

Letter to the Editor

High severe acute respiratory coronavirus virus 2 (SARS-CoV-2) seroconversion rate among geriatric staff from Strasbourg University Hospitals

Baptiste Panaget¹, Aurélie Velay PharmD, PhD^{1,2}, Louise Gontard¹, François Severac MD³, Maxence Meyer MD⁴, Elisabeth Antoni⁵, Georges Kaltenbach MD, PhD⁴, Laurence Kling-Pillitteri MD⁶, Yasmine Sammour MD⁷, Yves Hansmann MD, PhD⁸, Céline Hernandez MD⁹, Thierry Lavigne MD, PhD⁹, Jean-Marc Lessinger PharmD, PhD¹⁰, Maria Gonzalez MD, PhD^{6,11}, Marie-Josée Wendling MD¹, Floriane Gallais PharmD^{1,2}, Sabrina Garnier Kepka MD¹² and Samira Fafi-Kremer PharmD, PhD^{1,2}

¹Laboratoire de Virologie, CHU de Strasbourg, Strasbourg, France, ²INSERM, Strasbourg University, Strasbourg, France, ³Service de Santé Publique, CHU de Strasbourg, Strasbourg, France, ⁴Service de Gériatrie, CHU de Strasbourg, Strasbourg, France, ⁵Pôle de Biologie, CHU de Strasbourg, Strasbourg, France, ⁶Service de santé au travail du personnel hospitalier, CHU de Strasbourg, Strasbourg, France, ⁷Direction, CHU de Strasbourg, Strasbourg, France, ⁸Service des maladies infectieuses et tropicales, CHU de Strasbourg, Strasbourg, France, ⁹Service d'hygiène hospitalière, CHU de Strasbourg, Strasbourg, France, ¹⁰Laboratoire de Biochimie Clinique et Biologie Moléculaire, CHU de Strasbourg, Strasbourg, France, ¹¹Service de Pathologies Professionnelles, CHU de Strasbourg, Strasbourg, France and ¹²Service d'Urgences Medico-Chirurgicales Adultes, CHU de Strasbourg, Strasbourg, France

To the Editor—The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) emerged in China at the end of 2019 and spread worldwide, leading to the current pandemic. During the first pandemic wave in France, the northeastern region was one of the first and most affected areas. Thus, healthcare workers (HCWs) in the Strasbourg University Hospitals (SUH) were early and intensively exposed to SARS-CoV-2. This exposure varied between hospital departments, notably at the beginning of the pandemic. Some departments were rapidly dedicated to the care of SARS-CoV-2 patients, with earlier implementation and use of personal protective equipment (PPE). In this study, we evaluated SARS-CoV-2 seroprevalence in hospital staff according to department in SUH.

From June 22, 2020, to November 1, 2020, SARS-CoV-2 serology was offered to all hospital staff at SUH. Each participant completed a questionnaire collecting data about their occupational department and the onset of symptoms (ie, type of symptoms and delay expressed in weeks between onset and serum sampling time). Serum samples were tested using an immunochromatographic lateral flow assay (Biosynex COVID-19 BSS, Switzerland, Fribourg) detecting IgM and IgG directed against the receptor binding domain of SARS-CoV-2 spike protein (Supplementary Fig. 1 online). This assay was reported to have overall estimated sensitivity of 93% and clinical specificity of 99%.¹

Univariable and multivariable analyses were performed using R version 4.0.4 software (R Foundation for Statistical Computing, Vienna, Austria). Statistical significance was set at $P < .05$. Hospital departments were grouped together according to staff exposure risk

for multivariable analysis (see Supplementary Material online for statistical analysis detail). This study was approved by the local ethics review committee (record CE-2021-79).

In total, 5,694 HCWs participated in this study. Participant characteristics and serological results of the cohort are presented in Supplementary Table 1 (online). The mean age was 40.4 years (SD, ± 11.7). In total, 482 participants had positive serology (8.5%) and among them, 422 participants answered about the onset of symptoms, including 48% of asymptomatic subjects (Supplementary Fig. 2 and Supplementary Table 1 online). The seropositive and symptomatic subjects predominantly reported anosmia (29.2%) and ageusia (27.2%).

The departments in the “geriatric group” showed the highest seroprevalence rate (27.7%) (Supplementary Table 2 online) and a strong association with seropositive status (OR, 5.3; 95% CI, 3.5–8.2; $P < .05$) (Supplementary Table 3 online and Fig. 1). Seroprevalence rates in the frontline departments were all lower than in the geriatric group: internal medicine department (which contains the infectious disease department, 15%), department of thoracic pathology (11.6%), anesthesia and reanimation department (7.9%), and emergency departments (8.1%).

However, the seroprevalence rate of 8.5% was concordant with those reported in the literature in Europe,² and we found a high rate of asymptomatic infections (48%). Remarkably, working in a geriatric department was associated with positive serology. The high rate of seroconversion among staff in the geriatric department contrasted with low seroconversion rates among staff in departments on the frontline from the start of the pandemic.

Many contributing factors could explain this high seroprevalence. First, the onset of 2 clusters of contamination in geriatric departments, from the beginning of March 2020, led to contamination of caregivers. At the onset of the pandemic, no guidelines were in place for systematically wearing a surgical mask (ie, this obligation was implemented on March 23, 2020). Second, even when the wearing

Author for correspondence: Samira Fafi-Kremer, E-mail samira.fafi-kremer@chru-strasbourg.fr

Cite this article: Panaget B, et al. (2021). High severe acute respiratory coronavirus virus 2 (SARS-CoV-2) seroconversion rate among geriatric staff from Strasbourg University Hospitals. *Infection Control & Hospital Epidemiology*, <https://doi.org/10.1017/ice.2021.402>

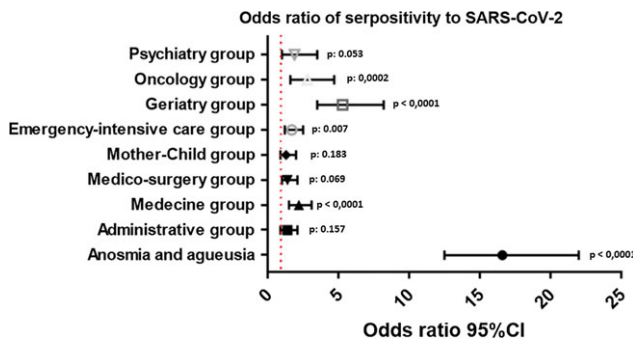


Fig. 1. Odds ratio of SARS-CoV-2 seroprevalence according to a history of anosmia and/or agueusia and the type of hospital department. Data are depicted as odds ratios (black or grey symbols) and 95% confidence intervals (bars on either side), and *P* values are mentioned for each criterion.

a mask became compulsory for caregivers and patients, implementation was laborious, especially among patients with cognitive disorders. Some of these fragile patients do not stay in their rooms but walk in the corridors, thus favoring virus circulation. Moreover, patients in geriatric departments often complain of discomfort when wearing a mask. Third, elderly COVID-19 patients were frequently admitted to geriatric departments (up to 50% of beds during the first wave in SUH). Cases of nosocomial transmission were reported probably related to the type of patient care (eg, repeated nursing and grooming). Another difficulty was the asymptomatic or atypical forms of the disease,³ which were not well known at the beginning of the pandemic, possibly leading to underdiagnosis. The advanced age of the patients also led to prolonged shedding of the virus.⁴

Despite the implementation of protective measures for caregivers, the number of clusters remains high in geriatric units, in nursing homes, as well as in long-term care facilities,^{5,6} leading to substantial mortality rates.⁷ The recurrence of these clusters

paralleled the arrival of new variants of SARS-CoV-2. Considering the higher risk of being exposed to SARS-CoV-2 when working in a geriatric department, vaccination of staff working in these services is a priority.

Supplementary material. To view supplementary material for this article, please visit <https://doi.org/10.1017/ice.2021.402>

Acknowledgments.

Financial support. Strasbourg University Hospital supported this study. This sponsor had no role in the design, methods, subject recruitment, data collections, analysis or preparation of this report.

Conflicts of interest. All authors have no conflicts of interest to declare.

References

- Velay A, Gallais F, Benotmane I, *et al*. Evaluation of the performance of SARS-CoV-2 serological tools and their positioning in COVID-19 diagnostic strategies. *Diagn Microbiol Infect Dis* 2020;98:115181.
- Galanis P, Vraika I, Fragkou D, Bilali A, Kaitelidou D. Seroprevalence of SARS-CoV-2 antibodies and associated factors in healthcare workers: a systematic review and meta-analysis. *J Hosp Infect* 2021;108:120–134.
- Gan JM, Kho J, Akhumbay-Fudge M, *et al*. Atypical presentation of COVID-19 in hospitalised older adults. *Ir J Med Sci* 2021;190:469–474.
- Meyer M, Meyer A, Calabrese L, *et al*. Quantitative description of SARS-CoV-2 RT-PCR, a cohort of 76 COVID-19 older hospitalized adults. *J Am Geriatr Soc* 2021;69:1170–1174.
- Martinot M, Carnein S, Kempf C, Gantner P, Gallais F, Fafi-Kremer S. Outbreak of SARS-CoV-2 infection in a long-term care facility after COVID-19 BNT162b2 mRNA vaccination. *Clin Microbiol Infect* 2021; S1198-743X(21)00369-4.
- Zollner-Schwetz I, König E, Krause R, Pux C, Laubreyter L, Schippinger W. Analysis of COVID-19 outbreaks in three long-term care facilities in Graz, Austria. *Am J Infect Control* 2021;S0196-6553(21)00522-8.
- Meyer M, Calabrese L, Meyer A, *et al*. Clinical and virological follow-up of a cohort of 76 COVID-19 older hospitalized adults. *J Am Geriatr Soc* 2021; 69:1167–1170.