‘mental health crisis’, noting that ‘The U.S. is ill-prepared, with some clinics already on the brink of collapse’ (Wan, 2020). Celebrities also focused on the link between the coronavirus and mental health issues through various social media platforms, noting increased levels of anxiety and depression (Macke, 2020). Academic researchers also warned of a ‘considerable increase’ in anxiety and depressive symptoms, even among those individuals who did not have a previously

diagnosed mental health condition (Cullen *et al.*, 2020). But is there empirical evidence to support a link between the pandemic and an increase in reported mental health issues? The purpose of this article is to examine the relationship between the COVID-19 pandemic and the number, type, and locations of 911 mental health calls reported in the City of Detroit, one of the areas that has been particularly hard-hit by the virus.

Mental health in times of crisis

While the global impacts of the COVID-19 pandemic have been unprecedented, the study of mental health in times of crisis has a rich history. The psychological impacts of tragic events such as the World Trade Center terrorist attacks,

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hurricanes, earthquakes, fires, and mass shootings on the general public as well as first responders have been examined (Gard and Ruzek, 2006; Jones *et al.*, 2012; Shultz *et al.*, 2013). These events may result in heightened levels of fear, anxiety, helplessness, post-traumatic stress disorder (PTSD), and depression.

Similarly, researchers have examined the relationship between mental health and public health emergencies, such as the severe acute respiratory syndrome epidemic in 2003 and the human immunodeficiency virus and acquired immune deficiency syndrome (AIDs/HIV) epidemic (which began in 1982) (Ho *et al.*, 2020; Lau *et al.*, 2008; KFF.org, 2019). The psychological toll on victims, families, caregivers, and the public from these events can be profound and long-lasting. These impacts may be further exacerbated by extended quarantines, closures of non-essential businesses, and the impact on the economy, as individuals struggle with social isolation and fear of unemployment and financial ruin (Ho *et al.*, 2020). Reger *et al.* (2020) further note the potential impacts of stay-at-home orders, lack of ability to participate in religious services, and reduced access to mental health care professionals on the suicide rate. The very measures that have been taken to prevent the spread of COVID-19 (i.e. closures of schools, businesses, community centres) may ultimately lead to a heightened level of suicide risk.

In response to the COVID-19 pandemic, a survey was launched on 23 April 2020 to measure the impact on mental health. Conducted by the US Census Bureau and the National Center for Health Statistics, the results indicated that between 23 April 2020 and 19 May 2020, approximately one-third of respondents reported symptoms of anxiety or depressive disorders. In contrast, the results of a comparable survey found that from January to June 2019, only 11% of respondents indicated that they had experienced symptoms of anxiety or depressive disorder (Centers for Disease Control and Prevention, 2020). Other researchers have focused on the psychiatric consequences of the COVID-19

virus itself on those infected, such as inflammation of the brain, damage to nerve cell direct infection of the brain, and other acute neuropsychiatric symptoms (Brenner, 2020; Troyer *et al.*, 2020). While individuals may report heightened levels of mental distress, do increased levels of anxiety and depression result in greater numbers of emergency calls for service to the police for mental health-related issues?

The police and mental health calls for service

It is not uncommon for the police to come in to contact with mentally ill citizens. As noted by White and Weisburd (2018, p. 194), law enforcement officers 'are often the *first and only* community resource to respond to a situation where a person is having a mental health crisis (emphasis added)'. Surveys have noted that individuals with mental illnesses are painted as violent, dangerous, and unpredictable, leading to fear of those with disorders. This trepidation often leads to calls for service to the police to control the 'problem', whether it be complaints of homelessness; panhandling; disturbing the peace; or, in some cases, valid concerns regarding the behaviour of a violent person struggling with their disorder. Serving in the peace-keeping role, law enforcement officers are often transformed into 'street-corner psychiatrists' and act as gatekeepers for both the criminal justice and mental health care systems (Teplin, 2000; Lersch and Chakraborty, 2020).

In the special cases of suicide and suicide threats, the police may be called either to protect the individual-threatening suicide or to investigate the circumstances surrounding the death. The police must respond to all incidents involving reported deaths and treat the location of a suicide as a crime scene until the official cause of death is determined. Additionally, the act of suicide is still considered a crime in some states, thereby requiring the involvement of the police.

In response to calls for service related to suicide threats, law enforcement officers may initiate an involuntary civil commitment to a mental health facility. The exact criteria for this process may vary based on jurisdiction (Sheehan, 2009). In the USA, most states require the presence of dangerousness in order to initiate compulsory confinement. That is, a person must pose an imminent threat to either self (suicide) or others (homicide) in order to be taken into custody (Testa and West, 2010).

The geography of mental health

As a field of inquiry within academic geography, mental health geography is a relatively small, but growing, area of research (Philo, 2005; Lersch and Christy, 2020). Faris and Dunham (1939) conducted one of the first studies in the USA that examined the spatial epidemiology of mental illness. Without the aid of sophisticated software, the home addresses of 34,864 people admitted to hospitals and sanatoriums in Chicago from 1922 to 1934 were mapped. Definite ecological patterns were found between the rates of admissions and the structure of the city, especially with respect to schizophrenia. Overall, the rates of admissions in the more socially disorganized central areas of the city were the highest; the rates steadily decreased as one moved farther into the outskirts in the suburban areas. Similarly, Shaw and McKay (1942) explored relationships between the distributions of juvenile delinquency and other social problems, including infant mortality, tuberculosis, and mental health disorders. Not surprisingly, the rates for these various measures all decreased as one moved out of the central cities.

Contemporary studies continue to advance knowledge of the relationship between neighbourhood characteristics and mental health issues. Employing more and more sophisticated statistical analyses (see, e.g. Jones, 2007; Chang *et al.*, 2011; Kirchner and Shiffman, 2016), many researchers utilize data from the Census to measure social

indicators at the tract, city, county, state, or other areal unit thought to represent neighbourhoods. Social disorganization, urbanization, poverty, unemployment, lack of stable housing, level of education, and median income are frequently used socio-demographic predictors of mental illness (Stack, 2000a, 2000b; Rehkopf and Buka, 2006; Trgovac *et al.*, 2015; Vaughan *et al.*, 2019). Interestingly, demographers have shown that many of these same predictors are associated with higher risk of death from COVID-19 (Drefahl *et al.*, 2020).

In recent studies of the geography of mental health in the City of Detroit, results of optimized hot spot analysis revealed statistically significant areas with higher and lower numbers of calls for service related to mental health issues. This concentration of calls was especially pronounced with cases of suicide, where only 6.5% of the City's total area was identified as a hot spot. The total area for statistically significant hot spots for all mental health calls was 165.64 km²; the City of Detroit encompasses 254.92 square miles (see Lersch, 2020; Lersch and Christy, 2020). Other researchers have reported similar concentrations of mental health calls for service (see, e.g. Hodgkinson and Andresen, 2019; White and Goldberg, 2018) While areal concentrations have been previously reported, what impact (if any) does the COVID-19 crisis have on the geography of mental health calls for service?

Purpose of the present study

The purpose of the present study was to explore the relationship between the COVID-19 pandemic and the number and type of 911 mental health calls to the Detroit Police Department. Given the results of previous studies, one might suspect that as the COVID-19 crisis unfolded, individuals would experience heightened levels of anxiety, depression, and other mental health maladies, which may result in higher numbers of calls for service to

the police for intervention and assistance. Additionally, given the previous literature on mental health and geography, neighbourhoods with higher levels of reported COVID-19 cases and deaths may experience increased levels of mental health crises, resulting in geographic clustering of both COVID-19 cases and police calls for service due to mental health issues. Specifically, the following research questions will be explored:

1. Is there evidence of a significant, positive correlation between the daily 911 mental health-related police calls for service and the number of reported cases of COVID-19?
2. Is there evidence of a spatial relationship between the locations of 911 mental health calls for service and areas with higher levels of reported cases of COVID-19?

The setting: Detroit, Michigan, USA

The City of Detroit is located within Wayne County in South-eastern Michigan. According to the [United States Census Bureau \(2019\)](#), the estimated population in 2017 was 679,865 persons. The median household income was \$27,838 and 37.9% of the City's residents lived in poverty. The majority of residents were Black or African American (79.2%), with 14.1% White, and the remaining classified as other. Most Detroit residents were not Hispanic or Latino (92.4%).

There are a number of characteristics of the City of Detroit that make it unique. First and foremost is the catastrophic reduction in population. The population of the city dropped from nearly two million residents in 1950 to its current level of under 700,000 residents ([Binelli, 2013](#)). A number of reasons have been given for the decline. Describing Detroit as 'one of the most notorious examples of severe decline in North America', [Xie et al. \(2018, p. 350\)](#) noted the impact of urban sprawl, a history of racial segregation, and persistently high levels of poverty. Others ([Beyer, 2018](#); [Binelli, 2013](#)) have pointed to the decline of the

automotive industry, race riots, years of municipal corruption resulting in bankruptcy, poor urban planning, and high tax rates coupled with poor municipal services as key factors.

This mass exodus from the city resulted in a second unique attribute: the proliferation of abandoned and demolished structures. At the peak of the city's decline, nearly 100,000 structures stood empty and abandoned. The city encompasses an area of 139 square miles with nearly 40 square miles of vacant land due to demolitions and property abandonment ([Binelli, 2013](#)).

Finally, Detroit is unique due to its consistently high crime rate. Detroit is one of the most violent cities in the world. In 2017, a total of 13,796 violent crimes were reported to the police. Every year, the Federal Bureau of Investigation (FBI) calculates crime rates for geographic areas (i.e. cities, counties, states). The violent crime rate includes murder, rape, assault, and robbery. The violent crime rate in Detroit was 2,057 violent crimes per 100,000 people, which was much higher than the national level of 383 violent offences per 100,000 ([FBI, 2018](#)).

Detroit and COVID-19

The City of Detroit was thrust into the national spotlight on 5 April 2020 when the metropolitan area was identified as an outbreak hotspot during a COVID-19 Task Force briefing. At that time, Detroit reported the third highest number of cases in the USA ([WXYZ, 2020](#)). According to the [New York Times \(2020\)](#), the Detroit metropolitan area has been described as a 'hardest hit place', ranked seventh highest in the USA with respect to the rate of cumulative confirmed deaths, behind New York City and New Orleans.

The unique characteristics of the City of Detroit make the area particularly vulnerable to the spread of COVID-19. Along with the high poverty rate, residents report higher levels of obesity, diabetes, hypertension, and a lack of access to health

insurance and reliable transportation (Abdalla, 2020). Additionally, Detroit is home to one of the largest African American populations in the USA. Nationally, the COVID-19 rate is disproportionately higher among African Americans. In the state of Michigan, African Americans account for 40% of the deaths due to the coronavirus, but only 14% of the state-wide population is African American (Shau, 2020).

Methods

Mental health-related calls for service

The City of Detroit maintains a robust open data portal that provides access to maps and data sets focused on a variety of government services, including public safety, health, transportation, and land use (City of Detroit, n.d.). Launched in 2015, the portal was funded through a grant from the Socrata Foundation in an effort to assist in the re-development efforts (Shueh, 2015).

One of the data sets maintained in the Open Data Portal contains all 911 calls to the Detroit Police Department (DPD) for emergency police services and officer-initiated calls, which includes traffic stops, street stops, and observations of crimes in progress. Data collection began on 20 September 2016 and continues to the present, with data updated on a daily basis. Along with the description of the call, day, time, and other basic information, the DPD also includes latitude and longitude of the incident. To protect the identity of those involved, the DPD randomly offsets the coordinates by up to 180 feet along the street segment.

For this analysis, the calls for service were limited to non-officer-initiated events (i.e. a 911 call was placed by a citizen requesting police services). The calls were placed between 12:01 a.m. on 26 February 20 and midnight on 27 April 20. 26

February was selected as the start date as this was the first reported case of COVID-19 in the City of Detroit.¹ During this time frame, there were 1,552 were mental health-related calls. Using ArcGIS 10.7, these incidents were geocoded based on the provided XY coordinates.

The DPD has several different classifications that were grouped into three categories used in this analysis:

- suicides in progress ($n = 186$);
- suicide threats ($n = 300$); and
- mentally Ill Person {total $n = 1,063$; includes mental not violent $n = 370$; mental violent—armed ($n = 140$); and mental violent not armed ($n = 553$)}²

COVID 19 cases

Two sources for the COVID-19 cases were used. The first source was presented by ClickOnDetroit.com and included a daily count of the new reported cases, beginning on 26 February and continuing through this writing (<https://www.clickondetroit.com/news/local/2020/04/16/detroit-covid-19-data-tracking-cases-deaths/>). The daily number of deaths was also reported, with the first COVID-19 death in the City of Detroit noted on 18 March.

The second source was from the Detroit Health Department in which the total number of cases was reported by ZIP code. As of this writing, the cases are updated twice a week; the totals used in this analysis were as of 3 May 2020. These data include a number of caveats. The cases reflect Detroit residents only that had a known ZIP code. Given the rapidly evolving nature of the pandemic, the totals were preliminary and could change as new information is/was made available. Due to confidentiality concerns, the exact address of

¹ Source: Detroit COVID-19 data: Tracking cases, deaths. <https://www.clickondetroit.com/news/local/2020/04/16/detroit-covid-19-data-tracking-cases-deaths/> (accessed 3 May 2020).

² There were three remaining calls that fell into the category of 'other' in 2020.

individuals diagnosed with COVID-19 is not made available for analysis.

The City of Detroit completely encompasses two distinct municipalities that support their own police departments: Hamtramck and Highland Park. Comparable data were unavailable for these two cities, which were excluded from the analyses. ZIP code boundaries do not exactly coincide with the boundary of the City of Detroit. There were five zip codes (48203, 48211, 48212, 48236, and 48239) that were split between neighbouring cities. The 48212 ZIP code includes the city of Hamtramck, which covers an area of 2.1 square miles and had an estimated population of 21,716 in 2018 (US Census Bureau, 2020). As the total population of the ZIP code was 39,222 residents, the total number of cases in this ZIP code was reduced by 45%, which was proportionate to the excluded residents of Hamtramck.

Results

The first research question explored in this analysis examined the relationship between the COVID-19 pandemic and the number of mental health-related calls for service. This question was investigated two different ways. First, as the City of Detroit had comparable data back to Spring of 2017, it was of interest to compare the annual total number of 911 calls for service for the time period of 26 February to 26 April for the three previous years. The comparison is presented in [Figure 1](#).

As can be seen in [Figure 1](#), in the time period of interest the number of 911 calls during the 2020 pandemic was actually the lowest of the 4 years. While the reported suicides in progress remained relatively stable over the 4-year period, the total number of mental health-related calls for service declined by 16% from 2019 to 2020³.

Similarly, [Figure 2](#) displays the mental health-related calls for service by day for the time frame of interest (26 February to 25 April) for each of

the 4 years of available data. While the highest number of daily calls occurred on 2 March 2020 with 51 calls, in 2019, there were also high numbers of calls on 20 March ($n = 50$) and 22 March ($n = 48$).

Secondly, the analysis focused on the daily counts of COVID-19 cases and the mental health calls for service. Specifically, is there evidence of a significant, positive correlation between the daily 911 mental health-related police calls for service and the number of reported cases of COVID-19?

[Table 1](#) presents the descriptive statistics for the daily counts of COVID-19 cases, deaths, as well as the number of 911 calls for mentally ill persons, suicide threats, and suicides in progress. [Figure 3](#) graphically displays the counts per day. As can be seen in [Figure 3](#), while the number of reported COVID-19 shows a dramatic pattern of increase to the peak of 374 cases on 3 April 2020, the mental health-related calls for service remain relatively flat.

To better analyse changes in the daily counts, [Figure 4](#) displays the same counts with the number of COVID-19 cases removed, allowing the reader to more clearly inspect for patterns. Calls for service for mentally ill persons were the highest on 2 March, with 38 calls. This point was very early in the pandemic. On 24 March at midnight, the Governor of Michigan issued a Stay at Home order. Four days later, on 28 March, there were 29 calls for a mentally ill person; this was the second highest number for the time period of interest. Interestingly, despite the increasing deaths, cumulative cases of COVID-19, and the restrictive Stay at Home mandate, the calls for service did not see an increasing pattern.

[Table 2](#) displays the bivariate Pearson's product moment correlation coefficient values between the various types of 911 calls for service, the COVID-19 cases, and the reported deaths. No significant correlations were found between the number of COVID-19 cases and the number of calls for

³ When comparing annual totals, data from 2/29/2020 were removed.

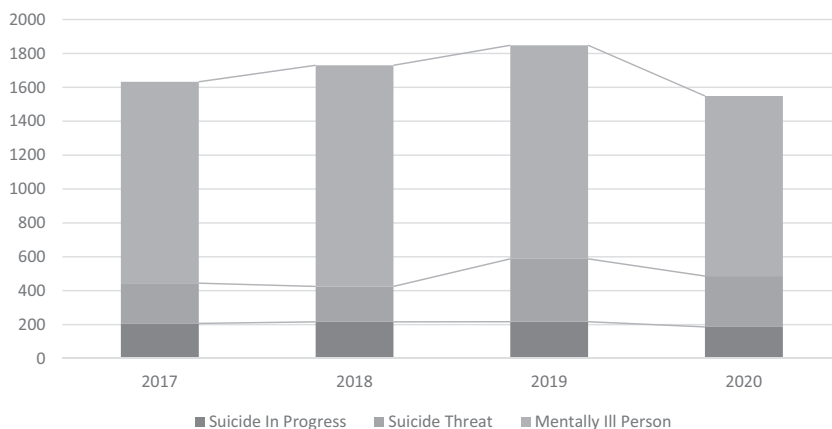


Figure 1: 911 mental health calls by year 2/26–4/26.

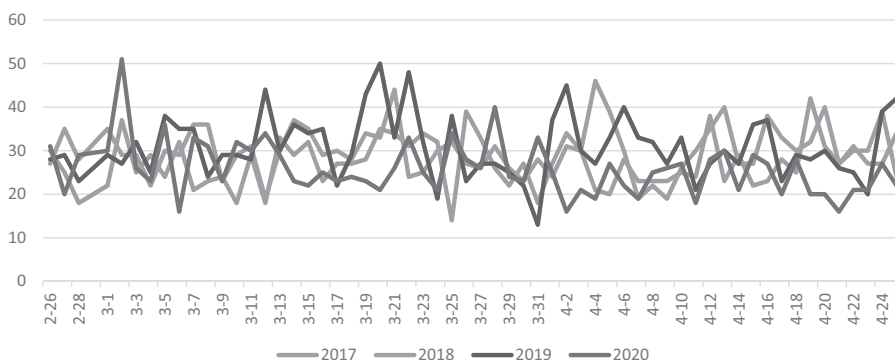


Figure 2: 911 mental health-related calls for service by year daily comparisons.

Table 1: Descriptive statistics: daily counts from 26 February 2020 to 26 April 2020

N	Minimum	Maximum	Mean	Standard deviations
COVID-19 cases	0	374	141.42	108.017
COVID-19 deaths	0	54	16.31	16.228
Mentally ill person	9	38	17.72	5.022
Suicide threat	0	11	5.00	2.386
Suicide in progress	0	8	3.10	2.039

suicide threats declined over the time period of interest. Additionally, the relationship between the day and calls for suicide threats was also a significant negative correlation, while the relationship between day and suicide threats was marginally significant ($p = 0.07$). So, as one moves later into the time frame of interest, calls for suicides in progress and suicide threats both declined.

mentally ill persons or the suicides in progress. The only significant correlation was between the COVID-19 cases and the threats of suicide, but this was an inverse relationship. That is, as the cases of COVID-19 increased, the number of

Geographic concentrations

The second research question explored in this analysis focused on the geography of the mental health calls for service and the rate of COVID-19 cases by ZIP code. Specifically, is there evidence of a spatial relationship between the locations of 911

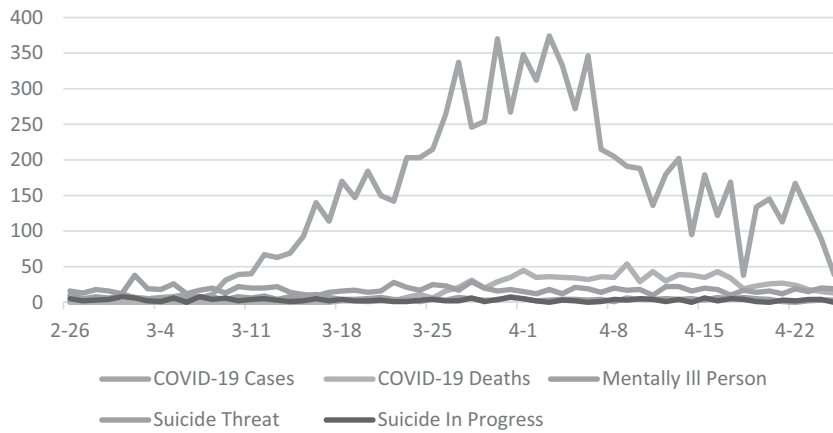


Figure 3: COVID-19 and mental health calls by day.

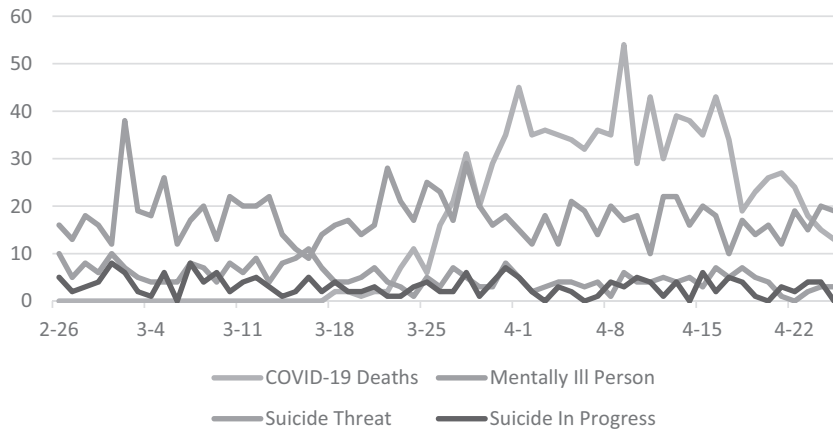


Figure 4: COVID-19 deaths and mental health calls by day.

Table 2: Pearson’s r correlation coefficients

Variable	Day	COVID-19 cases	COVID-19 deaths	Mentally ill person	Suicide threat	Suicide in progress
Day	1.000					
Cases	0.490**	1.000				
Deaths	0.767**	0.669**	1.000			
Mentally ill person	-0.104	-0.033	-0.100	1.000		
Suicide threat	-0.517**	-0.394**	-0.386**	-0.100	1.000	
Suicide in progress	-0.236(<i>p</i> =.07)	-0.179	-0.094	0.099	0.338**	1.000

***p* < 0.01.

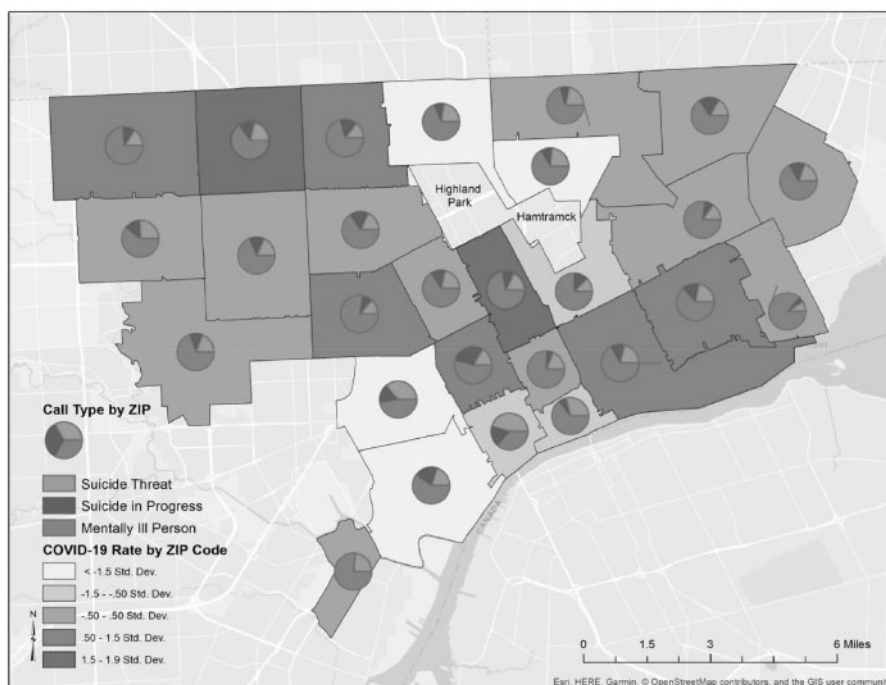


Figure 5: Locations of 911 mental health calls for service and COVID-19 cases by ZIP code.

mental health calls for service and areas with the higher rates of reported cases of COVID-19?

ZIP Code Boundaries and demographics were downloaded from Esri's ArcGIS Online Living Atlas. The layer contains the ZIP Code and 2018 population counts for all US ZIP code polygons. This layer was then clipped to the City of Detroit boundary to include only the relevant ZIP codes. The number of COVID-19 cases by ZIP code was reported by the Detroit Health Department and was accessed on 3 May 2020. The counts per ZIP code were converted to a rate per 100,000. There were 27 ZIP codes with a mean of 1,237 COVID-19 cases per 100,000 (SD = 401.21; range = 529–2,008 cases per 100,000). Figure 5 displays the COVID-19 rate by ZIP code symbolized by standard deviation values. Darker colours indicate ZIP codes with higher COVID-19 rates. Additionally, the locations of the 911 calls for service from 26 February 2020 to 26 April 2020 by type are also displayed by call type for each ZIP code. These

calls were clipped to the ZIP code boundary for the City of Detroit, reducing the total number of calls from 1,552 to 1,535.

To determine if the reported cases were clustered within the ZIP codes, a Global Moran's I test for autocorrelation was conducted using ArcGIS 10.7. The Moran's I was not significant ($I = 0.101$, $p > 0.05$), which means that the pattern of higher and lower rates was not significantly different than random. This result must be interpreted with caution, given the number of ZIP codes; a minimum of 30 features is ideal for analysis. While some ZIP codes were found to have higher rates than others, there does not appear to be evidence of statistically spatial clustering of reported rates of COVID-19 within the City of Detroit.

Optimized hot spot analysis

Finally, the pattern of 911 calls for service was compared to the distribution of COVID-19 rates by ZIP code. This analysis used optimized hot spot

analysis. This tool uses the Getis-Ord G_i^* statistic, which identifies areas where a feature has a high (or low) number of incidents and is surrounded by other features that similarly have high (or low) values (Lentz, 2009). The optimized hot spot analysis tool mines the data in order to obtain parameters that will yield optimal hot spot results (Esri, 2018). The tool aggregates the point data, identifies the correct scale of analysis, and automatically corrects for multiple testing and spatial dependence. Statistically significant results indicate the locations where point clusters are unusually intense or sparse.

Optimized hot spot analysis was conducted for four classifications of 911 calls for service: suicides in progress, suicide threats, mentally ill person, and the total number of 911 calls, regardless of type. Only two of the analyses found statistically significant hot spot locations; no cold spots were identified. Figure 6 displays the optimized hot spot results for all 911 calls, regardless of classification type.

As can be seen in Figure 6, the hot spot areas for all 911 mental health calls were located in the south-central area of the city, in the downtown area. These hot spots coincided with ZIP codes that had both below and above the mean COVID-19 rate for all ZIP codes. The hot spots were not located in the areas with the highest rate of COVID-19 cases.

Statistically significant hot spots were also identified for the suicide threats. As can be seen in Figure 7, the general location was similar to the hot spot areas for all 911 mental health calls for service. In the case of suicide threats, some of the hot spot areas were found in areas with higher rates of COVID-19 cases.

As a point of comparison, Figure 8 displays the results of the optimized hot spot analysis using the locations of all mental health-related calls for service that occurred within the same time frame (2/

26–4/26) for the previous 3 years.⁴ Interestingly, the dispersion of mental health calls was markedly different for the 2017–2019 COVID-19 time frame when compared to the 2020 results. As can be seen in Figure 8, there were several larger areas identified as statistically significant hot spots. While no cold spots were identified during the COVID-19 time frame in 2020, there were several areas in the previous years that had lower concentrations of mental health calls for service.

Discussion

The purpose of this study was to explore the rate and geographic distribution of 911 calls for service related to mental health issues during the COVID-19 pandemic in the City of Detroit, MI, USA. This study is similar to other recent attempts to explore the relationship between the COVID-19 pandemic and levels of crime and police calls for service (see, for example, Ashby, 2020a, 2020b; Felson *et al.*, 2020; Hodgkinson and Andresen, 2019, 2020; Mohler *et al.*, 2020; Stickle and Felson, 2020). The results of the instant study were somewhat counterintuitive in that the total number of calls for mental health issues was at the lowest level when compared to the same time period for the previous 3 years. Furthermore, as both the daily reported cases and deaths increased over time, there was a significant decline in both suicide threats and suicides in progress. This finding suggests that while individuals may be experiencing heightened levels of depression and anxiety, the police are not being called in to assist with the matter.

This may be related to a similar phenomenon, where the number of individuals found dead in their homes experienced a dramatic spike during the pandemic. A report by Fox 2 Detroit noted increases as high as 400 per cent for Priority 4 emergency medical service calls in the South-eastern Michigan region, which are calls for people

⁴ Separate analyses were conducted for each of the previous 3 years for the time frame from 2/26 to 4/26. The patterns of hot and cold spots were similar, especially for 2018 and 2019. These additional maps are available from the author on request.

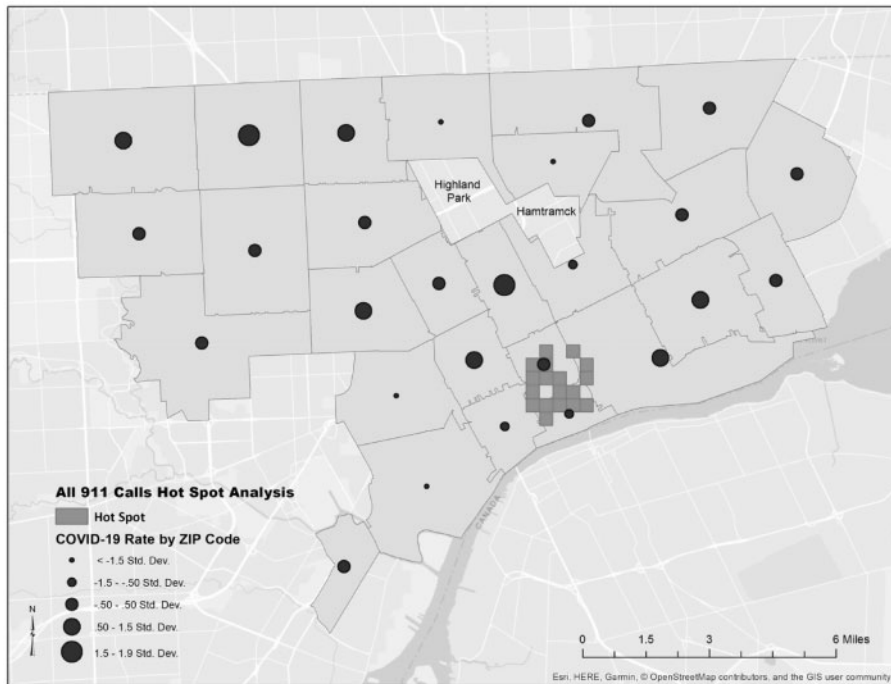


Figure 6: Hot spots of 911 mental health calls for service and COVID-19 cases by ZIP code.

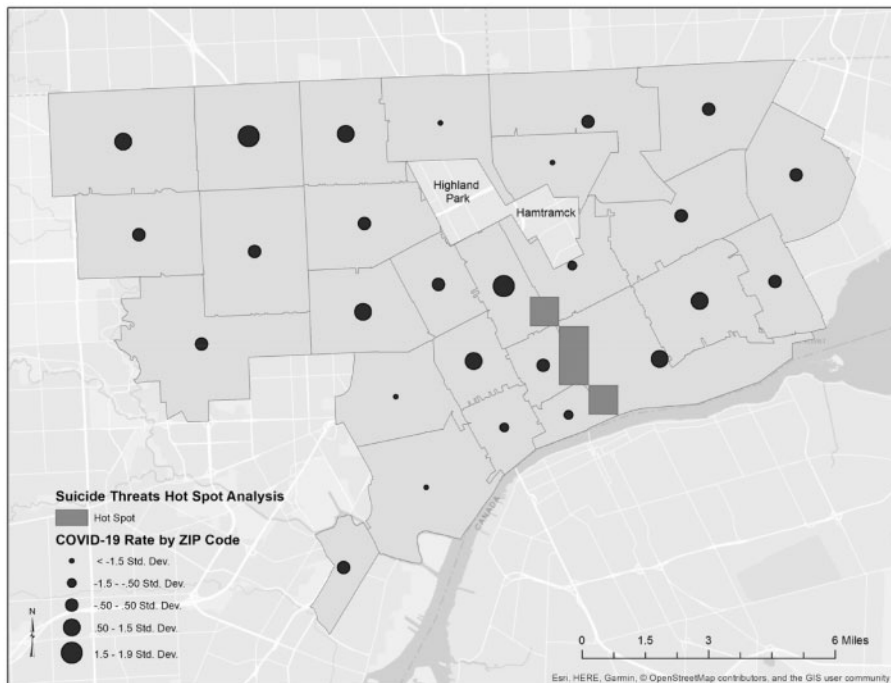


Figure 7: Hot spots of 911 suicide threats calls for service and COVID-19 cases by ZIP code

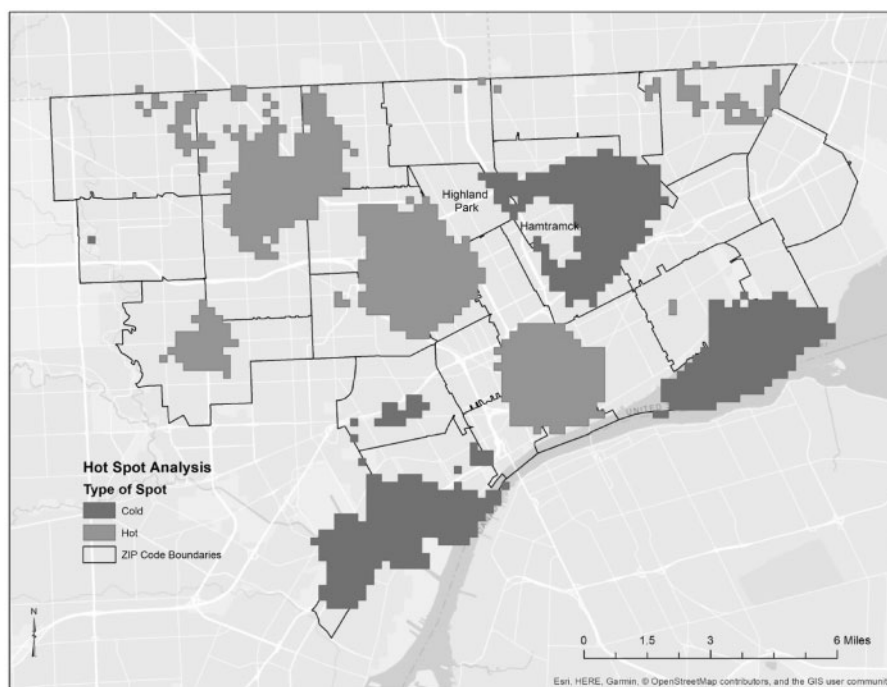


Figure 8: Hot spots and cold spots for all 911 mental health calls for service: time frame 2/26—4/26 combined from 2017 to 2019.

dead in their homes (Fox 2, 2020). People may be fearful of seeking help for their condition, whether it be for chronic physical or be mental conditions.

With respect to the geographic distribution of 911 mental health-related calls for service, significant hot spots were found for the total calls as well as for threats of suicide. These hot spots did not coincide with the spatial distribution of the reported cases of COVID-19 by ZIP code. While higher and lower areas of reported cases were found, these differences by ZIP code were not found to be significant. This result may have been different if the number of cases was known for smaller geographic areas, such as census tracts or blocks. Given the rapidly evolving nature of the pandemic, perhaps these data will become available for future analyses.

Of particular interest was the comparison of the geographic clusters of the 911 calls for service during the initial COVID-19 crisis with the locations for the same time period for the previous 3 years.

The 2020 calls were more evenly spread throughout the city, with relatively small areas identified as hot spots; only 1.84 square miles of the City were identified as a hot spot (out of a total area of 254.82 sq. miles). No cold spots were found. Conversely, the calls that occurred for the previous 3 years in the same time frame demonstrated definite areas of clustering and dispersion. The total area of the hot spots was 24.05 square miles, and the total area of the cold spots was 22.81 square miles. This lack of statistically significant hot and cold spots during the COVID-19 pandemic makes targeted prevention strategies more difficult.

This study focused on a single city with rather unique characteristics. The ability to generalize the results beyond this location would be problematic. It would be of interest for future researchers to replicate this study in other urban areas to see if similar results are found. It should also be noted that the time frame for this analysis was prior to the death of George Floyd in Minneapolis,

Minnesota, on 25 May 2020 while in police custody. This incident, along with the civil unrest that followed, may have an impact on the likelihood for individuals to call the police for assistance. While the purpose of this study was to explore the impact of the COVID-19 pandemic on mental health-related calls for service, future researchers may wish to expand the time frame for analysis in order to examine the continuing influence of the COVID-19 pandemic as well as the civil unrest on mental health.

Arguably, the greatest weakness of this study is the reliability and validity of the COVID-19 reported cases and deaths. These numbers can and do change over time, as public health officials have been rushed to reported updated data on the outbreak. It should be noted that the Detroit Health Department reports the daily totals based on the date of the onset of the disease. If this date is not known, either the referral date is used or the specimen collection date of the first positive COVID-19 case is used. It is unknown what impact these data reporting issue may have on the results.

Additionally, several caveats were noted with respect to the reported ZIP code of the COVID-19 case totals. The Detroit Health Department acknowledges that the totals are preliminary and may change as new information becomes available. If a case does not have an accurate ZIP code, then the case is excluded. Further, the counts reported by the City of Detroit may be slightly different than those from the Michigan Department of Health and Human Services depending on the exact time of day that the data were accessed.

While the results of this study did not find an increase in 911 calls for service during the height of the COVID-19 pandemic, police agencies should not assume that all is well in their communities. In fact, the opposite may be true, given the heightened levels of unemployment, anxiety, isolation, and depression that many citizens report. Agencies may take advantage of this opportunity to connect citizens to local social service agencies and other community resources even if

an officer has not been called to a home for an emergency mental health issue.

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