Abstract

The whole world is facing a great number of challenges as a result of the global pandemic generally refers to as the COVID-19 pandemic. This disease infects, hospitalizes, and kills folks at an unusual rate that forces authorities around the globe to adopt control measures with the intent to minimize its devastating powers. For instance, the number of challenges that come with this global pandemic is unprecedented in the United Stated, and the racial demographics of who is being tested, infected, received a vaccine, hospitalized, and died are still not as clear as they should be while the deadly virus seems to continue moving on its paths and creating new form of variants through mutations in additions to the strains that have been infecting and killing people at a very high rate due to its capability to change its DNA sequence. There are currently three new variants circulating in the United states. The three new mutations, which are 50% more contagious than the mutants that are currently infecting and killing people worldwide were first discovered in the United Kingdom, South Africa, and Brazil. The UK variant has already been confirmed in several states in the United States (US). This variant was first identified in Colorado in early January after a young person who had not traveled outside of the US tested positive for it. Since its first appearance in early January, it has been identified in at least 20 states nationwide. The South African variant was first discovered in South Carolina on Thursday, January 28, 2021 after two persons that recently traveled to South Africa tested positive for it. The last recent strain also known as the Brazil variant was discovered in Minnesota after a resident who traveled to Brazil on January 9, 2021 tested positive for the virus. These new variants have raised some serious concerns to a point that makes health officials speculate that the two messenger RNA (mRNA) vaccines manufactured by Pfizer and Moderna that are currently approved by the Food and Drug Administration (FDA) to prevent folks from being infected by COVID-19 may not work against them.

The Coronavirus infects and kills people of all race, age, gender, and ethnicity, and this has not been a secret. It appears that COVID-19 infects and kills certain group of people at a higher percentage. Since the onset of the virus, there has been a lot of speculations that it tends to infect and kill black and brown people at a higher rate as oppose to other races and ethnicities. Thus, does COVID-19 discriminate against people of color? This project will make attempts to investigate if there is race disparity in deaths that are associated with COVID-19.

Introduction

In late 2019, the novel coronavirus (COVID-19) emerged from Wuhan, China, and it quickly became a global pandemic that affected more than 130 countries and territories. It infects and kills people of all ages and races, but it does not appear to attack folks in a similar fashion. Thus, its mode of transmission is not very well understood. Some speculate that COVID-19 is transmitted from person to person when an infected person coughs, sneezes, or talks, droplets or tiny particles called aerosols carry the virus into the air from their nose or mouth or surfaces that contain the virus. Anyone who is within 6 feet of that person can breathe it into their lungs and becomes infected if the person ingests a great deal of virus. On surfaces where it is present, the virus can remain infectious from 2 hours and up to 9 days depending on the surface materials. Also, it can remain airborne for up to 3 hours post aerosolization. Furthermore, a small majority

of carriers develop mild to no symptoms. Therefore, transmission occurs rapidly and inconspicuously with both symptomatic and asymptomatic individuals unknowingly transmitting the virus, resulting in more people being infected. However, the real method of transmission is not very well studied since the disease is new. Some folks asymptomatically carry the virus and carry their life burdens while other are very symptomatic. In patients that display symptoms of COVID-19, this highly contagious disease causes severe acute respiratory syndrome, which infects lower respiratory airways and results in fatal pneumonia. The COVID-19 pandemic is a major challenge for health officials around the globe. Its effect is widely visible, resulting in about a 5.6% mortality rate and causing major economic and social devastations. Research data continues to prove that COVID-19 affects all race and ethnicity with older individuals as well as those with underlying health conditions are more vulnerable to experiencing severe illnesses and death. Data analysis of COVID-19 from the USA highlights pre-existing health disparities among African Americans and Hispanic as the potential cause of poor prognosis. For instance, African Americans have a 44% greater chance of dying from stroke, 20% more likely to have asthma, 25% more likely to have heart disease, 72% more likely to have diabetes, and 23% more likely to be obese as opposed to non-Hispanic Whites according to the National Health Care disparities. This is very alarming, so government and public health officials should address this major concern because data has revealed that black people accounted for a higher share of COVID-19 cases than their share in the population in 21 out of 30 states reporting data. Also, black folks accounted for a higher share of deaths than their share of the total population in 19 out of 24 states. Therefore, it is imperative to urgently take necessary measures to address and mitigate the effects of health disparities. This project aims at identifying race disparities in deaths that are associated with the COVID-19 pandemic in the United States.

Methods

As of January 31, 2021, the COVID-19 pandemic which started in late 2019 has already resulted in more than 26.1 million reported U.S cases and more than 439 thousand associated deaths. During the months of May through August, The Centers for Disease Control (CDC) examined the effects/impacts of the COVID-19 pandemic in the United States by assessing indicators like COVID-19–like illness-related emergency department (ED) visits, positive reverse transcription–polymerase chain reaction (RT-PCR) test results for SARS-CoV-2, the virus that causes COVID-19, confirmed COVID-19 cases, and confirmed deaths in connection with the Coronavirus infections. Reverse transcription-polymerase chain reaction is a laboratory method used to make many copies of a specific genetic sequence for analysis. It uses an enzyme called reverse transcriptase to change a specific piece of Ribonucleic Acid (RNA) into a matching piece of Deoxyribonucleic Acid (DNA). This piece of DNA is then amplified (made in large numbers) by another enzyme called DNA polymerase. The amplified DNA copies help tell whether a specific messenger RNA (mRNA) molecule is being made by a gene. This highly advance Ribonucleic Acid (RNA) technique has very useful purposes in activation of certain genes, which may help diagnose a disease, such as Coronavirus and cancer. It may also be used to study the RNA of certain viruses, such as the human immunodeficiency virus (HIV) and the hepatitis C virus to help diagnose and monitor an infection. This technique is also called RT-PCR. In COVID-19 diagnostic testing, RT-PCR is used to detect the presence of the virus in the patient’s body. In a

single-stranded RNA, the genome of SARS-CoV-2 is encoded. Therefore, an appropriate nucleic acid preparation method must be used so that all RNA in the patient's swab sample can be extracted. Once the RNA has been extracted, the remaining RNA molecules that have been left isolated are then converted to complementary DNA (cDNA) using the reverse transcriptase enzyme.

Besides investigating the effects of the COVID-19 pandemic in the United States, it is also critical to understand the impacts of the virus in different ethnic groups. Thus, a racial and demographic analysis of COVID-19 can help authorities to make informed decisions. In the United States, access to testing was limited to government officials, celebrities, and a selected number of healthcare workers, symptomatic or asymptomatic in the beginning of the outbreak. On 18 March 2020, the federal government passed the Families First Coronavirus Response Act (FFCRA). The passing of this act allows all individuals to get tested for COVID-19 nationwide at no cost. The Families First Coronavirus Response Act was an excellent move for all citizens, but it did not solve the lack of testing issues that was experienced in the early phase of the outbreak; especially in minority communities.

Consequently, the results were shocking as the data in connection with the racial breakdown of COVID-19 cases and deaths started to be made available. For instance, black folks account for 32% of Louisiana's population, and 70% of deaths caused by the novel coronavirus are among African Americans. On the other hand, white Americans in Louisiana account for 62% of the population but recorded only 28% of COVID-19 deaths. In Illinois, early data reported 380 COVID-19 deaths. The percentage of deaths among black Americans (43%) is higher compared with those among whites (36%), Hispanics (8.4%), Asians (3.7%), and others (6.8%). Illinois is an area where 70% of the population is white, and black accounts for 15% of its population. In Michigan, a similar phenomenon was observed. The black population is about 14% but accounted for 40% of COVID-19 deaths. New York is not any different from Illinois and Michigan where Hispanics and African Americans are dying at a relatively higher rate in comparison with other ethnic groups. Both ethnic groups account for 29% and 22% of New York's population, respectively, but the reported death toll for Hispanics is 34% while African Americans deaths account for 28%. Similar situations are observed in other states and counties like Connecticut, Milwaukee County, North Carolina where black and people of colors are dying at a higher rate comparing to other ethnic groups. The pattern and commonality of infections and deaths adopted by the novel Coronavirus continues state lines, and the common denominator for the high infection and mortality rate in all these states is race and ethnic background. Thus, does race disparity exist in deaths that are related to the COVID-19 pandemic? I will make attempts to answer the question in this project.

This project is based on crowd-sourced data on COVID-19 patients in Maryland compile at https://catalog.data.gov/dataset/md-covid-19-confirmed-deaths-by-race-and-ethnicity-distribution. It is a collection of the statewide confirmed and probable COVID-19 related deaths that have been reported each day by the Vital Statistics Administration by categories of race and ethnicity. The collection provides confirmed COVID-19 deaths among Maryland residents by race and ethnicity. The resource which is a compilation of daily updates provided by the

Government officials from throughout Maryland attempts to present crucial information in a unified format; most importantly different patient race and ethnicity distribution assigned by the data administrators. It is a csv raw data file that contains data for about 6277 patients combined into 4 different ethnicities, and it is the source of data used in this project. This data published on October 22, 2020 was updated on January 7, 2021, and it is likely to change again prior to the completion of this project since COVID-19 data fluctuate at a very high rate.

Note- This part of the project has not yet been completed since it is a rough draft. I plan on providing information like death distribution characterization of patient within each ethnic group, clustering of patient race, and so forth in this section at the completion of the project.

Result

Table (1) provides a first assessment of the death distributions within each ethnic group. Table (1) shows a clear difference between the overall distribution of deaths from all the different race or ethnic groups. The detail distribution showing in the table suggests that COVID-19 does not discriminate against races and ethnicities when death is taking into perspective. Therefore, the virus infects and kills people of all race and ethnicities.

Figures (1) is a line chart that shows the trend of deaths for all the different races. It provides a good, detailed distribution among all the race and ethnicities. It shows that White folks died at a higher rate compared to African Americans, Hispanics, and Asians.

Figure (2) is a bar chart that displays the death distribution for all the races and ethnicities for Maryland residents that died from The Coronavirus infections. Like figure (1), figure (2) shows that White folks take the top death spot compared to African Americans that occupy the second place following by Hispanics third, and Asians fourth.

Based on these results, one can make the assumptions that the data does not show racial disparities for minorities among Maryland residents that died from COVID-19. Thus, it is critical to look at Maryland's racial demographics to better understand COVID-19 deaths disparities. White folks account for 57.3% of Maryland's total population whereas African Americans, Hispanics, and Asians represent 29.89%, 9%, and 6.28% of Maryland's total population, respectively.

Revisiting figure (2), it shows that the percentage of white people that died from COVID-19 in Maryland is about 45% compared to African Americans 39%. Taking Maryland's demographics into perspective, black folks account for 29% of the total population, but they represent 39% of the deaths in connection with COVID-19; whereas White people make up 57.3% of the total population in Maryland but account for about 45% of the deaths related to the Coronavirus pandemic. Therefore, one can conclude that racial disparities are present is minorities that died from COVID-19 in Maryland, primarily in African American.

Table 1

	African_American	White	Hispanic	Asian	Other	Not_Available	Total_Cases
count	275.00	275.00	275.00	275.00	275.00	275.00	275.00
mean	1,390.72	1,521.57	375.07	126.71	38.72	34.80	3,448.88
std	463.45	619.21	143.00	42.45	11.85	26.74	1,249.35
min	139.00	109.00	13.00	10.00	7.00	5.00	342.00
25%	1,201.50	1,264.00	319.00	112.00	33.00	13.00	2,921.50
50%	1,486.00	1,524.00	419.00	133.00	39.00	25.00	3,570.00
75%	1,633.00	1,746.00	461.00	147.50	45.50	53.50	4,003.50
max	2,253.00	3,082.00	600.00	210.00	64.00	134.00	6,213.00

Figure 1

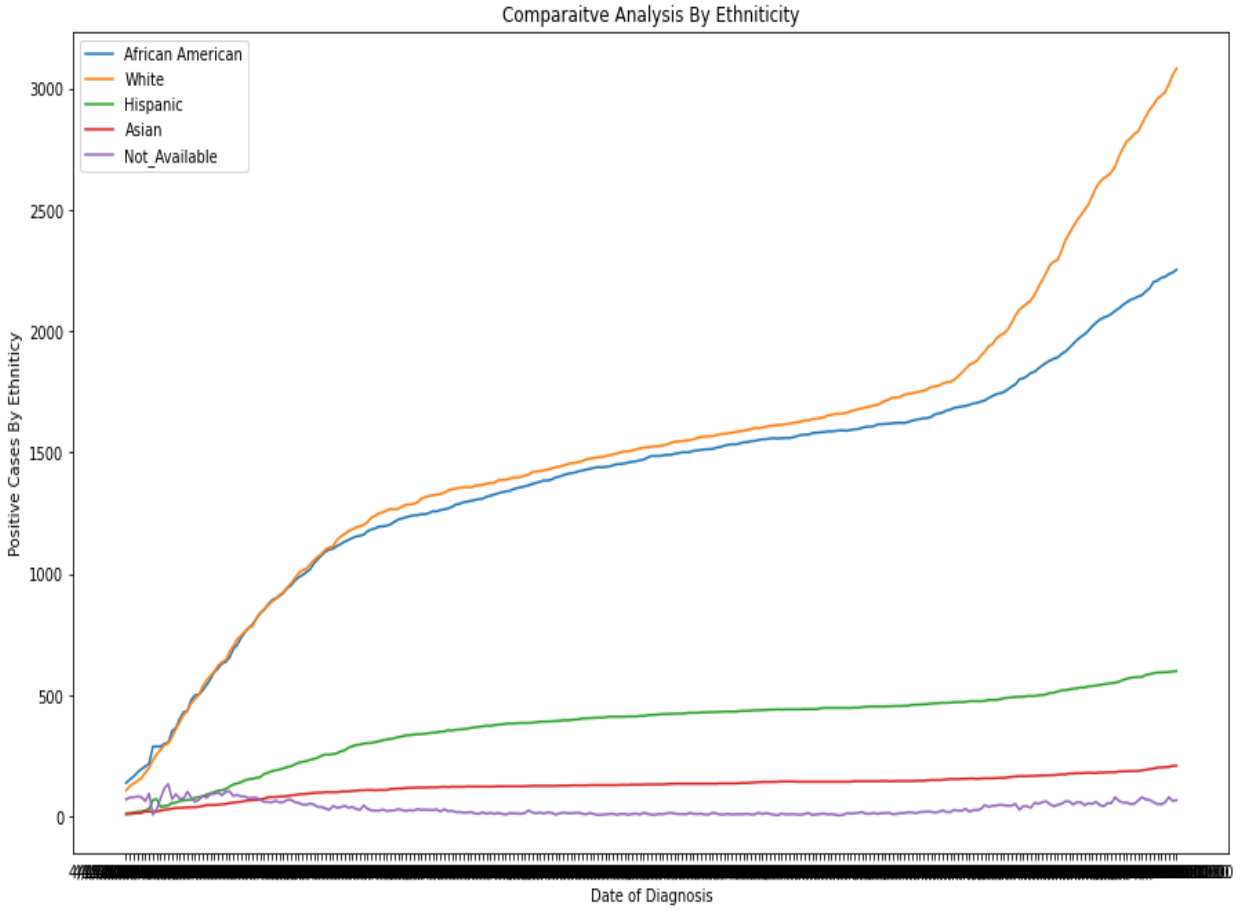
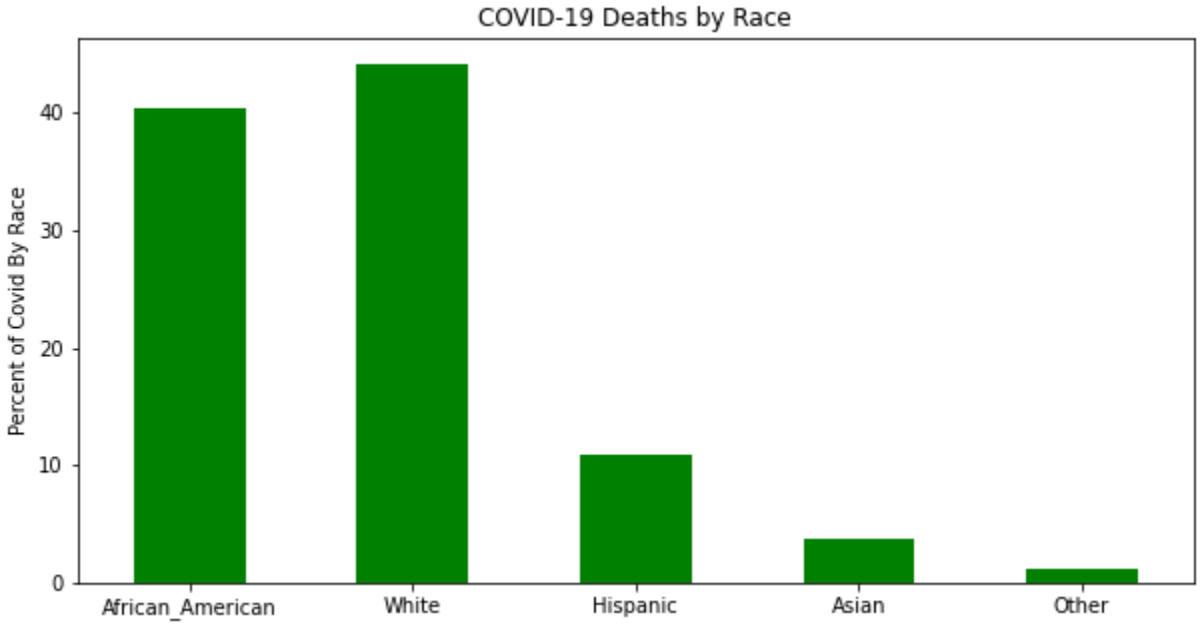


Figure 2



Discussion

There are many COVID-19 related compilations of data in the public domain emerging from agencies as varied as World Health Organization (WHO) and state governments. COVID-19 deaths related study like this is carried out on group specific data where all deaths are more or less of the same origin. However, in such a scenario, the race profile differences observed between different ethnic groups would be further confounded by additional factors such as different access to healthcare distribution in the general population demographic area, and in some instance diet and nutrition. While other jurisdictions have yet to publicly report their data based on race and ethnicity currently published research data have shown that the COVID-19 pandemic in the United States affected a larger proportion of black and brown persons from the onset of the virus to the time of this writing, and all four US census regions have seen the shift towards black and brown people. The main drivers behind this shift are social and economic factors that drive health outcomes, which contribute to a higher death rate among African Americans and Hispanics in comparison with other ethnic groups. Therefore, a plan of action is urgently needed to respond to the challenges of this pandemic and any health threats in African American and brown skin communities because of several factors that affect health outcomes. A critical tool that can ensure that African Americans and Hispanics are safe during this pandemic is fair access to healthcare, which would allow them to receive necessary medical treatment because the embedded racism in the healthcare system and the socioeconomic and health disparities continue to make the effect of the virus worst for black Americans, Hispanics, and other minorities in the USA. Overall, the existing poor healthcare system for African Americans, Hispanics, and the systematic health disparity are what makes the COVID-19 virus more dangerous to these specific ethic groups. COVID-19 is a new pandemic, and it is deeply rooted in history in the continuous plight of African Americans and brown people in this country. This

reality is not settled for black and brown people to rely on the same systems that historically inflicted harm and damage on them to protect and serve them against this virus.

Thus, it is imperative to conduct research that can help understand the source of exposure to COVID-19 for African Americans and Hispanics as well as a plan of care and health outcomes for them in various cities. This can help authorities to better understand their needs, so they can be represented better.

Conclusion

The death toll of the novel coronavirus COVID-19 (SARS-CoV-2) pandemic on African Americans and Hispanics is yet another event showing the racialized health inequalities that exist in the USA. The death toll for black folks is higher among these ethnic groups. It appears that African Americans have systematically experienced the worst health outcomes compared with any other racial and ethnic group in the USA. Studies recently conducted have shown that the burdens of the COVID-19 pandemic tend to be higher for black and brown people among minorities living in low-income communities where access to quality healthcare and other relevant needs is scarce. The COVID-19 pandemic did not initiate health disparity in the USA. Health disparity is a problem that exists for a long-time in the healthcare system. The COVID-19 pandemic is just a catalyst that significantly highlighted the pre-existing racial inequalities. It signals that the current healthcare system has a huge bias toward certain ethnicity and urgent actions need to be taken to make it fair for everyone.

Questions

1-What is the mode of transmission of COVID-19?

2-How does COVID-19 impact different race/ethnicity?

3-Does COVID -19 affect black and brown folks at a higher rate compared toother ethnic group?

4-What role does race play in COVID-19 deaths?

5-What race or ethnic group is more vulnerable to die from Coronavirus infections?

6-Why white folks are less likely to die from VOVID-19 compared to Black and Hispanics?

7-Is the healthcare system fair for everyone?

8-Why COVID-19 deaths are higher in certain ethnic groups compared to others?

9-Why does COVID-19 kills white folks at a lower rate?

10-Which race and ethnic group does COVID-19 target the most?

Appendix 1: COVID-19 Deaths by Race and Ethnicity Distribution for the State of Maryland

This appendix describes deaths of COVID-19 cases by race and ethnicity distribution for the state of Maryland, including the process the Centers for Disease Control (CDC) uses to investigate the death distribution of the COVID-19 pandemic fir different ethnic group in the

United States, and then gives details of the crown-sourced data that will be used to complete the project. See the main text above for a description of the methods, analysis, and results.

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