Rapid Reviews COVID-19

Review 2: "Disaggregating Asian Race Reveals COVID-19 Disparities among Asian Americans at New York City's Public Hospital System"

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RR:C19 Evidence Scale rating by reviewer:

- **Potentially informative.** The main claims made are not strongly justified by the methods and data, but may yield some insight. The results and conclusions of the study may resemble those from the hypothetical ideal study, but there is substantial room for doubt. Decision-makers should consider this evidence only with a thorough understanding of its weaknesses, alongside other evidence and theory. Decision-makers should not consider this actionable, unless the weaknesses are clearly understood and there is other theory and evidence to further support it.

Review:

Marcello et al. (2020) studies differences in COVID-19 outcomes among Asian ethnic subgroups using electronic health record data on patients who received a SARS-CoV-2 test at New York City's public hospital system between March 1 and May 31, 2020. The analysis includes a comparison of the average positivity, hospitalization, and mortality rates by race and ethnicity and a multivariable logistic regression of mortality outcomes that controls for demographics such as sex and age and comorbidities such as diabetes and obesity. The paper establishes two primary findings: 1) the positivity and hospitalization rates of South Asians are the highest within Asian subgroups and the second highest across races, and 2) the mortality rate of Chinese-descent patients are the highest within Asian subgroups and across races, as well as statistically larger than whites after controlling for demographics and comorbidities. In contrast, the mortality rate of Asian patients as a whole is not statistically different from whites.

On *Rapid Review's* strength of evidence scale, I rate this paper as potentially informative. In terms of strengths, the study's granular patient-level data allows for a detailed analysis of outcomes by race that controls for demographics and comorbidities. This provides some insight into other factors that drive racial disparities in COVID-19 outcomes, such as differential exposure due to occupational sorting, differences in access to care due to immigration status, impediments to isolate if infected, and poorer healthcare options due to lower income. The paper broadly discusses these factors but does not appear to have the necessary data, such as patient occupation, immigration status, housing conditions, and patient income levels, to conduct further statistical analysis. Second, the paper takes seriously the issue of non-

random missing data on race on by re-classifying Asian patients using an Asian surname list rather than relying on self-reported data. In future work, it would be beneficial if the authors shed light on the extent to which this data issue affects the conclusions drawn.

Here, I address two issues that readers should consider prior to drawing conclusions from the study. First, the study finds the odds of dying for blacks to be *significantly lower* than whites in the sample. They do not find a significant difference in the odds of dying for Hispanics relative to whites. These results stand in contrast with the findings of other studies in the literature (CDC 2020). I find important differences between the study's sample, which is restricted to NYC's public hospital system, and the population of patients tested and treated for Covid-19 in New York City. In Table 1 of the Supplementary Material, I compare the hospitalization and mortality rates by race for New York City[1] with those from the study. There are notable differences in outcomes across race and ethnic subgroups. In the NYC H+H sample, mortality rates for whites are 2.5 times higher than NYC's, but only between 1.4 to 1.7 times higher for blacks, Asians and Hispanics. This could explain why the study does not find significant differences in outcomes for blacks, Asians and Hispanics relative to whites. Furthermore, mortality rates of patients in the study's sample are on average three times higher than those of NYC, whereas hospitalization rates are almost twice as high compared to the NYC average. This suggests that the study's sample overrepresents higher risk patients, which calls for caution when extrapolating the results to other jurisdictions.

Second, the study's findings require a nuanced view of why positivity and hospitalization rates are the highest for South Asians but mortality rates are higher for Chinese-descent patients among Asian subgroups. I find a more consistent picture where South Asians bear a disproportionate burden of the disease among Asian subgroups from examining the *share* of COVID-19 outcomes by race and ethnicity in the study's sample[2]. While South Asians constitute 30 percent of Asians in New York City, they make up more than half of positive cases and hospitalizations as well as almost half of all COVID-19 deaths among Asians in the NYC H+H sample. In contrast, while Chinese-descent Asians constitute close to half of Asians in New York City, they make up only around 20 percent of positive cases and hospitalizations among Asians and slightly below 30 percent of deaths among Asians in the sample. The finding that South Asians bear a disproportionate burden of the disease is consistent with the findings of other studies cited (for example, Bhala et al. 2020).

Selection into testing is one reason why this result is obscured when looking just at mortality rates. If Chinese-descent Asians have a lower prevalence of the disease than South Asians but seek treatment only under more severe circumstances, then Chinese-descent Asians would have a higher mortality rate but lower share of deaths relative to South Asians in the sample. The narrative that Chinese-descent Asians are less likely seek treatment is consistent with the findings in Table 2. While Chinese-descent Asians make up close to half of Asians in New York City, they constitute only 22 percent of total Asians tested for COVID-19 in NYC's public hospital system. However, existing data does not provide sufficient evidence to establish this conclusion. For example, if Chinese-descent Asians are more likely to be tested and treated outside of NYC's public hospitals than other Asian subgroups, this would also result in a lower overall share of COVID-19 deaths among Asians in the sample relative to the share of Asian population in the city.

[1] Source: New York City Department of Health and Mental Hygiene, Covid-19: Data, Rates of Cases, Hospitalization, and Deaths by Race/Ethnicity Group, May 14 (<https://www1.nyc.gov/assets/doh/downloads/pdf/imm/covid-19-deaths-race-ethnicity-05142020-1.pdf>). The analysis uses data as of May 13 and is unchanged using data as of May 31. However, the latter does not differentiate between patients classified as Other and unknown.

[2] Table 2 also shows the share of positive cases, hospitalization and deaths for New York City. Data on test by race and ethnicity is not collected consistent at the city level, hence is unavailable.

References

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Supplementary Material

Race/Ethnic group	NYC Covid 19 (May 13)		NYC H+H (May 31)	
	Hospitalized	Death	Hospitalized	Death
	%	%	%	%
Total	27.1	8.2	49.0	24.1
White, non-hispanic	36.6	13.5	53.3	33.6
Black, non-hispanic	46.2	14.3	57.5	23.7
Asian, non-hispanic	44.4	15.5	51.6	25.5
Hispanic	43.8	14.9	45.8	21.7
Other	10.8	1.7	41.4	24.0
Other known	78.5	57.3	48.2	22.9
Unknown	10.0	1.1	28.7	26.1
South Asian			54.7	23.7
Chinese			52.6	35.7
Other Asian			44.8	21.0

Table 1: Hospitalization and mortality rates for New York City and NYC H+H sample. New York City data comes from the New York City Department of Health and Mental Hygiene, Covid-19: Data, Rates of Cases, Hospitalization, and Deaths by Race/Ethnicity Group, May 14 (<https://www1.nyc.gov/assets/doh/downloads/pdf/imm/covid-19-deaths-race-ethnicity-05142020-1.pdf>). NYC H+H data is obtained from Marcello et al. (2020) Figure 1.

Race/Ethnic group	ACS 2014-2018	NYC Covid 19 (May 13)				NYC H+H (May 31)		
	Population %	Positive %	Hospitalized %	Death %	Test %	Positive %	Hospitalized %	Death %
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
White, non-hispanic	32.1	15.4	20.8	25.3	9.4	8.1	8.9	11.3
Black, non-hispanic	21.8	15.9	27.0	27.6	24.4	24.2	28.4	23.8
Asian, non-hispanic	14.0	4.0	6.5	7.4	11.7	11.7	12.4	12.4
Hispanic	29.1	16.3	26.3	29.4	29.4	34.0	31.8	30.6
Other	3.0	48.4	19.2	10.2	25.0	21.9	18.6	21.9
Other known		0.6	1.7	4.1	15.8	14.3	14.1	13.6
Unknown		47.8	17.7	6.1	9.2	7.6	4.5	8.3
South Asian	30.2				48.2	53.2	56.4	49.4
Chinese-descent	48.9				22.2	19.9	20.3	27.9
Other Asian	20.9				29.6	26.7	23.2	22.0

Table 2: Share of tests, positive cases, hospitalization, and deaths by race and ethnicity for New York City and NYC H+H sample. Population share by race and ethnicity for New York City is also shown. Share for South Asian, Chinese-descent and Other Asian is among all Asians, not the full tested population. Population share data comes from the Census Bureau's American Community Survey 5-Year Data (2014-2018). New York City data comes from the New York City Department of Health and Mental Hygiene (DOHMH), Covid-19: Data, Rates of Cases, Hospitalization, and Deaths by Race/Ethnicity Group, May 14

(<https://www1.nyc.gov/assets/doh/downloads/pdf/imm/covid-19-deaths-race-ethnicity-05142020-1.pdf>). NYC H+H data is computed using number of tests from Marcello et al. (2020) Table 1 and testing, hospitalization and mortality rates from Marcello et al. (2020) Figure 1.