Rapid Reviews COVID-19

Review 2: "Disparities in COVID-19 Fatalities among Working Californians"

Yi Li¹

¹University of Michigan

Published on: Dec 28, 2021

License: [Creative Commons Attribution 4.0 International License \(CC-BY 4.0\)](https://creativecommons.org/licenses/by/4.0/)

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:

This manuscript by Cummings et al. investigated the occupational distribution of mortality rates among working-aged Californians in 2020 with respect to the COVID-19 pandemic. Specifically, this work sought to (1) characterise COVID-19 fatalities that occurred in 2020 among working Californians, (2) describe the distribution of occupations, and (3) examine temporal trends. The authors calculated age-adjusted overall and occupation-specific COVID-19 mortality rates, using 2019 American Community Survey to define denominator counts. Individuals were classified as “confirmed working,” “likely working,” or “not” working, and the authors also studied the distribution of demographics (age, sex, race and ethnicity, country of origin, citizenship, and education level) by these working status groups.

Age-adjusted mortality rates were stratified by these categories, as well as more granular occupation-specific groups. The authors found that COVID-19 accounted for 10% of fatalities among working-aged Californians last year. Further, the authors report an overall age-adjusted COVID-19 mortality rate of 30.0 per 100,000 workers, with those in occupational categories such as farming, material moving, construction, production, and transportation having mortality rates higher than this overall rate. Additionally, mortality rates were reported to be three-fold higher for male compared with female workers and three- to seven-fold higher for Latino and Black workers compared with Asian and White workers.

The authors also allude to a potential interaction effect (page 7, line 169) between occupational categories and individual demographics such as sex and race/ethnicity. A potentially unique strength of this study is that the authors employed machine learning

and probabilistic matching techniques to merge three important data sources: (1) the California Electronic Death Registration System (EDRS), (2) the state's COVID-19 Case Registry, and (3) the state's Employment Development Department (EDD) records derived from quarterly tax reports. However, these techniques should be elaborated on in much greater detail to assess their validity and potential implications. It is noted that a majority (51%) of individuals went unmatched to either the "confirmed working" or "not working" employment status groups, and the resulting "likely working" group showed the greatest variation in mortality rates over calendar time (Fig. 2). These results were compared to one domestic (Massachusetts) and one international study (United Kingdom).

Overall, the paper is well written with sound evidence for disparate occupational trends in mortality. The authors clearly enumerated the potential limitations of their study and elaborate on their implications. Many of these shortcomings, however, point to potential underreporting, which would bias their results towards the null, leading to an attenuation in the disparate outcomes they are seeing. The authors conclude that Californians in manual labor and in-person service occupations experienced disproportionate COVID-19.