A Digression About Race, Ethnicity, Class and Covid-19

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1.0 Introduction

Much has been written in the last few months about the relationship between Covid-19 infection rates and deaths, and Minority groups, especially of African-Americans. For example:

> ***Coronavarus disparities by race in Onondaga County[1]:***
> *"African Americans in Onondaga County are more than three times as likely as white residents to get infected with Covid-19, on a per capita basis Blacks are also nearly three times as likely to land in the hospital. The Death Rate from Covid-19 is more than 50% higher for Blacks than for whites."*

Such statements are based on the percentages and number of Covid-19 deaths, by ethnicity of the deceased, compared with their overall population share. Based on these and other assessments, correlations have been established that imply that Minorities, especially African-Americans, are somehow (genetics?) more prone to succumb to Covid-19, than whites and other races.

Such statements are based on two technical themes. The first one is statistical; the second one is biological. And both topics are subject to dispute. Firstly, statistical correlation between two variables does not imply causation, only association. If A is correlated with B, we cannot state that A implies B or vice-versa. We can only state that A and B are in some way associated and, as A increases (decreases) so does B, or as A increases (decreases), then B moves in the opposite direction. Lack of correlation implies that A and B move independently of each other.

Another very important correlation characteristic is that A and B may not be directly associated – but that they may be associated through a third variable C, that is effecting both A and B. This, could produce an indirect effect that gives the appearance that A and B are directly correlated.

The second question is genetic, and is indirectly implied by such apparent correlations: is there an innate biological characteristic of Minorities, especially of African-Americans, that make them more prone to becoming infected with (or dying from) Covid-19?

This paper has deliberately been titled "Digression", because it is mainly a theoretical discussion. Illustrative examples are provided. But no data analysis nor hard data are used, as we do not have them. We hope to inspire some researchers, with access to such data, to analyze them.

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[1] Post Standard, Sunday August 16/2020. Front Page.

2.0 An Illustrative Example of Spurious Correlation

Many years ago we obtained a SUNY Grant to study a problem in statistical education. We had observed, through our many years teaching statistics, that our classes consisted of two groups of students. One group would like and study the subject, and thence obtained good grades. The other group of students took statistics only because it was a required course, did not like it, did not study it appropriately, and thus obtained poor grades in the course.

To try to help such students improve I created, thanks to a SUNY grant, the "Minitab and Pizza" workshop. I would teach, every week, one Statistics Lab, where practical examples were given, and then solved using Minitab statistical software. And in order to entice students to attend this, completely voluntary Lab, all attendees were provided with pizza and soda.

I made it very clear that no other reward (e.g. no course credit) would be given, as this Lab was voluntary, and thus taught outside ordinary class schedule. Its only rewards would be the chance to improve their statistics grades through such reviews, and the pizza and refreshments provided.

I took weekly Lab attendance. Then, using the final course grades I performed statistical analyses to assess the Lab results. Those students that had regularly attended said Lab also had obtained the highest grades in the course. On the other hand, those students that had barely (or never) attended the Lab, obtained the lowest grades, or failed the course.

When the Dean saw the results, he became very excited. He thought that the Lab had succeeded in helping students improve their grades. I disagreed, showing the Dean additional information regarding said experiment.

I knew my students; and I knew who had attended (and who had not attended) our *Minitab and Pizza Lab*. In fact, those students that had consistently attended the Lab belonged to the group of *high achievers*, as shown by their high pre-Lab tests and quiz grades. Those other students who had initially (pre-Lab) done poorly in class, either never attended the Lab, or attended only its first session –stopping as soon as they verified that they would not receive extra credit, or any other reward by attending the Lab, other than the additional knowledge obtained through it.

Therefore there was *a third variable, student type: engaged and weak students.* Engaged students went to class, studied hard, and took advantage of every opportunity to improve (including the Lab). They would have obtained a good grade, with or without such Lab. Weak students were not interested in statistics, and did not attend the Lab, either. They would have obtained a lower grade even if I had not taught the Lab -which they chose not to attend.

At first sight, results gave *the appearance* that the Lab had a *positive impact* in raising student grades, as final course grades correlated with the attendance to Lab. *However*, detection of the *third, common variable, student type*, *showed how Lab itself, had little if any direct impact*.

A similar situation may arise *with the number of Covid-19 deaths and infections* occurring *in the Minority and African-American communities*, as will be discussed in the next section.

Details of said research are *discussed in the article Minitab and Pizza,* found in:

https://www.researchgate.net/publication/237389660_Minitab_and_Pizza_A_Workshop_Experiment

3.0 A possibly misinterpreted correlation between Covid-19 and Minorities

Let's focus, for the sake of discussion, in the African-American community. As any other, it can be divided into two groups: one consisting of more affluent, better educated individuals; another one consisting of working poor, unemployed, etc. who often gathers in modest neighborhoods.

Among the first group, just for illustration, we find a two-term US President and several of his Secretaries and Advisors, as well as Secretaries and Advisors of his predecessor white President. We also find a sitting Secretary, three Senators, several members of Congress' Black Caucus, and the Vice Presidential candidate of one of our two major political parties.

The above African-Americans share a more affluent economic status, and more solid education. However, there is no indication of them having been more infected with –or more dying of- Covid-19. *It may not be race or ethnicity but poverty* and other negative social conditions, such as insufficient or no health care, poor living conditions, working in higher risk jobs, living in overcrowded quarters, what causes these populations to become infected in larger percentages. Notice and *verify how, middle and upper class African-Americans and Hispanics* are affected in *similar numbers*, as *their middle and upper class peers in mainstream white America.*

We remember how NYS Gov. Andrew Cuomo, in several of his daily televised appearances to discuss Covid-19 data, showed a map with one of New York City's poorest boroughs, heavily populated by Minorities and African-Americans. He stated how it also included a substantial percentage of NYC Covid-19 infections and deaths. A natural but spurious conclusion was that *Minorities and African-Americans, somehow, suffered a greater share* of this disease. And, if such were true, this proneness could be construed as genetic in nature.

If such assumption were to hold true, we would also find higher rates of Covid-19 infections and deaths among the more affluent group of Minorities. But we do not. What may be occurring, just as with our Minitab and Pizza Lab experiment given above, is that the *variables Ethnicity and Covid-19 deaths and infections* are both *associated with a third*, hidden variable: *high poverty*!

There is room to suspect (and an interest to test, statistically) that *Covid-19 has hit hardest* into *Minority and African-American* communities, *not because* these have any specific *genetic trait*, *inherent to their race* or ethnicity, *but because they are poorer*. We read, for example:

> *"… delays in treatment brought on by a lack of good health insurance may explain why covid-19 now seems to be killing African Americans at twice the rate of white Americans".[2]*

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[2] The Economist, July 11, 2020. Briefing: Race in America. Page 15.

Other poor people, of other races and ethnicities, *have also been hit hard* by Covid-19. This is so *because they also may live in overcrowded and unhealthy quarters, do not exercise or eat right, do not have adequate medical insurance* and, thence, go to the doctor after they get sick, perhaps too late to (1) redress their medical problems, and (2) to prevent the occurrence of other medical issues such as heart disease, diabetes, obesity, cholesterol, etc that, constitute serious Covid-19 *co-morbidities*. But such things, if treated early, can be controlled before they become chronic.

4.0 Conclusions

By suggesting a questionable link between ethnicity and Covid-19 infections and deaths, *we are failing to address* (and hence to attack and resolve) *the real problem* behind it: the high poverty levels among minorities, including African Americans.

In the Minitab and Pizza workshop example, the Dean could have made it permanent. But this would have made little difference because weaker students could chose not to attend voluntarily. My proposal to make said Lab a mandatory part of our stats course was not accepted, because the course would then become a three-weekly-session one. This solution would ensure attendance of all students, but would interfere negatively with most other courses schedules.

In a similar manner, an effort to reduce the higher rates of Covid-19 deaths and infection among African Americans would require addressing *poverty*. For it is *poverty* that creates most socio-economic and environmental conditions that propitiate a higher vulnerability to Covid-19 in this sub-population, inducing its higher infection and death rates.

It is known that Minorities and African-Americans are represented among the poor in greater numbers than they are in the general population. It is also known that higher levels of infection and death are fostered by socio-economic and environmental conditions enhanced by poverty: over-crowdedness, and bad eating habits and insufficient exercise, that enable co-morbidities. We may be able to design social and economic programs that may help improve these issues.

Before closing we want to raise two important concerns. Firstly, the causes of poverty among minorities and African Americans are several and complex. Their treatment falls outside the scope of this paper. They have been discussed, elsewhere. Interested readers are encouraged to consult these sources.

Secondly, there is another very important reason not to blame race, ethnicity and genetics in the higher Covid-19 infections rates and deaths, occurring among minorities and African Americans. If genetics were its main cause instead of socio-economic and environmental conditions, genetics could also apply in other areas, that some parties, with an interest in debasing specific races, may want to miss-use, to their advantage, opening a slippery-slope.

Finally, we encourage those researchers who have access to the appropriate population data, to implement statistical analyses that will either disprove or ratify statements made in this article.

About the Author

Jorge Luis Romeu retired Emeritus from the State University of New York (SUNY). He was for sixteen years, a Research Professor at Syracuse University, where he is currently an Adjunct Professor of Statistics. Romeu worked for many years as a Senior Research Engineer at the Reliability Analysis Center (RAC), an Air Force Information and Analysis Center operated by IIT Research Institute (IITRI). Romeu received seven Fulbright assignments: in Mexico (3), the Dominican Republic (2), Ecuador, and Colombia. He holds a doctorate in Statistics/O.R., is a C. Stat. Fellow, Royal Statistical Society (RSS), a Member of the American Statistical Association (ASA) and of the American Society for Quality (ASQ). Romeu is a Past ASQ Regional Director, and holds Reliability and Quality ASQ Certifications. He created and directs the *Juarez Lincoln Marti International Ed. Project* (https://web.cortland.edu/matresearch/) which supports i) higher education in Ibero-America and ii) the https://web.cortland.edu/matresearch/QR&CIInstPg.htm

This article is part of our *pro-bono collaboration to the American struggle against Covid-19*, based on our *Proposal for Fighting Covid-19 and its Economic Fallout* that can be read in: https://www.researchgate.net/publication/341282217_A_Proposal_for_Fighting_Covid-19_and_its_Economic_Fallout Such proposal encourages retired professionals like this author to contribute *pro-bono* analyses, based on our long research experience.

Previous work on Coronavarus include: *A Markov Chain Model for Covid-19 Survival Analysis* https://www.researchgate.net/publication/343021113_A_Markov_Chain_Model_for_Covid-19_Survival_Analysis *An Example of Survival Analysis Applied to Covid-19 Data*, found in https://www.researchgate.net/publication/342583500_An_Example_of_Survival_Analysis_Data_Applied_to_Covid-19, *Multivariate Statistics in the Analysis of Covid-19 Data,* and *More on Applying Multivariate Statistics to Covid-19 Data*, both of which can also be found in: https://www.researchgate.net/publication/341385856_Multivariate_Stats_PC_Discrimination_in_the_Analysis_of_Covid-19, as all above-cited articles, also in our *ResearchGate* web page: https://www.researchgate.net/publication/342154667_More_on_Applying_Principal_Components_Discrimination_Analysis_to_Covid-19 *Design of Experiments to the Assessment of Covid-19*: https://www.researchgate.net/publication/341532612_Example_of_a_DOE_Application_to_Coronavarius_Data_Analysis, Outsource: https://www.researchgate.net/publication/341685776_Off-Shoring_Taxpayers_and_the_Coronavarus_Pandemic and *reliability methods for ICU* units: https://www.researchgate.net/publication/342449617_Example_of_the_Design_and_Operation_of_an_ICU_using_Reliability_Principles