Discussion | In the United States in 2020, we found that the proportion of community-dwelling homebound adults aged 70 years or older substantially increased, particularly among Black non-Hispanic and Hispanic/Latino individuals. Although our study could not establish the reasons for this first major increase in the homebound population in a decade, a likely explanation is compliance with social distancing and other public health recommendations to minimize the risk of infection with SARS-CoV-2. Our study also found notable racial and ethnic differences. For example, White non-Hispanic individuals were more likely to reside alone, which may have left them without caregiving assistance. In contrast, Black non-Hispanic and Hispanic/Latino individuals were more likely to live in multiperson households, which may have increased their risk of being exposed to SARS-CoV-2. Although the reason for higher rates of being homebound among Black non-Hispanic and Hispanic/Latino populations is unknown, it may be due to greater regional incidence of SARS-CoV-2 or reduced resources to safely navigate leaving home (eg, private transportation and safe grocery shopping options). The respondents, particularly Black non-Hispanic and Hispanic/Latino individuals, infrequently used digital technologies, a finding that is consistent with results of a prior study and has implications for equity regarding expanded telemedicine use.[6] Other limitations of our study include that homebound rates may have fluctuated during the pandemic and by region, which we did not capture. The extent to which the increased prevalence of homebound older adults that we observed in 2020 will continue in 2021 as the COVID-19 pandemic abates, as well as the likely social, psychological, and physical effects, remains to be seen.

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Association of Vaccine Type and Prior SARS-CoV-2 Infection With Symptoms and Antibody Measurements Following Vaccination Among Health Care Workers

Two messenger RNA (mRNA) vaccines (Pfizer-BioNTech and Moderna) encoding the spike protein of SARS-CoV-2 induce the production of spike antibodies that neutralize SARS-CoV-2[1] and are clinically effective against COVID-19.[2] These vaccines can elicit greater local and systemic reactions in persons with prior SARS-CoV-2 infection.[3] Whether symptoms following vaccination are associated with effectiveness is unknown, and, therefore, anxiety can arise in persons who did not develop a reaction following vaccination.[4] We evaluated symptoms following vaccination and serum spike antibody levels in a cohort of hospital workers (HWs) who received either mRNA vaccine and had known status of prior SARS-CoV-2 infection to identify differences in symptoms and serum immunoglobulin G (IgG) antibodies against S1 spike protein.

Methods | In June 2020, HWs in the Johns Hopkins Health System provided oral informed consent to participate in a longitudinal study of S1 spike antibodies in which serum samples and survey responses were collected every 3 to 4 months. Ethical approval was obtained from the Johns Hopkins University Institutional Review Board. The HWs who participated for a study visit between March 10 and April 8, 2021, were included in this analysis if their serum sample was collected 14 or more days after receiving dose 2 of either mRNA vaccine. Using an enzyme-linked immunosorbent assay (Euroimmun), IgG antibody measurements were determined based on optical density ratios with an upper threshold of 11 based

Table. Significant Symptoms and Antibody Measurement Following SARS-CoV-2 mRNA Vaccines

Characteristic	Significant symptoms		
	Following dose 1	Following dose 2	Following dose 1 or 2
Adjusted odds ratio (95% CI) of symptoms following dose 1, dose 2, either dose			
Significant symptoms following dose 1	NA	1.21 (0.67-2.17)	NA
Age >60 y	1.42 (0.64-3.14)	0.46 (0.29-0.72)	0.47 (0.31-0.73)
Male sex[a]	0.82 (0.37-1.79)	0.88 (0.63-1.25)	0.88 (0.63-1.24)
Vaccine type[b]: Moderna	1.65 (0.87-3.11)	2.44 (1.75-3.42)	2.33 (1.67-3.26)
Prior SARS-CoV-2 infection	4.59 (2.36-8.92)	0.60 (0.36-0.99)	0.83 (0.51-1.33)
Median antibody measurement (IQR) and adjusted relative median antibody measurement (95% CI) >14 d following second dose vaccine			
	Median antibody measurement of each group		Relative median antibody measurement[c]
	Yes	No	
Significant symptoms	8.82 (8.04-9.68)	8.46 (7.62-9.16)	1.05 (1.03-1.07)
Age >60 y	8.39 (7.26-9.16)	8.62 (7.89-9.43)	0.92 (0.88-0.96)
Male sex	8.41 (7.65-9.11)	8.66 (7.85-9.48)	0.95 (0.92-0.98)
Vaccine type: Moderna	9.28 (8.45-10.59)	8.51 (7.70-9.22)	1.09 (1.06-1.11)
Prior SARS-CoV-2 infection	9.28 (8.56-11.00)	8.56 (7.80-9.33)	1.10 (1.07-1.14)

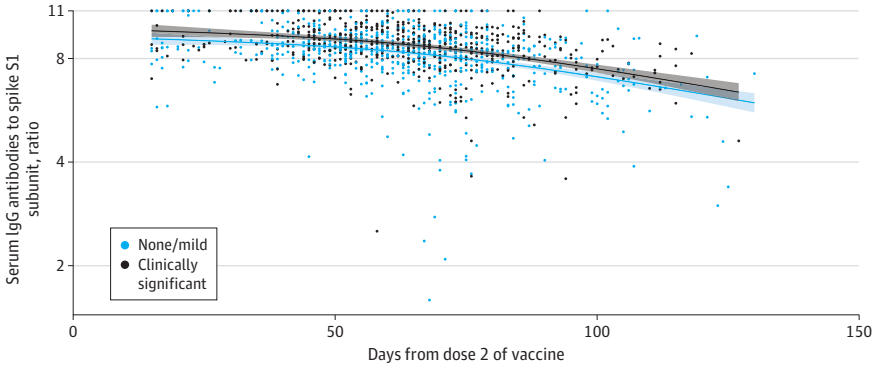
Abbreviations: IQR, interquartile range; NA, not applicable.

[a] Reference group: Female; 3 participants reported other sex, all of whom reported mild or no symptoms after dose 1, and 1 of them reported significant symptoms after dose 2. The antibody measurements for them were 6.53, 8.98, and 8.16 separately.

[b] Reference group: Pfizer.

[c] Time since 14 days after dose 2 and other covariates have been adjusted. The 95% CIs were constructed via the percentile bootstrap procedure using 10 000 bootstrap samples.

Figure. Antibody Measurement More Than 14 Days Following Dose 2 of SARS-CoV-2 Messenger RNA (mRNA) Vaccines Over Time Stratified by Symptoms



Relationship of serum immunoglobulin G (IgG) antibodies recognizing the S1 subunit of spike and days after the second dose of SARS-CoV-2 mRNA vaccine in 953 hospital workers (1 participant who was receiving immunosuppressant medication did not develop IgG antibodies and is not shown). The IgG antibody measurements represent the ratio of 2 optical densities (ODs): the OD of the patient serum over the OD of an assay calibrator provided by the manufacturer. A measurement greater than 1.23 indicates the presence of spike antibodies with an upper threshold of 11 based on assay saturation.[1,5] Antibody measurements were stratified by symptoms after either vaccine dose. The curves were predicted median antibody measurement over time (time was allowed as a natural cubic spline with 2 degrees of freedom) stratified by symptoms, set age, sex, vaccine type, and prior infection as the sample average. Shaded areas represent 95% CIs.

on assay saturation.[1] Prior SARS-CoV-2 infection was defined as having (1) a positive SARS-CoV-2 polymerase chain reaction test result prior to 14 days after dose 2 or (2) S1 spike IgG measurement greater than 1.23 prior to vaccination.[5] Participants self-reported symptoms following vaccination as none, mild (injection site pain, mild fatigue, headache), or clinically significant (fatigue, fever, chills). Logistic regression models were used to explore the association of prior SARS-CoV-2 infection and vaccine type with symptoms following each dose, adjusting for sex and age. A linear regression model was used to explore the association between magnitude of antibody response (log-transformed) and age, sex, prior infection, vaccine type, symptoms, and time after 2 doses of vaccine. Analyses were performed in R, version 4.0.2 (R Foundation).

Results | A questionnaire and serum sample were collected 14 or more days following dose 2 for 954 HWs. Clinically significant symptoms were reported by 52 of the 954 (5%) after dose 1 and 407 (43%) after dose 2. After adjusting for prior SARS-CoV-2 infection, age, and sex, the odds of clinically significant symptoms following either dose were higher among participants who received the Moderna vs the Pfizer vaccine (dose 1: odds ratio [OR], 1.83; 95% CI, 0.96-3.50; dose 2: OR, 2.43; 95% CI, 1.73-3.40) (**Table**). Prior SARS-CoV-2 exposure was associated with increased odds of clinically significant symptoms following dose 1 (OR, 4.38; 95% CI, 2.25-8.55) but not dose 2 (OR, 0.60; 95% CI, 0.36-0.99), after controlling for vaccine type, age, and sex.

Regardless of symptoms, the vast majority of participants (953 of 954, greater than 99.9%) developed spike IgG

antibodies 14 or more days following dose 2; 1 participant who was taking immunosuppressant medication did not develop IgG antibodies (**Figure**). Reporting clinically significant symptoms, age younger than 60 years, female sex, receipt of Moderna vaccine, and prior SARS-CoV-2 exposure were independently associated with higher median IgG measurements, after adjusting for time after dose 2.

Discussion | Nearly 100% of HWs in this study mounted a strong antibody response to the spike protein after dose 2 of the SARS-CoV-2 mRNA vaccine independent of vaccine-induced reactions. Clinically significant symptoms following dose 1 were associated with prior SARS-CoV-2 infection, confirming prior reports.[4] Clinically significant symptoms following vaccination were more frequent following dose 2 and receipt of the Moderna vaccine.[3]

This study included participants within a longitudinal cohort study, leading to 2 potential limitations. First, the timing of survey collection may have led to recall bias and affected symptom reporting. Second, immune response was measured by enzyme-linked immunosorbent assay and not neutralizing antibody titers.

Spike IgG antibody measurements were higher in HWs who received the Moderna vaccine, had prior SARS-CoV-2 infection, and reported clinically significant reactions. The role of higher antibody levels in preventing COVID-19 and providing lasting immunity remains unknown, however. Overall, the findings suggest that regardless of vaccine reactions or prior SARS-CoV-2 infection, either spike mRNA vaccine will provide a robust spike antibody response.

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Financial Associations Between Authors of Commentaries on Randomized Clinical Trials of Invasive Cardiovascular Interventions and Trial Sponsors

Editorial commentaries by content experts help readers understand and interpret the implications of the studies they accompany. However, the value of the synthesis of evidence and opinions is diminished when authors have relevant financial associations.[1,2] In this cross-sectional study, we examined the financial associations between authors of commentaries on randomized clinical trials (RCTs) of invasive cardiovascular interventions and trial sponsors, and whether the financial associations were disclosed.

Editorial page 1557

Methods | Using a comprehensive search strategy, we identified RCTs involving coronary, vascular, and structural interventional cardiology, and vascular and cardiac surgery procedures published between January 1, 2013, and May 31, 2019.[3] We recorded the trial sponsor, publication year, and publishing journal, and identified the accompanying commentary, if any, through links on journal websites and trial citations.[4] For each commentary, we recorded the declared financial associations of all authors, including those with the trial sponsors. We obtained this information from disclosure statements in the articles or accompanying International Committee