Minor consent laws are structured to protect clinicians who rely on minors’ independent consent when providing STI/HIV services. These statutes therefore benefit both minors and clinicians, allowing minors to obtain STI/HIV services without involving their guardians, and enabling clinicians to provide these services to minors without risking legal sanctions. Due to low levels of knowledge about these laws and a dearth of institutional policies and procedures to support their use, minors often do not receive the services they need.5,6 Training, policies, and procedures that support and routinize the application of these statutes may empower clinicians to rely on them more confidently in practice. Ensuring that clinicians, researchers, and minors understand and trust these minor consent laws may expand access to STI/HIV services for youth.

Kimberly M. Nelson, PhD, MPH
Alexandra Skinner, MPH
Kristen Underhill, DPhil, JD

Author Affiliations: Department of Community Health Sciences, Boston University School of Public Health, Boston, Massachusetts (Nelson); Department of Health Law, Policy, & Management, Boston University School of Public Health, Boston, Massachusetts ( Skinner); Cornell Law School, Ithaca, New York (Underhill).

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Corresponding Author: Kimberly M. Nelson, PhD, MPH, Boston University School of Public Health, 801 Massachusetts Ave, Fourth Floor, Boston, MA 02118 (knel@bu.edu).

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Concept and design: Nelson, Underhill.

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Association Between BNT162b2 Vaccination and Long COVID After Infections Not Requiring Hospitalization in Health Care Workers

Survivors of COVID-19 may present with long-lasting symptoms.1 Some factors have been associated with the development of post-COVID conditions (also referred to as “long COVID”),2 including hospitalization.3 A study of older US veterans showed 15% reduction of long COVID after vaccination; however, study limitations included the low number of women and suboptimal vaccination schedules.4

Methods | The study was approved by the Humanitas Research Hospital institutional review board. Each participant provided written informed consent.

We conducted an observational cohort study from March 2020 to April 2022 in individuals working in 9 Italian health care facilities.5,6 Polymerase chain reaction (PCR) tests for SARS-CoV-2 were conducted every week (in COVID wards) or 2 weeks (in other wards) for hospital personnel, or if they developed symptoms or were exposed to cases. All health care workers were required to receive 3 doses of vaccine (BNT162b2), with the first and second doses administered in January–February 2021 and the booster dose in November–December 2021.

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Between February and April 2022, each participant completed a survey including demographics, comorbidities, a list of SARS-CoV-2–related symptoms at the time of infection and their duration (survey in the Supplement), and vaccination status. We defined long COVID as reporting at least 1 SARS-CoV-2–related symptom with a duration of more than 28 days before the survey. We included asymptomatic infections in the acute infection group (they could not have long COVID by definition) to avoid overestimating the prevalence of long COVID. The analysis was restricted to healthcare workers who were tested every 1 or 2 weeks with complete demographic data and a documented positive result for SARS-CoV-2 between March 2020 and March 2022.

By the date of infection, we divided the patients into 3 groups corresponding to the peaks in our data and circulation of variants of concern in Italy (wave 1, February-September 2020 [wild-type variant]; wave 2, October 2020-July 2021 [Alpha]; and wave 3, August 2021-March 2022 [Delta and Omicron]) (eFigure in the Supplement). A multivariable logistic regression model was used to assess the relationship between long COVID and characteristics, including participant sex, age, SARS-CoV-2 infection, wave, and vaccination status 14 days prior to infection. Time since second vaccination was assessed among vaccinated individuals.

The Clopper-Pearson method was used to calculate 95% CIs and the Mann-Whitney U test or the t test for continuous variables and the χ² test for categorical variables to calculate P values. The significance threshold was defined as P < .05 (2-sided). Analyses were done in Python, version 3.8.3.

**Results** Of 2560 participants, 739 individuals (29%) had COVID-19 (89 asymptomatic), of whom 229 (31.0%; 95% CI, 27.7%-34.5%) had long COVID (Table 1). The prevalence of long COVID varied across the pandemic waves, from 48.1% (95% CI, 39.9%-56.2%) in wave 1 to 35.9% (95% CI, 30.5%-41.6%) in wave 2 to 16.5% (95% CI, 12.4%-21.4%) in wave 3. The number of vaccine doses was associated with lower long COVID prevalence: 41.8% (95% CI, 37.0%-46.7%) in unvaccinated patients, 30.0% (95% CI, 6.7%-65.2%) with 1 dose, 17.4% (95% CI, 7.8%-31.4%) with 2 doses, and 16.0% (95% CI, 11.8%-21.0%) with 3 doses. Older age, higher body mass index, allergies, and obstructive lung disease were associated with long COVID.

With a reference group of unvaccinated females in wave 1 with no allergies or comorbidities (Table 2), male sex (odds ratio [OR], 0.65; 95% CI, 0.44-0.98, P = .04), 2 vaccine doses (OR, 0.25; 95% CI, 0.07-0.87, P = .03), and 3 vaccine doses (OR, 0.16;
Table 2. Multivariable Logistic Regression Analysis of the Association of Long COVID (N = 229) With Patient Characteristics

<table>
<thead>
<tr>
<th></th>
<th>OR (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male sex</td>
<td>0.65 (0.44-0.98)</td>
<td>.04</td>
</tr>
<tr>
<td>Agea</td>
<td>1.23 (1.01-1.49)</td>
<td>.04</td>
</tr>
<tr>
<td>BMin</td>
<td>1.10 (0.92-1.31)</td>
<td>.30</td>
</tr>
<tr>
<td>Allergies</td>
<td>1.50 (1.06-2.11)</td>
<td>.02</td>
</tr>
<tr>
<td>No. of comorbiditiesc</td>
<td>1.32 (1.04-1.68)</td>
<td>.03</td>
</tr>
<tr>
<td>COVID-19 wave</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.72 (0.48-1.08)</td>
<td>.11</td>
</tr>
<tr>
<td>3</td>
<td>1.34 (0.26-7.01)</td>
<td>.73</td>
</tr>
<tr>
<td>Vaccine dosed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.86 (0.21-4.39)</td>
<td>.83</td>
</tr>
<tr>
<td>2</td>
<td>0.25 (0.07-0.87)</td>
<td>.03</td>
</tr>
<tr>
<td>3</td>
<td>0.16 (0.03-0.84)</td>
<td>.03</td>
</tr>
</tbody>
</table>

Abbreviations: BMI, body mass index; OR, odds ratio.

a Age and BMI have been standardized (mean = 0; SD = 1). Age SD = 11.3 years; BMI SD = 3.9.

b Number of comorbidities is a discrete variable ranging from 0 to 4, where 4 represents 4 or more different comorbidities.

c At least 14 days prior to infection.

95% CI, 0.03-0.84, P = .03) were associated with a lower probability of long COVID. Older age (OR, 1.23; 95% CI, 1.01-1.49, P = .04), allergies (OR, 1.50; 95% CI, 1.06-2.11, P = .02), and an increasing number of comorbidities (OR, 1.32; 95% CI, 1.04-1.68, P = .03) were associated with a higher probability. No statistically significant association with infection wave was found. Among vaccinated individuals (n = 265), time between the second vaccination dose and infection was not associated with long COVID (OR, 0.66; 95% CI, 0.34-1.29).

Discussion | In this longitudinal observational study conducted among health care workers with SARS-CoV-2 infections not requiring hospitalization, 2 or 3 doses of vaccine, compared with no vaccination, were associated with lower long COVID prevalence. Study limitations include that symptoms and duration were self-reported, and causality cannot be inferred.

Elena Azzolini, MD, PhD  
Riccardo Levi, MSc  
Riccardo Sarti, MSc  
Chiara Pozzi, PhD  
Maximiliano Mollura, MSc  
Alberto Mantovani, MD  
Maria Rescigno, PhD  

Author Affiliations: IRCCS Humanitas Research Hospital, Milan, Italy (Azzolini, Pozzi, Mantovani, Rescigno); Department of Biomedical Sciences, Humanitas University, Milan, Italy (Levi, Sarti); Politecnico di Milano, Department of Electronic, Information and Bioengineering, Milan, Italy (Mollura).

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Corresponding Author: Maria Rescigno, PhD, Humanitas University, Via Rita Levi Montalcini, 4, 20072 Pieve Emanuele (MI), Italy (maria.rescigno@hunimed.eu).