Differential occupational risk for COVID-19 and other infection exposure according to race and ethnicity

Devan Hawkins MS, ScD

Abstract

Background: There are racial and ethnic disparities in the risk of contracting COVID-19. This study sought to assess how occupational segregation according to race and ethnicity may contribute to the risk of COVID-19.

Methods: Data about employment in 2019 by industry and occupation and race and ethnicity were obtained from the Bureau of Labor Statistics Current Population Survey. This data was combined with information about industries according to whether they were likely or possibly essential during the COVID-19 pandemic and the frequency of exposure to infections and close proximity to others by occupation. The percentage of workers employed in essential industries and occupations with a high risk of infection and close proximity to others by race and ethnicity was calculated.

Results: People of color were more likely to be employed in essential industries and in occupations with more exposure to infections and close proximity to others. Black workers in particular faced an elevated risk for all of these factors.

Conclusion: Occupational segregation into high-risk industries and occupations likely contributes to differential risk with respect to COVID-19. Providing adequate protections to workers may help to reduce these disparities.

KEYWORDS
COVID-19, infectious disease, occupational health, occupational segregation, racial/ethnic disparities

1 | INTRODUCTION

As states have begun to release data about COVID-19 cases, the evidence is emerging that people of color, particularly Black Americans, are at an elevated risk both for contracting the disease, being hospitalized and dying from it.\(^1\,^2\) Different explanations have been provided to account for these disparities including people of color being more likely to live in densely populated areas, and, due to structural factors like discrimination and racism, being more likely to be socioeconomically disadvantaged and have comorbid health conditions that contribute to the risk of COVID-19.\(^3\,^4\) Discrimination within the healthcare system may also contribute to worse outcomes when COVID-19 is contracted.

Occupational exposures are an important factor to consider in explaining these racial and ethnic health disparities. It has already been established that some occupations and industries are an elevated risk for COVID-19, especially those employed in healthcare and other essential industries.\(^5\,^6\) Some of these differences may be related to different characteristics of the occupation worked, including exposures to infections and close proximity to others.\(^7\,^8\)

Due to occupational segregation, people of color are often employed in an occupation that tends to be at a higher risk for occupational injuries, illnesses and fatalities.\(^9\) To assess how this occupation segregation may contribute to racial and ethnic disparities for COVID-19, this study sought to determine whether there were racial and ethnic disparities in workers employed in essential industries.
industries and in occupations with a higher risk of exposure to infections and close proximity to others.

2 | METHODS

Data showing employment by industry and occupation according to race and ethnicity were obtained from the Bureau of Labor Statistics (BLS) Current Population Survey (CPS) for the year 2019. The only race and ethnicities included in this data were White, Black, Asian, and Hispanic. The Hispanic category included all those indicating that they were Hispanic regardless of race and the individual race categories included those who indicated that they were Hispanic. The Brookings Institute performed an analysis in which they characterized industries according to whether they were either likely or possibly part of the essential workforce according to guidelines published by the Department of Homeland Security. We matched this data with the employment data from the BLS CPS and calculated the percentage of workers likely or possibly employed in essential industries according to race and ethnicity. We also provide data about employment to select essential industries.

Based on previous analyses, we obtained data about the occupational risk for infections and close proximity other from the Occupational Information Network (O*Net). The data for exposure to infections is based on a survey that is sent to workers that ask, “How often does this job require exposure to disease/infections?” The data for proximity to others is based on another question that asks, “To what extent does this job require the worker to perform job tasks in close physical proximity to other people?” Based on the responses to this question, occupations are given a score between 0 and 100 that corresponds to their frequency of exposure to infections/proximity to others. For this analysis, high-risk occupations for infections were categorized as those with a score of 51 or higher and higher risk for proximity to others was categorized as 76 or higher.

We combined these occupational scores with the employment data from the BLS CPS and calculated the percentage of workers with a high risk of exposure to infections and proximity to others according to race and ethnicity. We also provide data about select occupations with high exposure to infections and close proximity to others.

Finally, we categorized some occupations as high risk for both exposure to infections and proximity to others if they were in the high-risk group for both variables. Again we calculated the percentage of workers who fell into this high-risk category by race and ethnicity and provide data about select high-risk occupations.

This project was considered exempt from review by the MCPHS University Institutional Review Board because it was conducted with previously collected, deidentified data.

| Variable                                    | White (%) | Black or African American (%) | Asian (%) | Hispanic (%) |
|---------------------------------------------|-----------|-------------------------------|-----------|--------------|
| Likely employed in essential industry       |           |                               |           |              |
| Healthcare and social assistance            | 26.89     | 37.75                         | 26.16     | 27.20        |
| Hospital                                    | 12.76     | 19.82                         | 14.62     | 11.11        |
| Animal slaughtering and processing          | 4.36      | 6.13                          | 6.45      | 2.89         |
| Likely and possibly employed in essential industry | 35.41  | 44.64                         | 35.16     | 33.00        |
| Employed in occupations with frequent exposure to infections | 11.28  | 14.73                         | 13.02     | 11.37        |
| Respiratory therapist                       | 0.08      | 0.17                          | 0.13      | 0.04         |
| Registered nurse                            | 2.60      | 2.60                          | 3.98      | 1.06         |
| Licensed practical and vocational nurse     | 0.49      | 1.20                          | 0.30      | 0.43         |
| Employed in occupations with frequent close proximity to others | 25.10  | 29.03                         | 24.26     | 25.81        |
| Physical therapists                          | 0.25      | 0.12                          | 0.57      | 0.06         |
| Personal care aids                          | 0.93      | 2.37                          | 1.63      | 1.44         |
| Medical assistants                          | 0.47      | 0.59                          | 0.38      | 0.79         |
| Employed in occupations with frequent exposure to infections and close proximity to others | 8.12   | 10.75                         | 9.95      | 6.23         |
| Bus drivers                                 | 0.39      | 0.96                          | 0.23      | 0.37         |
| Flight attendants                           | 0.09      | 0.12                          | 0.08      | 0.08         |

TABLE 1: Percent employment by essential industries, occupations with frequent exposure to infection and proximity to others, according to race/ethnicity, 2019.
3 | RESULTS

As is shown in Table 1, Black workers were more likely to be employed in both likely and possibly essential industries. Black and Asian workers were most likely to be employed in the healthcare and social assistance industry and in hospitals. In addition, Black and Hispanic workers were more than twice as likely to be employed in the animal slaughtering and processing industry, where there have been notable outbreaks of COVID-19. Employment in all likely or possibly essential industries can be seen in Table S1.

Black and Asian workers were also more likely to be employed in occupations with a high risk of infections. Both Black and Asian workers were more likely to be employed as respiratory therapists. Asian workers were more likely to be employed as registered nurses and Black workers were more likely to be employed as licensed practical and vocational nurses.

Black workers were most likely to be employed in occupations frequently requiring close proximity to others. With respect to some of the occupations that require the most frequent proximity to others, White and Asian workers were most likely to be employed as physical therapists. Black, Hispanic, and Asian workers were most likely to be employed as personal care aids, and Black and Hispanic workers were most likely to be employed as medical assistants.

Black and Asian workers were most likely to be employed in occupations with both frequent exposures to infections and proximity to others. Two occupations that fell into this category—bus drivers and flight attendants—had Black workers more likely to be employed in them. Employment in all occupations with data available according to the risk of infection and proximity to others can be seen in Table S2.

4 | DISCUSSION

These findings highlight that people of color are vulnerable to infection in the current COVID-19 pandemic due to the nature of their employment. In particular, Black workers, who have been impacted most acutely by the pandemic,1,2 were more likely to be employed in essential industries, in occupations with frequent exposure to infections and close proximity to others. This suggests that some of the racial and ethnic variability in risk for COVID-19 may be due to occupational segregation.

These findings have some limitations. There is variability in what exactly is an essential service from state to state, so actual racial and ethnic employment patterns may differ in different localities. In addition, the O*Net variable for infections considers all infections and not specifically COVID-19. Some occupations may have a high risk of infections that are spread in a way distinct from COVID-19. O*Net also did not have exposure information for all occupations, limiting the generalizability of these findings. Finally, this analysis only included data about four race and ethnicity categories. It is very likely that occupational segregation with respect to other racial and ethnic groups could impact risk for COVID-19.

Protecting frontline workers is essential in the current crisis because these workers are particularly vulnerable to the disease. Such protection may also help to reduce racial and ethnic disparities in the burden of COVID-19. These protections should include personal protective equipment to limit exposure to the virus, as well as protections for if a worker becomes sick, including paid sick leave and worker’s compensation benefits.

CONFLICT OF INTEREST

The author declares that there is no conflict of interest.

DISCLOSURE BY AJIM EDITOR OF RECORD

John D. Meyer declares that he has no conflict of interest in the review and publication decision regarding this article.

AUTHOR CONTRIBUTIONS

Devan Hawkins conceived of this study, acquired data, and drafted the paper. He approves this version of the manuscript and agrees to be accountable for all aspects of the work.

ETHICS APPROVAL AND INFORMED CONSENT

This project was considered exempt from review by the MCPHS University Institutional Review Board because it was conducted with previously collected, deidentified data.

ORCID

Devan Hawkins http://orcid.org/0000-0002-7823-8153

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SUPPORTING INFORMATION
Additional supporting information may be found online in the Supporting Information section.

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