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Short communication

## COVID-19 cluster in vaccinated healthcare workers in Mayotte

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### ABSTRACT

We report a significant cluster of SARS-CoV-2 (B.1.617.2 variant) among young healthcare workers (HCW) (median age of 27 years) living in the Mamoudzou interns apartment complex, belonging to the Hospital Center in Mayotte. Among them, 18 developed SARS-CoV-2 infection (62.1%) and all were symptomatic. The infection rate was higher for people who had had a second dose more than 6 months before than for those who had had a second dose less than 6 months before ( $P=0.05$ ). This epidemic had no individual consequence, but the hospital functioning in Mayotte was significant impacted. This report reinforces the need for a third dose of vaccine among HCWs, in addition to non-pharmaceutical measures.

Mayotte is a French overseas department in the Indian Ocean, where the epidemic of coronavirus disease (COVID-19) was favorably evolving since March 2021 [1]. During the week 42 of 2021, the incidence rate of COVID-19 was only 17.2 cases per 100,000 inhabitants (versus 56 per 100,000 inhabitants in Metropolitan France), despite the low vaccination coverage of only 61.5% of the population over 12 years of age with at least two doses of vaccine (compared to 86.6% in mainland France). According to the latest results of genetic screening carried out in Mayotte, all strains of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) carried the L452 R mutation indicative of the delta variant (B.1.617.2) [1]. Since September 15, 2021, all healthcare workers (HCWs) in France is subject to vaccination requirement to be allowed to work [2]. However in October 2021, the intern apartment complex of the Hospital Center of Mayotte (CHM) experienced a significant COVID-19 cluster among HCWs. The Iris intern apartment complex is a former hotel; bedrooms and bathrooms are individual. The 29 interns and spouses are distributed into four kitchens and the other living spaces are common. People did not wear masks at home. Cleaning was performed by housekeepers four times a week. Alcohol-based hand sanitizers were available in the building.

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The aim of this study was to describe the demographic and health characteristics, as well as the dynamics of a SARS-CoV-2 cluster among medical interns at the Hospital Center of Mayotte.

This retrospective observational study was conducted from October 26, 2021 (first case of COVID-19 in the cluster) to October 31, 2021 (last case) at the Iris intern apartment complex located in Mamoudzou Hospital, in Mayotte. Absent residents since October 19, 2021 were excluded. An anonymous self-administered questionnaire was distributed. Oral, written, and informed consent from all participants was obtained.

Results were expressed as total numbers (percentages) for categorical variables and as medians [25th–75th percentiles] for continuous variables. Categorical variables were compared using Chi-square test or Fisher's exact test, as appropriate. A  $P$ -value  $< 0.05$  was considered significant. Analyses were performed using SAS statistical software (8.2, Cary, NC, USA).

Overall, all individuals living at the Iris intern apartment complex in Mayotte were assessed and tested (i.e. 29 individuals). Results are shown in Table 1. We designed an epidemic curve to visualize the date of disease onset (Fig. 1). Out of the 29 individuals, 18 (64.3%) were tested positive for SARS-CoV-2. Our population consisted of 62.1% of women and 37.9% of men, with a median age of 27 years [25–35]. No comorbidity was reported in 26 of 29 individuals (89.7%). One person had heart disease with idiopathic primary hypertension, another had immunodeficiency (associated with hemolytic anemia and idiopathic thrombocytopenic purpura), and one had a body mass index  $> 30$  kg/m<sup>2</sup>. Five cases (17.2%) had previously been infected with SARS-CoV-2. Twenty-six of the 29 individuals (96.6%) had a complete vaccination schedule, with a second injection performed with the BNT162b2 RNA vaccine in 89.7% of cases. A recent vaccination schedule (1–6 months) was

**Table 1**  
Clinical characteristics of the study cohort.

Characteristics	SARS-CoV-2 infection			P-value
	Total (n=29)	Yes (n=18)	No (n=11)	
Age (years)	27 [26–28]	27 [26,27]	27 [26–30]	0.22
Male sex	11 (37.9)	4 (22.2)	7 (63.6)	0.06
Comorbidities	3 (10.3)	2 (11.1)	1 (9.1)	0.99
Active smoking	9 (31)	7 (38.9)	2 (18.2)	0.59
Body mass index > 30 kg/m <sup>2</sup>	1 (3.4)	0 (0)	1 (9.1)	0.38
Prior SARS-CoV-2 infection	5 (17.2)	2 (11.1)	3 (27.3)	0.39
First dose with Pfizer-BioNTech vaccine	27 (93.1)	16 (88.9)	11 (100)	0.17
Time since last dose of vaccine and SARS-CoV-2 test (months)	6.7 [6–7.4]	7.1 [6.2–7.5]	6 [5.2–6.9]	0.036

Results are expressed as n (%) or median [25th–75th] as appropriate.

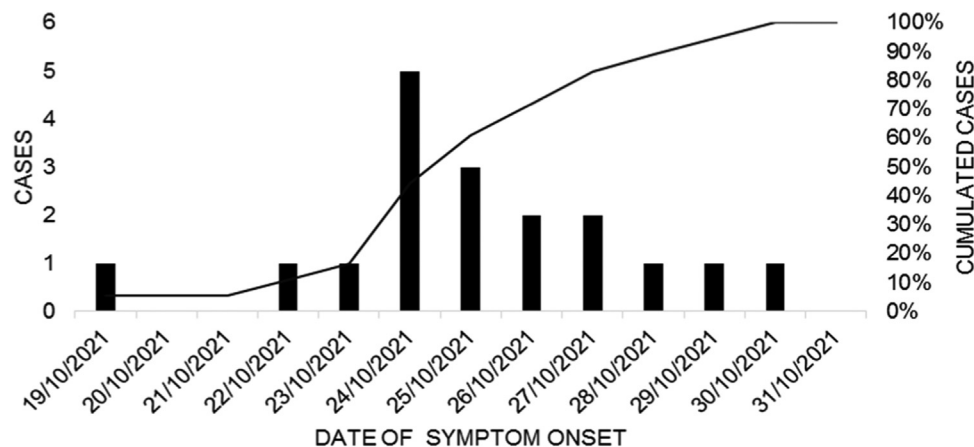


Fig. 1. Epidemic curve of the cluster.

found for 22.2% of individuals in the infected group and 63.6% in the uninfected group ( $P=0.05$ ).

All cases were also symptomatic. Three symptomatic patients remained negative on repeated antigen and RT-PCR tests. All RT-PCR tests were performed by the CHM laboratory. The main symptoms were asthenia (55.2%), fever (51.7%), cough (44.8%), diarrhea (37.9%), and anosmia (37.9%). No severe form was observed (no hospitalization and no death).

Of those with a negative rapid antigen test, three (27.3%) did not perform any RT-PCR test. Of those with a positive RT-PCR test, seven (38.9%) had a negative antigen test.

This outbreak of SARS-CoV-2 contamination occurred in 18 residents or spouses living together at the Iris intern apartment complex in Mayotte despite a complete vaccination schedule for 96.6% of them. Most cases were young adults in excellent health with theoretically good quality vaccine responses compared to older people [3]. On October 26, 10 interns were tested positive. The first case could not be identified for sure. The week before, one of these cases had been in contact with many symptomatic patients with unfortunately no test performed at the CHM. However, he complied with all personal protective measures during this consultation and was fully vaccinated.

One may note that a higher proportion of people infected with SARS-CoV-2 had had a second vaccine injection more than 6 months before compared with uninfected people ( $P=0.05$ ). Health consequences for individuals were limited with no hospitalization. However, the impact on the proper functioning of hospital services was not negligible. Prompt and strict guidelines were implemented by the CHM to limit the extent of the epidemic. The pediatric, intensive care, gynecology-obstetrics and emergency units had to operate with a small number of residents for a week. Medical care lines had to be adapted or even closed, because cases did not work for 10 days. As far as we know, no patient or no other HCW, who

did not live in the Iris intern apartment complex, was contaminated. Rehousing of positive cases was effective from October 29 onwards. Bio-cleaning of the intern apartment complex was carried out on October 30 and 31 to allow new interns arriving for the November 2021–May 2022 semester to carry out their duties on the initially scheduled date.

The rapid spread of the virus within this community of young people raises questions. First of all, interns did not wear masks at home. The organization of community life has to be adapted in this epidemic context to prevent this type of cluster. Moreover the protection of a two-dose vaccination schedule with the BNT162b2 RNA vaccine against the delta variant (B.1.617.2) decreases after 6 months [4]. A booster after 6 months has thus been recommended in France since October 6, 2021. When the cluster started at the end of October, no intern in Mayotte had received this third dose and many HCWs are currently hesitant about vaccination in France [5].

In a context of low incidence rate in Mayotte, 94.4% of infected interns were vaccinated (with a complete schedule) with 72.2% of vaccinations performed more than 6 months before. This study reinforces the need for a third dose of vaccine among HCWs, in addition to non-pharmaceuticals measures, to fight the COVID-19 pandemic so as not to destabilize the functioning of healthcare structures [6].

#### Contributions of authors

Lara Mayrand: conceptualization, methodology, validation, investigation, writing-original draft preparation, visualization, supervision, project administration, formal analysis, data curation, writing-reviewing and editing.

Nicolas Allou: supervision, writing-reviewing and editing, formal analysis, data curation.

Fanny Colliac Chirié: conceptualization, methodology, validation, investigation, writing- original draft preparation, visualization, supervision, project administration; formal analysis, data curation, writing- reviewing and editing.

All authors provided critical revision of the manuscript for important intellectual content. All authors had full access to all data (including statistical reports and tables) in the study and can take responsibility for data integrity and accuracy of the data analysis. All authors approved the version to be published.

### Disclosure of interest

The authors declare that they have no competing interest.

### Ethical Approval

All procedures performed in studies involving human participants were in accordance with the 1964 Helsinki declaration and its later amendments.

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