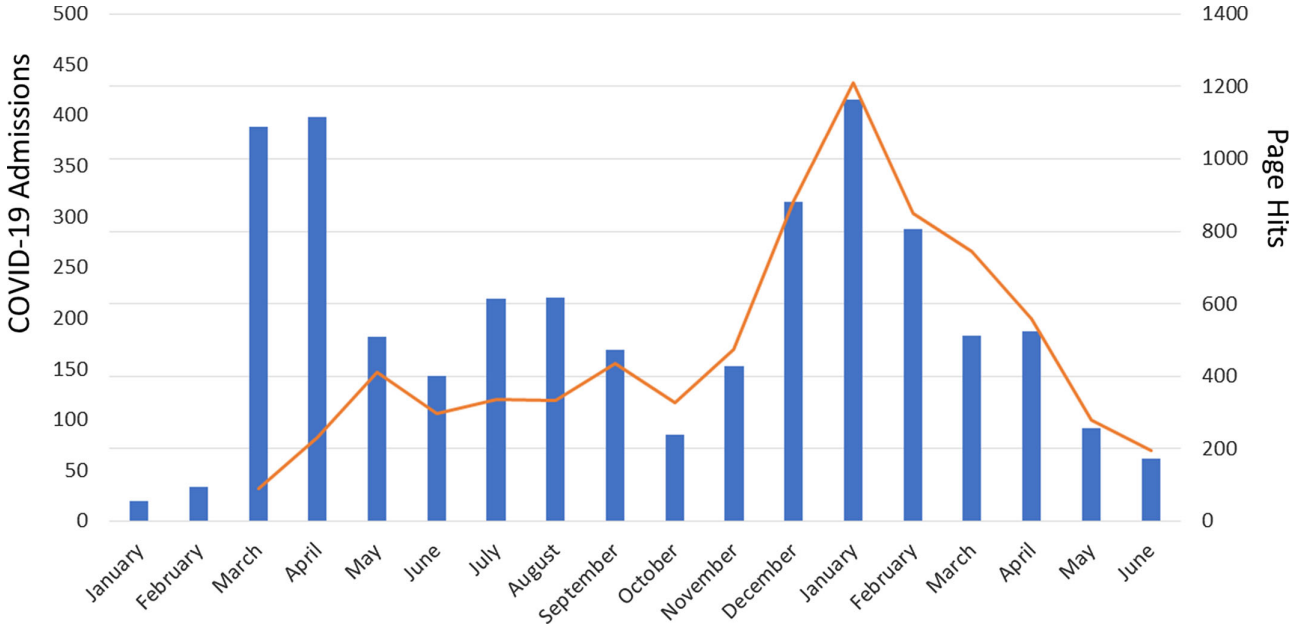

Fig. 1. COVID-19 guidelines page views (bars) compared to inpatient COVID-19 admissions (line graph), January 2020 through June 2021.

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Severe acute respiratory coronavirus virus 2 (SARS-CoV-2) seroprevalence among laboratory staff: Safe handling of coronavirus disease 2019 (COVID-19) samples

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To the Editor—Since the beginning of the coronavirus disease 2019 (COVID-19) epidemic in France in March 2020, laboratories have had to reorganize to implement COVID-19 diagnosis at a large scale. In this context, the handling of samples from suspected COVID-19 patients can expose laboratory staff to severe acute respiratory coronavirus virus 2 (SARS-CoV-2). The protection of healthcare workers (HCWs) is a critical point for pandemic control, at an individual level for care continuity and at a collective scale to avoid transmission to their contact cases.[1] Guidelines for respiratory- or stool-sample handling have recommended wearing filtering facepiece respirator 2 (FFP-2) mask, double pairs

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of gloves, and a disposable gown. After the first pretreatment in a microbiological safety station, samples need further biological inactivation before viral RNA extraction and genome amplification for SARS-CoV-2 detection.

In our laboratory, the number of SARS-CoV-2 RT-PCR tests increased gradually, from 20 analyses per day in February 2020 to 1,500 per day by the end of April 2020. The staff from the molecular microbiology department was the first to be involved. Later, additional technicians had to reinforce the team and a large proportion of laboratory technicians were involved in handling SARS-CoV-2 samples. At the time of the study, 9,727 samples had been processed in the laboratory, among which 3,182 were positive for SARS-CoV-2 (32.7%).

In April 2020, a screening campaign was proposed to the whole laboratory staff of the Nancy University Hospital to determine their anti–SARS-CoV-2 serological status. All eligible laboratory workers were asked to complete a questionnaire. The following clinical and epidemiological data were collected: year of birth, sex, department within the laboratory (ie, hematology, microbiology, reproductive biology, human leukocyte antigen typing, immunology, molecular microbiology, cytometry, emergency analyses, reception and dispatching, automated analyses, genetic, pharmacology, biochemistry, point-of-care supervision, information technology support, management, environmental biology, biopathology, cleaning, and hemophilia center), and exposure to sample triple packaging or to respiratory and stool samples, exposure to a confirmed or suspected COVID-19 case (in a professional or personal context). Data regarding COVID-19–linked symptoms (ie, flu-like syndrome, dry cough, digestive disorders, loss of taste and smell) were also collected.

The detection of anti–SARS-CoV-2 IgM and IgG was performed using a flow lateral immunoassay (Biosynex BSS IgM/IgG, Biosynex Swiss Illkirch-Graffenstaden, France). Staff with positive serology and without a prior COVID-19 diagnosis were recommended for RT-PCR in nasopharyngeal swab and further serological follow-up.

The association between exposure to sample triple packaging, exposure to respiratory or stool samples collected to detect SARS-CoV-2, symptoms attributable to COVID-19, and SARS-CoV-2 seroprevalence were tested using the χ^2 test or the Fisher exact test, according to condition of use. *P* values were two-tailed, and the significance level was set at .05. We used SAS version 9.4 statistical software (SAS Institute, Cary, NC) to conduct the analyses.

Among 417 laboratory workers, 396 were eligible for the study. Most workers were women (81.1%). The median age was 42.5 years (range, 20–68). In total, 178 laboratory workers (44.9%) had been in contact with COVID-19 samples packaging, while 147 (37.1%) had been in contact with stool and/or respiratory samples (Table 1). For the management of the pandemic, 35 (8.8%) laboratory workers were specifically involved in the COVID-19 diagnosis sector. Overall, 135 (34.1%) and 109 (27.5%) workers had been in contact with a confirmed or suspected COVID-19 case, respectively.

SARS-CoV-2 antibodies were detected in 9 laboratory workers (seroprevalence, 2.3%). The most exposed persons were maintenance agents, microbiology technicians, and COVID-19 area staff, but the laboratory department was not associated with SARS-CoV-2 seroprevalence ($P = .54$). Likewise, handling COVID-19 sample packaging ($P = .74$) or handling samples from confirmed or suspected COVID-19 patients ($P = .30$) were not associated with SARS-CoV-2 seroprevalence.

Table 1. Characteristics of the Laboratory Staff Cohort

Cohort Description	No.	% or Mean
Age	396	42.5 y
Sex		
Male	75	18.9
Female	321	81.1
Contact with COVID-19 sample packaging		
Yes	178	44.9
No	218	55.1
Contact with COVID-19 sample		
Yes	147	37.1
No	249	62.9
Previous COVID-19 diagnosis (RT-PCR)		
No	370	93.4
Yes	26	6.6
SARS-CoV-2 RT-PCR		
Positive	6	22.2
Negative	21	77.8
Contact with a confirmed COVID-19 case		
Yes	109	27.5
No	287	72.5
Contact with a suspected-COVID-19 case		
Yes	135	34.1
No	261	65.9
Fever		
Yes	78	19.7
No	318	80.3
Cough		
Yes	88	22.2
No	308	77.8
Gastro-intestinal symptoms		
Yes	63	15.9
No	333	84.1
Anosmia/Ageusia		
Yes	11	2.8
No	384	97.2
Anti-SARS-CoV-2 IgM/IgG		
Yes	9	2.3
No	387	97.7

Note. RT-PCR, reverse-transcription polymerase chain reaction.

The laboratory workers had a median age of 42.5 years (range, 20–68), and most were women. A large study on HCWs did not show any association between age or sex with positivity for SARS-CoV-2 IgG.[2] Interestingly, sex differences were observed in the perception of epidemic, with women being more emotionally affected and giving more attention to protective measures.[3]

Many studies have evaluated SARS-CoV-2 seroprevalence in the general population and hospital HCWs, but to our knowledge, no studies have focused on laboratory staff. In HCWs, the

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seroprevalence was higher, reaching 8.5% in Geneva University Hospital employees[4] and 13.35% in a COVID-19–dedicated hospital in India.[5] In these studies, the proportion of anti–SARS-CoV-2 seroconversion was higher in employees working in COVID-19 areas. Risk factors included nosocomial outbreak and the use of public transportation.[4] This last point was not evaluated in our study, but other nonprofessional risk factors, such as a contact with COVID-19 confirmed case, were not associated with a seroconversion.

In the urban area of the hospital around the same date, the raw SARS-CoV-2 seroprevalence was 2.1% among 2,006 individuals,[6] suggesting the absence of high risk among laboratory staff, probably due to the strict application of the recommendations of the French Society of Microbiology (SFM) concerning sample handling. The benefit of correct use of personal protective equipment was also observed in HCWs, even in the most exposed groups.[7]

Despite the small size of the cohort and of self-reporting data collection, the work presented here originally targets SARS-CoV-2–exposed laboratory staff. Today, most staff have been vaccinated, and studies evaluating the exposure of laboratory workers to a new airborne and/or hand-borne pathogen will no longer be possible. These data confirm the effectiveness of the good laboratory practices, which have to be quickly applied in future viral emergencies.

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Healthcare-associated transmission of severe acute respiratory coronavirus virus 2 (SARS-CoV-2) among Thai healthcare personnel who receive 2 doses of a coronavirus disease 2019 (COVID-19) vaccine: A call for considering a booster dose

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To the Editor—There have been consistent reports of healthcare personnel (HCP) acquiring COVID-19 as a result of workplace exposure, either directly or indirectly.[1,2] In Thailand, the emerging alpha variant of severe acute respiratory coronavirus virus 2 (SARS-CoV-2) replaced the original strain in February 2021, followed by the emergence of the delta variant of SARS-CoV-2 in April 2021.[3] Immunization of HCP was the first priority of the coronavirus disease 2019 (COVID-19) vaccination campaign, and most HCP received vaccine, based on the government vaccine allocation. As of July 19, 2021, CoronaVac (Sinovac-Biotech) and ChAdOx-1 (AstraZeneca) are the only 2 COVID-19 vaccines available in Thailand. Despite 2 doses of vaccine, the number of HCP who were infected with SARS-CoV-2 in Thailand is continuously increasing. To better understand the epidemiology of healthcare-associated SARS-CoV-2 transmission among HCP, we performed a retrospective review of HCP who received 2 doses of COVID-19 vaccine.

At Thammasat University Hospital a 650-bed, academic medical center in Pratum Thani, Thailand, a COVID-19

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