

Risk for Severe COVID-19 Illness Among Health Care Workers Who Work Directly with Patients



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INTRODUCTION

A recent study from the Centers for Disease Control found that health care workers in the USA accounted for 19% of confirmed COVID-19 cases with information on occupation.¹ At the same time, evidence is mounting that pre-existing conditions such as cardiovascular disease, diabetes, hypertension, and obesity, as well as older age, are associated with a higher risk of hospitalization, admission to an intensive care unit, and death among those with COVID-19.² Health care workers who have direct contact with patients not only have an increased likelihood of being exposed to COVID-19, but those who are older or who have high-risk comorbidities are at particular risk of adverse COVID-19 outcomes. In the USA, 8.8% of physicians and 3.8% of registered nurses are aged ≥ 65 years.³ The objective of this study is to estimate the prevalence of high-risk comorbidities and older age for five types of health care workers, focusing on those who have direct contact with patients. The study also examines the sociodemographic characteristics of health care workers who are at higher risk for adverse COVID-19 outcomes.

METHODS

This study used pooled data on adults aged ≥ 18 years from the 2017 and 2018 National Health Interview Surveys (NHIS) ($n = 52,159$). The NHIS are nationally representative of the non-institutionalized civilian population. A subsample was created of individuals who reported physical or hands-on contact with patients as part of their routine work and whose occupation was health care practitioner or technician (Standard Occupational Classification (SOC) code 29) or health care support (SOC code 31) ($n = 1814$).⁴ Practitioner and technician occupation categories were further defined by the entry level education required for the occupation (see Tables 1 and 2).⁵

COVID-19 high-risk comorbidity variables available from the NHIS were BMI ≥ 40 , cancer in the past 3 years, cardiovascular disease, chronic lung disease or an asthma attack in

the past year, current smoker, diabetes, kidney disease, and liver disease.² Direct patient care health care workers were categorized as being at higher risk of adverse COVID-19 outcomes (“higher-risk health care workers”) if they had ≥ 1 high-risk comorbidity or if they were aged ≥ 65 years ($n = 745$). Descriptive statistics were calculated and Pearson design-based *F*-tests were used to determine whether percentages differed significantly across occupation categories. All estimates were weighted and accounted for the NHIS complex sampling design.

RESULTS

Of the 3.8% of US adults who worked directly with patients as health care workers, 38.6% were higher risk. Among direct patient care health care workers, the prevalence of high-risk comorbidities, older age, and higher-risk status differed significantly across occupation categories (Table 1). Among the subsample of higher-risk health care workers, 67.5% had 1 high-risk comorbidity, 28.3% had ≥ 2 high-risk comorbidities, and 10.8% were aged ≥ 65 years. Of this subsample, 52.5% worked in support roles, 54.0% worked in hospitals or nursing homes, 74.9% were women, 64.4% were white, 17.8% were African American, and 9.9% were Latino. Among higher-risk health care workers, there were significant differences across occupation categories in work setting, gender, race/ethnicity, health insurance status, and financial resources (Table 2).

DISCUSSION

The findings of this study suggest that more than a third of individuals in health care occupations who work directly with patients are at an elevated risk of adverse COVID-19 outcomes if they become ill. Additionally, a quarter of higher-risk health care workers have multiple high-risk comorbidities, further increasing the likelihood of adverse COVID-19 outcomes. More than half of higher-risk health care workers work in hospitals or nursing homes, settings with high levels of exposure to COVID-19. These findings highlight the crucial importance of personal protective equipment for those who work directly with patients across health care occupations and locations of care. Furthermore, health care practitioners and technicians with lower education and those in health care support occupations are more likely to have high-risk comorbidities as well as strained financial resources. Assuming that

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Table 1 Prevalence of High-Risk Characteristics for Adverse COVID-19 Outcomes Among Health Care Workers Who Work Directly with Patients, by Occupation Category (n = 1814)

	Doctors and other clinicians (n = 252)	PA/NP, therapists, and others with Master's degree (n = 151)	Nurses, nutritionists, and others with Bachelor's degree (n = 433)	LPNs, EMTs, and others with less than a Bachelor's degree (n = 462)	Home health aides, medical assistants, and other support roles (n = 516)	p value
	Weighted % (95% CI)	Weighted % (95% CI)	Weighted % (95% CI)	Weighted % (95% CI)	Weighted % (95% CI)	
1 or more high-risk comorbidity	29.6 (23.5–36.4)	25.4 (18.5–33.8)	32.1 (26.9–37.7)	45.5 (39.7–51.5)	41.2 (36.2–46.4)	< .000
Age ≥ 65 years old	9.2 (6.3–13.3)	1.5 (0.7–3.5)	4.3 (2.7–6.8)	3.0 (1.8–4.9)	3.2 (2.0–5.1)	< .000
1 or more high-risk comorbidity or age ≥ 65	32.4 (26.1–39.4)	26.6 (19.6–35.0)	33.8 (28.7–39.4)	46.8 (40.9–52.7)	42.6 (37.5–47.8)	< .000

PA physician assistant, NP nurse practitioner, LPN licensed practical nurse, EMT emergency medical technician. Of individuals in the health care sector who worked directly with patients, 14.8% were doctors or other clinicians; 8.4% were physician assistants, nurse practitioners, therapists, or others with Master's degrees; 24.4% were nurses, nutritionists, or others with Bachelor's degrees; 24.6% were licensed practical nurses, EMTs, or others with less than a Bachelor's degree; and 27.9% were home health aides or medical assistants. Analyses were weighted and accounted for the NHIS complex sampling design

Table 2 Work Setting, Demographic, and Socioeconomic Characteristics of Health Care Workers Who Work Directly with Patients and Are at Higher Risk of Adverse COVID-19 Outcomes, by Occupation Category (n = 745)

	Doctors and other clinicians (n = 86)	PA/NP, therapists, and others with Master's degree (n = 50)	Nurses, nutritionists, and others with Bachelor's degree (n = 149)	LPNs, EMTs, and others with less than a Bachelor's degree (n = 227)	Home health aides, medical assistants, and other support roles (n = 233)	p value
	Weighted % (95% CI)	Weighted % (95% CI)	Weighted % (95% CI)	Weighted % (95% CI)	Weighted % (95% CI)	
Work setting						
Hospital	24.7 (15.1–37.8)	64.1 (46.9–78.4)	65.3 (55.4–74.0)	44.9 (36.8–53.3)	13.4 (9.2–19.2)	< .000
Nursing home	1.9 (0.5–7.4)	1.4 (0.2–9.5)	2.6 (1.0–6.8)	14.5 (9.7–21.1)	34.5 (27.7–42.1)	< .000
Female	28.1 (17.8–41.4)	79.0 (63.5–89.0)	83.7 (74.5–90.2)	77.8 (69.6–84.4)	87.6 (81.2–92.0)	< .000
Race/ethnicity						
White (non-Latino)	73.3 (59.6–83.5)	73.5 (54.6–86.5)	56.2 (45.1–66.7)	73.7 (65.7–80.4)	55.8 (47.6–63.7)	< .000
African American (non-Latino)	7.2 (2.5–19.2)	2.7 (0.4–16.8)	20.0 (12.7–32.7)	14.5 (9.7–21.3)	25.8 (19.4–33.5)	
Latino	1.7 (0.4–7.0)	6.3 (1.6–21.9)	6.8 (2.4–17.9)	10.5 (6.2–17.0)	15.6 (10.2–23.1)	
Other	17.8 (9.4–31.4)	17.5 (7.0–37.5)	16.0 (9.3–26.2)	1.3 (0.3–4.9)	2.8 (1.1–7.3)	
Has health insurance	98.4 (92.9–99.7)	100	98.7 (95.4–99.6)	93.5 (87.7–96.6)	85.8 (79.8–90.2)	< .000
Family financial resources						
Income < 200% of federal poverty line	0.4 (0.1–2.9)	1.0 (0.1–6.8)	4.5 (2.0–9.7)	12.2 (8.2–18.0)	36.9 (29.4–45.1)	< .000
Could not afford prescription medication, past 12 months	0.7 (0.1–4.6)	1.0 (0.1–6.8)	5.6 (2.9–10.6)	7.3 (4.3–12.0)	17.5 (12.0–24.7)	< .000
Worried food would run out, past 30 days	0	0	2.0 (0.1–6.9)	12.2 (8.1–18.0)	26.6 (20.3–34.1)	< .000

PA physician assistant, NP nurse practitioner, LPN licensed practical nurse, EMT emergency medical technician. Of individuals in the health care sector who worked directly with patients and were at higher risk of adverse COVID-19 outcomes, 12.4% were doctors or other clinicians; 5.8% were physician assistants, nurse practitioners, therapists, or others with Master's degrees; 21.3% were nurses, nutritionists, or others with Bachelor's degrees; 29.8% were licensed practical nurses, EMTs, or others with less than a Bachelor's degree; and 30.7% were home health aides or medical assistants. Analyses were weighted and accounted for the NHIS complex sampling design

the estimates from the pooled 2017 and 2018 NHIS data offer reasonable estimates for 2020, the findings highlight the precarious position of health care workers who hold these jobs and the difficult trade-off they may face in deciding whether to risk their health or to risk losing their livelihood.

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Compliance with Ethical Standards:

Conflict of Interest: The authors declare that they do not have a conflict of interest.

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