

Examination of Community Health Profiles with Elevated COVID-19 Morbidity and Elevated COVID-19 Mortality.

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Abstract

The coronavirus (COVID-19) pandemic unexpectedly decimated poor and vulnerable communities in New York City, causing insurmountable illness and loss of life. Yet, limited information is provided on the actual health profiles of communities dramatically affected by morbidity, and/or mortality. The purpose of this study is to examine the health, socioeconomic conditions, and environmental characteristics that put vulnerable communities at increased risk for morbidity and mortality from COVID-19. Two communities were selected in New York City, one with the highest number of COVID-19 cases, and the other with the highest number of COVID-19-related mortality. Data on health, socioeconomic conditions, and environmental characteristics on these two communities were extracted from public records on June 11th, 2020. The results of the study show that the community with the highest number of COVID-19 cases is impoverished, uneducated, predominantly foreign-born with limited English proficiency, severely overcrowded, and lacked access to healthcare. In contrast, the community with the highest number of deaths experience outstanding health disparities (on diseases that were associated with COVID-19 deaths), avoidable hospitalization, incarceration, and premature deaths. Moreover, they are US-born, have limited access to quality healthcare, and reside in a medically underserved community. This study adds to existing literature on COVID-19 affecting vulnerable communities with high incidence and mortality. Future research should explore lifestyle behaviors/activities (such as the type of employment, low wages, duration of symptoms before accessing healthcare, and access to food, laundry, and other essential supplies) that may have exacerbated the spread of the virus and death from the virus.

Background

Since the first laboratory confirmed COVID-19-related death on March 11th, 2020 (CDC, MMWR, 2020), COVID-19 has triggered significant social, political, and economic upheaval in the lives of people who live, work, and play in NYC. As of May 25th, 2020, over 196,098 persons have been infected, resulting in 51,197 hospitalization and 16,482 laboratory-confirmed deaths (NYCDOHMH, 2020). According to the New York City Department of Health and Mental Hygiene (NYCDOHMH, 2020) data, the city's poor and vulnerable communities experienced exceedingly high rates morbidity and mortality due to the pandemic. While COVID-19 infection rates among the 44-64 and 65+ age groups were similar, there was a significant disparity in mortality rates, 184 per 100,000 in adults ages 44-64 vs. 1,055 per 100,000 in adults ages 65 and older (NYCDOHMH, 2020). Similarly, mortality rates were disproportionately higher among men at 255 per 100,000 compared to women at 155 per 100,000. Mortality rates were higher among Latinos, 230 per 100,000 and Blacks, 218 per 100,000, compared to Whites at 109 per 100,000 and Asians at 102 per 100,000, respectively. There was a steady increase in COVID-19 cases, hospitalization, and death rates associated with incremental, increased levels of poverty (NYCDOHMH, 2020). There are two communities in Queens that has faced alarming morbidity and mortality, Corona and Far Rockaway. Corona is located in Queens District 4 which includes the bordering town of Elmhurst. Far Rockaway is located in District 14 which includes the bordering towns of Arverne, Broad Channel, Edgemere, Rockaway Park, and Breezy Point.

The Corona, Queens, community has been dramatically affected by COVID-19. In June 6th, 2020, Corona had the highest number of COVID-19 infection in the borough and New York city, accounting for 7,723 cases. The mortality rate is 354 per 100,000. Corona rests in the northern western section of Queens, just east of Woodside and west of Flushing. In 2017, the population of both communities, Corona and Elmhurst represented 146,301. Latinx made up 51% of the community, followed by Asians 36%. Representation of Blacks and Whites in the community were comparable at 5% (NYU Furman Center, 2017). Corona's age demographic comprised of ages 0-17 at 21%, 18-24 at 9%, 25-44 at 33%, 45-64 at 25%, and 65 and older at 11%. Sixty-three (63%) of its residents are foreign born, and 51% have limited English proficiency. Far Rockaway, Queens, District 14 has also been gravely affected by the pandemic. This district's mortality rate of 476 per 100,000 is the highest in the borough and the city (NYCDOHMH, 2020).

However, the actual number of COVID-19 cases is 2351, significantly less than Corona. Far Rockaway is located on the most southern tip peninsula in Queens. Included in District 14 are the communities of Arverne, Broad Channel, Edgemere, Rockaway Park, and Breezy Point, which has a population size of 114,390. Blacks are the largest racial group in the community at 40%, followed by Whites 33%, then Latinx at 22%, Asians at 3% and Other 2%. The age demographic in Far Rockaway comprised ages 0-17 at 26%, 18-24 at 18%, 25-44 at 25%, 45-64 at 26%, and 65 and older at 14%. Most of its residents are US-born, representing 74% and, 13% have limited English proficiency.

It is evident that Corona and Far Rockaway have distinct demographic characteristics across population density, geography, and outcomes of COVID-19. NYCDOHMH reports that severe illness and deaths due to COVID-19 are caused mainly by underlying medical conditions such as heart disease, lung disease, cancer, diabetes, immunodeficiency, kidney disease, and liver disease. However, it is unclear why Corona had the greatest number of COVID-19 cases, and Far Rockaway, the highest number of deaths in the city. This study aims to examine the health, socioeconomic conditions, and environmental characteristics that may have put these communities at increased risk for morbidity and mortality rates from COVID-19.

Methods

The health, socioeconomic conditions, and environmental characteristics in the Corona and Far Rockaway communities was examined using public data extracted from the NYCDOHMH Community Health Profiles and New York University (NYU) Furman Center on June 11th, 2020 and includes demographic data in each community district in NYC. The data contains information on health status, health outcomes, avoidable hospitalizations, and socio-economic conditions. One of the advantages of NYCDOHMH's Community District Health Profiles is that most of its data is provided as rate or a proportion (percentage), making it possible to compare variables between the two districts. NYU Furman Center provided information on demographic and housing conditions in 2018. NYU Furman Center defined communities by districts as well.

The data collected by the NYCDOHMH was aggregated by Community Districts which encompass multiple towns. In the case of Corona, it is in District 4 which includes its neighboring town, Elmhurst; Far Rockaway is in District 14 which includes Far Rockaway, Arverne, Edgemere, Broad Channel, and Breezy Point. Therefore, data for these adjacent towns is included in the study. In contrast, the public data COVID-19 cases are provided by zip code; this study made a good faith attempt to match the zip code-based data with the boundaries of Districts 4 and 14.

Results

Table 1 displays the public data from NYCDOHMH and NYU Furman Center, providing descriptive statistics for the two communities, Corona and Far Rockaway. The variables examined to assess health status were: self-reported physical and mental health status, rates of obesity, hypertension, hepatitis C, human immunodeficiency virus (HIV), psychiatric hospitalizations, avoidable hospitalization, physical activity, and influenza vaccination. Access to healthcare was measured by having health insurance. To determine socioeconomic status, we used educational status, poverty level, and incarceration. To assess environmental characteristics, we examined overcrowding, rent burden, and supermarket to bodega ratio variables.

	Far Rockaway	Corona
Demographics	%	%
Population	n=114390	n=188107
Born Outside	26	63
Limited English Proficiency	13	51
<i>Race</i>		
Asian	3	36
Black	40	5
Latino	22	51
White	33	6
Other	2	1
<i>Age</i>		
0-17	26	21
18-24	8	9
25-44	25	33
45-64	26	25
65 and older	14	11
<i>Education</i>		
Less than High School Diploma	22	30
High School and Some College	43	42
College Degree	35	28
COVID-19 Characteristics		
COVID-19 incidence	n=2152	n=7302
COVID Deaths	n=445	n=307
Access to Healthcare Characteristics		
Uninsured	11	25
Obesity	32	19
Diabetes	15	11
Hypertension	34	23
Avoidable Hospitalization	1345/100000	892/100000
Psychiatric Hospitalization	1158/100,000	440/100,000
HIV	15/100,000	25/100,000
HCV	69/100,000	34/100,000
Health Status		
Good, Better, Very Good or Excellent	75	68

Mortality Characteristics		
Premature Mortality	269/100,000	105/100,000
Heart Disease	75/100,000	16/100,000
Cancer	57/100,00	35/100,000
Diabetes	0	3/100,000
Suicide	0	4.4/100,000
Drug-related Conditions	12.4/100,000	0
Life Expectancy	77	86
Socioeconomic characteristics		
Poverty	18	27
Unemployment	8	6
Incarceration	824/100,000	227/100,000
Environmental characteristics		
Severe crowding rate	3	12
Housing units	46463	48857
Rent Burden	53	62
Supermarket-Bodega	1:08	1:16

Health Status/Access to healthcare characteristics self-reported physical and mental health status (“Good,” “Very Good,” or “Excellent”) was slightly different in Corona than in Far Rockaway at 68% and 75% respectively. However, this finding is contradictory to the actual rates of disease conditions found in Far Rockaway, particularly those associated with COVID-19 deaths. For instance: obesity rates are 30% higher in Far Rockaway than Corona. Meanwhile, hypertension rates are slightly higher in Far Rockaway at 34% compared to Corona at 27%.

The number of avoidable hospitalization (from diseases that could be addressed in primary care) is considerably higher in Far Rockaway with rates of 1,345 per 100,000 than in Corona with rates of 892 per 100,000. Similarly, significant health disparities were found in the rate of psychiatric hospitalizations in Far Rockaway at 1,158 per 100,000 compared to Corona’s rate 440 per 100,000. Regarding infectious diseases, the number of new hepatitis C virus (HCV) cases reported was twice as high in Far Rockway. Conversely, the number of new HIV infections was 40% greater in Corona than Far Rockaway. Regarding preventive health, the data reveals that residents in Corona are uninsured at twice the rate as those in Far Rockaway. The percent of adults with influenza vaccination in Corona is marginally higher at 45% when compared to Far Rockaway at 38%. The percentage of self-report physical activity in the past 30 days though is comparable between the two communities.

Some other health metrics, however, show staggering differences. For premature mortality, Far Rockaway’s rate (269 per 100,000) is over 2.5 times that of Corona (105 per 100,000). The rate of heart disease in Far Rockaway (75 per 100,000) is almost five times what is seen in Corona (16 per 100,000). Cancer is almost two times greater in Far Rockaway and, life expectancy is shorter in Far Rockaway at an average age of 77 than in Corona at an average age of 86. Lastly, some diseases that are listed in the top five premature deaths were unique to each community. For instance, Corona includes diabetes (at a rate of 3 per 100,000) and suicide (at a rate of 4.4 per 100,000) whereas drug-related conditions were in Far Rockaway’s list at a rate of 12.3 per 100,000.

Socioeconomic characteristics

Based on NYCDOHMH Community District Health Profile, 30% of residents in Corona have less than a high school diploma which, is almost 30% greater than Far Rockaway. Conversely, Far Rockaway has slightly more college-educated residents than Corona. Regarding poverty, Corona is 33% significantly more impoverished than Far Rockaway. Likewise, the rate of incarceration among residents 16 years and older is disproportionately higher in Far Rockaway than Corona at a rate of 824 per 100,000 and 227 per 100,000. However, unemployment (among residents 16 years old and older) is slightly higher in Far Rockaway than Corona at 8% and 6%, respectively.

Rent burden (the percent of rent-occupied homes) in Corona is 15% greater than Far Rockaway at 62% and 53%, respectively. Concerning accessing food, the ratio of the supermarkets to bodegas (delis) in Corona is 1:16, half as many supermarkets per bodega than the 1:8 ratio in Far Rockaway. Another unique characteristic discovered is that Corona has a 72% greater severe overcrowding rate (based on the five-year American Community Survey estimates) than Far Rockaway (NYU Furman, 2018). A lack of healthcare facilities and resources profoundly affected Far Rockaway as it is considered a medically underserved community after the closing of Peninsula Hospital in 2012 (New York State, Office of the State Comptroller, 2018).

Discussion

This study provided invaluable insights on the various health, socioeconomic, and environmental factors that put the residents of Corona and Far Rockaway at heightened risk for COVID-19. There are distinctive characteristics in each community that make them more susceptible to either infection or death. Although the residents of Corona have less access to healthcare, and a larger foreign population than does Far Rockaway, the health status of Corona residents is significantly better. This finding is consistent with other studies that highlight that immigrant children and adults have better health and lower mortality rates than US-born individuals (Singh, G. Rodriguez-Lainz, A. Kogan, M., 2013). Moreover, the study indicated immigrants have less access to healthcare similar to the residents in Corona, a densely populated immigrant community (Singh, G. Rodriguez-Lainz, A. Kogan, M., 2013).

High COVID-19 Mortality in Far Rockaway

Based on the community health profiles, the characteristics of Far Rockaway proved to be the perfect storm for disproportionate deaths due to the virus. The existing health conditions found in the community made them much more vulnerable to deaths from COVID-19. For instance, the rate of disease conditions such as diabetes, hypertension, obesity, and HCV in Far Rockaway outnumbered Corona, except for new HIV infections. As discussed in prior studies, some of these conditions, specifically diabetes, hypertension, and obesity, are directly associated with death from COVID-19 (CDC, 2019; Docherty, 2020). Compounding the issue further, residents of Far Rockaway had almost double the number of avoidable hospitalizations than Corona. NYCDOHMH defines avoidable hospitalizations as those who present to the hospital with medical conditions that could have been prevented with access to quality care (NYCDOHMH, 2018).

High rates of avoidable hospitalization suggest that residents are not getting adequate access to primary healthcare or preventive programs to manage disease conditions. Furthermore, Far Rockaway had almost three times the rate of psychiatric hospitalizations than Corona, which is defined as psychiatric hospitalizations as “difficulty accessing preventive services and early care, greater exposure to stressors and interruptions in health insurance coverage” (NYCDOHMH, 2018). This finding is in concert with prior studies which demonstrated that Blacks experienced more serious and frequent psychological anguish than Whites, partly due to systematic poverty and racism (51-53). The disproportionate rate of poor health found in Far Rockaway suggests a wide gap in access to quality healthcare services. One of the reasons for this disparity is that in 2018 the area was designated as a medically underserved community in NYC (NYS Comptroller, 2018). Furthermore, a report from Doctors of the World (2014) revealed that residents were unable to receive it. In the same report, residents reported barriers to healthcare in the community included long wait times, inconvenient hours, and far geographic distance.

High COVID-19 Morbidity in Corona

As noted earlier, Corona has the highest number of COVID-19 cases in Queens and in the city. One distinguishing characteristic of Corona that separates it from Far Rockaway is the built environment. The built environment in this study refers to housing conditions and limited affordable housing. According to the NYU Furman Community Health Profile report, Corona is four times more severely overcrowded than Far Rockaway (NYU Furman Center, 2018). Severe overcrowding was defined as more than 1.5 household members in each room per unit. In 2018, the number of housing units in Corona was 48,857, only 5% greater than Far Rockaway, 46,463 (NYU Furman Center, 2018). However, the population in Far Rockaway is 39% less than Corona, reinforcing the severity of crowding in Corona. Individuals who live in congested, crowded conditions are unable to socially distance and are at higher risk for COVID-19. The ripple effect of socioeconomic factors increases the risk for infection among Corona residents. One of the main reasons for overcrowding may more than likely be due to poverty. Corona has a 27% greater poverty level compared to Far Rockaway. Even though Corona has a slightly lower unemployment rate than Far Rockaway, it seems likely that the vast income disparities influence the way people live. The lack of affordable housing and high cost of living in NYC leaves families with no other alternative but to share rooms and live in crowded spaces.

Racial/ethnic enclaves

Apart from the health, socioeconomic, and environmental conditions affecting the health of the two communities, it is vital to highlight the racial and ethnic composition of both communities, each with distinct differences in health outcomes. As discussed earlier, Far Rockaway experienced significant mortality due to COVID-19. The second largest mortality rate was Flushing, although its population is over double that of Far Rockaway (NYCDPHMH, 2018-Flushing). Concerning race, Blacks represented the largest racial group in Far Rockaway (40%) followed by Whites (33%). However, Blacks account for substantially more COVID-19 cases than Whites. Blacks live in areas of the district where there is the most significant number of COVID-19 cases (particularly in zip codes 11691 and 11692) Blacks were significantly more concentrated and marginalized in these specific areas. The high mortality rates of COVID-19 in the Black community runs parallel to the elevated rates of other diseases that existed in the community before the pandemic.

These contrasting racial disparities reflects the systematic oppression faced in the community. Even though most of the residents in Far Rockaway are US-born, have access to health insurance and high English proficiency; their health status is incredibly more inferior than the large foreign-born population that reside in Corona. Study after study indicates that Blacks suffer grossly disproportionately from ill-health, poor disease outcomes, and lack of access to healthcare compared to Whites and other racial groups. Blacks continue to be overwhelmingly overrepresented with high rates of incarceration, substance use/abuse, and mental health conditions (NYCDOHMH, 2018). Corona, on the other hand, has a different racial composition compared to Far Rockaway. The community is majority Latinx, representing 51% of the population followed by Asians at 36%. Unlike Far Rockaway, there were more foreign-born in Corona (63%) and 30% of residents are undereducated, having less than a high school diploma. Even though they have better health outcomes than Blacks in Far Rockaway, socioeconomic and environmental conditions seem to put them at heightened risk for COVID-19 infection. The dense concentration of impoverished foreign-born residents in Corona seems like the perfect breeding ground for COVID-19. These racial and housing disparities seem consistent with other research in that urbanization (the movement of migrants to urban areas), may lead to substandard housing and unsanitary conditions that put new migrants at risk for infectious diseases (Carl-Johan, N, 2015).

Conclusion

The findings in this study highlight the distinct health, socioeconomic, and environmental factors in two communities that make them more susceptible to risk for COVID-19 infection (in Corona) or death from COVID-19 (Far Rockaway). Severe overcrowding places individuals at heightened risk for COVID-19 in Corona, Queens. Other factors including lifestyle behaviors/activities (such as the type of employment, low wages, and access to food, laundry, and other essential supplies) that may compound the issue further. Disproportionate existing health outcomes in Far Rockaway increased individuals' risk for mortality due to COVID-19 despite having health insurance. To that end, this study underscores the underlying conditions that should be targeted in COVID-19 prevention efforts.

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