Brookline Public Health Report on the Novel Coronavirus (COVID-19)

Brookline Public Health and Human Services
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Message from the Health Commissioner

The mission of the Brookline Public Health and Human Services is to preserve, protect, and promote the physical, mental, and environmental health of the Brookline Community. We collaborate with partners to reduce health inequities and respond to emerging public health challenges. We envision an inclusive community that is healthy, safe, connected, and equitable for all. Our goal is to control communicable diseases and existing and potential environmental hazards; to provide health education and clinical health services, with emphasis on the prevention and early detection of chronic diseases and the improved management of lifestyle issues affecting health; and to deliver services dealing with conditions resulting from the abuse of drugs or alcohol.

In line with our goals and mission, we have implemented a range of preventative public health measures in Brookline to the fight against the COVID-19 pandemic. We are proud to announce that we successfully contained the spread of the virus early on during the pandemic and were successful in maintaining one of the lowest disease rates in Massachusetts. I hope this report will help Brookline residents and the general public to understand the trajectory of the virus and the impact of our mitigation strategies at the community level.

-Dr. Swannie Jett

Executive Summary

COVID-19, which is caused by the novel coronavirus (SARS-CoV-2), is one of the most widespread global pandemics to date. The purpose of this report is to provide Brookline residents with information about the virus, the recent data and data trends, the effects on the community, and the Brookline Department of Health's response. The first section of this report is an introduction to COVID-19, including transmission, symptoms, risk factors, treatment, and prevention. The second section assesses the impacts of COVID-19 across global, state, and town lines, before focusing specifically on the Town of Brookline. The report details actions taken by the Department of Health to prevent the spread of the disease. Finally, the report provides specific Town of Brookline data, including trends in cases and deaths.

Brookline was successful in containing the spread of the virus early on during the pandemic and has one of the lowest rates of the disease in Massachusetts. The sustained implementation and enforcement of community mitigation measures like face-mask mandates, social distancing and reducing large gatherings, and active outreach and communication with community members were key to Brookline's success. Brookline reported a total of 2,123 cases and 96 deaths by the end of March 2021. Minority race/ethnicity groups were most affected with the highest rates of positive cases in Blacks and Hispanics; the highest cumulative death rate was observed in the Asian population.

The prospects of the COVID-19 disease control in Brookline in 2021 are promising with the FDA approval of three vaccines and smooth vaccine rollout in Massachusetts. However, it is imperative that COVID-19 variants continue to be monitored as the pandemic continues.

COVID-19: The Basics

INTRODUCTION

The severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2, which causes the disease COVID-19) is a new respiratory virus that was first identified in Wuhan, China, in December 2019. Because this is a novel virus, there was no previous exposure or protective immunity to stop or slow the transmission of the disease. This allowed for rapid spread around the world, leading to one of the largest and most widespread global pandemics in modern times. Since the first cases in December 2019, there have been more than 130 million cases and 2.8 million deaths worldwide as of March 2021.[1]

SYMPTOMS

COVID-19 spreads from person to person via respiratory droplets that are produced when an individual coughs, talks, or sneezes.[2] The clinical manifestation of COVID-19 ranges from asymptomatic to severe illness.[2] While the combination of symptoms is different across individuals, the most commonly reported symptoms include:

- Cough
- Fever
- Chills
- Muscle pain
- Shortness of breath or difficulty breathing
- Sore throat
- Headache
- New loss of taste or smell
- Fatigue
- Congestion or runny nose

This list is not exhaustive; in addition to those listed above, there have also been reports of less common symptoms, including diarrhea and nausea/vomiting.[2] On average, symptoms present 2-14 days after exposure, with a median incubation period of 5.1 days. The duration of symptoms is typically 10-14 days.[2]

MORTALITY

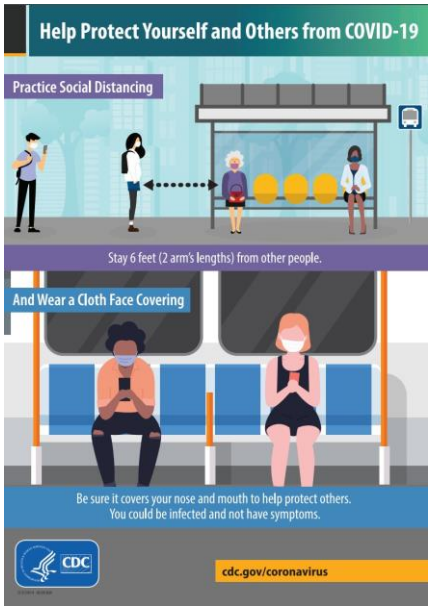
There is varying data on the mortality associated with COVID-19. However, there are certain groups that are at high-risk for severe illness and death, including people aged 65 years and older, people who live in a nursing home, and people of all ages with underlying medical conditions. Specifically, those with chronic lung disease, serious heart conditions, a compromised immune state (i.e., cancer, organ transplant, immune deficiencies, and poorly controlled HIV), diabetes, or chronic kidney disease have been associated with more severe disease or worse outcomes.[3]

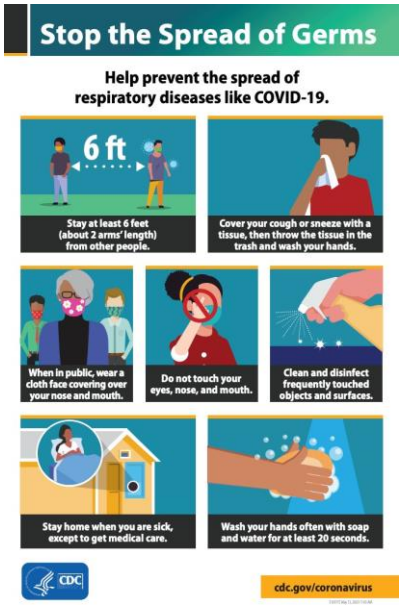
TREATMENT

The U.S. Food and Drug Administration (FDA) has provided emergency use authorizations to two potential treatments for COVID-19 cases: Remdesivir, an antiviral drug is approved for hospitalized COVID-19 cases; and several monoclonal antibody treatments have been approved for mild/moderate COVID-19 cases that may progress to serious hospitalized COVID-19.[3] Current treatment plans for mild cases include mandatory quarantine and acetaminophen (Tylenol) for symptomatic relief.[4]

PREVENTION

Prevention of person-to-person transmission has become one of the main focuses of most public health efforts, which requires individual, community, and state public health actions. Community mitigation measures can help slow the spread of COVID-19; these measures include wearing





masks, social distancing, reducing the number and size of large gatherings, pausing operation of businesses where maintaining social distancing is challenging, working from or staying at home, and implementing certain workplace and educational institution controls. At the individual level, the measures include maintaining social distance, wearing face masks when in public, washing hands often, and completing a 14-day quarantine if exposed. The U.S. FDA has given emergency use authorization for three COVID-19 vaccines, the Pfizer/BioNTech COVID-19 vaccine, the Moderna COVID-19 vaccine, and the Johnson & Johnson's Janssen COVID-19 vaccine.[5]

A Timeline of COVID-19 Developments in 2020[6]

Jan 09	WHO announces mysterious coronavirus-related pneumonia in Wuhan, China.
Jan 21	CDC confirms first US coronavirus case in Washington state.
Jan 31	WHO issues global health emergency.
Feb 03	US declares public health emergency.
Mar 11	WHO declares COVID-19 a pandemic.
Mar 13	Trump declares COVID-19 a national emergency.
Mar 19	California issues statewide stay-at-home order.
Mar 27	Trump signs into law the CARES Act, the largest economic recovery package in history, providing $2 trillion in aid to hospitals, small businesses, and state and local governments.
Apr 28	Young, poor avoid care for COVID-19 symptoms.
May 21	US and AstraZeneca form vaccine deal.
May 28	US COVID-19 deaths pass the 100,000 mark.
Jun 10	US COVID-19 cases reach 2 million.
Jun 22	Study suggests 80% of cases in March went undetected.
Jul 07	US surpasses 3 million infections.
Jul 27	Senate introduces HEALS Act, the second COVID-19 economic stimulus.
Aug 04	Rural hotspots face lack of intensive care unit beds.
Aug 13	Biden calls for 3-month mask mandate.
Aug 17	COVID-19 now the third-leading cause of death in the US.
Aug 28	First known case of COVID-19 reinfection reported in the US.
Oct 02	Trump, First Lady test positive for COVID-19; Trump enters hospital.
Oct 08	White House COVID-19 outbreak grows to 34.
Nov 04	US reports unprecedented 100,000 cases in 1 day.
Dec 11	FDA approves Emergency Use Authorization (EUA) for COVID-19 vaccine from Pfizer, BioNTech.
Dec 18	FDA approves EUA for Moderna's COVID-19 vaccine.
Dec 21	New more contagious COVID-19 variant circling the UK.
Dec 29	First US case of new more contagious COVID-19 variant found in a Colorado man with no travel history.
Dec 31	2.8 million people in the US received an initial vaccination, falling short of the goal to give 20 million vaccinations by the end of the year.

The Impact

THE U.S.

The United States became the epicenter of COVID-19 on March 26, 2020 when the number of cases officially surpassed that of China. As of March 2021, over 30 million Americans have contracted the disease.[1] However, many experts believe the actual number of cases may be higher due to a widespread shortage of tests during the spring and summer of 2020. COVID-19 reduced U.S. life expectancy by a year in the first half of 2020, the biggest drop since WWII. Racial minorities suffered the biggest impact, with Black Americans losing nearly three years and Hispanics losing nearly two years of their life expectancy.[7]

COVID-19 placed a profound burden on the U.S. healthcare system. As of December 12, 2020 a total of 96,444 individuals had been hospitalized for COVID-19, representing a cumulative hospitalization rate of 295.8 per 100,000 population.[8] Within the first few weeks of the pandemic, many hospitals in New York and other states in New England had reached full capacity. Many states and cities were forced to undertake substantial measures to accommodate the surge, including the establishment of field hospitals and drive-through testing tents to alleviate stress on hospitals.[8]

The impact on healthcare extends beyond the specific morbidity and mortality of COVID-19. As hospitals prepared for surges in cases, other services and offices were shut down to prevent exposure and spread. Emergency departments, primary care offices, and many specialty offices were closed during the early stages of the pandemic. As a result, many Americans were not able to access care as needed, and mortality due to other conditions, including but not limited to heart disease, Alzheimer's/dementia, and diabetes, also increased.[9] While the official death toll in the U.S. was 328,014 (as of December 27), researchers believe the total death toll from COVID-related closures and fallout to be much higher.[1]

Finally, the U.S. economy has greatly suffered as a result of COVID-19. Industries across the board—notably healthcare, airlines, and hospitality— lost billions in revenue, and the future of many companies remains unclear. The number of unemployed Americans increased sharply from February 2020, and peaked in April 2020 when 23.1 million Americans were unemployed, a historic unemployment rate of 14.4%, reflecting the highest rate in the post-WWII era.[11]

IN MASSACHUSETTS

Massachusetts (MA) became one of the earliest hotspots for COVID-19 spread. On March 10, 2020, Governor Charlie Baker declared a State of Emergency, and within the first few weeks of the pandemic, the state had the third highest number of cases in the nation.[10] The peak of the first surge was on April 17th, when 2,977 new cases were recorded. Since then, the number of cases declined steadily but by October, cases started to increase and peaked on January 4th with 9,047 new cases in one day. As of March 2021, there have been over 598,000 total cases and over 16,000 deaths in the state.[12]

Amidst the pandemic's economic shutdown, an estimated one in four MA workers lost their jobs. By the beginning of May 2020, 780,000 individuals had filed jobless claims for traditional unemployment benefits. The official unemployment rate in MA was 16.2% in April 2020 and 16.3% in May 2020, the highest rates since 1976. These unemployment rates in MA in April and May are tied for the fourth- highest in the nation.[13] The state's unemployment rate has since declined, at 7.4% in December 2020 and 6.8% in March 2021.[11]

In response to declining COVID-19 cases, Governor Baker released a four-phase plan on May 18, 2020, for reopening the state. The plan included mandatory safety standards for workplaces and "best practices" recommendations to ensure reopening occurs without leading to a new spike in cases. The progression through stages was not predetermined and will instead be driven by the most recent public health data. Key metrics include positive test rate, deaths, hospitalizations, healthcare system readiness, testing capacity and contact tracing capabilities. The state will move forward or back in stage as needed. On December 13, MA entered Phase 3, which included the reopening of gyms, fitness studios, movie theaters, museums and other indoor entertainment venues.[14]

So far, three vaccines, the Pfizer-BioNTech COVID-19 vaccine, the Moderna COVID-19 vaccine, and the Johnson & Johnson's Janssen COVID-19 vaccine have received emergency use authorization in the U.S.[5] Vaccination of health care workers performing COVID-facing care began in MA on December 15th, 2020.[15] Phase 1 of the state vaccination plan included health care workers, long term care and assisted living facilities, first responders, and home-based health care workers.[15] Phase 2 of the MA vaccination plan started on February 1, 2021 and began with

individuals 75 years or older before expanding to individuals 65 years and older or individuals with two or more medical conditions. By the end of March, phase 2 eligibility expanded to also include K-12 educators, staff and childcare workers, and individuals 60 years and older.[15]

IN BROOKLINE

Compared to other densely populated towns and cities in MA, Brookline experienced a relatively low burden of disease. There have been 2,123 positive cases and 96 total deaths as of March 2021 from COVID-19. Given the close proximity to Boston (an epicenter of the disease within the state), the lower rates could be a reflection of successful social distancing and quarantine practices by Brookline residents. The subsequent sections will analyze Brookline COVID-19 trends and data more closely.

Brookline also experienced lower rates of unemployment compared to the rest of the state. In April and May 2020, the unemployment rates were 8.4% and 7.4%, respectively. The town is reopening in accordance with Governor Baker's plan, but continues to monitor COVID-19 trends vigilantly and practice safe social distancing measures.

Since the approval of three vaccines for prevention of COVID-19, Brookline has received limited doses for distribution. By the end of March, the town of Brookline has received 2,100 doses of vaccine, with 1,945 doses administered, 954 individuals fully vaccinated, and 150 doses on hand. These numbers only include vaccinations distributed through the town of Brookline and do not reflect individuals who were vaccinated elsewhere.

Our Response

The Brookline Department of Public Health firmly believes the most effective approach to prevention of disease is to act quickly and swiftly. As a result, Brookline was one of the first towns across the nation to implement contact tracing and mandatory face-coverings in public. Other components of our response included weekly publications, town hall meetings, and efforts to limit large gatherings of people. We believe our approach has been fundamental to the relatively low burden of disease in Brookline.

"Stop the spread. Save a life. WEAR A MASK."

The Brookline Mitigation Plan, developed by the Health Commissioner, guided the policies and strategies to stop the spread of the disease. These strategies are described below.

FACE-COVERING

- ✓ Brookline, on April 17th, 2020, became one of the first townships to implement mandatory face-coverings.
- ✓ Masks were freely distributed in highly-trafficked areas.
- ✓ We invested in town-wide communication of the face-covering mandate via posters, advertisements, and social media campaigns.
- ✓ Virtual mask-making events were conducted to encourage use of masks in a social way.

SOCIAL DISTANCING AND REDUCING LARGE GATHERINGS

- ✓ All public schools were closed effective March 13, 2020 until the end of the academic year.
- ✓ Popular pedestrian streets were reconfigured to better accommodate social distancing.
- ✓ Local elections were postponed to avoid the gathering of large populations. Later, the election occurred as "No-Touch" with extra social distancing precautions.
- ✓ We continuously updated regulations for food and retail establishments to ensure the highest level of safety for both employees and patrons, guided by the latest data on transmission from the CDC and other top agencies.

- ✓ Seniors-only hours at the grocery stores were implemented to limit exposure among vulnerable populations.
- ✓ We implemented an eviction moratorium in April 2020 to ensure members of the Brookline community could still practice safe social distancing protocols.

OUTREACH AND COMMUNICATION WITH COMMUNITY MEMBERS

- ✓ Brookline was one of the first townships to begin contact tracing efforts.
- ✓ An official COVID-19 website was launched on March 17, 2020 to keep residents informed about recent data, publications, and communications.
- ✓ Every week, the site was updated with "Need to Know Updates" and data reports for public viewing.
- ✓ The COVID-19 Call Center was activated on March 18, 2020 where residents could call with any questions, comments, or concerns regarding any virus-related topics.
- ✓ The Call Center was demobilized on June 19, 2020 after a steady decline in cases.
- ✓ We routinely organized broadcasts and WebEx Town Halls to provide opportunities for the public to directly interact with officials and health experts. Examples of these meetings include the Advisory Council Public Health Virtual Town Hall on March 24, 2020, the Youth Town Hall on April 29, 2020 and the Conversation about COVID-19 WebEx on June 22, 2020.

MENTAL HEALTH

- ✓ Brookline Police Social Workers held office hours for those in need of support or resources related to mental health.
- ✓ Virtual mask-making events were conducted to increase social connectivity.
- ✓ We implemented an eviction moratorium in April 2020 to relieve stress during a financially burdensome time.
- ✓ The Department of Public Health partnered with FriendshipWorks to combat the detrimental impact of social isolation on mental health, offering residents weekly check-ins through the "Friendly Caller Program."

EQUITY AND SOCIAL DETERMINANTS OF HEALTH

- ✓ Seniors-only hours at the grocery stores were implemented to limit exposure among vulnerable populations.
- ✓ We implemented an eviction moratorium in April 2020 to relieve financial burden for socioeconomically disadvantaged people.
- ✓ Free and reduced pricing lunches were available to students in qualifying families on Mondays, Wednesdays, and Fridays.
- ✓ Free masks were distributed in highly-trafficked areas.
- ✓ Free pop-up testing sites were organized for any individual who had participated or been in large gatherings.

A Timeline of Brookline's Response to COVID-19 in 2020

Mar 13	All public schools closed until April 6.
Mar 16	The Brookline Health Commissioner declares a public health emergency with Select Board.
Mar 16	Townhall, food establishments, and other town facilities closed.
Mar 17	Brookline's COVID-19 website launched to keep residents informed.
Mar 18	Brookline's COVID-19 Call Center with Emergency Management launched.
Mar 18	Local cable channels live broadcast the Advisory Council on Public Health meeting.
Mar 23	Grocery stores implement special hours for seniors to shop.
Mar 24	Brookline Public Health hosts a virtual town hall for residents to ask questions to community experts.
Apr 3	Officials postpone the local election to limit large gatherings.
Apr 7	Officials release enhanced regulations for food establishments.
Apr 9	Officials reconfigure streets to accommodate social distancing by pedestrians.
Apr 17	The Health Commissioner mandates face masks for all residents >2 years old in all public spaces.
Apr 29	The Virtual Youth Town Hall hosted.
Apr 21	Public school closure extends to the end of the academic year.
May 7	Town distributes free masks in highly trafficked areas.
May 20	The Brookline Police Social Workers begin holding office hours for those in need of mental-health related support or resources.
Jun 17	Town offers free pop-up testing sites for those who have been in large gatherings in the wake of city-wide protests and demonstrations.
Jun 19	Officials demobilize the COVID-19 Call Center and Email following a steady decline in cases.
Jun 22	The Conversation about COVID-19 WebEx hosted.

The Data

HOW BROOKLINE COMPARES TO THE STATE AND THE NATION?

By mid-March 2021, there were over 119 million COVID-19 cases globally and 29 million cases in the United States, of which, approximately 576,000 were in the state of Massachusetts (Table 1). A total of 1,983 COVID-19 cases and 96 deaths were reported to the Brookline Health Department by March 12, 2021 (Table 1). When compared to national and state trends, the cumulative COVID-19 rate in Brookline is among the lowest in Massachusetts and much lower than the national cumulative case rate (Figure 1). Likewise, the per day new case rate per 100,000 individuals was consistently lower in Brookline than in either the state or the country (Figure 2). Across many demographic trends, including age and gender, data from Brookline closely mirrors national trends.

		04/17/20	04/24/20	05/06/20	05/20/20	05/27/20	06/05/20	10/05/20	03/12/21
Global	Confirmed cases	2.2M	2.7M	3.7M	4.9M	5.7M	6.6M	35.5M	119.5M
	Deaths	151K	187K	258K	324K	353K	391K	1.4M	2.6M
U.S.	Confirmed cases	690K	906K	1.2M	1.6M	1.7M	1.9M	7.7M	29.3M
	Deaths	36K	51K	73K	92K	101K	110K	210K	531K
MA	Confirmed cases	32K	46K	70K	88K	94K	102K	135K	576K
	Deaths	1K	2K	4K	6K	6K	7K	10K	17K
Brookline	Confirmed cases	177	237	311	341	350	368	505	1,983
	Deaths	4	18	33	38	44	44	64	96

Table 1: COVID-19 confirmed cases and deaths on the global, national, state, and local scale at select time points between April 2020 and March 2021.

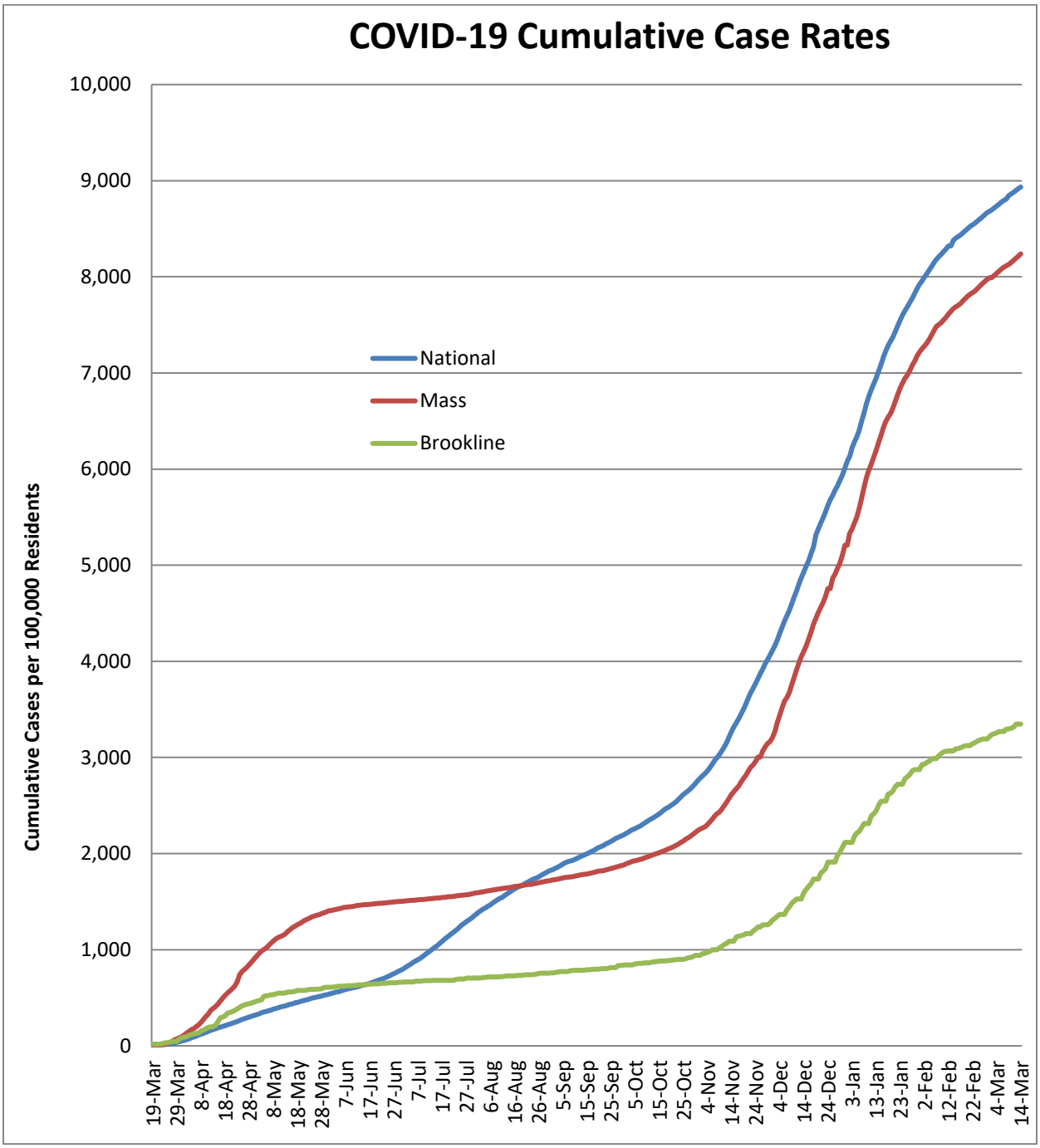


Figure 1: COVID-19 Cumulative Case Rates on the local, state and national levels. Data from March 2020 through March 2021.

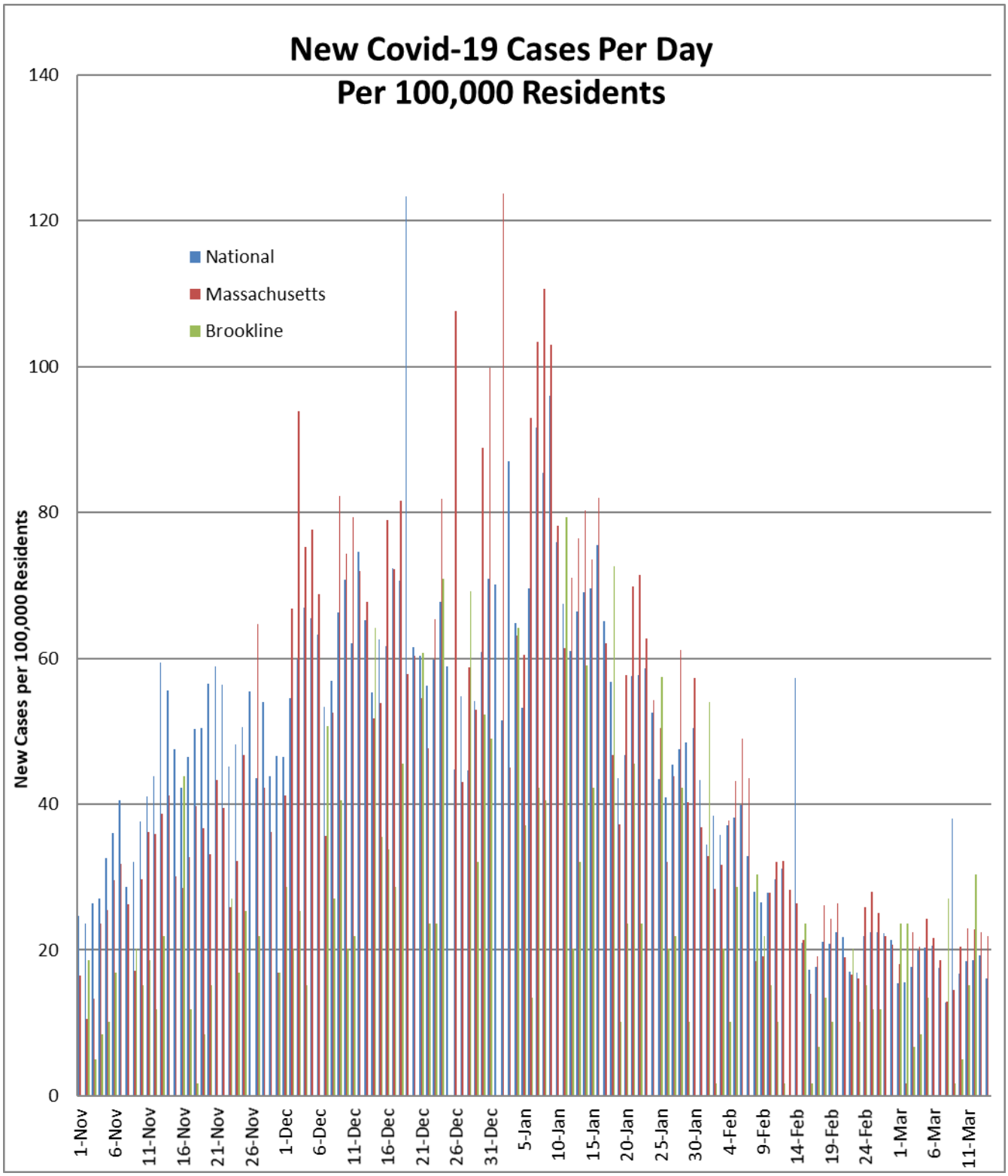


Figure 2. New COVID-19 cases per day per 100,000 residents across the country (blue), state (red), and in Brookline (green).

DETAILED DATA ON CASES AND DEATHS IN BROOKLINE

Total Cases in Brookline

A total of 1,983 COVID-19 confirmed cases and 96 deaths were reported to the Brookline Health Department by March 2021 (Table 2). In addition to the confirmed cases, there have been at least 198 probable cases and 43 suspected cases (Table 2). Since the beginning of the outbreak in Brookline, over 1,500 people completed their required quarantine period (Table 2). In the past year, COVID-19 cases in Massachusetts and Brookline peaked in April 2020 and again in December 2020/January 2021. The first peak coincided with the introduction of COVID-19 into the state while the second peak coincided with decreasing temperatures resulting in more indoor socializations and increased travel and socialization for the holiday season. These two peaks are reflected in the steeper slopes of Figure 3, and the higher case counts per month in Figure 3.

	4/17/20	4/24/20	5/6/20	5/20/20	5/27/20	6/5/20	7/21/20	8/10/20	8/24/20	10/5/20	11/16/20	12/8/20	1/19/21	2/9/21	2/23/21	03/9/21
Positive cases	177	237	311	341	350	368	404	425	440	505	670	1,027	1,658	1,801	1,868	1,953
Probable cases	-	-	-	-	-	-	100	114	122	122	-	135	168	175	188	195
Quarantined individuals	228	235	272	292	300	312	354	373	380	-	629	950	1,267	1,391	1,476	1,551
Individuals released from quarantine	131	143	171	224	246	256	284	295	305	333	431	530	667	705	705	790
Individuals released from isolation	78	92	123	185	206	228	280	296	318	355	435	590	961	1,080	1,114	1,181
Total of Suspect Cases	26	31	40	79	87	88	-	-	-	-	88	-	-	-	-	-
Deaths	4	18	33	38	44	44	57	59	60	64	68	74	90	93	95	96

Table 2. Brookline COVID-19 Status Report. Data from April 2020 through March 2021. (- data unavailable) This table provides a snapshot of cumulative counts for each metric at selected time point throughout the year.

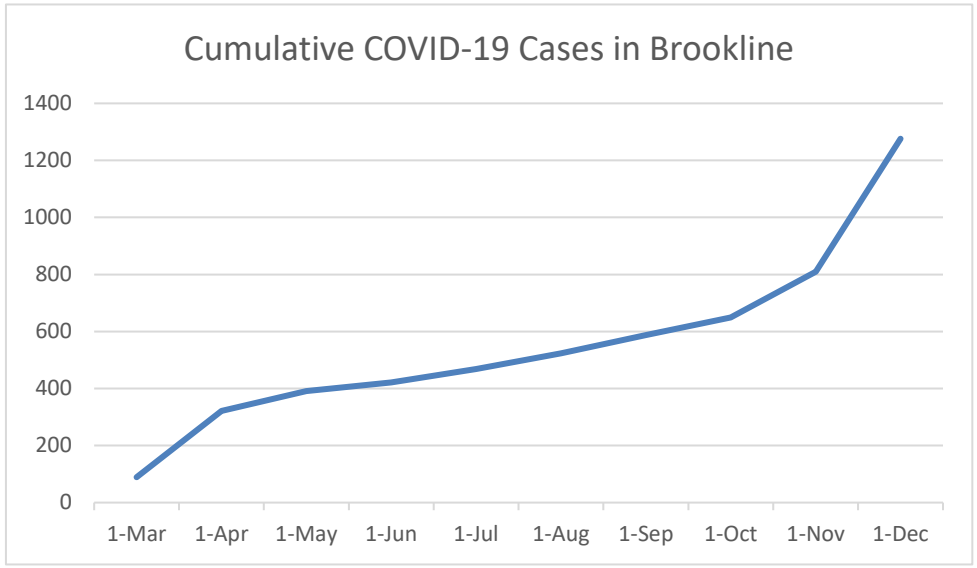
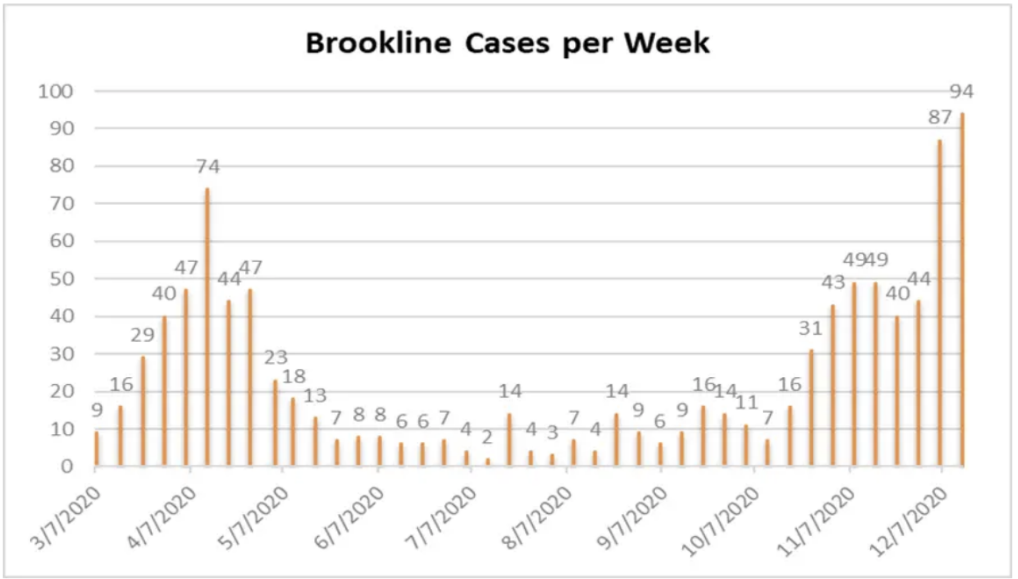


Figure 3. Cumulative COVID-19 Cases in Brookline. Data from March 2020 through December 2020.

Figure 4. Weekly COVID-19 Case Counts from Brookline. Data from March 2020 through December 2020.



As cases increased in the spring of 2020, the Brookline Health Department worked diligently to contact cases and identify individuals who were exposed to the virus. Early notification allowed for these individuals to begin a quarantine periods of two weeks to help slow the spread of the virus. Throughout the first three months, the number of individuals in quarantine was often equal to or greater than the number of COVID-19 cases (Figure 5).

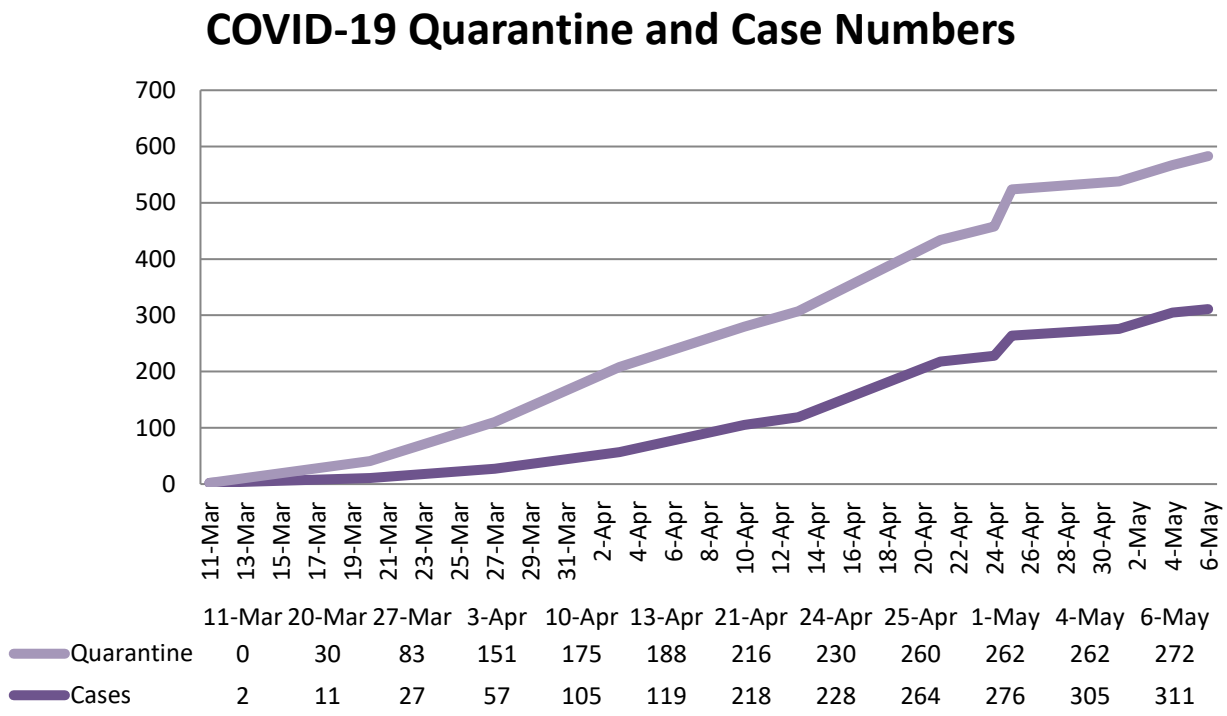


Figure 5. COVID-19 Quarantine and Case Numbers. Data from March 2020-May 2020.

COVID-19 Cases by Social Determinants of Health

COVID-19 Cases by Age

Across the country and the world, COVID-19 has affected different age groups in different ways. Nationally, the death rates among older populations are reliably higher even while the most number of cases are occurring among younger Americans.[16] These trends remain true in Brookline as well. Among Brookline residents, the age group with the largest number of COVID-19 cases was 20-29-year-olds (Figure 6). Likewise, the trend continues on a per month basis – in every month except for April 2020, the 20-39 age group had the highest proportion of cases ranging from 33% to 65% of cases for any given month (Figure 7).

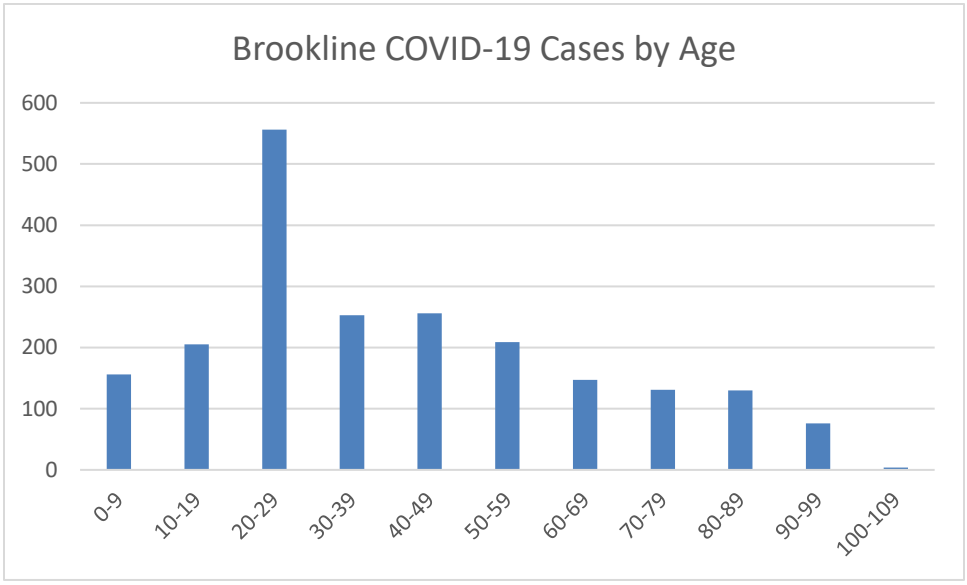


Figure 6: COVID-19 Cases in Brookline by Age. Data from March 2020 through March 2021.

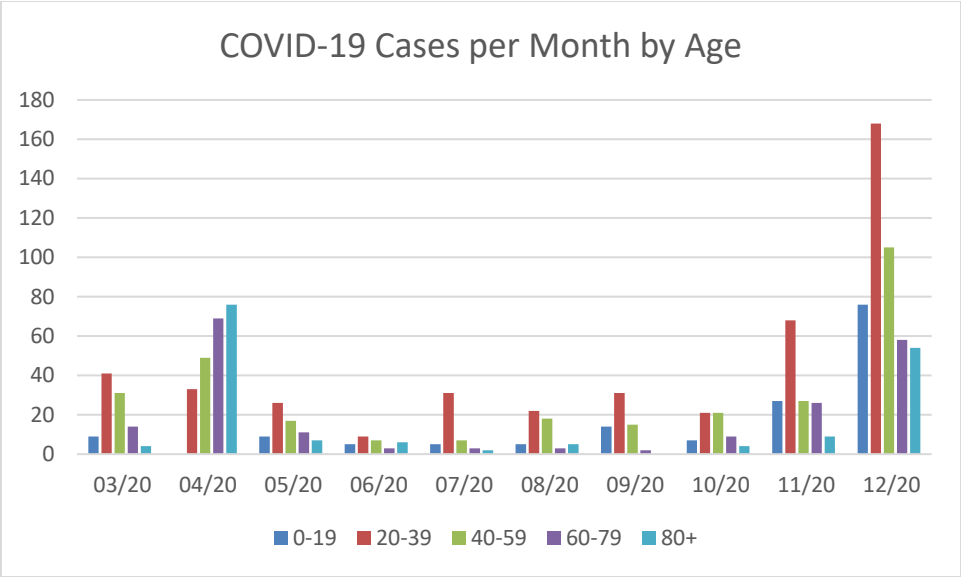


Figure 7: COVID-19 Cases in Brookline by Age over Time. Bars are colored proportionally to the number of cases from each age group per month. Data from March 2020 - December 2020.

COVID-19 Cases by Gender

Since the start of the outbreak in Boston, of cases with known gender, more cases have been detected in women, 54%, than in men, 46% (Figure 8). These estimates align with 2019 census population trends in Brookline, which estimates that 53% of the population of Brookline is female, suggesting that there is no difference in the rate at which men and women become diagnosed with COVID-19.[17] These trends match those observed at the national level; across the U.S., 52% of cases have been diagnosed in women while 48% were in men.[16]

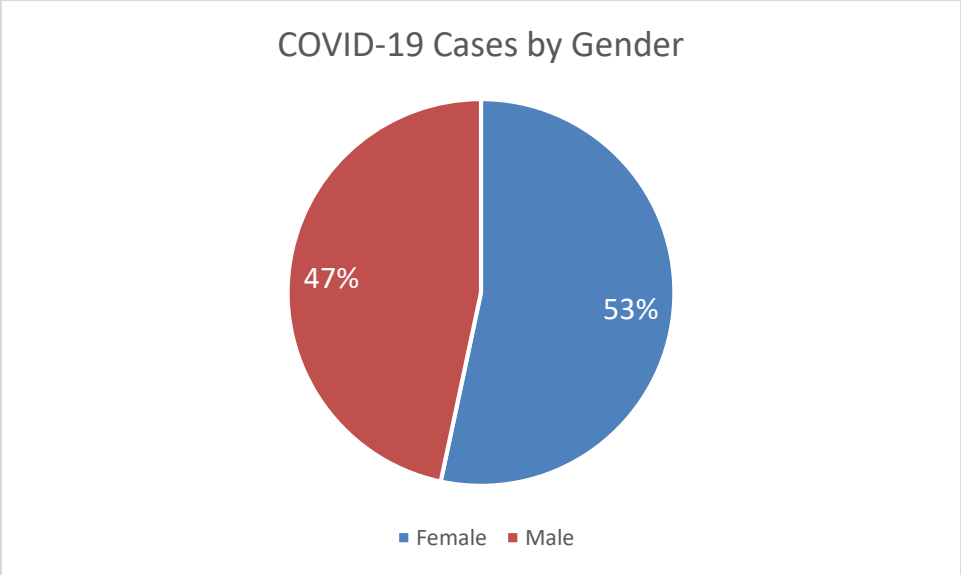


Figure 8: COVID-19 Cases in Brookline by Gender. Data from March 2020-2021.

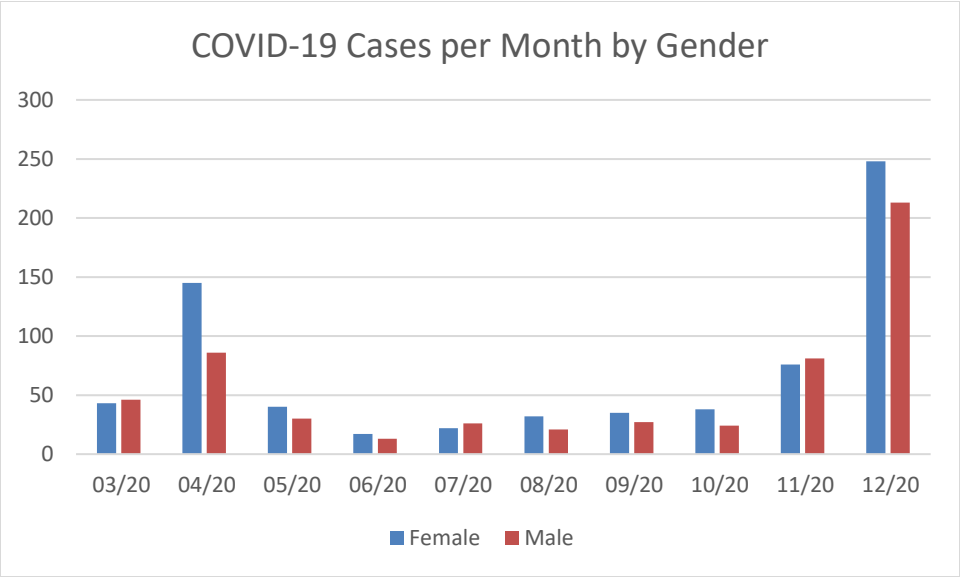


Figure 9: COVID-19 Cases in Brookline by Month and Gender. Data from March 2020 – December 2020.

COVID-19 Cases by Age and Gender

Separating Brookline COVID-19 cases by age and gender demonstrates similar results. The age/gender group with the highest number of cases was females 20-30 years old – 178 cases, followed by males of the same age range – 128 cases (Figure 10).

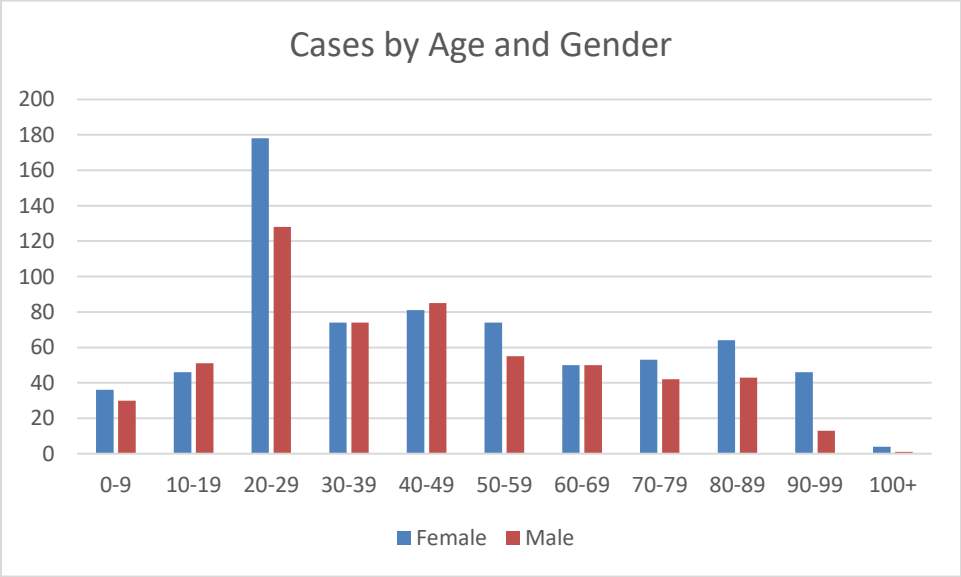


Figure 10: Brookline COVID-19 cases by age and gender. Data from March 2020 – December 2020.

COVID-19 Cases by Race and Ethnicity

Of Brookline cases with known race/ethnicity data, 64% were White, 14% Other Race/Ethnicity, 10% Asian, 8% Latinx/Hispanic, and 4% were Black/African American (Figure 11). When adjusted by the race/ethnicity proportions that comprise the population of Brookline, Other Race/Ethnicity and Black/African American had the highest cumulative rates of 12,104 and 5,090 per 100,000 residents, respectively from March 2020 to March 2021 (Figure 11, right, Table 3). Asian and White had the lowest cumulative rates of 2,075 and 3,090 per 100,000 residents (Table 3).

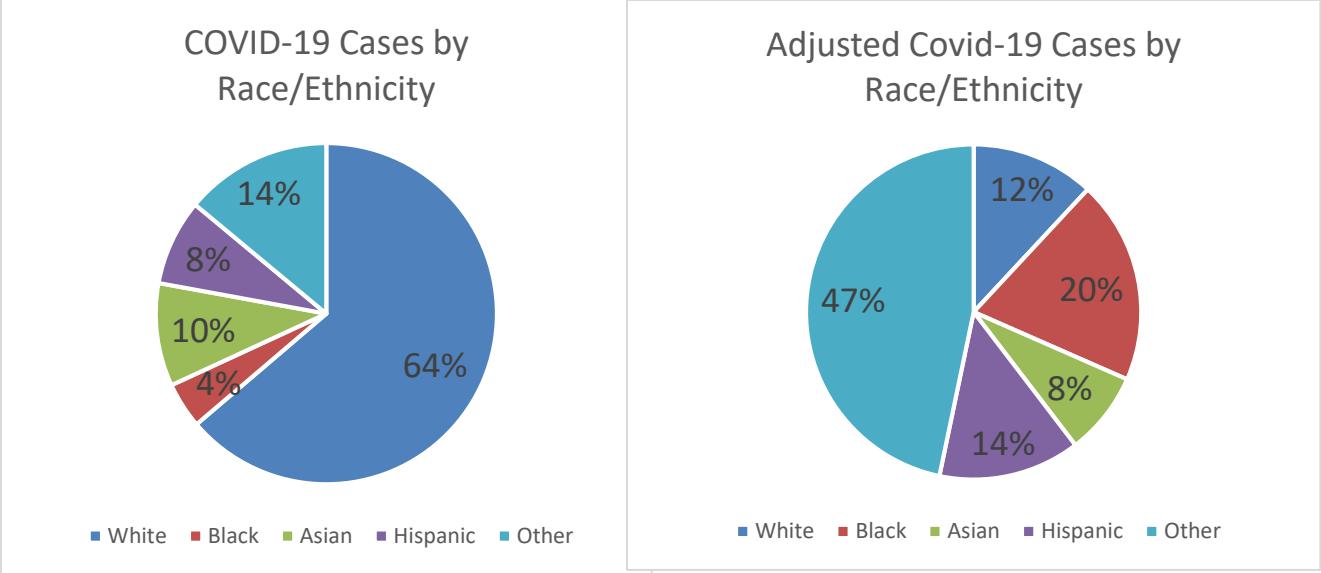


Figure 11: Unadjusted (left) and adjusted (right) COVID-19 cases by Data from March 2020 – March 2021.

Races	**Cases**	**Population**	**Brookline Cum. Rate per 100,000**	**MA Cum. Rate per 100,000**[10]
White	1,274	41,217	3,090	4,891
Black	87	1,709	5,090	7,464
Asian	195	9,397	2,075	3,635
Hispanic	163	4,604	3,540	15,789
Other	279	2,305	12,104	--

Table 3: COVID-19 Annual cumulative rates per 100,000 people by race/ethnicity in Brookline and MA. Data for one year from March 2020-2021.

COVID-19 Cases by Housing Status

The majority of Brookline residents who were diagnosed with COVID-19 were stably housed - 86.9%. The remaining cases with known housing status were split between long term care facilities - 11.3%, Other unspecified - 1.4%, and treatment recovery center(s) - 0.4% (Table 4).

Housing Status	Cases
Stably Housed	617
Long term Care Facility	80
Other	10
Treatment Recovery Center	3
Total: Known Housing Status	710

Table 4: Brookline COVID-19 Cases by Housing Status. Data from March 2020-2021.

Total Deaths in Brookline

Brookline reported a total of 96 deaths from COVID-19 by the end of March 2021. COVID-related deaths peaked in April 2020, with 30 deaths, and then declined steeply (Figure 12). Although there was a second peak of COVID-19 cases in December 2020-January 2021, fewer deaths were observed during that peak compared to the first wave in April 2020. Almost all the deaths were among the elderly population (>65 years). Both the counts and adjusted counts (i.e., the number of deaths adjusted for their proportion in the corresponding population by age) show an increasing number of deaths with increasing age. Of the 96 deaths, 63 were aged 80 years and over (Figure 13). The highest absolute number of deaths were among White people. However, when the numbers were adjusted by proportion in the corresponding population by race, Asian people had the highest death rate (Figure 14).

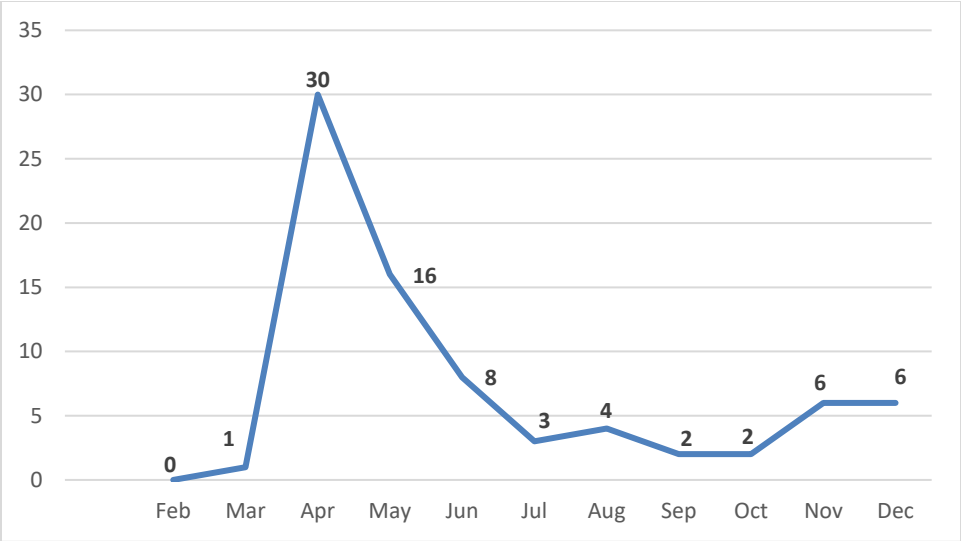


Figure 12: Deaths from COVID-19 in Brookline. Data from February 2020 through December 2020.

COVID-19 Deaths Segregated by Determinants of Health

The greatest number of deaths among confirmed COVID-19 cases occurred in the age group 80+, representing 70% of the deaths from COVID-19 (Figure 13). 19% of deaths occurred in the 70-79 age group and 10% occurred in the 60-69 age group, with only 1% of deaths in the 50-59 age group (Figure 13). The trends observed here match the national trends observed, older populations have a much higher rate of death from COVID-19 compared to younger populations.[16]

When examining COVID-19 deaths by race/ethnicity, White had the highest proportion of deaths at 61%, but when weighted by proportion of the race/ethnicity in the Brookline population, had only the second highest at 23% (Figure 14). The Asian population had the highest proportion of deaths by race/ethnicity when weighted by population (Figure 14). When comparing the unadjusted and adjusted pie charts, an increase in the size of the slice indicates that a population group had disproportionately higher rates of death compared to a section that decreased in size (Figure 14).

COVID-19 Deaths by Age

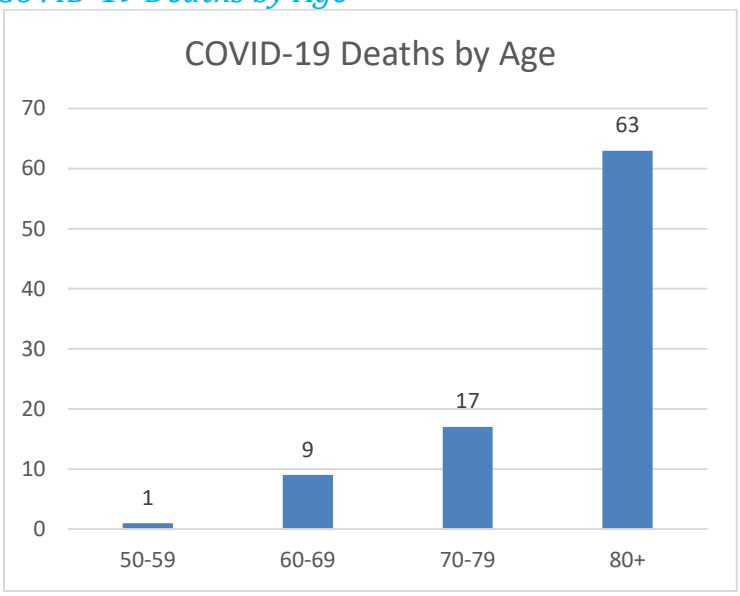


Figure 13. COVID-19 Deaths by Age in Brookline. Data from March 2020 through December 2020.

COVID-19 Deaths by Race

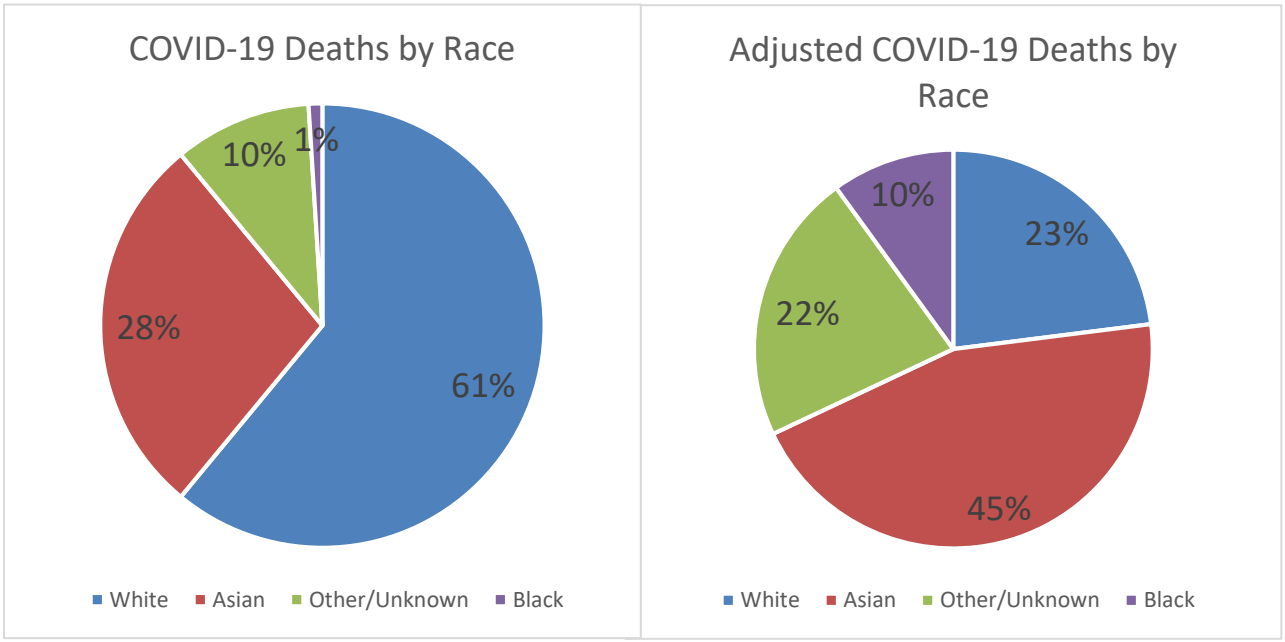


Figure 14. Unadjusted (left) and adjusted (right) proportion of COVID-19 deaths by race/ethnicity in Brookline. Data from March 2020 – December 2020.

Location of COVID-19 Deaths

The highest *density* of deaths was located in the intersection of census tracts 4005 and 4008, as shown by the heat map in Figure 15. The *number* of deaths were highest in the census tract 4008 followed by eight census tracts to the south -- 4011, 5.02, 3736, 4012, 1201.05, 3739, 1301 and 1106.01 (Figure 16, left). When the number of deaths were adjusted by rates per 10,000 population, census tract 4008 still had the highest death rate, followed by two census tracts, 4011 and 5.02 (Figure 16, right).

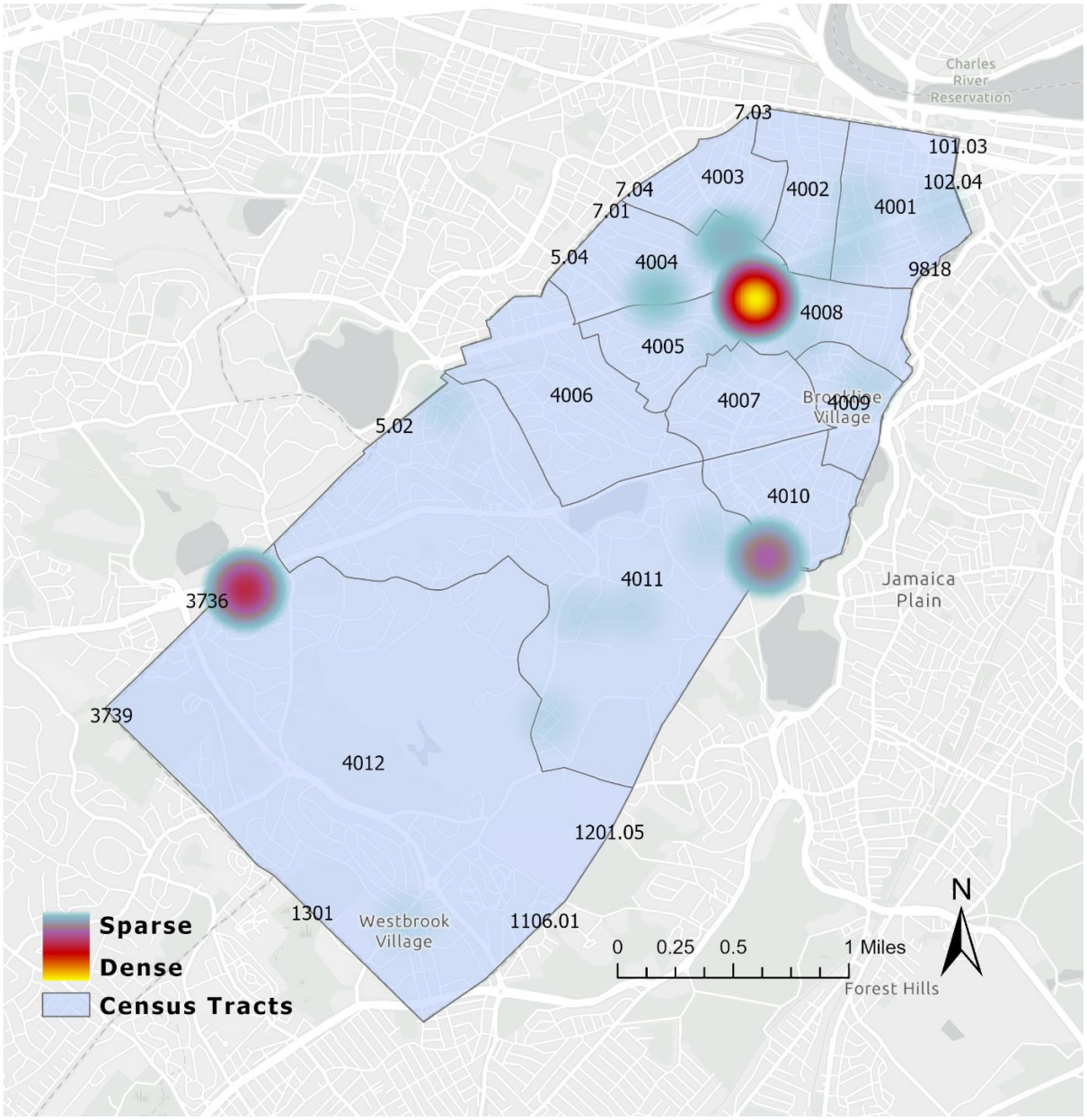


Figure 15: Heat map of COVID-19 deaths in Brookline. Data from March 2020 through December 2020.

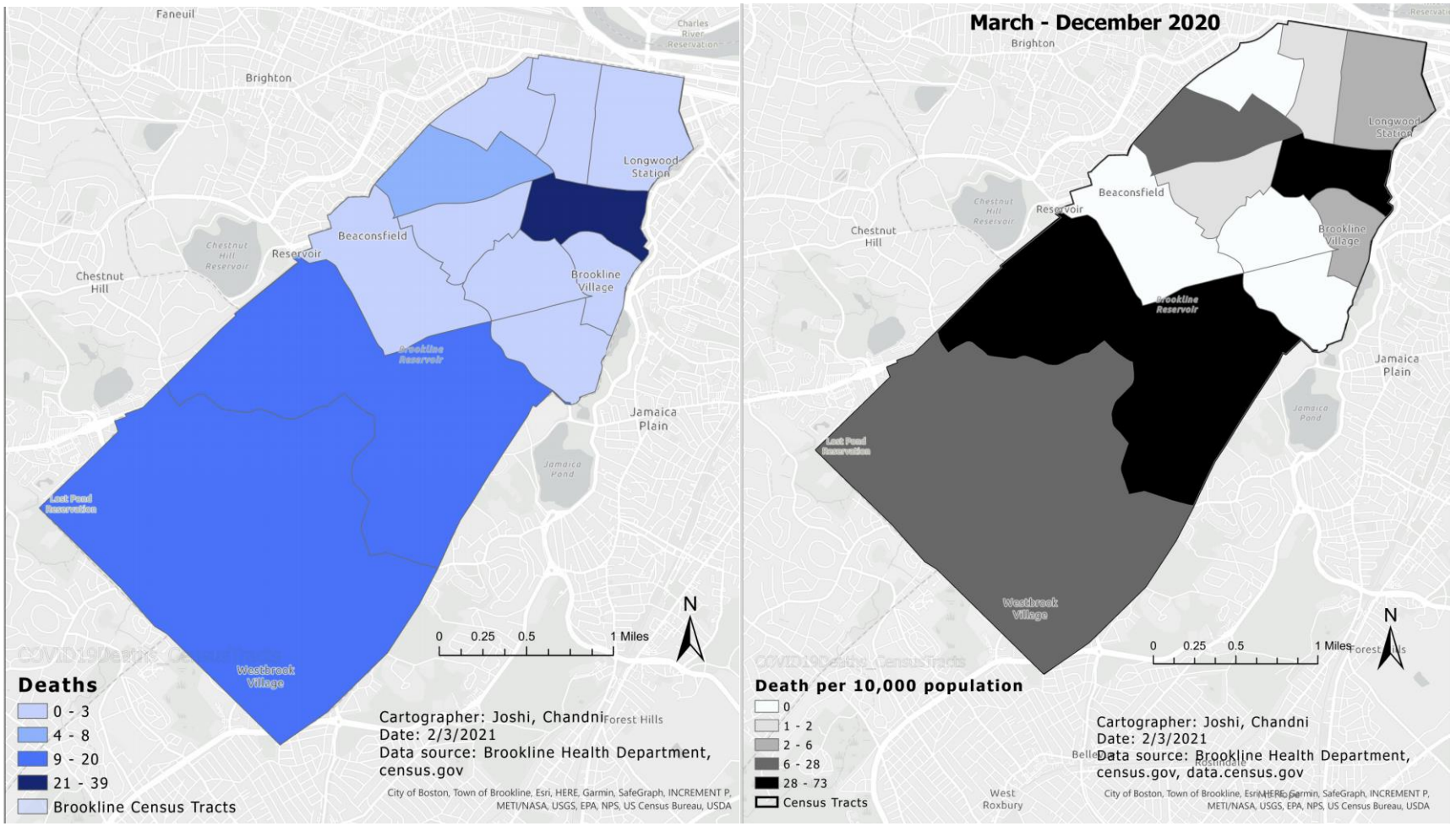


Figure 16: Number (Left) and 10-month rate per 10,000 people (right) of COVID-19 Deaths in Brookline Census Tracts. Data from March through December 2020.

References

1. WHO. WHO Coronavirus (COVID-19) Dashboard. Accessed May 2, 2021. https://covid19.who.int
2. CDC. Coronavirus Disease 2019 (COVID-19) – Symptoms. Centers for Disease Control and Prevention. Published February 22, 2021. Accessed May 2, 2021. https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html
3. FDA. Know Your Treatment Options for COVID-19. *FDA*. Published online March 15, 2021. Accessed May 2, 2021. https://www.fda.gov/consumers/consumer-updates/know-your-treatment-options-covid-19
4. CDC. COVID-19 and Your Health. Centers for Disease Control and Prevention. Published February 11, 2020. Accessed May 2, 2021. https://www.cdc.gov/coronavirus/2019-ncov/if-you-are-sick/steps-when-sick.html
5. CDC. Different COVID-19 Vaccines. Centers for Disease Control and Prevention. Published April 23, 2021. Accessed May 2, 2021. https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines.html
6. AJMC. A Timeline of COVID-19 Developments in 2020. Published online January 1, 2021. Retrieved March 19, 2021. https://www.ajmc.com/view/a-timeline-of-covid19-developments-in-2020
7. Suliman A. Covid-19 cuts U.S. life expectancy by a year in first half of 2020, biggest drop since WWII. Accessed May 2, 2021. https://www.nbcnews.com/news/us-news/covid-19-cuts-u-s-life-expectancy-year-first-half-n1258219
8. CDC. COVID View - December 12, 2020. Accessed May 2, 2021. https://www.cdc.gov/coronavirus/2019-ncov/covid-data/pdf/covidview-12-18-2020.pdf
9. Woolf SH, Chapman DA, Sabo RT, Zimmerman EB. Excess Deaths From COVID-19 and Other Causes in the US, March 1, 2020, to January 2, 2021. *JAMA*. Published online April 2, 2021. doi:10.1001/jama.2021.5199
10. The Wall Street Journal. Massachusetts Ranks Third Among States with Most Coronavirus Cases 2020. Published online April 18, 2020. Accessed March 19, 2021. https://www.wsj.com/articles/massachusetts-ranks-third-among-states-with-most-coronavirus-cases-11587211201
11. Falk G, Carter JA, Nicchitta IA, Nyhof EC, Romero PD. Unemployment Rates During the COVID-19 Pandemic: In Brief. :16.
12. Mass.gov. COVID-19 Response Reporting. Accessed May 2, 2021. https://www.mass.gov/info-details/covid-19-response-reporting
13. Chris L. Mass. Unemployment Rate Tied for 4th-Highest in US. Published June 20, 2020. Accessed May 2, 2021. https://www.nbcboston.com/news/local/mass-unemployment-rate-tied-for-4th-highest-in-us/2146503/
14. Mass.gov. Baker-Polito Administration Announces Statewide Rollback to Phase Three, Step One, Additional Restrictions Effective December 13th. Accessed May 2, 2021. https://www.mass.gov/news/baker-polito-administration-announces-statewide-rollback-to-phase-three-step-one-additional
15. Mass.gov. Massachusetts' COVID-19 vaccination phases. Accessed May 2, 2021. https://www.mass.gov/info-details/massachusetts-covid-19-vaccination-phases
16. CDC. COVID Data Tracker. Centers for Disease Control and Prevention. Published March 28, 2020. Accessed May 2, 2021. https://covid.cdc.gov/covid-data-tracker
17. U.S. Census Bureau QuickFacts: Brookline CDP, Massachusetts. Accessed May 2, 2021. https://www.census.gov/quickfacts/fact/table/brooklinecdpmassachusetts/SEX255219#SEX255219