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## Letter to the Editor

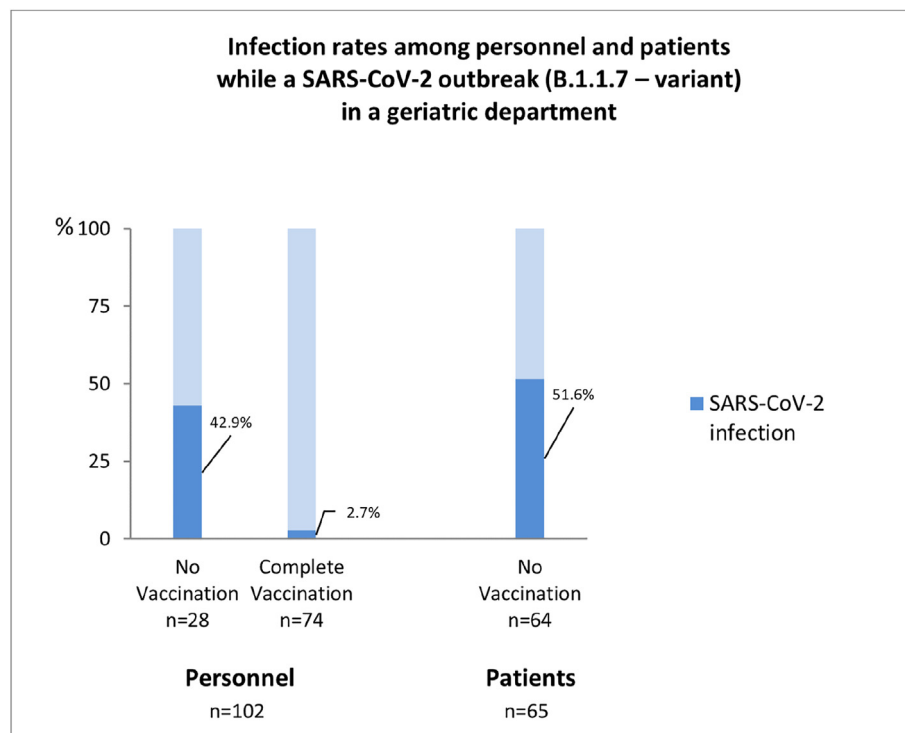
## Effect of SARS-CoV-2 vaccination among health care workers in a geriatric care unit after a B.1.1.7-variant outbreak



The coronavirus disease 2019 (COVID-19) pandemic has stressed many medical systems worldwide. This has had a significant impact on ensuring emergency and critical care from the outset. Health care workers are at high risk of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) exposure both in the workplace and in their private lives.<sup>1</sup> The required isolation and quarantine of hospital staff in the event of suspected or confirmed SARS-CoV-2 infection places a heavy burden on health care facilities. To maintain medical care, health care workers have been prioritized for SARS-CoV-2 vaccination, which has been available in Germany since December 2020. Currently, it is difficult to assess the extent to which vaccination of hospital staff is actually having a positive impact on health care delivery.

We report a SARS-CoV-2 outbreak with the B.1.1.7 variant in a geriatric department of a medium-sized hospital in Siegen/

Germany (the protocol was reviewed and approved by the local ethical board [2021-324-f-S]).<sup>2</sup> The team providing comprehensive geriatric care to the patients includes not only physicians and nurses but also occupational, physical and speech therapists, dietitians, psychologists or social workers, in total more than 100 persons. On February 28, 2021, the first of 65 inpatients with mild respiratory symptoms at that time was found to have SARS-CoV-2 infection by PCR analysis of a nasopharyngeal specimen. Over the next 21 days, an additional 33 patients were diagnosed with the virus. In subsequent serial testing, SARS-CoV-2 was detected in 14 staff members. Although only one patient had prior completed vaccination against SARS-CoV-2, 74 hospital staff had complete vaccine protection (application of both doses of BNT162b2 mRNA COVID-19 vaccine, BioNtech/Pfizer).<sup>3</sup> Although patients treated in a geriatric unit had an older age and thus a higher morbidity to



**Fig. 1.** Infection rate among personnel and patients in the geriatric department while the SARS-CoV-2 outbreak. One patient out of 65 had a complete vaccination. In this patient SARS-CoV-2 could be proved by PCR analysis; he did not present any symptoms related to COVID-19.

**Table 1**  
Patients and staff members in the geriatric unit of the Diakonie Hospital Jung-Stilling Siegen, Germany; SARS-CoV-2 (B.1.1.7-variant) outbreak March 2021.

	Personnel Members (n = 102)		Patients (n = 65) <sup>e</sup>	
	Vaccination <sup>c</sup> (n = 74; 72.5%)	No Vaccination (n = 28; 27.5%)	SARS-CoV-2 Infection (n = 34 <sup>e</sup> ; 52.3%)	No SARS-CoV-2 Infection (n = 31; 47.7%)
<b>Age</b> (median, IQR <sup>a</sup> , years)	44.6 (33.2–55.3)	34.4 (26.6–44.2)	82.6 (80.8–86.5)	83.4 (81.1–85.4)
<b>Sex</b>				
Female	57 (77.0%)	25 (89.3%)	25 (73.5%)	23 (74.2%)
Male	17 (23.0%)	3 (10.7%)	9 (26.5%)	8 (25.8%)
<b>SARS-CoV-2 detection<sup>d</sup></b>	2 (2.7%)	12 (42.9%)	34 (100%)	–
Respiratory symptoms <sup>b</sup>	2 (100%)	2 (16.6%)	5 (14.7%)	–

IQR, interquartile range; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

<sup>a</sup> Refers to IQR.

<sup>b</sup> Refers to mild symptoms as observed in a common cold.

<sup>c</sup> Completed vaccination against SARS-CoV-2 with BNT162b2 mRNA COVID-19 Vaccine (BioNtech/Pfizer).

<sup>d</sup> All diagnosed subjects carried the B.1.1.7-variant.

<sup>e</sup> Among 65 patients treated in the department at the beginning of March 2021, only one was identified as having a completed vaccination against SARS-CoV-2; nonetheless, he got infected with the virus variant of B.1.1.7.

SARS-CoV-2, most of them showed an asymptomatic clinical presentation ( $n = 29$ ) or only mild symptoms ( $n = 5$ ); one multimorbid patient infected with SARS-CoV-2 died during this period, but without showing the clinical phenotype of COVID-19. Among the vaccinated personnel ( $n = 74$ ), SARS-CoV-2 was detected in two, both with mild respiratory symptoms. In contrast, SARS-CoV-2 was detected in 12 of 28 unvaccinated personnel; again, two showed mild respiratory symptoms. All patients/staff members in whom SARS-CoV-2 was detected carried the B.1.1.7 variant described previously. Serial testing was performed on a voluntary basis and was repeated at least three times during the outbreak period (see Fig. 1 and Table 1).

In summary, our analyses indicate that completed vaccination of health care workers with BNT162b2 mRNA SARS-CoV-2 Vaccine (BioNtech/Pfizer), resulting in sufficient immunization at 74 of 102 (75.5%), leads to a significant reduction in new cases of SARS-CoV-2 infection with the B.1.1.7 variant among team members, even in an outbreak setting. Although the vaccination effectively protected staff members from an infection with SARS-CoV-2 (97.3%), we noticed remarkable infection rates in unvaccinated personnel (42.9%) as well as among the 64 unvaccinated patients (51.6%) treated in the department during the outbreak. In the remaining one patient with complete vaccination, SARS-CoV-2 could be proved by PCR analysis; he did not present any symptoms related to COVID-19. Our observation also suggests that infection with the B.1.1.7 variant of SARS-CoV-2 remains mostly asymptomatic and, in few cases, it may lead to a mild clinical presentation in health care workers as well as in multimorbid geriatric patients. It could be speculated if the high percentage of vaccinated personnel might have been determined the mild clinical manifestation in infected patients. Potentially, the interaction between/with vaccinated persons might result in general lower virus doses leading to decreased morbidity in case of infection of target individuals.<sup>4</sup> If true, this would additionally support the prompt and rapid vaccination of health care workers in a pandemic situation. Furthermore, our results suggest that widespread and effective vaccination of health care workers ensures maintenance of health care even in the presence of high infectious SARS-CoV-2 activity in appropriate patients. Reports like ours might also help to overcome the general vaccine hesitancy, encouraging individuals undergoing vaccination.<sup>5</sup>

## Author statements

### Ethical approval

The protocol was reviewed and approved by the local ethical board (2021-324-f-S).

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None declared.

### Competing interests

None declared.

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