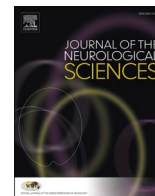


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# Journal of the Neurological Sciences

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## The importance of race and other social determinants of health for understanding cognitive health inequality found in Valdes et al.'s "Demographic and social determinants of cognitive dysfunction following hospitalization of COVID-19"

The COVID-19 pandemic has led to unprecedented changes in health and wellbeing. One of the most notable and concerning changes has been persistent cognitive functioning complications reported after recovering from COVID. People who survived COVID-19 have described these symptoms as "brain fog", which encompass low energy, concentration problems, and disorientation. Reports of worse cognitive functioning are not limited to people who experienced severe COVID-19 symptoms. While people who experienced hospitalization experienced the most severe declines, those who were not hospitalized also had a decrease in cognitive performance following COVID-19 infection [1,2]. These declines encompass several domains of cognitive functioning (i.e. attention, executive functioning, memory encoding, etc.), showing a broad impact [3]. Given the adverse consequences of COVID-19 on brain health and the millions of people it has infected and continues to infect, a key public health concern is whether COVID will lead to greater cognitive health declines among those who are already at greatest risk (people with preexisting conditions) and whether it will exacerbate sociodemographic inequalities in health that have been documented in prior studies.

In "Demographic and Social Determinants of Cognitive Dysfunction following hospitalization of COVID-19", Valdes et al. investigate this issue. Specifically, the authors evaluate whether known social determinants of health (i.e. race, education level, etc.) are correlated with worse cognitive functioning following hospitalization. They find that being racially classified as black, having fewer years of formal education, and experiencing unemployment prior to hospitalization were all associated with greater risk of cognitive dysfunction six months after hospitalization. These associations were robust to adjustments for pre-existing health conditions. These findings add to the plethora of recent studies that have documented inequalities in COVID-19 exposures and outcomes, showing how the most disadvantaged groups are experiencing the worst outcomes of the pandemic even after accounting for being diagnosed or exposed to COVID in the first place. Put differently, this study shows the stark inequality in COVID-related cognitive dysfunction that may exacerbate pre-existing inequalities and should be a major concern for health researchers in figuring out what may lie in store in the coming years.

One of the most notable, and complex, finding that the authors discovered was the stark differences in cognitive dysfunction between Black and non-Black patients. Black patients were more than 5.53 times more likely to experience cognitive dysfunction six month after hospitalization than non-Black patients. While the authors cannot fully account for the factors that might be driving the observed race differences,

they adjust for health conditions that may be driving the part of the difference in association, but do not find that the difference by racial category can be ascribed to differences in premorbid conditions, nor from differences in severity of COVID hospitalization. Rightfully so, the authors point out that this finding brings up more questions than it provides answers. While this study shows another form of racial inequality in COVID-19 experiences, more research is needed in why these differences arise. For example, while high school education is accounted for, pre-COVID infection cognitive functioning may already differ in ways that are not reflected on whether respondents had at least 12 years of education. Black patients may have lower cognitive functioning scores at baseline, making the conversion to impairment more likely. In population health studies, older Black Americans have lower overall cognitive functioning [4] and are consistently at greater risk of dementia incidence at earlier ages [5,6]. Therefore, it could be that the greater risk of adverse cognitive health outcomes after COVID hospitalization for Black older adults are reflecting population processes that have preexisted the pandemic. Other work should build on this study by investigating whether rates of decline also differ, even though evidence suggest that rates of decline are consistent across race groups in the population. And it is important to note that the greater susceptibility is most likely due to other social and economic factors that cannot be accounted for in this study due to data limitations, such as finer grain measures of education or other life course factors associated with cognitive development and function.

Additionally, while the severity of COVID was accounted for, more research needs to investigate whether differences exist in the quality of care or treatment that may be leading to worse health outcomes for Black older adults. Prior work has shown that race ethnic minorities often experience lower quality of care in hospital settings, regardless of insurance status, age, or severity of illness [7]. It may be that Black older adults received worse COVID care, which in turn makes their post-COVID health complications more severe. More research in this area is needed. And, lastly, the measurements for understanding cognitive functioning are imperfect. Studies should evaluate whether the same differences exist across different types of cognitive functioning tests.

In summary, this article lays the foundation for starting to understand differences in cognitive impairment following COVID-19-related hospitalization across various social and economic factors. It adds to the social determinants of health literature by showing stark inequalities in cognitive dysfunction risk, while also pointing to the fact that these differences cannot easily explained by adjusting for severity of symptoms or prior premorbid conditions. But most importantly it adds to the

<https://doi.org/10.1016/j.jns.2022.120151>

Received 5 January 2022; Accepted 7 January 2022

Available online 13 January 2022

0022-510X/© 2022 Published by Elsevier B.V.

growing body of literature that shows stark inequalities in health during the COVID-19 pandemic that warrants further investigation from researchers across the various disciplines to address health disparities that will most likely continue even after the pandemic has subsided or become more manageable.

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