COVID Information Commons (CIC) Research Lightning Talk

Transcript of a Presentation by Timothy Oladunni, (University of the District of Columbia), February 10, 2021

Title: *A Time Series Analysis and Forecast of COVID-19 Healthcare Disparities*

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Timothy Oladunni CIC Database Profile

YouTube Recording with Slides

February 2021 CIC Webinar Information

Transcript Editor: Lara Azar

Transcript

Timothy Oladunni:

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Okay, hi everyone, my name is Timothy. I'm from the University of the District of Columbia, I'm working with two of my colleagues from Engineering, I'm a computer scientist. So the title of my presentation is 'A Time Series Analysis and Forecast of COVID-19 Healthcare Disparities.'

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The motivation of our study, we found out that during this COVID, despite the fact that African-Americans are 30 percent of the population, they are disproportionately impacted by COVID-19. Number one, data shows that compared to white non-hispanics, Blacks are 1.4 times more likely to contract COVID-19. Two, data shows that Blacks are 3.7 times more likely to be hospitalized after contracting the disease. And three, Blacks are 2.8 times more likely to die after hospitalization. These numbers are a source of concern to us, so our project objective is to design, develop and evaluate a data-driven decision-making approach to COVID-19 disparities. We're using time series analysis and forecasting modeling. The goal is to reduce the spread of COVID-19 and improve mitigation strategies to combat the disease's disparate impact. Methodology, number one, the data collection. So the data set will be obtained from the states coverage dashboard from COVID tracking project and Boston University Center for Antiracist Research dashboard. We'll define the following. Number one, the Black COVID-19 death so total COVID-19 death, we call that BTDR. Two, we define Black COVID-19 cases to total COVID-19 cases, we call that BTCR. Finally, we have CHCD,

which is the COVID-19 healthcare disparity, we define it as BTDR minus BTCR, this we did in the states that we considered for experiment.

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So on my screen, you can see that our experiment was run December 13, 2020, so we have the time series analysis of COVID-19 cases and deaths in Black communities. Data analysis was based on selected states with modest-to-significant Black populations. So as you see on my screen, the states considered include: Florida with 18% Black, Georgia 34% Black, Maryland 33%, Mississippi 39% Black, North Carolina 24%, South Carolina 28%, Pennsylvania 30%, and Virginia 21%. On the screen you see some graphs. We have four graphs, so on the rightmost at the top is Black cases as of December 13, 2020. On the left are the total cases as of December 13, 2020, then the lower left is total deaths as of December 13, 2020, and the right-hand side is Black deaths as of December 13, 2020. Our graphs are divided to three quarters, three quarters because COVID came in March so the major catastrophe started in April. So unlike honorary calendar years that's supposed to be divided into four, we start, we divide our COVID cases to three quarters so from April to December, we have three quarters. So it started in quarter one, you can see the trajectory of the graph, in terms of the graph as it moves. Now, we computed the table below, so this table is a sort of concern. On the state, you can see the state we considered, total cases, Black cases the BTCR, total death, Black death BTDR and CHCD. In Florida as we see, the cases as of December 13th was more than a million, out of these cases the Black deaths were 146,000. When we computed the Black cases to total cases ratio, which is Black cases divided by total cases, it was 12.65%. Then, at that same time the total death in that state was 20,000 plus out of which 3,000 plus were Black, but we computed the BTDR, which is the Black deaths to total deaths, it came as 16.89%. Here the disparity. When we consider cases we had 12.65% activities here, what that suggests is that at the time of this experiment, out of every 100 cases of COVID, 12, more than 12 were Black. But when you move to those who die, so 16.89% means that out of every 100 cases of those who contracted COVID and died, more than 16 were Black. The same thing happened in Georgia it was 27.18%, meaning that out of every 100 people that contracted the disease, 27 were Black, but when you look at the BTDR, that is the Black deaths to total deaths, it means that out of every 100 people that died of COVID 34.7% were Black. So the pattern is this thing is not the state that we consider, it is a source of concern to our study. And what happened? How come 12.65%, all of a sudden jumped to 16.89% and the CHCD, that is the COVID-19 healthcare disparity is- every other state we consider they are in red. And we can see that COVID is synonymous with wherever you find the Black mark.

I live in Maryland and the counties that are more affected are, *[inaudible]* county, *[inaudible]* country, and Baltimore county, these are predominantly Black. So the pattern is the same you know in every state in the country where you find a large population of Blacks. So this graph answers our first question, the first question is their healthcare disparity, so this first graph shows that yes, it exists. The second question now is will COVID-19 healthcare disparity continue? So in answering this question we built these models.

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So we did forecasting - COVID-19 cases and deaths in Black communities for March 31, 2021. So the forecasting model we built then we decided to build cases to take care of some unknowns, some of the states had what you called strength, some states had both strength and seasonality, so we started to build models for both strength and seasonality. And whether you consider that trend or

seasonality, it turns out that COVID-19 healthcare disparity will still continue. For instance, in Florida forecasting to March 31st, we see that the beat the BTCD forecast will be like 11.14%, then the BTDL will still be 15.08%, with the exception of South Carolina who is an outlier, our experiment shows that COVID-19 health care disparity mostly in a Black community will still continue. And for the unknown, we don't have we do not have the answer, but we built only a forecasting model from December of last year till March 31st.

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In conclusion, the result of experiments suggests that COVID-19 healthcare disparity exists in the Black community and will continue, at least to the end of the fourth quarter of 2021. Thank you very much.