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# Identifying the settings at risk of transmission of SARS-CoV-2, the role of children in household transmission, and the incubation period of the main variants in an online case-control study in France

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# Sorbonne Université

Ecole doctorale Pierre Louis de Santé Publique

*Unité d'épidémiologie des maladies émergentes, Institut Pasteur*

## **Identifying the settings at risk of transmission of SARS-CoV-2, the role of children in household transmission, and the incubation period of the main variants in an online case-control study in France**

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Thèse de doctorat d'épidémiologie

Dirigée par Arnaud Fontanet

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## Summary

We aimed to identify the community settings associated with the risk of SARS-CoV-2 infection, the role of children in household transmission, and the incubation period of the SARS-CoV-2 infection.

In a case-control study conducted in mainland France among adults with recent infection and uninfected controls matched on age, sex, region, population size, and calendar week, we estimated the odds ratios of SARS-CoV-2 infection for community settings, behaviours, activities, and children presence in the household. We leveraged the case series to describe the circumstances of transmission. We studied the effect of intra-household isolation from a child with ongoing infection. We determined the incubation period across variants of SARS-CoV-2. Between October 2020 and October 2022, we included 691,454 cases and 57,065 controls. After matching 175,688 cases with 43,922 controls (4:1) across the study divided into nine periods, we identified the risk associated with shared offices, shared transport, and leisure activities. Among the cases who could identify the source of transmission, the most reported transmissions took place in the household, with extended family or friends, or in the workplace. People living with children were at increased risk of infection, but isolation from an infected child (particularly ventilation of indoor areas) was associated with decreased transmission. The incubation period of the omicron variant was shorter by approximately 1 day compared with the historical strain.

The evidence provided by this study on the transmission of SARS-CoV-2 will help design mitigation strategies in the context of pandemic preparedness.



## Résumé

Notre objectif était d'identifier, pour l'infection à SARS-CoV-2, les lieux de transmission, le rôle des enfants dans la transmission intra-domiciliaire et la période d'incubation.

Dans une étude cas-témoins en France métropolitaine incluant des adultes avec infection récente et des témoins non infectés appariés sur l'âge, le sexe, la région, la taille de population, et la semaine, nous avons estimé les odds ratios d'infection par le SARS-CoV-2 pour certains lieux d'intérêt, comportements, activités et la présence d'enfants au domicile. Nous avons analysé les circonstances de transmission décrites par les cas. Nous avons étudié l'effet de l'isolement entre un enfant infecté et les parents au sein des foyers, et la période d'incubation pour différents variants.

D'octobre 2020 à octobre 2022, nous avons inclus 691454 cas et 57065 témoins. Après appariement de 175688 cas avec 43922 témoins (4 :1) durant l'étude divisée en neuf périodes, nous avons identifié un risque augmenté d'infection associé aux bureaux partagés, transports en commun et lieux de loisirs. Parmi les cas ayant identifié la source de transmission, celles-ci avaient lieu principalement dans les foyers, auprès de la famille élargie ou d'amis, ou sur le lieu de travail. Les personnes vivant avec des enfants avaient un risque augmenté d'infection, mais l'isolement d'un enfant infecté (notamment l'aération des espaces clos) était associé à une diminution de la transmission. La période d'incubation du variant omicron était environ 1 jour plus courte que pour le variant historique.

Cette étude apporte des éléments de preuve sur la transmission du SARS-CoV-2 qui contribueront à la préparation aux prochaines pandémies.

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## **Introduction**

### **The SARS-CoV-2 pandemic**

Rarely in modern history has a pandemic caused as much morbidity, mortality, and disruption in societies as the SARS-CoV-2 pandemic. Since its emergence in Wuhan in late 2019, this respiratory virus has spread globally, causing an estimated 14.8 million excess deaths by the end of 2021 according to the World Health Organization (1). Even after the widespread availability of vaccines, updated estimates at the end of 2023 reported 28.43 million excess deaths (2). The economic impact is partially reflected by the reportedly \$12,500 billion lost in economic output through 2024 according to the International Monetary Fund.

Epidemiology has played a central role throughout the pandemic, whether to step up surveillance capacities, investigate this emerging pathogen, or advise public policy makers. An essential policy decision from the early days of the pandemic was to restrict the movements and interactions of populations to limit the spread of SARS-CoV-2 and mitigate the morbidity and mortality and their associated burdens on healthcare systems. Early evidence quickly showed that viral shedding and infectiousness of people infected with SARS-CoV-2 could start before symptom onset (3). Consequently, isolating cases needed to be combined with thorough tracing and isolation of contacts, which some countries achieved (4). Where this could not be done exhaustively, restrictions had to limit the interactions in the general population, hoping thus to limit the contacts of the pre-symptomatic or asymptomatic cases before diagnosis and isolation. While contacts in households can hardly be limited for more than a few days, interactions in community settings such as leisure venues, the workplace, or schools are more accessible to public health interventions. Thus, many countries issued stay-at-home orders, prohibiting non-essential movements and contacts in most settings, including schools, the workplace, shops, or sports and leisure facilities. Evidence from France has supported the effectiveness of such stringent measures to reduce SARS-CoV-2 transmission and healthcare burden (5). The wide reach of this policy was however responsible for negative economic (6), educational (7), or health impacts (8,9). Epidemiological evidence on the settings most at risk of transmission was thus needed to help policy design more targeted restrictions.

## **The scientific question: identifying the settings of transmission**

Identifying the settings of transmission can be achieved through various approaches. One can aim to identify the physical (e.g., the properties of droplets or airborne particles) and biological (e.g., characterize viral shedding, viral mechanisms of cell entry) mechanisms of transmission (10). From there on, one can infer the environments and settings most likely to favour these mechanisms and promote appropriate mitigation strategies. Early on, the role of droplets in viral transmission, alongside existing pandemic preparedness plans, have contributed to recommending measures such as physical distancing, hand hygiene or limitations of mass gatherings (11,12). Later on, the identification of airborne transmission has underscored the role of indoor settings and the potential benefit of masks and enhanced ventilation of indoor areas (10,13). This justified for instance the mask mandate in most indoor settings issued by the French government in July 2020 (14).

Another scientific strategy is to identify the types of settings in which transmission can occur, and those where it occurs the most. This makes sense from a public health perspective for various reasons:

(i) Restrictions decided by public authorities were easily categorized by type of setting: prohibited access to all cultural facilities, or all sports indoor facilities for instance. These categories are well defined and easy to comprehend for the public.

(ii) This can help identify transmission chains, either by the case themselves or by the person in charge of contact tracing. This is especially true when no obvious source case could be identified, but multiple potential exposures are reported, by ruling out for instance the ones that took place in environments unfavourable to transmission.

(iii) It can inform public health guidance for the public. Informing people on settings where they might encounter SARS-CoV-2 (e.g., attending gatherings, visiting leisure venues) offers an opportunity to adopt protective behaviours accordingly (e.g., mask-wearing, physical distancing, or prior testing). This applied early in the pandemic, as the public health goal was to involve everyone in the effort to reduce transmission chains, even those whose personal risk of severe COVID-19 was very low. This is still true nowadays, as high population immunity has substantially reduced the burden of SARS-CoV-2 on healthcare systems, and the goal has

gradually shifted to essentially reducing the individual hazard for those most at risk of severe disease.

In the present work, we categorized the settings of interest as community settings or the household. While transmission in community settings can be mitigated through non-pharmaceutical interventions, the household transmission of SARS-CoV-2 is less modifiable through public restrictions (point (i)), as those are hard to sustain for more than a few days. Nonetheless, understanding the transmission chains in the household can help contact-tracing (point (ii)) and public health guidance to the public (point (iii)), by proposing evidence-based mitigation strategies such as isolation measures or testing protocols in case of exposure. The role of children in household transmission represents a topic of particular interest in the study of household transmission. Indeed, children are the targets of specific public health interventions in schools, such as mask-wearing, ventilation, repeated testing, hybrid education, or school closures. The risk of household transmission between a child and an adult may also differ from that between two adults given differences in contact patterns.

## **How can we identify the settings of SARS-CoV-2 transmission?**

The identification of settings most at risk of transmission can be addressed through various study designs.

Outbreak reports have generated crucial early evidence, particularly in settings with low community transmission. Outbreak investigations have identified transmission linked to bars and restaurants (15–19), air travel (20,21), cruise ships (22), buses (23), choir practices (24), fitness classes and indoor sports (18,19,25), religious gatherings (26), nursing homes (27), food processing plants (28), schools (29), homeless shelters (30), and worker dormitories (31). Although these studies offer insight into where and how transmission can occur, they are prone to selection bias. For example, outbreaks are more likely to be detected in crowded settings in which contacts are easily identifiable. Furthermore, they cannot be used to determine the frequency and the relative risks of infection by setting.

Other studies have aimed to screen all contacts of a series of cases and identify in which settings contacts were more likely to result in transmission (32–34). This study design requires the correct and comprehensive identification of contacts, which can be difficult for SARS-CoV-2 in case of long-distance airborne transmission (35). Superspreading events can represent high

proportions of the total case count. Several studies have identified that a minority of cases generated a majority of cases, sometimes with a ratio as high as 20% to 80% (20% of cases were responsible for 80% of secondary cases) (36,37). Hence, contact-tracing must be comprehensive and equally effective across settings to accurately estimate the risk of transmission and compare different settings. In addition, some environments such as public transport are prone to close but short interactions, and mostly with unrelated people, making effective contact-tracing especially challenging. Relying solely on contact tracing and outbreak investigations would thus potentially underestimate the risk of transmission in numerous settings.

Case series can also provide insight in the contribution of various settings to transmission through a descriptive analysis of transmission events (38,39). They do not depend on the comprehensive identification of contacts and are less likely to selectively identify crowded settings as the place of transmission. They can identify household transmission chains. Nonetheless, they rely on the correct identification of the source case, which requires sufficient knowledge on the modes of transmission of SARS-CoV-2 and can be challenging in case of multiple exposures or transmission from an asymptomatic case.

Another approach is to estimate the risk or odds ratios of infection associated with visits to different settings, through cross-sectional seroprevalence surveys (40–42), case-control studies (43–46), or retrospective (47,48) or prospective (49–51) cohort studies. All of those present methodological challenges, such as the correct identification of exposure-outcome timing for cross-sectional studies or cohort studies if between-visit interval is long, or selection bias for case-control studies. They are usually not best suited for the assessment of household transmission.

The relative contribution of transmission in community settings and in households to the overall case burden can be estimated through descriptive case series approaches (38) or modelling analysis of serological surveys (52). Specific household-dedicated studies often used retrospective or prospective cohort designs. They aimed to determine secondary attack rates within the household and study the characteristics of the source case or the secondary cases associated with the risk of transmission (53–55). The role of children in household transmission has been studied using these designs as well (56,57), but another common approach has been to determine the risk or odds ratios of the risk of infection associated with living with a child (58–62). While it cannot be used to determine secondary attack rates, this strategy is not prone

to biases induced by lower testing propensity which might particularly affect children given high proportion of asymptomatic infections and possible reluctance to sample very young children (63,64).

In the present work, we chose a case-control design for the following reasons:

- The incubation period of COVID-19 only lasts a few days, and the investigation was done right after the diagnosis for cases, thus we estimated that the risk of memory errors, a frequent limitation of case-control studies, would be low.
- We aimed to obtain the first findings soon after the study onset (a request from policy makers), which a prospective cohort study for instance would not have permitted, given the necessary follow-up period to observe sufficient events.
- We could rely on existing surveillance systems to identify cases, thus relieving the burden of identifying cases (either with ongoing infection or seropositive participants indicating a past infection) specifically for the study.
- A case-control study also allowed us to describe the circumstances of transmission of cases in a case series approach.

This is how we designed the ComCor case-control study, which was conducted between 2020 and 2022 and whose design and main statistical analyses are detailed below. In the first months of the study, we were able to identify several settings associated with an increased risk of infection, including bars, restaurants, night clubs, indoor sports activities, carpooling, airplanes, or trains (65,66). We also reported an increased risk of infection for people living with children, particularly when these children attended daycare or preschool (65,66).

In the present work, we aimed to expand upon previous work to further study the evolution of community settings associated with the risk of infection, the role of children in household transmission, and estimate the SARS-CoV-2 incubation period across the main variants of concern.

I first detail a rapid review of literature of the community settings of transmission. I then present the design and main statistical analyses of the ComCor study. Finally, I present an outline of the thesis.

## **Rapid review**

To provide a detailed understanding of the current evidence on the settings of transmission, I performed a rapid review of literature. The focus was put on community settings of transmission. These cover a large variety of settings, making a wide-ranging assessment of a rapid review well suited. Unlike for household transmission, no systematic review has been published to date (54,55). In this review, the aim was to assess the published research on community settings of transmission, including the workplace, shops, shared transport, and leisure activities. Medline was searched using Pubmed, relying on Mesh terms related to the settings of interest and their free-text equivalents restricted to titles or abstracts, as well as a series of keywords on study designs to include epidemiological studies on SARS-CoV-2 (see Annex page 2). References of the reports that investigated several community settings were screened. After screening titles and abstracts, selected reports were assessed for inclusion through full-text reading to determine inclusion. Data were extracted on the study setting (time and place), the study design, the size of the study population, the community exposures of interest and the main findings for these exposures. Studies on the occupational exposures of healthcare workers were not included in the review, but studies that included healthcare workers were included if they investigated other professional categories or community exposures other than the workplace. Case reports of outbreaks in community settings were not included.

The Pubmed search was launched on 13 January 2023 and email alerts were set up and screened through 22 January 2024. The initial search retrieved 2812 articles and led to the inclusion of 135 reports. The subsequent screening of the references of the main publications and the email alerts led to the inclusion of another 35 reports (Table 1).

The most frequent study designs were cross-sectional studies, relying on estimates of anti-SARS-CoV-2 antibody seroprevalence or prevalent ongoing SARS-CoV-2 infection (n = 68), prospective (n = 47) or retrospective (n = 12) cohorts, case-control studies (n = 27), and assessment of community exposures most at risk of transmission in contact-tracing (n = 13). The main community exposures that were studied were the occupation (n = 120) (most often in healthcare workers, n = 41) including 27 reports on the role of remote (or in-person) work, transport or travel (n = 52) (mainly public transport, n = 34), leisure activities (n = 43) (mainly sports activities, n = 24, restaurants, n = 16, and bars, n = 12), as well as gatherings (n = 23), and shops or retail facilities (n = 12). Most of the studies were conducted in Europe (n = 79) or



in the USA (n = 45). Most studies were conducted in 2020 (n = 148), including 35 that continued into 2021 (and until 2022 for 4 of them), while 26 started in 2021 (2 continued in 2022). Studies with the largest sample sizes often relied on population registries to study occupational exposures (67–72) or used ecological correlation to study the risk associated with gatherings (73).

Regarding the workplace, most studies aimed to assess the occupations at increased risk of infection or included a specific professional category (n = 79), in some cases focusing on occupations including contacts with the public or customers (n = 15), while others studied the role of remote work (n = 27). Contact with public or customers was repeatedly found associated with an increased risk of infection (69,72,74–79). In-person work was frequently associated with an increased risk of infection, or conversely working remotely was associated with a decreased risk (45,48,50,51,78–94).

Most studies that investigated the risk associated with the visit to shops found no increased risk of infection (44–46,51,87,95,96). A few studies found increased risk of infection but often for high frequency of visits to shops (32,41,93,97).

Most studies that investigated the risk associated with the use of public transport found an increased risk of infection, mostly studying all public transport together (33,40,46,47,51,82,98–105). Some studies investigated travels overall (41,84,91,102,106–117), and most of them also found an increased risk of infection associated with traveling (91,107,108,110,112,113,115,117).

Evidence on the role of sports activities point to an increased risk mostly for indoor sports (43,44,51,96,106,118–121). While most studies investigating the transmission in bars found an increased risk (43,44,46,51,84,106,108,122), the evidence was more contrasted on restaurants: some studies reported an increased risk (49,51,96,106) but most did not (44–46,84,87,93,123–125). The studies that investigated night clubs or parties mostly found an increased risk associated with those settings (46,51,108,125,126) whereas a few did not (84,93). Several studies collected data on the attendance of gatherings, such as private events, religious gatherings, or sports events, frequently reporting an increased risk associated with attendance (43,49,73,103,106,123,125,127,128).

While most studies focused on a handful of community exposures, particularly those focusing on professional categories, a few aimed to identify a wide range of community settings associated with the risk of infection (38,41,43–46,49,51,84,87,91,93,95,96,106,108,123–125). Most of them were case-control studies (43–46,91,96,106,108,123,125), others assessed factors associated with seropositivity or ongoing infection using a cross-sectional design (41,84,87,124) or prospective cohorts (49,51,93,95). The number of participants with SARS-CoV-2 infection ranged from 40 (123) to 8913 in a study conducted in Denmark by Cajjar and colleagues who opted for a web-based auto-questionnaire (43). This often limited sample size led to the inclusion of a limited number of covariates in regression models and wide uncertainty in the estimates (44,45,96,106), illustrating the challenge to show significant associations of potentially low amplitude. To increase statistical power, some studies created composite variables for rare exposures such as public transport, retail or leisure activities, or occupational exposure, producing grouped estimates for these exposures (44,51).

Overall, this review highlights the importance of indoor settings, with high proximity, and long duration spent in the settings, such as public transport, bars, night clubs, private gatherings, or in-person work. These results are in line with the ones reported in the first few months of the ComCor study (65,66). This review also underscores the lack of iterative assessment through the course of the pandemic, apart from one cohort study which evaluated exposures at risk in December 2020 – February 2021 (93) and again in September – December 2021 (51). There is very limited evidence on the settings of transmission in periods of predominance of the Omicron variant. Finally, the multiplicity of community exposures of interest, their relatively low prevalence in the population of the studies, and the potentially small effects of each individual exposure, stress the need for substantial study sizes to effectively identify community exposures associated with the risk of infection while adjusting for confounders.

**Table 1: Reports included in the rapid review of studies on the community settings of transmission**

First author	Journal	Year	Design	Country	Participants	Settings
Acurio-Paez (98)	<i>Int J Environ Res Public Health</i>	2021	Cross-sectional	Ecuador	2457	Transport
Airoldi (129)	<i>Ann Work Expo Health</i>	2022	Cross-sectional	Italy	22,708	Occupation
Al-Abri (130)	<i>Int J Infect Dis</i>	2021	Cross-sectional	Oman	17,457	Occupation
Alishaq (131)	<i>Infect Drug Resist</i>	2022	Cross-sectional	Qatar	2826	Occupation
Alishaq (132)	<i>BMC Public Health</i>	2021	Prospective cohort	Qatar	376	Occupation
Al-Kuwari (133)	<i>Front Public health</i>	2021	Prospective cohort	Qatar	9172	Occupation
Amer (105)	<i>Am J Epidemiol</i>	2023	Prospective cohort	Spain	10,959	Transport
Arashiro (106)	<i>Influenza &amp; other respir viruses</i>	2022	Case-control	Japan	778	Occupation Leisure Transport Gatherings
Arnaldo (134)	<i>Clin Inf Dis</i>	2022	Cross-sectional	Mozambique	21,183	Occupation
Aung (135)	<i>Int J of General Med</i>	2021	Cross-sectional	USA	36,041	Occupation
Baccolini (123)	<i>Front Public health</i>	2022	Case-control	Italy	120	Leisure Transport Gatherings
Bajos (80)	<i>BMC Public health</i>	2021	Other	France	10,101	Occupation
Barros Ferreira (136)	<i>Int J Occup Med Environ Health</i>	2022	Cross-sectional	Portugal	1696	Occupation
Bastuji-Garin (81)	<i>J Clin Med</i>	2023	Other	France	1055	Occupation
Beale (137)	<i>Occup Environ Med</i>	2022	Cross-sectional	UK	3775	Occupation
Beale (138)	<i>J Occup Med Toxicol</i>	2023	Prospective cohort	UK	15,190	Occupation
Belloni (139)	<i>J Occup Environ Med</i>	2023	Cross-sectional	Switzerland	455	Occupation
Berghöfer (140)	<i>Eur J Epidemiol</i>	2022	Prospective cohort	Germany	1097	Occupation
Bernardes-Souza (141)	<i>JMIR Public Health Surveill</i>	2021	Cross-sectional	Brazil	400	Occupation
Berselli (142)	<i>Int J Occup Med Environ Health</i>	2022	Cross-sectional	Italy	7561	Occupation
Bi (116)	<i>Lancet infect Dis</i>	2020	Contact-tracing	China	653	Transport
Blomquist (143)	<i>Influenza &amp; other respir viruses</i>	2021	Contact-tracing	England	2313	Transport
Bojorquez-Chapela (99)	<i>BMJ Glob Health</i>	2022	Cross-sectional	Mexico	481	Transport
Bonde (67)	<i>Scand J Work Environ Health</i>	2023	Prospective cohort	Denmark	2,451,542	Occupation
Bonde (68)	<i>Occup Environ Med</i>	2023	Prospective cohort	Denmark	2,451,542	Occupation
Bulfone (144)	<i>Int J Environ Res Public Health</i>	2022	Case-control	USA	174	Leisure
Cajar (43)	<i>BMJ Open</i>	2022	Case-control	Denmark	68,965	Occupation Leisure Transport Gatherings
Chen (145)	<i>Zhong Liu Zazhi</i>	2020	Contact-tracing	China	2147	Leisure Transport
Coleman (107)	<i>Can J Public Health</i>	2022	Prospective cohort	Canada	2834	Transport
Cooper (127)	<i>BMJ Open</i>	2022	Cross-sectional	UK	2044	Occupation Gatherings

Costa (42)	<i>Clin Inf Dis</i>	2021	Cross-sectional	Brazil	4987	Occupation Transport
Cummings (146)	<i>Transbound Emerg Dis</i>	2022	Case-control	USA	1631	Occupation Leisure Transport
Cuomo (147)	<i>Clin Inf Dis</i>	2023	Case-control	USA	621	Leisure
Da Silva Torres (109)	<i>Front Cell Infect Microbiol</i>	2022	Cross-sectional	Brazil	1337	Transport
De la Rosa Ruiz (148)	<i>Rev Esp Salud Public</i>	2021	Prospective cohort	Spain	642	Occupation
De Matteis (74)	<i>Med Lav</i>	2022	Prospective cohort	Italy	2052	Occupation
De Santi (149)	<i>Acta Biomed</i>	2021	Cross-sectional	Italy	341	Occupation
Della Valle (150)	<i>Int J Environ Res Public Health</i>	2021	Cross-sectional	Italy	2255	Occupation
Deslandes (151)	<i>J Infect Public Health</i>	2021	Contact-tracing	France	38,670	Occupation
Drakesmith (152)	<i>Int J Popul Data Sci</i>	2022	Prospective cohort	Wales	5157	Leisure
Ellingjord-Dale (153)	<i>BMC Infect Dis</i>	2022	Prospective cohort	Norway	121,374	Transport
Fatima (154)	<i>J Sleep Res</i>	2021	Prospective cohort	UK	18,221	Occupation
Finci (155)	<i>Euro Surveill</i>	2022	Case report	Germany	1270	Occupation
Fisher (122)	<i>Morb Mortal Wkly Rep</i>	2020	Case-control	USA	314	Leisure
Fisher (89)	<i>Morb Mortal Wkly Rep</i>	2020	Case-control	USA	314	Occupation
George (156)	<i>Epidemiol Infect</i>	2021	Cross-sectional	India	499	Occupation
Grant (157)	<i>J Occup Environ Med</i>	2021	Cross-sectional	USA	1231	Occupation
Halatoko (158)	<i>Plos One</i>	2020	Cross-sectional	Togo	955	Occupation
Hanane (159)	<i>BMJ Open</i>	2023	Cross-sectional	France	3228	Occupation
Hernandez-Garcia (121)	<i>Eur J Pediatr</i>	2023	Prospective cohort	Spain	234	Leisure
Hiironen (160)	<i>Epidemiol Infect</i>	2022	Case-control	England	12,338	Occupation
Hobbs (125)	<i>Morb Mortal Wkly Rep</i>	2020	Case-control	USA	397	Leisure Transport Gatherings
Hohmuth (161)	<i>BMC Public health</i>	2022	Prospective cohort	Germany	2808	Leisure
Holt (97)	<i>Thorax</i>	2022	Prospective cohort	UK	15,227	Shops
Hoskins (51)	<i>Epidemiol Infect</i>	2022	Prospective cohort	UK	11,413	Occupation Shops Leisure Transport
Hoskins (93)	<i>Wellcome Open Res</i>	2022	Prospective cohort	UK	10,858	Occupation Shops Leisure Transport
Hu (162)	<i>Clin Inf Dis</i>	2021	Contact-tracing	China	72,093	Transport
Islamoglu (163)	<i>Travel Med Infect Dis</i>	2021	Cross-sectional	Turkey	5022	Occupation Transport
Iwamoto (164)	<i>Vaccines</i>	2022	Cross-sectional	Guatemala	1334	Occupation
Javed (110)	<i>BMC Infect Dis</i>	2022	Cross-sectional	Pakistan	17,764	Transport
Judson (94)	<i>Ann Epidemiol</i>	2023	Prospective cohort	USA	3846	
Kagucia (165)	<i>Open Forum Infect Dis</i>	2021	Cross-sectional	Kenya	830	Occupation
Kahlert (124)	<i>Clin Microbiol Infect</i>	2021	Cross-sectional	Switzerland	4664	Occupation Leisure Gatherings
Karunathilake (166)	<i>BMC Public health</i>	2022	Cross-sectional	Sri Lanka	92	Occupation Leisure
Khanam (167)	<i>J Glob Health</i>	2022	Cross-sectional	Bangladesh	5116	Occupation

Kianersi (168)	<i>J Adolesc Health</i>	2021	Cross-sectional	USA	1076	Gatherings
Klein (95)	<i>Sci Adv</i>	2022	Prospective cohort	Germany	3051	Occupation Shops Transport
Klein (169)	<i>PLOS Glob Public Health</i>	2022	Cross-sectional	USA	118	Occupation
Kronfli (170)	<i>Front Public health</i>	2022	Cross-sectional	Canada	600	Occupation Leisure
Kronfli (171)	<i>Clin Inf Dis</i>	2022	Cross-sectional	Canada	1100	Occupation Leisure
Lalwani (90)	<i>Lancet Global Health</i>	2021	Cross-sectional	Brazil	2459	Occupation
Lan (75)	<i>Occup Environ Med</i>	2021	Other	USA	104	Occupation
Leidi (172)	<i>Occup Environ Med</i>	2022	Prospective cohort	Switzerland	10582	Occupation
Leite (45)	<i>Front Public health</i>	2021	Case-control	Portugal	1875	Occupation Shops Leisure Transport
Lerdsamran (173)	<i>Plos one</i>	2022	Cross-sectional	Thailand	2666	Occupation Transport
Levi (46)	<i>Int J Environ Res Public Health</i>	2023	Case-control	Italy	440	Occupation Shops Leisure Transport
Levorson (111)	<i>Plos One</i>	2021	Cross-sectional	USA	1038	Transport
Lewnard (174)	<i>Emerg Infect Dis</i>	2021	Prospective cohort	USA	14169	Occupation
Li (175)	<i>J Hosp Infect</i>	2023	Prospective cohort	Japan	1510	Occupation Gatherings
Lin (49)	<i>BMJ Open</i>	2021	Prospective cohort	USA	28,575	Occupation Leisure Gatherings
Llamas-Clark (117)	<i>BMJ Open</i>	2023	Other	Philippines	352	Transport
Loef (176)	<i>Chronobiol Int</i>	2022	Prospective cohort	Netherlands	26,051	Occupation
Lopez (177)	<i>Plos One</i>	2021	Cross-sectional	USA	753	Occupation
Luo L (32)	<i>Ann Intern Med</i>	2020	Contact-tracing	China	3410	Leisure Transport
Luo W (178)	<i>BMJ Open</i>	2022	Case-control	USA	62,664	Shops
Maechler (179)	<i>Clin Microbiol Infect</i>	2020	Contact-tracing	Germany	4333	Leisure
Magnusson (69)	<i>Eurosurveillance</i>	2021	Prospective cohort	Norway	3,559,694	Occupation
Malagon-Rojas (82)	<i>Int J Environ Res Public Health</i>	2020	Prospective cohort	Colombia	212	Occupation Transport
Malagon-Rojas (180)	<i>J Travel Med</i>	2021	Prospective cohort	Colombia	212	Occupation
Marcus (181)	<i>JAMA Netw Open</i>	2021	Prospective cohort	USA	10,613	Occupation
Martischang (100)	<i>Infect Control Hosp Epidemiol</i>	2022	Prospective cohort	Switzerland	3421	Transport
McGuire (182)	<i>Prehosp Disaster Med</i>	2021	Cross-sectional	USA	225	Occupation
Meylan (40)	<i>BMJ Open</i>	2021	Cross-sectional	Switzerland	1874	Transport
Meza (83)	<i>Am J Ind Med</i>	2023	Cross-sectional	USA	4335	Occupation
Mioch (183)	<i>Prev Med Rep</i>	2021	Cross-sectional	Netherlands	497	Occupation
Moe (184)	<i>Int J Occup Med Environ Health</i>	2022	Prospective cohort	Norway	238	Occupation
Montecucco (185)	<i>Med Lav</i>	2021	Contact-tracing	Italy	364	Occupation Leisure
Mora (186)	<i>JAMA Netw Open</i>	2021	Cross-sectional	USA	1107	Occupation
Morlock (112)	<i>Plos One</i>	2021	Retrospective cohort	USA	5203	Transport

Moyo (128)	<i>PLOS Glob Public Health</i>	2023	Cross-sectional	South Africa	13,290	Gatherings
Mulligan (187)	<i>Occup Environ Med</i>	2022	Cross-sectional	USA	713	Occupation
Munch (96)	<i>Plos One</i>	2022	Case-control	Denmark	1029	Shops Leisure Transport Gatherings
Munch (44)	<i>Epidemiol Infect</i>	2021	Case-control	Denmark	617	Occupation Shops Leisure Transport Gatherings
Mutambudzi (188)	<i>Occup Environ Med</i>	2020	Prospective cohort	UK	120,075	Occupation
Nafilyan (70)	<i>Occup Environ Med</i>	2022	Prospective cohort	UK	14,295,900	Occupation
Nagao (189)	<i>Eur J Clin Microbiol Infect Dis</i>	2023	Retrospective cohort	Japan	107,475	Occupation
Nakashita (190)	<i>Open Forum Infect Dis</i>	2022	Case-control	Japan	90	Leisure
Naushin (101)	<i>Elife</i>	2021	Cross-sectional	India	10,427	Occupation Transport
Newhouse (113)	<i>Front Pediatr</i>	2021	Case-control	USA	11,922	Transport
Ng (34)	<i>Lancet infect Dis</i>	2021	Contact-tracing	Singapore	7518	Occupation Transport
Nirala (191)	<i>J Family Med Prim Care</i>	2022	Cross-sectional	India	645	Occupation
Nygren (102)	<i>Infect Dis</i>	2021	Cross-sectional	Sweden	463	Occupation Transport
Oberste (47)	<i>BMC Public Health</i>	2023	Retrospective cohort	Germany	2433	Occupation Transport
Ochi (48)	<i>Int J Environ Res Public Health</i>	2021	Retrospective cohort	Japan	13,321	Occupation
Ochoa-Hein (192)	<i>Gac Med Mex</i>	2022	Contact-tracing	Mexico	1879	Transport
Paduano (193)	<i>Int J Environ Res Public Health</i>	2022	Cross-sectional	Italy	5128	Occupation
Pagen (84)	<i>Plos One</i>	2022	Cross-sectional	Netherlands	10,001	Occupation Leisure Transport
Papagiannis (194)	<i>Vaccines</i>	2022	Prospective cohort	Greece	900	Occupation
Pekmezaris (195)	<i>J Public Health</i>	2021	Other	USA	NA	Transport
Poustchi (76)	<i>Lancet Infectious Diseases</i>	2021	Cross-sectional	Iran	8902	Occupation
Rankin (77)	<i>Health Sci Rep</i>	2022	Cross-sectional	USA	344	Occupation
Rao (196)	<i>Plos One</i>	2021	Retrospective cohort	USA	106	Occupation
Reale (197)	<i>Paediatr Perinat Epidemiol</i>	2021	Cross-sectional	USA	2945	Occupation
Reuter (198)	<i>Scand J Work Environ Health</i>	2022	Prospective cohort	Germany	108,960	Occupation
Rhodes (78)	<i>Scand J Work Environ Health</i>	2022	Prospective cohort	UK	260,949	Occupation
Rhodes (199)	<i>J Epidemiol Community Health</i>	2022	Prospective cohort	UK	312,304	Occupation
Richard (200)	<i>Scand J Public Health</i>	2022	Cross-sectional	Switzerland	8344	Occupation
Rivera Ariza (201)	<i>Rev Esp Salud Publica</i>	2021	Contact-tracing	Spain	0	Occupation Leisure
Roberts (119)	<i>Clin J Sport Med</i>	2022	Prospective cohort	USA	80,786	Leisure
Sami (202)	<i>Emerg Infect Dis</i>	2021	Cross-sectional	USA	22,647	Occupation

Santa-Ramirez (203)	<i>Front Public health</i>	2022	Cross-sectional	Switzerland	2889	Occupation
Sasser (204)	<i>J Athl Train</i>	2022	Retrospective cohort	USA	30,074	Leisure
Schmid (85)	<i>Front Public health</i>	2022	Cross-sectional	Switzerland	425	Occupation
Schubert (114)	<i>Int J Environ Res Public Health</i>	2021	Prospective cohort	Austria	599	Occupation Transport
Schultz (205)	<i>JAMA Netw Open</i>	2022	Retrospective cohort	USA	4,038,217	Leisure
Schumacher (206)	<i>Br J Sports Med</i>	2021	Prospective cohort	Qatar	1337	Leisure
Sciaudone (207)	<i>IJID Reg</i>	2023	Cross-sectional	USA	218	Occupation Gatherings
Sebastião (208)	<i>BMC Infect Dis</i>	2021	Cross-sectional	Angola	343	Occupation
Segaloff (126)	<i>Open Forum Infect Dis</i>	2021	Cross-sectional	USA	517	Leisure Gatherings
Seijo Bestilleiro (120)	<i>Sports Health</i>	2022	Prospective cohort	Spain	23,845	Leisure
Sendi (209)	<i>Immun Inflamm Dis</i>	2022	Prospective cohort	Switzerland	1022	Occupation
Sewry (210)	<i>J Sci Med Sport</i>	2022	Prospective cohort	South Africa	185	Leisure
Shah (86)	<i>Clin Inf Dis</i>	2022	Case-control	USA	85,986	Occupation
Shi (211)	<i>Am J Ind Med</i>	2024	Cross-sectional	USA	52,726	Occupation
Sjörs Dahlman (212)	<i>J Transp Health</i>	2022	Cross-sectional	Sweden	262	Occupation Transport
Smith-Jeffcoat (87)	<i>Front Public health</i>	2022	Cross-sectional	USA	1078	Occupation Shops Leisure Transport Gatherings
Speaker (91)	<i>Cureus</i>	2021	Case-control	USA	339	Occupation Transport Gatherings
Sierpinski (39)	<i>Int J Occup Med Environ Health</i>	2020	Other	Poland	2122	Occupation
SRLF Trial Group (213)	<i>Ann Intensive Care</i>	2022	Prospective cohort	France	407	Gatherings
Ssuuna (214)	<i>BMC Infect Dis</i>	2022	Cross-sectional	Uganda	980	Occupation
Stefanizzi (215)	<i>Ann Ig</i>	2023	Retrospective cohort	Italy	2939	Leisure
Sundaram (71)	<i>CMAJ</i>	2021	Retrospective cohort	Canada	14,695,579	Occupation
Sy (216)	<i>Am J Epidemiol</i>	2021	Retrospective cohort	USA	NA	Transport
Talaei (41)	<i>BMC Med</i>	2022	Cross-sectional	UK	11,130	Occupation Shops Leisure Transport
Termansen (217)	<i>Scan J Med Sci Sports</i>	2022	Retrospective cohort	Denmark	162	Leisure
Torén (72)	<i>Scand J Work Environ Health</i>	2023	Case-control	Sweden	2,762,810	Occupation
Toumi (218)	<i>JAMA Netw Open</i>	2021	Other	USA	528	Leisure Gatherings
Tsuboi (219)	<i>Clin Inf Dis</i>	2022	Case-control	Japan	157,507	Transport
Utulu (103)	<i>Pan Afr Med J</i>	2022	Case-control	Nigeria	1494	Transport Gatherings
Van der Feltz (220)	<i>Ann Work Expo Health</i>	2023	Retrospective cohort	Netherlands	6794	Occupation
Vaux (38)	<i>BMC Inf Dis</i>	2023	Cross-sectional	France	24,514	Occupation Shops Leisure Gatherings
Waites (221)	<i>Sci Rep</i>	2022	Case report	UK	1942	Gatherings

Warszawski (222)	<i>Plos One</i>	2022	Cross-sectional	France	75,638	Occupation
Wei (79)	<i>Front Public health</i>	2022	Case-control	USA	780	Occupation
Whaley (73)	<i>JAMA Intern Med</i>	2021	Other	USA	6,535,987	Gatherings
White (223)	<i>Public Health</i>	2022	Contact-tracing	Ireland	859	Transport
White (92)	<i>Plos One</i>	2023	Case-control	USA	13,136	Occupation
Wong (115)	<i>Am J Trop Med Hyg</i>	2022	Case-control	Malaysia and Singapore	923	Transport
Woolley (50)	<i>Open Forum Infect Dis</i>	2022	Prospective cohort	USA	10,289	Occupation
Wu (33)	<i>Public Health</i>	2020	Contact-tracing	China	2994	Leisure Transport
Yanik (88)	<i>BMC Public health</i>	2022	Prospective cohort	UK	115,451	Occupation
Zabana (224)	<i>J Clin Med</i>	2022	Case-control	Spain	1460	Occupation
Zhang (225)	<i>Public Health Rep</i>	2023	Cross-sectional	USA	3080	Occupation
Zuñiga (104)	<i>J Clin Epidemiol</i>	2022	Cross-sectional	Chile	85,529	Occupation Transport



## The ComCor study

The ComCor study was designed to identify the sociodemographic characteristics, the behaviours and habits associated with the risk of SARS-CoV-2 infection (ComCor stands from “Comportements associés au risque d’infection par le Coronavirus SARS-CoV-2”). It lasted from October 2020 to October 2022 and was conducted in collaboration with the national health insurance system (*Caisse nationale d’assurance maladie*, CNAM) and the Ipsos institute, a market and opinion research company with a public affairs research activity that includes health-related research. The overarching principle is simple: using an online auto-questionnaire, we asked people with ongoing or recent SARS-CoV-2 infection about their exposures in the days preceding infection and compared these exposures with those of people without ongoing or recent SARS-CoV-2 infection, thus estimating the odds ratios of infection for exposures of interest. This case-control approach was complemented by a descriptive case series approach in which we asked cases if they could identify how they had been infected, including who the source case was, and in what type of setting (household, workplace, etc.) the transmission took place.

Once weekly for the complete duration of the study, the CNAM sent invitations to people with a recent diagnosis of ongoing SARS-CoV-2 infection. The CNAM is a national health insurance system which covers approximately 88% of the general French population. Adults with recent infection were identified from the nationwide SI-DEP database which included all positive SARS-CoV-2 tests (RT-PCR or supervised antigen tests, i.e., those performed by a healthcare worker, and not self-tests). The email addresses of the people who tested positive were identified from a distinct database of the CNAM, which covers approximately 55% of people covered by the CNAM. Only adults with declared residency in mainland France were eligible due to the structure of the database. The emails informed potential participants about the conduction of a study on the transmission of SARS-CoV-2 conducted by the Institut Pasteur in collaboration with Ipsos, the CNAM, and *Santé Publique France*. They included a link to an auto-questionnaire preceded by online information (see Appendix). Following consent, cases replied to a series of questions on their recent episode of SARS-CoV-2 infection (e.g., symptomatic status, date of test and symptom onset), the circumstances of transmission if they could identify them (inside or outside the household, repeated or unique contact with the source case, relationship with the source case, etc.), and the activities and settings they had visited in the few days preceding symptom onset, or the positive

test for asymptomatic cases. The duration for the exposures of interest was initially 10 days to cover a large scope of potential incubation periods (226). When the Omicron variant emerged in late 2021, a shorter incubation period was quickly reported compared with previously circulating variants (227,228). Hence, we modified the questionnaire to investigate exposures in the 7 days preceding symptom onset.

Once a week, Ipsos screened the demographic characteristics of included cases. We chose the following matching criteria:

- Sex: female or male, as self-reported
- Age in 3 categories: 18-29 years, 30-54 years, 55 years and above
- Region: only regions of mainland France were eligible as the CNAM only sent invitations to cases reporting residency in mainland France and Ipsos could not include controls from overseas French territories; Corsica was grouped with the Provence-Alpes-Côte d'Azur region in Southeastern France, thus resulting in 12 regions
- Size of the population in the area of residence, in 5 categories: rural or <5000 inhabitants, 5000-19,999 inhabitants, 20,000-99,999 inhabitants,  $\geq 100,000$  inhabitants, or the greater Paris area.

Based on the profile of the included cases, Ipsos invited potential controls to participate in the study, with the goal to reach, within a week, similar proportions for categories of the matching criteria among cases and controls (frequency-matching procedure). Following informed consent, controls responded to a similar online auto-questionnaire. The exposures of interest were investigated in the 10 (or 7) days preceding the questionnaire completion.

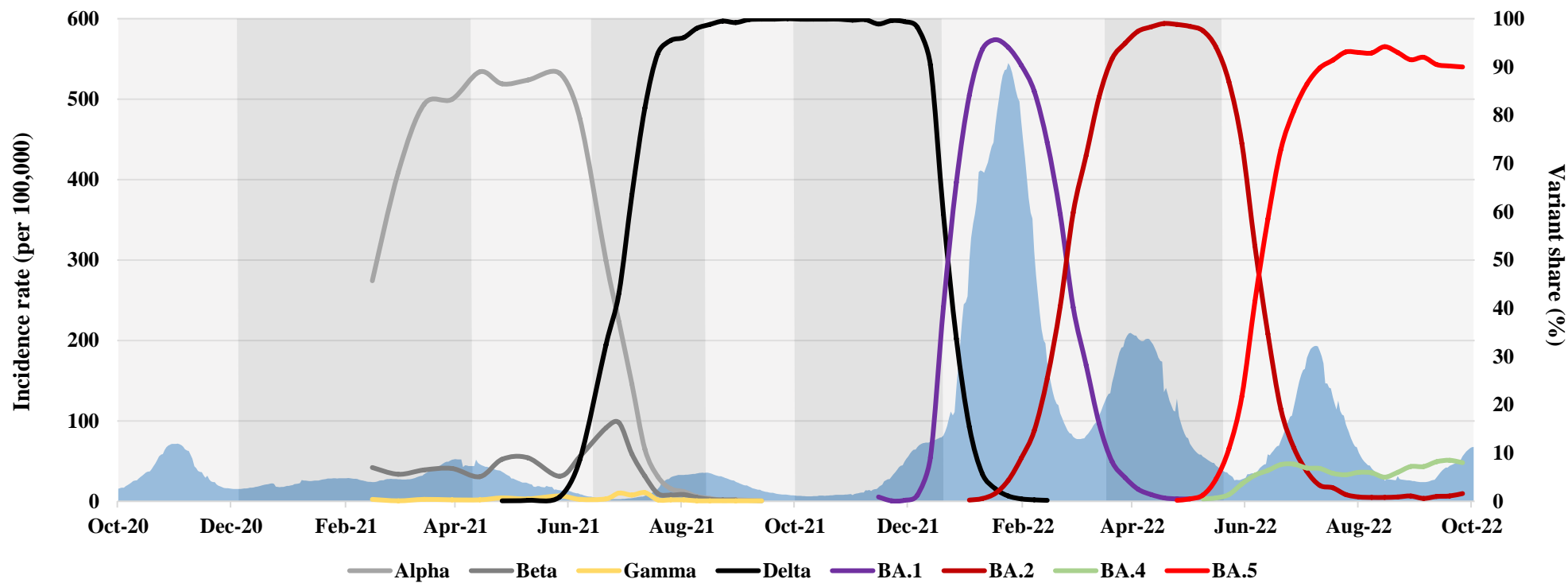
Non-inclusion criteria were guardianship or conservatorship status, previous participation for cases (at any time, in the previous two months from 6 January 2022 onward), and past infection for controls, until February 2021 when eligibility was extended to all adults without ongoing SARS-CoV-2 infection, as evidence pointed to a waning protection against reinfection.

The questionnaire lasted approximately 20 to 30 minutes for cases and controls (slightly longer for cases to include questions about the circumstances of transmission). The questionnaire was regularly modified as new research questions emerged to include for instance

the vaccine status, the variant responsible for the infection, or the use of self-tests in the days preceding participation.

To study the evolution of the risk associated with the exposures of interest over the course of the study, we divided the study period into nine shorter periods, based on incidence, important non-pharmaceutical interventions, and the circulating strain (Figure 1). We added a five- or four-day delay (depending on the predominant strain) between important shifts and the start of the new period to account for the incubation period. Period 1 began on 1 October 2020 and covered the second wave (historical D614G strain) and the second stay-at-home orders (start on 30 October 2020, less stringent than the first stay-at-home orders). Period 2 began on 4 December 2020 and covered the third wave (alpha variant) and curfew restrictions. Period 3 began on 9 April 2021 and covered the receding alpha wave and the third lockdown (less stringent than the previous two). Period 4 began on 14 June 2021 and covered the fourth wave and the emergence of the delta variant. Period 5 began on 14 August 2021 after implementation of the sanitary pass and covered the receding fourth wave (delta variant). Period 6 began on 2 October 2021 and covered the start of the fifth wave (delta variant). Period 7 began on 20 December 2021 and covered the fifth wave, during which the omicron variant (BA.1 subvariant) predominated. Period 8 began on 18 March 2022 (following the lifting of the mask mandate in most indoor spaces) and covered the omicron BA.2 wave. Period 9 began on 19 May 2022 (following the lifting of the mask mandate in public transport) and covered the omicron BA.4/BA.5 wave, extending to the end of the study period on 2 October 2022.

**Figure 1: SARS-CoV-2 daily incidence rate, proportions of the main circulating SARS-CoV-2 strains, division of the study period in 9 shorter periods, and main non-pharmaceutical interventions in France during the study period (October 2020 – October 2022)**



Period	1	2	3	4	5	6	7	8	9
<b>Onset date</b>	10/01/20	12/04/20	04/09/21	06/14/21	08/14/21	10/02/21	12/20/21	03/18/22	05/19/22
<b>Main non-pharmaceutical interventions</b>	Stay-at-home <sup>a</sup>	Curfew	Stay-at-home	-	Sanitary pass <sup>b</sup>	Sanitary pass <sup>b</sup>	Sanitary / Vaccine pass <sup>b</sup>	-	-
<b>Mask mandate</b>		In most public or private spaces open to the public						Lifted in indoor spaces	Lifted in public transport

## Thesis outline

In the present work, we aimed to further assess the settings of transmission of SARS-CoV-2 in mainland France by exploring the following aspects:

1. How did the settings of transmission evolve through the pandemic? During this two-year study, we observed changing restrictions, an increasing vaccine coverage, changes in circulating variants with varying infectiousness. These changes might have affected the settings at risk of transmission. We relied both on the case-control and the case series approaches for this question.

**Paper 1:** Risk of SARS-CoV-2 infection in professional settings, shops, shared transport, and leisure activities in France, 2020-2022. Galmiche et al., under peer-review.

**Paper 2:** Source of SARS-CoV-2 infection: results from a series of 584,846 cases in France from October 2020 to August 2022. Rakover et al., *BMC Public Health*, 2024.

2. How did the risk of household transmission from children to other household members evolve through the pandemic? We relied both on the case-control analysis to determine odds ratios of infection for those living with a child, and on the case series approach to estimate the evolution of the proportion of cases reporting a child from their household as the source case.

**Paper 3:** Risk of SARS-CoV-2 infection among households with children in France, 2020-2022. Galmiche et al., *JAMA Network Open*, 2023.

3. How could isolation mitigate the risk of transmission from children to adults within the household? We described the circumstances of household transmission using a case series approach. We included uninfected relatives from the same household and compared isolation from the same infected child between two adults, one with and one without ongoing infection.

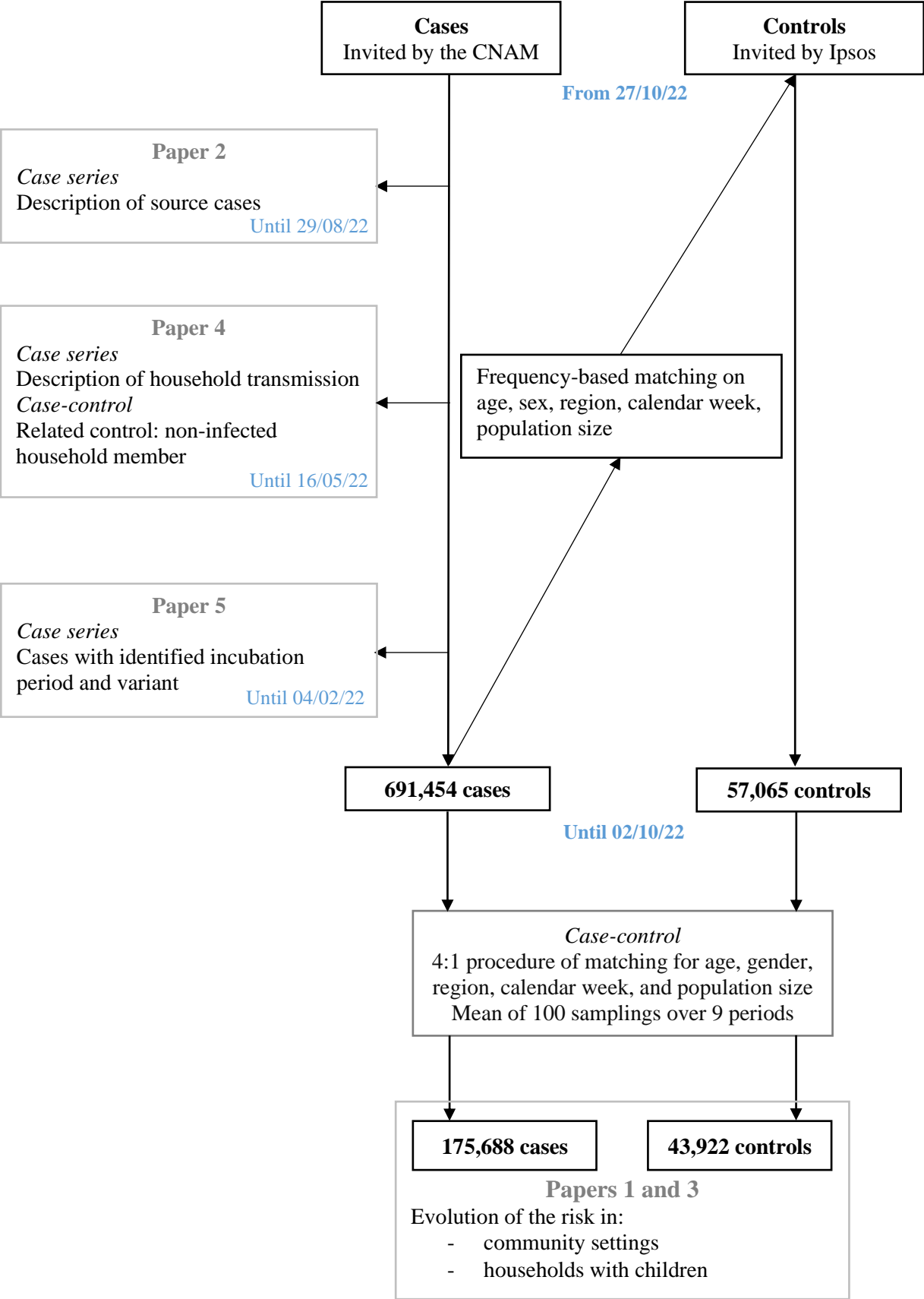
**Paper 4:** Reduction of SARS-CoV-2 intra-household child-to-parent transmission associated with ventilation: results from a case-control study. Galmiche et al., *BMC Public Health*, 2023.

4. We leveraged this cases series to study the incubation period of SARS-CoV-2 infection, which we determined in cases who reported a unique contact with an identified source case, and for whom the SARS-CoV-2 variant could be identified. We investigated how the incubation period was affected by the variant, the circumstances of infection, and individual characteristics.

**Paper 5:** SARS-CoV-2 incubation period across variants of concern, individual factors, and circumstances of infection in France: a case series analysis from the ComCor study. Galmiche et al., *Lancet Microbe*, 2023.

The Figure 2 summarizes the main goals, the analysis approaches, and the study periods of these various works.

**Figure 2: Study design, analyses, and time periods for the five papers of the thesis**



## **Risk of SARS-CoV-2 infection in professional settings, shops, shared transport, and leisure activities in France, 2020-2022**

In a first paper, we aimed to assess the evolution of the community settings at risk of transmission relying on the case-control approach. We hypothesized that settings associated with the risk of infection changed through the course of the study due to several important evolutions.

First, non-pharmaceutical interventions were repeatedly and markedly modified during the study. The study began in October 2020, before stay-at-home orders were issued, followed by a long period of curfew and other stay-at-home orders issued in the spring of 2021. Most restrictions were relaxed in the late spring and summer of 2021. Some community settings were closed altogether for entire stretches of the study: bars and restaurants for instance were closed from late October 2020 until the gradual reopening in May-June 2021. These policies affected the settings in which people were likely to interact, potentially resulting in changes in settings at risk.

Furthermore, the successive emergence of three variants through the course of the study might have impacted the community settings of transmission. The Alpha, Delta, and Omicron variants all presented increased transmissibility compared with the strain circulating previously (64,229,230). We could hypothesize that increased transmissibility led to increased risk in settings that were previously not associated with the risk of infection. On the other hand, one could assume that highly transmissible variants affected a wider population, making the risk more similar between those who visited settings previously at risk and those who kept avoiding them.

Finally, the roll-out of COVID-19 vaccines started in the elderly and most fragile in the last days of 2020 in France before progressively reaching other age groups until all people aged 18 and above became eligible in late May 2021. The sanitary pass was implemented in the summer of 2021, limiting access to a series of community settings to people with a complete vaccine series, a negative SARS-CoV-2 test or a proof of recent and resolved infection. The pass aimed to increase vaccine coverage. Another potential benefit was to reduce the risk of



transmission in the targeted settings, following findings that vaccine-induced immunity substantially reduced the risk of infection when exposed (231) and the risk of onwards transmission when infected (232,233). Our findings might also be affected by the waning of vaccine immunity soon reported after the emergence of the Delta variant, affecting both the protection against infection (234) and against onwards transmission (232,235).

This work is presented in the following paper, which is currently undergoing peer review.

*Paper under peer review*

**Risk of SARS-CoV-2 infection in professional settings, shops, shared transport, and leisure activities in France, 2020-2022**

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## **Abstract**

**Purpose:** The aim of the study was to identify settings associated with SARS-CoV-2 transmission throughout the COVID-19 pandemic in France.

**Methods:** Cases with recent SARS-CoV-2 infection were matched with controls (4:1 ratio) on age, sex, region, population size, and calendar week. Odds ratios for SARS-CoV-2 infection were estimated for nine periods in models adjusting for socio-demographic characteristics, health status, COVID-19 vaccine, and past infection.

**Results:** Between October 27, 2020 and October 2, 2022, 175,688 cases were matched with 43,922 controls. An increased risk of infection was documented throughout the study for open-space offices compared to offices without open space (OR range across the nine periods: 1.12 to 1.57) and long-distance trains (1.25 to 1.88), and during most of the study for convenience stores (OR range in the periods with increased risk: 1.15 to 1.44), take-away delivery (1.07 to 1.28), car-pooling with relatives (1.09 to 1.68), taxis (1.08 to 1.89), airplanes (1.20 to 1.78), concerts (1.31 to 2.09) and night-clubs (1.45 to 2.95). No increase in transmission was associated with short-distance shared transport, car-pooling booked over platforms, markets, supermarkets and malls, hairdressers, museums, movie theatres, outdoor sports, and swimming pools. The increased risk of infection in bars and restaurants was no longer present in restaurants after reopening in June 2021. It persisted in bars only among those aged under 40 years.

**Conclusion:** Closed settings in which people are less likely to wear masks were most affected by SARS-CoV-2 transmission and should be the focus of air quality improvement.

## **Introduction**

Identifying settings where transmission of SARS-CoV-2 occurs and quantifying their respective contribution has been central to advise evidence-based mitigation strategies such as social distancing policy, testing practices, contact tracing, and information to the public (236). As the impact of the pandemic recedes in most countries, knowledge on the settings of transmission can help guide improvement in air quality and individual protection approaches, particularly for elderly or immunocompromised people. Furthermore, drawing all available information from the SARS-CoV-2 pandemic is essential to preparedness efforts: in case of emergence of a new respiratory virus, knowledge derived from SARS-CoV-2 will support a timely and evidence-based public health response.

Throughout the pandemic, numerous factors potentially affecting where SARS-CoV-2 transmission may occur have undergone significant changes, including non-pharmaceutical interventions, vaccine coverage, or the circulating strain.

Several study designs have been used to address this question. Outbreak reports have generated crucial early evidence, particularly in settings with low community transmission, allowing accurate contact tracing (151,155,237–239). Other studies have aimed to screen all contacts of a series of cases and identify in which settings contacts were more likely to result in transmission (32,33). These designs often require the correct identification of contacts, which can be difficult for SARS-CoV-2 in case of long-distance airborne transmission (35) or superspreading event: a study in Hong Kong reported that approximately 20% of cases were responsible for 80% of secondary cases (36). It is especially challenging in locations where unrelated people interact closely, for instance in public transport. Other studies have estimated the risk or odds ratios of infection associated with different settings, through cross-sectional seroprevalence estimates (40–42) or case-control designs (43–46).

While many studies have identified the risk associated with venues such as bars, night-clubs, or public transport, none have provided a long-term outlook to assess potential changes through the pandemic. In the present study, which was conducted over a two-year period, we used a case-control design to identify settings associated with the risk of SARS-CoV-2 infection in France and assess how these evolved through the pandemic.

## Methods

We conducted an online case-control study in mainland France. The methods of the study have been reported before (65,66,240). We included cases aged 18 and above with recently diagnosed SARS-CoV-2 infection reported in a national information system: all cases diagnosed through RT-PCR or rapid antigen tests were centralized by the national health insurance system (*Caisse nationale d'assurance maladie*, CNAM). The CNAM sent email invitations to cases identified within the past week who had previously provided their email address (approximately 55% of all people affiliated with the CNAM, who represent about 89% of the population of mainland France). After providing consent, participants completed an online questionnaire about sociodemographic information, health status, household description, and recent exposures of interest. The questions focused on the 10 days preceding the onset of the symptoms (or testing if asymptomatic). This period was reduced to 7 days after the emergence of the omicron variant given its shorter incubation period (241). Following the participation of the cases, controls were enrolled by Ipsos, a market and opinion research company, and matched with cases using a frequency-matched procedure. Matching criteria were age (18-29, 30-54,  $\geq 55$  years old), sex (male or female as self-reported), region (largest administrative subnational division), and size of population in the area of residence.

We did not include potential cases and controls who were under a legal status of curatorship or guardianship at the time of participation. Until February 2021, we included only controls without a past episode of SARS-CoV-2 infection. Eligibility for controls was then extended to people without ongoing SARS-CoV-2 infection. We excluded cases and controls reporting an episode of SARS-CoV-2 infection in the past two months (other than the one leading to their participation for cases). To limit recall errors, we excluded cases who filled the questionnaire over 30 days after the onset of symptoms (or testing if asymptomatic).

To study the evolution of the risk associated with the exposures of interest over the course of the study, we divided the study period into nine shorter periods, based on incidence, important non-pharmaceutical interventions, and the circulating strain (see supplementary methods for further description of periods and non-pharmaceutical interventions throughout the study).

### *Statistical analysis*

For a better matching of controls with cases on the timing of exposure, considering that controls were initially included after the screening of cases, we proceeded to an exact matching procedure of four cases for one control on the calendar week of the outcome date (symptom onset or testing if asymptomatic for cases, questionnaire completion for controls). To account for the random selection of cases in the matching procedure, as those outnumbered controls

more than four times, we generated 100 databases of series of four cases matched with one control for each period.

We fitted logistic regression models to estimate the odds ratios of SARS-CoV-2 infection for the exposures of interest in a model including the matching variables, as well as health-related variables, including COVID-19 vaccine status, past SARS-CoV-2 infection, and sociodemographic characteristics. The choice of the adjusting variables was guided by subject matter knowledge to include all measured causes of the exposures, the outcome (SARS-CoV-2 infection), or both, relying on the disjunctive cause criterion (242). The exposures of interest were included as follows: workplace (work in an office, open-space arrangement, complete or partial remote office), gatherings (professional, private, or religious), retail settings (shops, hairdresser, beauty salon), shared transport (short-distance or long-distance transport, car-pooling), and leisure activities (cultural venues, sports facilities, bars, restaurants, parties, divided into night-clubs or private parties from period 5 onward). No estimate was produced for bars, restaurants, indoor sports facilities, and cultural venues for periods 2 and 3 as they were mostly closed then (odds ratios were estimated for the first period thanks to the inclusion of participants before the start of the stay-at-home orders).

These models were fitted for each of the 100 databases per period. We extracted the coefficients, exponentiated them and retained the median for the point estimate and the 2.5<sup>th</sup> and 97.5<sup>th</sup> percentiles for the 95% confidence interval. In complementary models, we explored potential interactions of bars, restaurants, and parties with age categorized as <40 or ≥40 years (*p*-value for interaction estimated with the median of the 100 estimates). To investigate how viral circulation in the country of destination could affect the risk associated with airplane travel, we calculated the mean daily incidence rate obtained from Ourworldindata.org in the country of destination over period 4 (summer of 2021, emergence of the delta variant) (243).

All statistical analyses were performed using Stata 16.0 (StataCorp, College Station, USA). (See supplementary methods for further description of statistical analysis.)

#### *Ethics approval*

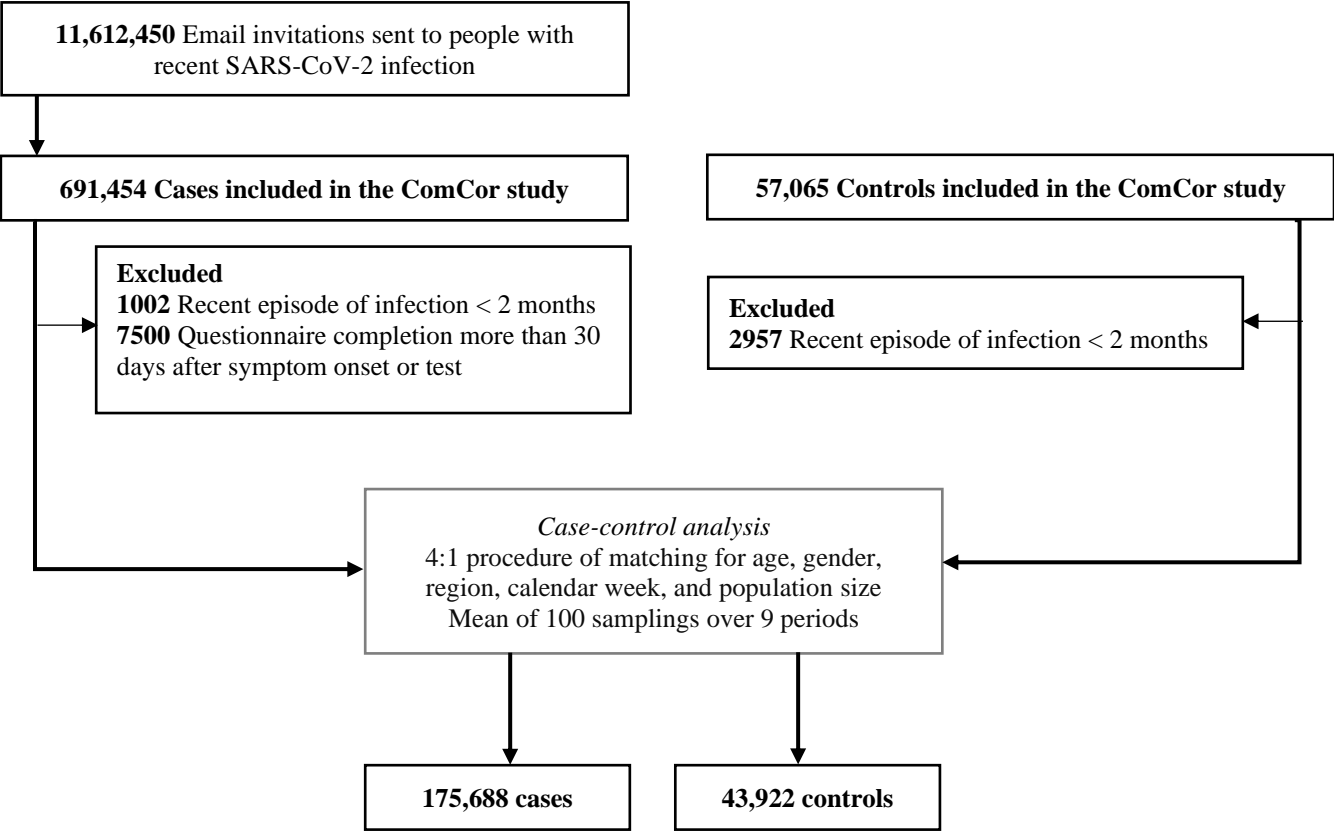
This study received ethics approval from the ethics committee *Comité de Protection des Personnes Sud Ouest et Outre Mer 1* on September 21, 2020 as required by French regulation on clinical research. The data protection authority, the *Commission Nationale de l'Informatique et des Libertés* (CNIL) authorized the processing of data on October 21, 2020. Informed consent was obtained from all participants.

## **Results**

From October 27, 2020 to October 2, 2022, we sent 11,612,450 email invitations to people with recent SARS-CoV-2 infection, and included 691,454 cases (6.0%) and 57,065 controls. After exclusion of participants with a reported episode of infection in the past two months and cases who responded to the questionnaire over 30 days after symptom onset, and matching of four cases for one control, we included 175,688 cases and 43,922 controls (Figure 1). The main socio-demographic and health status characteristics are summarized in table 1. The study population was characterized by a lower proportion of men (33.8% vs 47.6% in the general population aged 20 and over in France), a higher representation of people aged between 40 and 49 years (26.8% vs 16.7%) and of residents of the Ile-de-France region (where Paris is located) (22.7% vs 18.3%).

**Figure 1. Flow chart of participant enrollment and matching of cases and controls**

Legend: Study conducted in mainland France between October 2020 and October 2022.





**Table 1: Socio-demographic description of the study population (case-control study in mainland France, October 2020 to October 2022)**

	Cases, n (%)	Controls, n (%)	<i>p</i> -value
<b>Total</b>	<b>175688</b>	<b>43922</b>	
Male sex	59380 (33.8)	14845 (33.8)	>0.99
Age (years)			
18-29	21244 (12.1)	5311 (12.1)	>0.99
30-39	31888 (18.2)	7972 (18.2)	
40-49	47032 (26.8)	11758 (26.8)	
50-59	37960 (21.6)	9490 (21.6)	
60-69	24796 (14.1)	6199 (14.1)	
≥ 70	12768 (7.3)	3192 (7.3)	
Population in the area of residence			
<5000 inhabitants	44828 (25.5)	11207 (25.5)	>0.99
5000 – 19,999 inhabitants	13984 (8.0)	3496 (8.0)	
20,000 – 99,999 inhabitants	17800 (10.1)	4450 (10.1)	
Over 100,000 inhabitants	61956 (35.3)	15489 (35.3)	
Greater Paris area	37120 (21.1)	9280 (21.1)	
Region of residence			
Ile-de-France	39848 (22.7)	9962 (22.7)	>0.99
Auvergne-Rhône-Alpes	23384 (13.3)	5846 (13.3)	
Occitanie	17860 (10.2)	4465 (10.2)	
Provence-Alpes-Côte d'Azur and Corsica	15788 (9.0)	3947 (9.0)	
Grand Est	15336 (8.7)	3834 (8.7)	
Nouvelle-Aquitaine	15132 (8.6)	3783 (8.6)	
Hauts-de-France	14800 (8.4)	3700 (8.4)	
Pays de la Loire	8580 (4.9)	2145 (4.9)	
Bretagne	8324 (4.7)	2081 (4.7)	
Normandie	6124 (3.5)	1531 (3.5)	
Bourgogne-Franche-Comté	5876 (3.3)	1469 (3.3)	
Centre-Val de Loire	4636 (2.6)	1159 (2.6)	
Education level			
No diploma	3682 (2.1)	767 (1.7)	<0.001
Pre-high school diploma	25995 (14.8)	7722 (17.6)	
High-school diploma	31741 (18.1)	10559 (24.0)	
Bachelor's degree	62909 (35.8)	16340 (37.2)	
Master's degree or higher	45149 (25.7)	7056 (16.1)	
Missing	6212 (3.5)	1478 (3.4)	
Health conditions			
Diabetes mellitus	6157 (3.5)	2304 (5.2)	<0.001
Hypertension	20476 (11.7)	5773 (13.1)	<0.001
Chronic respiratory disease	14650 (8.3)	3132 (7.1)	<0.001
Coronary artery disease	2114 (1.2)	431 (1.0)	<0.001
Body-mass index (kg/m <sup>2</sup> )			
Healthy weight (≥18.5 & <25)	89392 (50.9)	20909 (47.6)	<0.001

Underweight (<18.5)	5409 (3.1)	1880 (4.3)	
Overweight ( $\geq 25$ & <30)	52824 (30.1)	13111 (29.9)	
Obesity ( $\geq 30$ )	28061 (16.0)	8023 (18.3)	
Housing			
Individual house	106786 (60.8)	25775 (58.7)	<0.001
Apartment	68223 (38.8)	18004 (41)	
Shelter	585 (0.3)	118 (0.3)	
Nursing home	92 (0.1)	25 (0.1)	
Living with a child			
Attending daycare	4946 (2.8)	928 (2.1)	<0.001
Attended for by a professional in-home caregiver	5772 (3.3)	904 (2.1)	<0.001
Attending preschool	16467 (9.4)	3327 (7.6)	<0.001
Attending primary school	29027 (16.5)	6185 (14.1)	<0.001
Attending middle school	26795 (15.3)	6183 (14.1)	<0.001
Attending high school	21990 (12.5)	5447 (12.4)	0.54
Attending university	14711 (8.4)	4075 (9.3)	<0.001
Past SARS-CoV-2 infection			
No past infection	165798 (94.4)	37376 (85.1)	<0.001
Past infection 61-180 days	8085 (4.8)	2968 (7.1)	
Past infection >180 days	1805 (1.1)	3578 (8.5)	
COVID-19 vaccine, time since last dose			
Unvaccinated	49989 (28.5)	13503 (30.7)	<0.001
1 dose, <90 days	3288 (2.0)	870 (2.1)	
1 dose, 90-179 days	552 (0.4)	260 (0.7)	
1 dose, >179 days	615 (0.4)	264 (0.8)	
2 doses, <90 days	7301 (4.9)	3024 (8.1)	
2 doses, 90-179 days	13718 (9.2)	3150 (8.5)	
2 doses, >179 days	7254 (5.2)	2092 (6.0)	
3 doses, <90 days	26324 (17.7)	6794 (18.3)	
3 doses, 90-179 days	40047 (32.4)	6810 (22.0)	
3 doses, >179 days	16697 (13.5)	2925 (9.5)	
4 doses, <90 days	2728 (2.4)	560 (2.0)	
Missing date of last dose	7162 (4.8)	3669 (9.9)	
Study period (onset date)			
1 (10/01/2020)	7308 (4.2)	1827 (4.2)	
2 (12/04/2020)	19636 (11.2)	4909 (11.2)	
3 (04/09/2021)	9008 (5.1)	2252 (5.1)	
4 (06/14/2021)	11264 (6.4)	2816 (6.4)	
5 (08/14/2021)	4820 (2.7)	1205 (2.7)	
6 (10/02/2021)	11248 (6.4)	2812 (6.4)	
7 (12/20/2021)	44136 (25.1)	11034 (25.1)	
8 (03/18/2022)	39652 (22.6)	9913 (22.6)	
9 (05/20/2022) (end date: 10/02/2022)	28616 (16.3)	7154 (16.3)	

We identified several settings associated with an increased risk of infection, including professional settings, shops, shared transport, and leisure activities (figure 2, eTables 1-3).

Regarding the workplace, we found a consistently increased risk associated with working in an open-space office compared with a non-open-space office environment (OR range through the nine periods of the study: 1.12 to 1.57). Remote office was associated with a decreased risk of infection when done only partially in the preceding days (0.72 to 0.90), but often not when the few days spent at the workplace were in an open-space environment (0.72 to 1.09). The risk varied through the study for people reporting working fully remotely, with an OR ranging between 0.67 and 1.64 depending on the period.

The visit of shops was overall not associated with any increased risk of infection. The only exceptions are convenience stores and take-away deliveries for which the risk remained increased through most of the study (periods 4 to 9, OR range: 1.15 to 1.44, and 1.07 to 1.28, respectively). Notably, we found no increased risk in retail facilities involving closer and longer contacts such as hairdressers or beauty salons.

Analyses on shared transport show that most short-distance transport such as buses, tramways or short-distance trains did not increase the risk of infection, except for the metro in which the risk was regularly moderately increased (periods 3, and 7 to 9, OR range: 1.07 to 1.19). On the other hand, long-distance trains and airplanes were associated with a notably increased risk, consistently for train (1.25 to 1.88) and for most of the study for airplanes (periods 2 to 6, and 9, OR range: 1.20 to 1.78). The models were adjusted on abroad travel, suggesting that the effect for airplane was not mediated through visit to a high-incidence country. In a sensitivity analysis, the risk for airplane travel remained increased after adjustment on the mean incidence in the country of destination (period 4: OR 1.58, 95% CI 1.41-1.78, compared with OR 1.67, 95% CI 1.52-1.88 without adjustment). Car travels also appeared to favor transmission in certain circumstances, with increased risks for taxi rides throughout the study in the periods when they were investigated (periods 3 to 9, OR range: 1.08 to 1.89), as well as for car-pooling, but only when traveling with relatives (periods 4 to 9, OR range: 1.09 to 1.68), not when the car-pooling was organized with unrelated persons through a dedicated platform (periods 4 to 9, OR range: 0.45 to 0.59).

Of all the cultural and sports facilities we investigated, we found an increased risk mainly for the attendance of concerts (periods 5 to 9, OR range: 1.31 to 2.09), and less consistently for theatres (periods 6, 7, and 9, OR range: 1.20 to 1.45) and the practice of sports indoors (periods

1, 5, and 7, OR range: 1.11 to 1.23). We found no increased risk associated with other settings such as museums, movie theatres, swimming pools, or martial arts facilities.

We initially identified an increased risk associated with bars and restaurants (as the questionnaire did not distinguish them at first): period 1, OR 1.97 (95% CI 1.84-2.07). As bars and restaurants reopened in the spring of 2021, we found an increased risk for bars (OR 1.57, 95% CI 1.50-1.64) but not for restaurants (OR 0.95, 95% CI 0.89-0.99). The risk gradually decreased afterward for bars, and they were no longer at risk from October 2021 (period 6) onward. However, there were significant interactions of bars with age categorized as under 40 years or 40 and above, with a persistently increased risk in those aged under 40 until the first omicron BA.1 wave (periods 4 to 7, OR range: 1.23 to 2.17) (eTables 5-6). Attending parties was initially consistently associated with an increased risk, particularly in those aged under 40 (periods 1 to 4, OR range: 1.33 to 3.24) (eTables 4-5). When we could distinguish private parties from parties in night-clubs, as those reopened in the summer of 2021, we found no increased risk for private parties (no interaction with age, eTables 5-6). In contrast, the risk was high for night-clubs (e.g., in period 6, OR 2.95, 95% CI 2.64-3.28). It decreased gradually through the various omicron waves in 2022 but remained increased in the last period of the study (omicron BA.4/5 wave, OR 1.54, 95% CI 1.41-1.66), regardless of the age category (eTables 5-6).

Period	1	2	3	4	5	6	7	8	9	
<b>Onset date</b>	10/01/2020	12/04/2020	04/09/2021	06/14/2021	08/14/2021	10/02/2021	12/20/2021	03/18/2022	05/19/2022	
<b>Main non-pharmaceutical interventions</b>	Stay-at-home <sup>a</sup>	Curfew	Stay-at-home	-	Sanitary pass <sup>b</sup>	Sanitary pass <sup>b</sup>	Sanitary / Vaccine pass <sup>b</sup>	-	-	
<b>Predominant strain(s)</b>	Historical	Historical – Alpha	Alpha	Alpha – Delta	Delta	Delta	Omicron BA.1	Omicron BA.2	Omicron BA.5	
<b>Mask mandates</b>	In most public or private spaces open to the public							Lifted in most indoor spaces	Lifted in public transport	
	<b>Adjusted odds ratio</b>									<b>Mean proportion in controls (%)</b>
<b>Workplace</b>										
No remote office, no open space	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	10.9
No remote office, open space	1.33	1.12	1.36	1.57	1.47	1.26	1.19	1.23	1.33	5.7
Partial remote office, no open space	0.77	0.86	0.76	0.76	0.72	0.77	0.90	0.86	0.86	7.4
Partial remote office, open space	0.89	0.72	0.74	1.01	0.85	1.09	1.00	0.98	0.95	6.9
Complete remote office	0.67	0.95	0.84	1.15	1.64	1.01	1.15	1.00	1.00	5.3
Working in a non-office setting	0.97	1.04	0.9	1.07	1.19	1.18	1.31	1.19	1.35	27.3
Not working	0.60	0.70	0.83	1.59	1.86	1.52	0.85	0.58	0.84	30.6
On leave during period of interest							1.82	1.18	1.58	9.2
<b>Gatherings</b>										
Professional meeting	1.14	1.01	0.96	0.88	0.94	1.25	1.14	1.11	1.31	23.5
Private meeting	1.75	0.91	0.84	0.78	0.66	0.87	0.93	0.82	0.82	48.7
Religious gathering	1.01	1.00	1.00	0.90	0.74	1.16	1.05	0.94	0.96	4.2
<b>Retail, shops</b>										
Any shop	0.84	0.56	-	-	-	-	-	-	-	80.9
Mall	-	-	0.66	0.77	0.73	0.72	0.68	0.72	0.79	23.4
Market	-	-	0.84	0.91	0.91	0.9	0.85	0.88	0.97	14.0
Convenience store	-	-	0.92	1.23	1.25	1.44	1.18	1.15	1.17	35.0
Supermarket	-	-	0.57	0.52	0.54	0.58	0.59	0.57	0.66	63.3
Other shop	-	-	0.62	0.51	0.72	0.61	0.66	0.71	0.88	4.7
Beauty salon	-	-	<i>closed</i>	1.12	0.84	0.69	0.77	0.72	0.80	6.1
Hairdresser	-	-	0.52	0.61	0.56	0.61	0.57	0.64	0.56	13.7

Period	1	2	3	4	5	6	7	8	9	
Onset date	10/01/2020	12/04/2020	04/09/2021	06/14/2021	08/14/2021	10/02/2021	12/20/2021	03/18/2022	05/19/2022	
Take-away delivery	-	-	0.97	1.07	1.19	1.13	1.11	1.12	1.28	30.5
Home delivery	-	-	1.13	1.01	0.99	0.82	0.91	0.85	0.80	16.3
<b>Shared transport</b>										
Metro	0.92	1.00	1.19	1.02	1.07	1.07	1.07	1.16	1.15	13.3
Tram	0.72	0.77	0.88	0.72	0.71	0.68	0.87	0.84	0.84	8.0
Short-distance bus	0.65	0.65	0.63	0.75	0.58	0.61	0.80	0.79	0.85	15.0
Short-distance train	0.91	0.64	0.46	0.6	0.98	0.94	0.91	0.85	0.91	6.8
Airplane travel	0.69	1.78	1.35	1.67	1.20	1.44	1.07	1.00	1.53	2.5
Boat travel	0.58	0.83	0.98	0.90	1.80	0.61	1.50	1.20	1.40	0.3
Long-distance bus	1.23	0.64	0.70	0.72	1.18	0.88	1.29	1.25	1.20	1.5
Long-distance train	1.41	1.86	1.88	1.36	1.32	1.80	1.61	1.38	1.25	4.0
Car-pooling	1.47	1.74	1.06	-	-	-	-	-	-	10.3
Car-pooling with relatives	-	-	-	1.27	1.19	1.68	1.10	1.09	1.18	21.0
Car-pooling booked over platform	-	-	-	0.48	0.48	0.45	0.49	0.59	0.45	2.0
Taxi	-	-	1.29	1.54	1.89	1.22	1.14	1.11	1.08	4.4
<b>Leisure activities</b>										
Any cultural venue	0.94	<i>closed</i>	<i>closed</i>	-	-	-	-	-	-	1.7
Movie theatre	-	<i>closed</i>	<i>closed</i>	0.66	0.66	0.71	0.66	0.67	0.53	9.4
Concert	-	<i>closed</i>	<i>closed</i>	0.85	1.51	1.31	2.09	1.68	1.45	2.1
Museum	-	<i>closed</i>	<i>closed</i>	0.59	0.61	0.87	0.91	1.13	0.95	2.8
Theatre	-	<i>closed</i>	<i>closed</i>	0.85	1.03	1.45	1.20	1.04	1.25	2.0
Indoor sports practice	1.23	<i>closed</i>	<i>closed</i>	1.08	1.2	1.05	1.11	1.02	0.86	7.0
Swimming pool	0.87	<i>closed</i>	<i>closed</i>	0.76	0.84	0.84	0.82	0.97	0.97	5.8
Indoor martial arts facility	-	<i>closed</i>	<i>closed</i>	0.42	0.44	0.85	0.93	1.01	0.58	1.3
Indoor gymnastics facility	-	<i>closed</i>	<i>closed</i>	0.92	0.71	0.84	0.92	0.97	0.59	3.8
Outdoor sports practice	-	-	0.72	0.75	0.78	0.68	0.77	0.72	0.71	28.0
Bar or restaurant <sup>c</sup>	1.97	-	-	-	-	-	-	-	-	15.7
Bar	-	<i>closed</i>	<i>closed</i>	1.57	1.28	1.04	1.00	0.84	0.89	14.6
Restaurant	-	<i>closed</i>	<i>closed</i>	0.95	0.93	0.88	0.95	0.93	0.85	33.0
Party	1.15	1.66	1.84	2.66	-	-	-	-	-	2.7

Period	1	2	3	4	5	6	7	8	9	
Onset date	10/01/2020	12/04/2020	04/09/2021	06/14/2021	08/14/2021	10/02/2021	12/20/2021	03/18/2022	05/19/2022	
Night-club	-	<i>closed</i>	<i>closed</i>	-	2.34	2.95	1.72	1.45	1.54	2.3
Private party	-	-	-	-	0.65	0.82	0.87	0.75	0.65	13.5



Legend: The study period was divided in nine shorter study periods based on incidence, the circulating strains (two strains are indicated when the period includes the rise of a new strain), and the main non-pharmaceutical interventions. The colors of the cells refer to 95% confidence intervals' width: in shades of blue if the upper bound of the 95% CI is < 1, in shades of red if the lower bound of the 95% CI is > 1. Cells are uncolored if the 95% confidence interval includes 1. The empty cells reflect the modifications of the questionnaire through the course of the study. Cases and controls were matched with a 4:1 ratio on sex (female or male), age (in 10-year-age categories), region, size of population of the area of residence, and week of exposure. To account for random selection of cases as those outnumbered controls more than four times, we generated 100 databases for each period with matched sets of 4 cases per control. The odds ratios were estimated in multivariable logistic regression models for each of the periods, adjusting for all the variables shown in the figure as well as the matching variables, household characteristics (number of people in the household, presence of children, type of housing), professional category, health status (body-mass index, smoking status, hypertension, diabetes mellitus, chronic respiratory disease, coronary artery disease, immunosuppression), past episode of infection (categorized as 61-180 days prior or >180 days prior), and COVID-19 vaccine status (number of doses and time since last dose divided in < 90 days, 90-179 days, ≥ 180 days). The odds ratio and the 95% confidence intervals estimates were inferred through the 50<sup>th</sup>, 2.5<sup>th</sup>, and 97.5<sup>th</sup> percentiles of the 100 estimates for each period. All variables shown here are dummy variables except for one combined variable regarding the workplace.

- A: The stay-at-home orders started on 10/30/2020; bars, restaurants, night-clubs, non-essential shops, and cultural venues were then closed.
- B: The sanitary pass was a proof of vaccine, past infection, or a recent negative test to enter a series of public spaces; the vaccine pass was implemented on 01/24/2022 to include only proofs of vaccine or past infection.
- C: Estimated in people exposed before the start of the stay-at-home orders on 10/30/2020.

## **Discussion**

This case-control study provides a long-term perspective on the settings most associated with the risk of SARS-CoV-2 infection in mainland France between October 2020 and October 2022. We identified increased risks for on-site office work, particularly in open space environments, professional meetings, concerts, theatres, long-distance public transit, as well as bars and night-clubs. On the other hand, we found no increased risk for most sports and cultural activities, religious gatherings, shops, and short-distance public transport.

All settings associated with an increased risk of infection in our study are characterized by varying degrees of common characteristics: mostly indoor settings with little air renewal, where contacts are close, numerous, often maskless, sometimes including singing or shouting, and usually last more than a mere few minutes. These factors are in line with knowledge on the conditions allowing transmission of SARS-CoV-2, through direct contact, large droplets, or fine aerosols (13,35), often indoors (118). Our findings, along with existing evidence on airborne transmission, stress the need to assess the feasibility and effectiveness of indoor air quality improvement strategies.

Apart from bars, restaurants, and night-clubs for which the risk decreased through the course of the study, the associations remained overall relatively stable. Following the implementation of the sanitary pass in most indoor places and long-distance transport in August 2021 (period 5 onwards), we observed a slight decrease in the risk associated with airplane travel, long-distance train, and bars, suggesting the sanitary pass contributed to decrease the risk of transmission in those environments. The odds ratios increased again in period 6 (October 2 to December 19, 2021). While this increase must be interpreted with caution given its limited amplitude, it may also result from a rapidly waning vaccine effectiveness on SARS-CoV-2 transmission (244), as the majority of the adult population was vaccinated between June and August 2021. Other factors could explain the decrease of the risk for bars and restaurants: night-clubs were closed from March 2020 until July 2021, and people may have been more prone to attend parties with closer and longer interactions in bars and restaurants during that time than in the later periods. The interaction of parties and bars with age, with higher odds ratios observed for people aged under 40, suggests the role of behavioral patterns in those environments. The summer of 2021 was also characterized by an important football European competition, during which public viewing in bars was popular and likely contributed to viral circulation. Another hypothesis is that the transmission of the more contagious delta and omicron variants did not require as favorable conditions as the previous strains, leading to a less differentiated risk between people visiting these settings and people who avoided them.



Studies on the evolution of settings of transmission through the emergence of the various strains in other countries would help explore this hypothesis.

Findings of other studies on settings of transmission are overall consistent with ours. The decreased risk for people reporting working remotely was also shown in several other studies (45,51,83,86), whereas the role of open-space offices has been little studied (245). The fact that people working in open-space offices while also working partially remotely were not at lower risk of infection suggests that the benefit of remote office was offset by the increased risk in open-space offices. The varying results for complete remote office suggest residual confounding in our analysis; these people were possibly exposed to SARS-CoV-2 transmission in other settings that they were more likely to visit, or in the household, in ways that our models could not account for. The absence of increased risk for retail facilities, as well as hairdressers and beauty salons, also reported by others (43–46,51,87,95,96), suggests that these facilities had low enough density and stringent enough measures to effectively limit transmission. Findings on shared transport, often studied altogether without distinction of the duration of the trip, have yielded conflicting evidence (41,43,51,87,105,153). A contact-tracing study on air travel in Ireland has underlined the role of the duration of the flight, with secondary attack rates reaching 14.9% for flights lasting over 5 hours vs 6.3% for shorter ones (223). The contrast we found between short- and long-distance shared transport supports the importance of the duration spent onboard.

Consistent with several other studies, we found no increased risk for cultural venues, sports facilities, and religious gatherings, apart from a slightly increased risk in theaters, concerts, and indoor sports facilities (43,44,46,51,96,124). Findings on dining and partying venues often reported an increased risk for bars (43,44,46,51,106,108), night-clubs and parties (46,51,108), whereas findings are more conflicted for restaurants (44,49,51,87,96,106). In a case-control study in Denmark conducted in June 2021, Munch and colleagues found an increased risk for the attendance of restaurants or cafés only for people reporting alcohol consumption (96). This highlights the role of behaviors within those settings on the risk of transmission. Two randomized trials conducted in France found no increased risk of SARS-CoV-2 infection in participants of mass gatherings with strict requirements for attendance, one at a concert (246) and one in a nightclub (247). These experimentations offer clues for continuation of mass indoor gatherings in case of an emerging respiratory pathogen.

The main limitation of the present study lies in the low participation rate (6.0%). As in other studies conducted online, we observed notable differences between our study population and the source population: we included a more female population, often in intermediary age groups,

and with a higher education level (248,249). These demographic factors were included in our matching procedure or in the adjusted models, thus limiting the risk of recruitment bias. This does however decrease the generalizability of our findings. Furthermore, unexpected findings such as the intermittently increased risk associated with complete remote office or the decreased risk for supermarkets illustrate potential recruitment bias or residual confounding. These biases are difficult to avoid entirely in a case-control study. We chose this design nonetheless as it enabled us to modify the questionnaire whenever necessary (introducing questions on the vaccine status, variants, etc.). It provided results soon after the beginning of the study which helped evidence-based decision-making in a time of high burden of SARS-CoV-2 in France (65,66). Since the incubation period of COVID-19 only lasts a few days, there was little risk of recall bias, which is a frequent limitation of case-control studies. The consistency of the present findings with those of other studies using different designs, such as cross-sectional seroprevalence estimates or prospective cohorts, also supports the validity of our approach. Despite significant power, our study could not assess finer exposures or behaviors associated with certain settings. We cannot exclude for instance that the increased risk associated with train or air travel was caused by exposures at the train station or the airport, or that specific partying venues might have been safe provided they implemented distancing or testing practices.

Overall, this case-control study shows that the workplace, long-distance shared transport, and several leisure activities were likely settings of effective SARS-CoV-2 transmission during the pandemic in mainland France. These findings will help focusing efforts on improvement in air quality and inform pandemic preparedness strategies.

## **References**

The references for this paper are at the end of the manuscript grouped with the other references of the thesis.

## **Source of SARS-CoV-2 infection: results from a series of 584,846 cases in France from October 2020 to August 2022**

Beyond the case-control analysis that we presented in the previous paper, we also aimed to analyze the reported circumstances of transmission. Estimating the proportions of cases who reported a household in the household, in the workplace, or during a leisure activity for instance helps to compare the relative contributions of each of these environments. As for the previous work, we chose to divide the study period in nine shorter periods as we suspected that the circumstances of transmission might have changed through the course of the study.

We decided to exclude healthcare workers from this analysis. We considered that they were more susceptible to professional exposures, potentially leading to an overrepresentation of workplace transmissions if healthcare workers were more likely to participate than other workers. They were also potentially more likely exposed to multiple sources in the workplace, making the correct identification of the source case more challenging.

We present this work in the following paper. It was led by Arthur Rakover, a medical resident in public health, with whom I collaborated closely.

RESEARCH

Open Access



# Source of SARS-CoV-2 infection: results from a series of 584,846 cases in France from October 2020 to August 2022

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## Abstract

**Background** We aimed to study the source of infection for recently SARS-CoV-2-infected individuals from October 2020 to August 2022 in France.

**Methods** Participants from the nationwide ComCor case–control study who reported recent SARS-CoV-2 infection were asked to document the source and circumstances of their infection through an online questionnaire. Multivariable logistic regression was used to identify the factors associated with not identifying any source of infection.

**Results** Among 584,846 adults with a recent SARS-CoV-2 infection in France, 46.9% identified the source of infection and an additional 22.6% suspected an event during which they might have become infected. Known and suspected sources of infection were household members (30.8%), extended family (15.6%), work colleagues (15.0%), friends (11.0%), and possibly multiple/other sources (27.6%). When the source of infection was known, was not a household member, and involved a unique contact ( $n=69,788$ ), characteristics associated with transmission events were indoors settings (91.6%), prolonged (> 15 min) encounters (50.5%), symptomatic source case (64.9%), and neither the source of infection nor the participant wearing a mask (82.2%). Male gender, older age, lower education, living alone, using public transportation, attending places of public recreation (bars, restaurants, nightclubs), public gatherings, and cultural events, and practicing indoor sports were all independently associated with not knowing the source of infection.

**Conclusion** Two-thirds of infections were attributed to interactions with close relatives, friends, or work colleagues. Extra-household indoor encounters without masks were commonly reported and represented avoidable circumstances of infection.

**Trial registration** ClinicalTrials.gov registration number: NCT04607941.

**Keywords** COVID-19, SARS-CoV-2, Transmission, Household

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## Introduction

The airborne spread of SARS-CoV-2 [1, 2] and the possibility of transmission by asymptomatic individuals [3] have considerably broadened the range of opportunities for viral transmission relative to pathogens for which close contact with symptomatic patients are required. Places where the risk is highest include poorly ventilated indoor environments where people do not systematically wear masks [4]. Several types of public places (bars, restaurants, indoor sports) and means of transportation (long-distance buses, airplanes) have been shown to be associated with an increased risk of transmission [5–8], with large clusters when people speak loudly and sing [9, 10]. As a result, the control of viral circulation has relied on the wearing of masks and the closure of public places, transportation, schools, and workplaces, and the implementation of contact tracing in May 2020 in France. This strategy has also involved imposing curfews and confinements, with major social and economic repercussions. However, the relative contribution of private and public places in overall transmission and that of family, friends, and work colleagues as sources of infection has been little studied. It is also unknown whether the relative contribution varied depending on the circulating variants and the nature of countermeasures applied during pandemic waves. This information may be relevant for the targeting of prevention and control measures for this and future airborne-transmitted epidemics. In this study, we present findings from a nationwide dataset analysis in France that includes information on 584,846 adults who were infected with SARS-CoV-2 between October 2020 and August 2022. Our objective was to study the circumstances of infection in recently SARS-CoV-2-infected individuals.

## Methods

### Participants and data collection

For this project, we used data from the ComCor case-control study, which we have previously described [7, 11, 12]. Adults with acute SARS-CoV-2 infection confirmed by RT-PCR or a rapid antigen test (except self-administered antigen tests) were invited to participate by email by the *Caisse Nationale d'Assurance Maladie* – the national health insurance agency, which receives notification of all SARS-CoV-2 infections in France. Cases received information online about the study before completing a questionnaire if they agreed to participate. For the present study, we included cases diagnosed between October 1, 2020, and August 29, 2022. Healthcare workers were excluded from the present analysis, as they were assumed to have higher occupation-related exposure to SARS-CoV-2 than the general population [13–15].

The questionnaire covered sociodemographic characteristics (age, sex, region, population of the area of residence, profession, and level of education) and comorbidities, as well as a series of potential situations of exposure in the days preceding infection from inside and outside the household (work habits, modes of transportation, attendance at restaurants and bars, etc.). We also collected information on the presumed source of infection (hereafter designated as case source), when identified by the participant, or the suspicion of a particular event during which infection likely occurred (hereafter designated as suspected event). In early 2022, based on the results of a qualitative study showing that half of participants who had answered “no known source” had, in fact, multiple suspected sources without being sure which one was involved, we introduced the option to report the most likely source while mentioning it was uncertain.

The questionnaire focused on the 10 days preceding symptom onset (or test for asymptomatic participants). This period was reduced to seven days in January 2022 following emergence of the B.1.1.529 (Omicron) variant, given its shorter incubation period [16].

The study was divided into nine periods according to the epidemic waves, emergence of variants, and non-pharmaceutical interventions, including lockdowns or curfews, as described in Figure S1. Major changes in restrictions throughout the study period included national lockdowns from October 30, 2020, to November 28, 2020, and from April 3, 2021, to May 19, 2021, as well as a nationwide curfew implemented on December 15, 2020, and lifted on June 20, 2021.

### Statistical analysis

We recorded the sociodemographic characteristics, sources of SARS-CoV-2 infection, and behaviours before and during SARS-CoV-2 infection for all participants infected between October 1, 2020, and August 29, 2022. In addition, we analyzed these characteristics over nine different time periods.

To better characterize cases without an identified source of infection, we used multivariable logistic regression to identify the sociodemographic factors and behavioral exposure associated with the profile. Variables introduced into the models were age (in ten-year categories), gender, region, population of the area of residence, and calendar week, as well as level of education, professional category, comorbidities (diabetes mellitus, hypertension, chronic respiratory disease, body-mass index), smoking status, living alone, vaccination status (measured in number of doses), past history of SARS-CoV-2 infection, exposure in the days before infection (use of public transportation, private and public gatherings,

cultural events, indoor sports, bars, restaurants, night-clubs, shops), and prevention measures (mask-wearing, hand-washing, physical distancing). We inspected the correlation between different community exposures before using them as covariates.

All statistical analyses were performed using Stata 16.0 (StataCorp, College Station, TX, USA).

**Results**

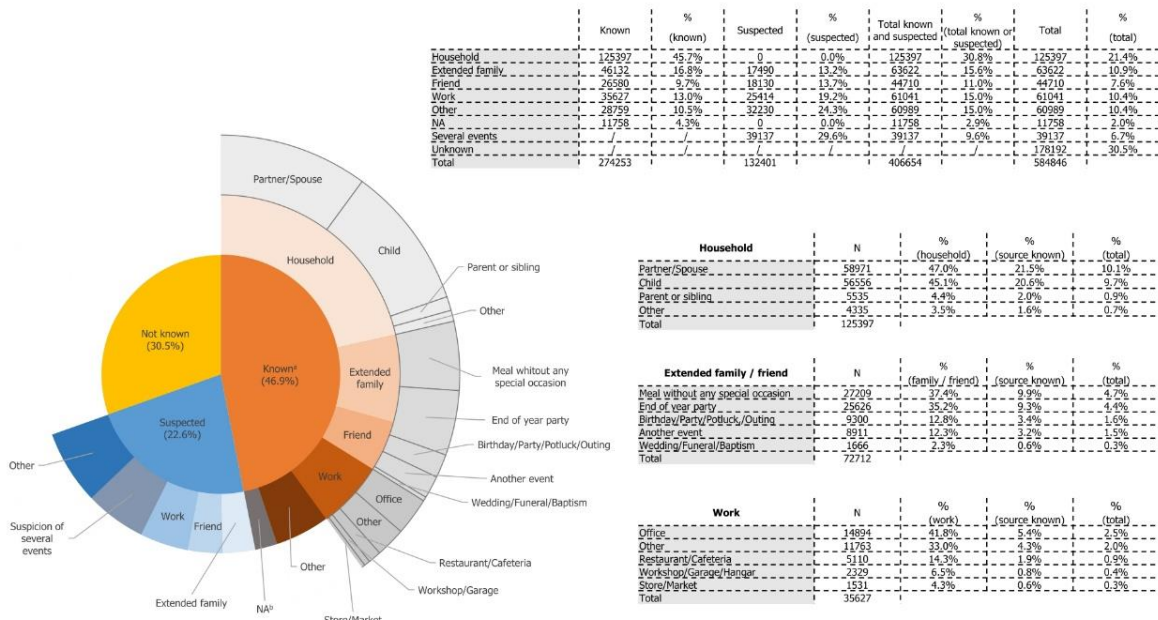
**Sociodemographic characteristics**

From October 27, 2020, to August 29, 2022, 11,446,403 adult individuals with a diagnosis of SARS-CoV-2 infection were contacted by e-mail by the national insurance program, of whom 680,396 (5.9%) replied. After the exclusion of healthcare workers (n=83,919) and participants with inconsistencies regarding the region of residence (French overseas territories while these were not targeted by the email invitations, missing region), the circumstances of transmission (e.g., details provided for workplace transmission while previously reporting intra-familiar transmission), or a past episode of infection (episode < 2 months prior to the ongoing episode), 584,846 participants with SARS-CoV-2 infection were retained for analysis. Participant characteristics are described in Table S1. Compared to the national SARS-CoV-2 infection database (système d'information de dépistage—SI-DEP—data available between October 1, 2020, and

March 12, 2022) [17], our study population was more predominantly female (66.0% versus 53.6% in the SI-DEP), and older (66.1% older than 40 versus 56.2% in the SI-DEP), except for the oldest age group of 70 years and older. In addition, relative to the French general population (data provided by the Institute of National Statistics and Economic Studies, INSEE), our study population had a higher socioeconomic status (31.1% were senior executives versus 21.6% in the INSEE database) [18]. The main characteristics remained largely stable throughout the study, except for a higher share of participants aged > 50 years during the last two periods (March 18 to August 29, 2022) compared to before (October 1, 2020, to March 17, 2022) (51.9% vs 32.8%, respectively, P < 0.001; Table S2).

**Source of SARS-CoV-2 infection**

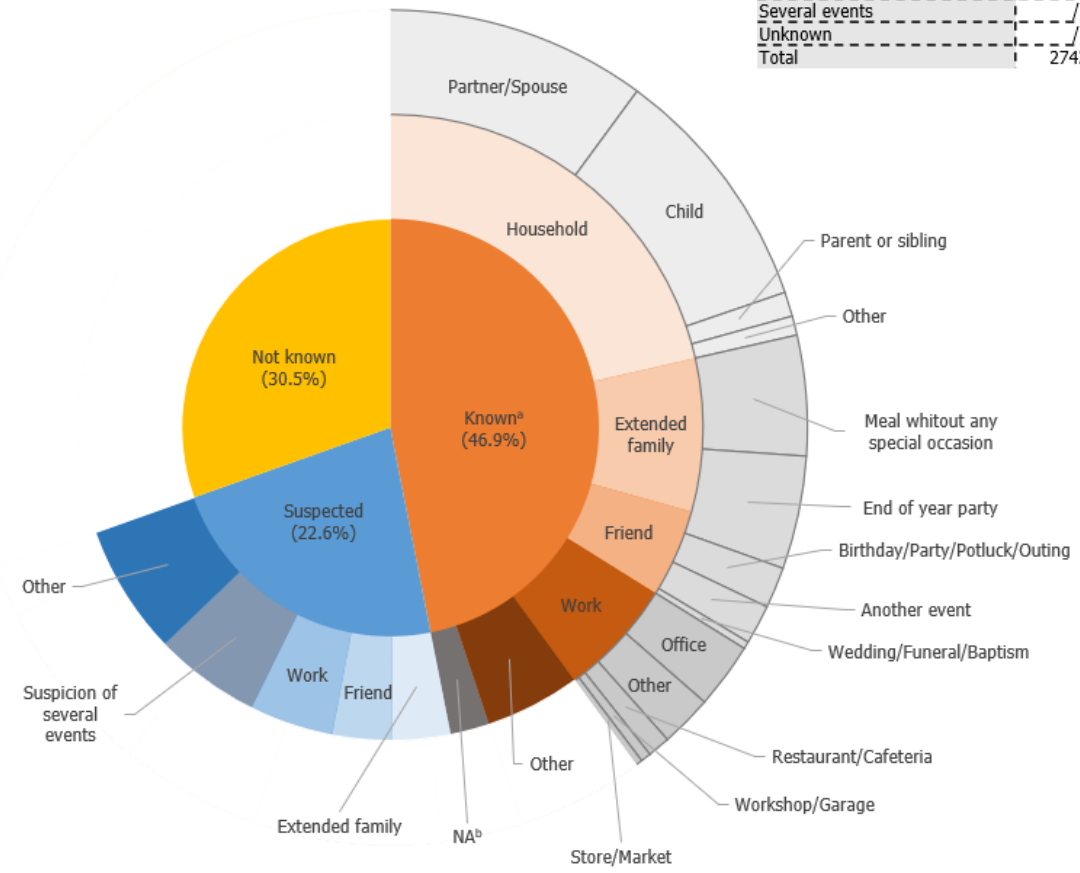
Approximately two-thirds (69.5%) of the participants knew the source of their SARS-CoV-2 infection or suspected one or more events related to the infection. More specifically, 46.9% were able to identify a source case (confirmed by a positive SARS-CoV-2 tests for 88.0% of them), 22.6% suspected one or more specific events during which transmission might have occurred, and 30.5% did not know how they were infected (see Fig. 1). Household members, extended family, colleagues, and friends represented 45.7%, 16.8%, 13.0%, and 9.7% of the sources



**Fig. 1** Characteristics of the source cases of SARS-CoV-2 infection from inside and outside the household. **a** Source known: 9.1% expressed doubts on the identification of the source case (option introduced in the questionnaire in January 2022); SARS-CoV-2 infection was confirmed with a test in 88% of the source cases. **b** Not applicable: 11,758 participants were considered to have missing values; between January 6 and March 1, 2022, participants who expressed doubts about the source of contamination were unable to provide details



	Known	% (known)	Suspected	% (suspected)	Total known and suspected	% (total known or suspected)	Total	% (total)
Household	125397	45.7%	0	0.0%	125397	30.8%	125397	21.4%
Extended family	46132	16.8%	17490	13.2%	63622	15.6%	63622	10.9%
Friend	26580	9.7%	18130	13.7%	44710	11.0%	44710	7.6%
Work	35627	13.0%	25414	19.2%	61041	15.0%	61041	10.4%
Other	28759	10.5%	32230	24.3%	60989	15.0%	60989	10.4%
NA	11758	4.3%	0	0.0%	11758	2.9%	11758	2.0%
Several events	/	/	39137	29.6%	39137	9.6%	39137	6.7%
Unknown	/	/	/	/	/	/	178192	30.5%
<b>Total</b>	<b>274253</b>		<b>132401</b>		<b>406654</b>		<b>584846</b>	



Household	N	% (household)	% (source known)	% (total)
Partner/Spouse	58971	47.0%	21.5%	10.1%
Child	56556	45.1%	20.6%	9.7%
Parent or sibling	5535	4.4%	2.0%	0.9%
Other	4335	3.5%	1.6%	0.7%
<b>Total</b>	<b>125397</b>			

Extended family / friend	N	% (family / friend)	% (source known)	% (total)
Meal without any special occasion	27209	37.4%	9.9%	4.7%
End of year party	25626	35.2%	9.3%	4.4%
Birthday/Party/Potluck/Outing	9300	12.8%	3.4%	1.6%
Another event	8911	12.3%	3.2%	1.5%
Wedding/Funeral/Baptism	1666	2.3%	0.6%	0.3%
<b>Total</b>	<b>72712</b>			

Work	N	% (work)	% (source known)	% (total)
Office	14894	41.8%	5.4%	2.5%
Other	11763	33.0%	4.3%	2.0%
Restaurant/Cafeteria	5110	14.3%	1.9%	0.9%
Workshop/Garage/Hangar	2329	6.5%	0.8%	0.4%
Store/Market	1531	4.3%	0.6%	0.3%
<b>Total</b>	<b>35627</b>			

of infection, respectively, when known; 30.8%, 15.6%, 15.0%, and 11.0% of the sources of infection, respectively, when known or suspected; and 21.4%, 10.9%, 10.4%, and 7.6% of all infections, respectively (see Fig. 1). The characteristics of the source cases reported by the participants are presented in Table S3.

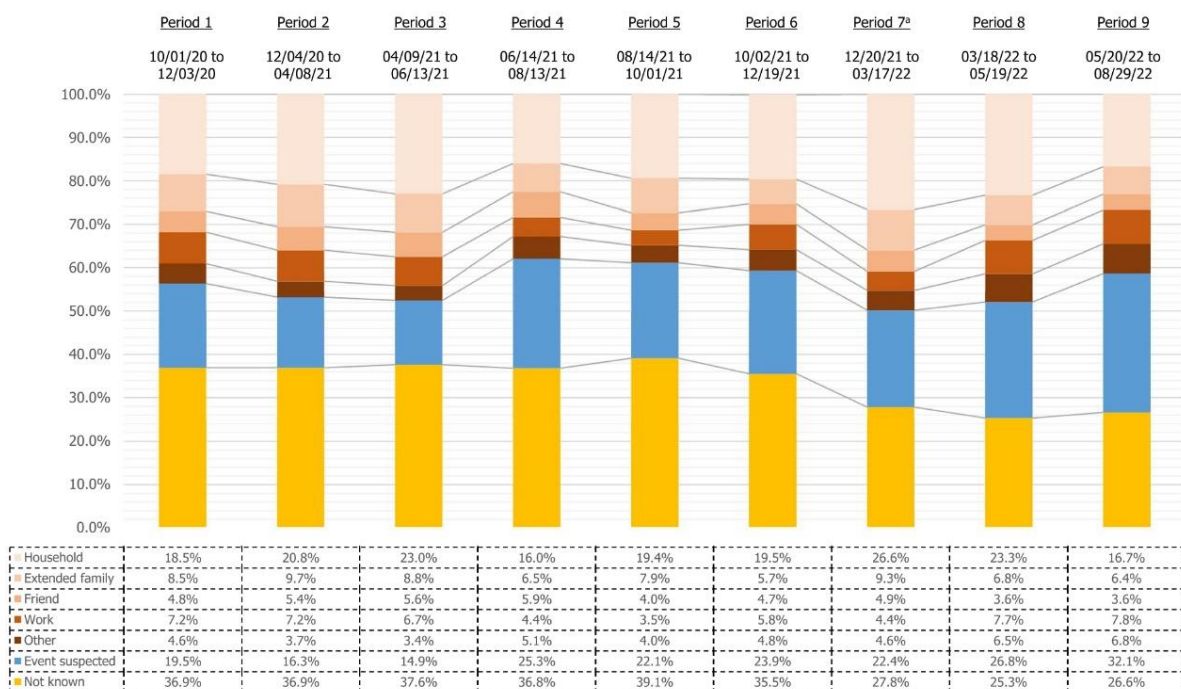
These proportions remained somewhat stable throughout the study period, except for the proportion of unknown sources, which decreased from a range of 35% to 39% during the first six periods (October 1, 2020 to December 19, 2021) down to 25% to 28% during the last three periods (December 20, 2021 to August 19, 2022) when the option of identifying a source of infection “with some doubt” was offered. We also observed an increase in the proportion of suspected events and a decrease in household or workplace infections between periods 1 to 3 (characterized by high stringency of non-pharmaceutical interventions) and periods 4 to 6, during which most restrictions were lifted and social interactions likely increased, making the correct identification of sources potentially more difficult (see Fig. 2).

When transmission occurred at home (45.7% of those with an identified source of infection), the source of infection was most frequently a partner/spouse (47.0%), followed by a child (45.1%), and the source of infection was most often (87.3%) symptomatic. The proportion

of children as a household source of infection increased from 25.1% during the first period (October 1 to December 3, 2020) to 58.1% during the seventh period (December 20, 2021 to March 17, 2022), before decreasing to 29.3% during the last period (May 20, 2022 to August 29, 2022) (see Fig. 3).

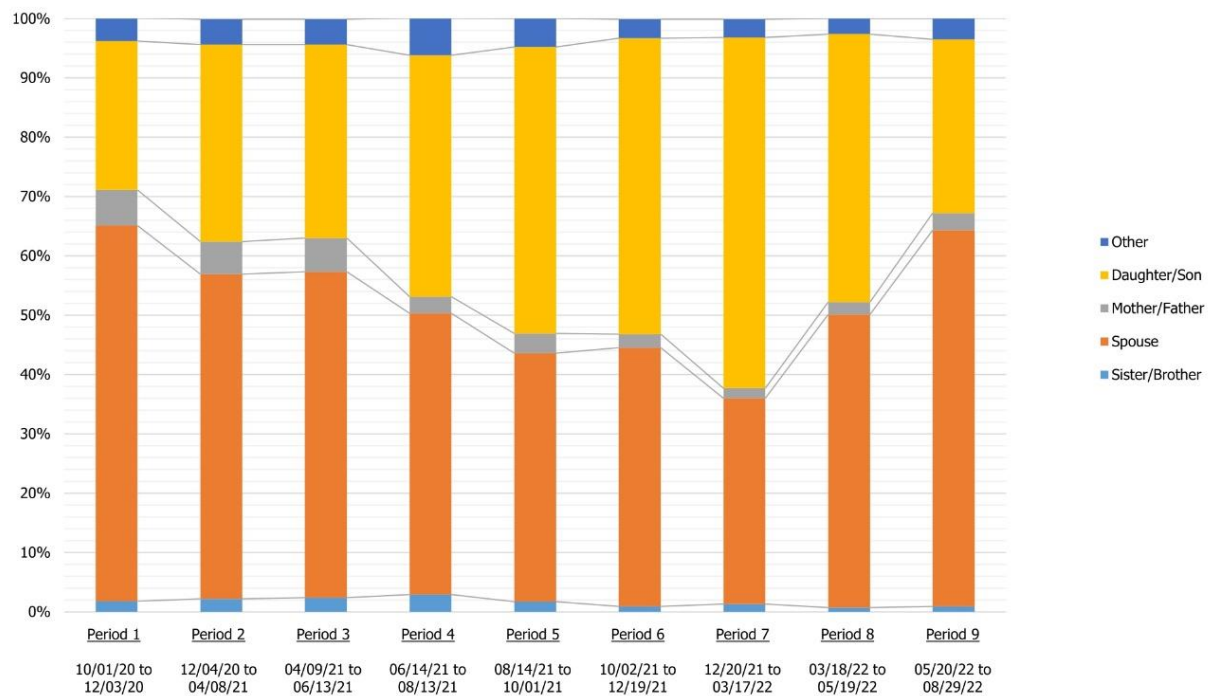
When transmission occurred outside of the household (54.3% of those with an identified source of infection) and involved extended family and friends (48.9% of extra-household sources of infection), transmission occurred mostly during meals (37.4%), end-of-the-year celebrations (mainly Christmas and New Year’s Eve) (35.2%), birthday parties or potluck outings (12.8%), and family ceremonies, such as weddings, funerals, and baptisms (2.3%) (see Fig. 1). When transmission involved colleagues (23.9% of identified extra-household sources of infection), transmission took place primarily in shared offices (41.8%), followed by restaurants/cafeterias (14.3%).

A single interaction with the source case was reported for half (50.9%) of the extra-household transmission events with a known source of infection. Source cases were symptomatic in 35.1% of these encounters, varying according to whether they were extended family, friends, or work colleagues (38.7%, 27.9%, and 44.1%, respectively,  $P < 0.001$ ) and the time period (Figure S2).



**Fig. 2** Characteristics of the sources of SARS-CoV-2 infection from inside and outside the household by period. <sup>a</sup> From January 2022 on, it was possible for participants to mention whether they had doubts or not about the identification of the source of infection





**Fig. 3** Distribution of the relationship to source cases of SARS-CoV-2 infection in the household by period

An average half of infections took place during prolonged (over 15 min) encounters (50.5%) (but more than 20% during an encounter shorter than 5 min) and in indoor settings (91.6%) (Table 1). Seasonality influenced the setting in which transmission occurred, with indoor spaces with closed windows accounting for approximately 80% of transmission during winter periods and approximately 40% during summer periods (see Fig. 4). The proportion of encounters that caused an infection during which neither the source case nor the participant wore a mask remained high and stable for encounters with family and friends (91.2% and 95.6%, respectively) and increased from 46.6% during the first period (October 1, 2020 to December 3, 2020) to 85.4% during the last period (May 20, 2022 to August 29, 2022) for encounters at work (Figure S3). Furthermore, the characteristics of the encounters (location, duration, mask-wearing) appeared to be minimally affected by the symptomatic status of the source case, except for mask-wearing (Table S4). Individuals who suspected an event but were unable to identify a source case, who accounted for 22.6% of all cases, reported shared meals (18.2%) and meetings (10.5%) as the most common type of event (Table S5). These events primarily took place in work (27.2%), family (18.8%), or friendly (19.4%) settings.

Approximately 30% of all participants did not know how they were infected. In the multivariable logistic

regression model, the factors independently associated with not knowing the source or event responsible for the infection were male gender, older people, low level of education, living alone, use of short-distance transport (bus, tram, subway, and train), or national or international transport (airplane, train, bus, cruise ship), frequentation of bars or restaurants, cultural venues (theatre, cinema, museum, concert, festival), retail or shops, public gatherings (school or university and religious), and indoor sports. When we analyzed nightclubs and private parties separately in a separate model with fewer observations (the initial questionnaire did not differentiate between these different types of parties), we found that nightclubs were associated with a higher risk of an unknown source of infection (Table 2). We observed only limited correlation between different exposures of interest (transport, gatherings, sports, parties, bars and restaurants) with correlation coefficient below 0.5. Thus we included all these variables as covariates in the regression model.

### Discussion

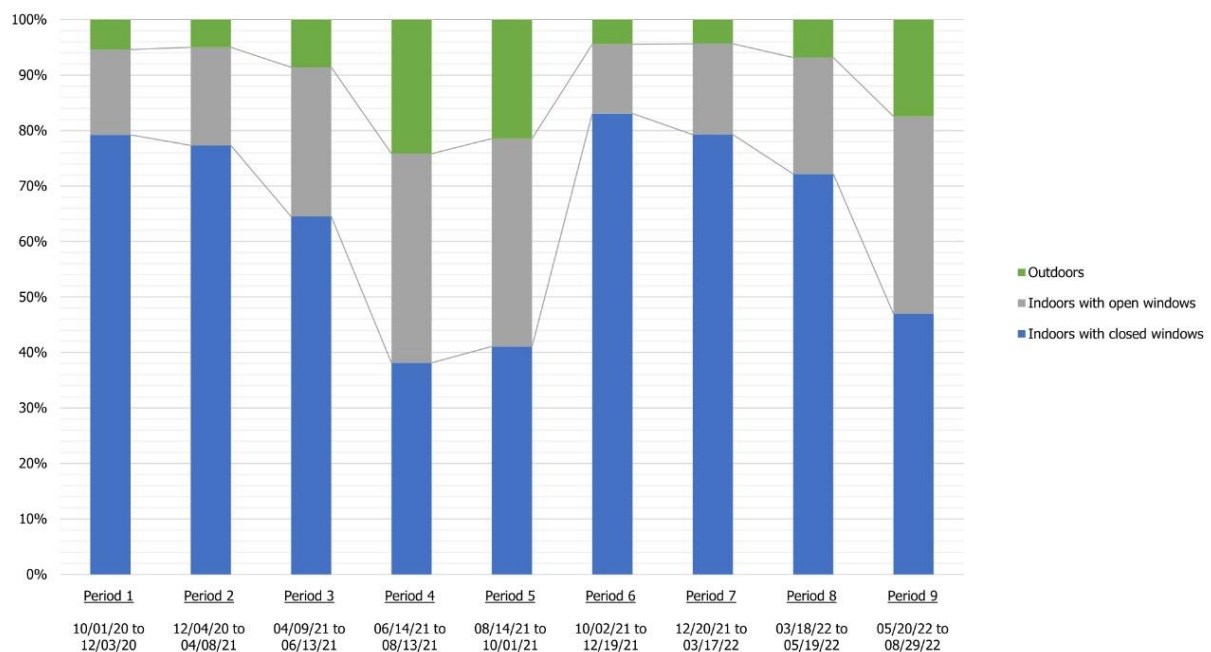
We present a descriptive analysis of the circumstances of contamination of 584,846 adults with a recent SARS-CoV-2 infection in France. Approximately two-thirds of cases believed they knew how they were infected, either because they were able to identify the source of infection

**Table 1** Characteristics of single-encounter meetings during which SARS-CoV-2 infection took place according to the origin of the source case (household members excluded) between October 1, 2020, and August 29, 2022

	Total (n = 69,788)		Work (n = 12,164)		Family (n = 21,668)		Friends (n = 18,164)		Other <sup>a</sup> (n = 17,784)		P value
	N	%	N	%	N	%	N	%	N	%	
Symptomatic											< 0.001
Yes	24,529	35.1%	5366	44.1%	8379	38.7%	5070	27.9%	5712	32.1%	
Location of encounter											
Indoors with closed windows	49,230	70.6%	9323	76.6%	15,323	70.7%	12,512	68.9%	12,072	67.9%	
Indoors with open windows	14,687	21.0%	2259	18.6%	5081	23.4%	4211	23.2%	3136	17.6%	
Outdoors	5863	8.4%	582	4.8%	1264	5.8%	1441	7.9%	2576	14.5%	
Duration of encounter											< 0.001
< 1 min	6350	9.1%	1528	12.6%	1885	8.7%	1389	7.6%	1548	8.7%	
< 5 min	8688	12.5%	2073	17.0%	2463	11.4%	1849	10.2%	2303	12.9%	
5–15 min	9594	13.7%	2140	17.6%	2681	12.4%	2049	11.3%	2724	15.3%	
> 15 min	35,206	50.5%	4809	39.5%	10,978	50.7%	10,430	57.4%	8988	50.5%	
Unknown	9943	14.2%	1614	13.3%	3661	16.9%	2447	13.5%	2221	12.5%	
Mask-wearing <sup>b</sup>											< 0.001
Neither wore a mask	57,330	82.2%	7169	58.9%	19,751	91.2%	17,364	95.6%	13,046	73.4%	
By suspected source of infection only	2088	3.0%	543	4.5%	598	2.7%	227	1.2%	720	4.1%	
By person infected only	4223	6.0%	1572	12.9%	601	2.8%	272	1.5%	1778	10.0%	
By both source case and participant	6139	8.8%	2880	23.7%	718	3.3%	301	1.7%	2240	12.6%	

<sup>a</sup>“Other” refers to any contamination that occurs in a cultural, sporting, religious, or health-related environment

<sup>b</sup> Mask-wearing during the last encounter with the source when multiple encounters occurred



**Fig. 4** Location of single encounters resulting in SARS-CoV-2 transmission among participants with an identified source by period

**Table 2** Factors associated with not knowing the source of contamination in logistic regression analysis

	<b>N (%) Source: known or suspected<sup>a</sup> (n = 273,497)</b>	<b>N (%) Source: not known<sup>a</sup> (n = 309,334)</b>	<b>Univariable analysis OR (95% CI)</b>	<b>Multivariable analysis Adjusted OR (95% CI)<sup>b</sup></b>
<b>Gender</b>				
Female	188,369 (68.9)	196,638 (63.6)	1 (ref)	1 (ref)
Male	85,128 (31.1)	112,696 (36.4)	1.27 (1.25–1.28)	1.19 (1.18–1.21)
<b>Age (years)</b>				
18 – 29	37,107 (13.6)	42,083 (13.6)	1 (ref)	1 (ref)
30 – 39	67,105 (24.5)	65,969 (21.3)	0.87 (0.85–0.88)	1.05 (1.03–1.07)
40 – 49	73,814 (27.0)	73,798 (23.9)	0.88 (0.87–0.90)	1.09 (1.07–1.09)
50 – 59	52,519 (19.2)	66,118 (21.4)	1.10 (1.09–1.13)	1.24 (1.21–1.26)
60 – 69	30,819 (11.3)	41,368 (13.4)	1.18 (1.16–1.21)	1.27 (1.24–1.30)
≥ 70	12,133 (4.4)	19,998 (6.5)	1.45 (1.41–1.50)	1.53 (1.49–1.60)
<b>Level of education</b>				
No high school diploma	42,035 (15.4)	57,066 (18.4)	1 (ref)	1 (ref)
High school diploma	49,528 (18.1)	56,249 (18.2)	0.84 (0.82–0.85)	0.85 (0.83–0.86)
Bachelor’s degree	95,733 (35.0)	99,859 (32.3)	0.77 (0.76–0.78)	0.75 (0.74–0.76)
Master’s degree	86,201 (31.5)	96,160 (31.1)	0.82 (0.81–0.83)	0.68 (0.67–0.69)
Living alone	38,489 (14.1)	68,623 (22.2)	1.74 (1.71–1.76)	1.50 (1.48–1.53)
<b>Short-distance transportation</b>				
Bus	23,493 (8.6)	38,932 (12.6)	1.53 (1.51–1.56)	1.16 (1.14–1.19)
Tram	12,918 (4.7)	20,155 (6.5)	1.41 (1.37–1.44)	1.10 (1.07–1.13)
Subway	28,427 (10.4)	47,331 (15.3)	1.56 (1.53–1.58)	1.18 (1.16–1.21)
Train	13,759 (5.0)	21,319 (6.9)	1.40 (1.37–1.43)	1.08 (1.06–1.11)
<b>Car-pooling</b>				
Yes	57,040 (20.8)	71,057 (30.0)	1.13 (1.11–1.15)	1.00 (0.99–1.02)
Car-pooling with relatives <sup>c</sup>	43,631 (15.9)	54,780 (17.7)	1.14 (1.13–1.15)	0.99 (0.97–1.00)
Car-pooling booked on a platform <sup>c</sup>	1775 (0.6)	2713 (0.9)	1.37 (1.29–1.46)	1.06 (1.00–1.13)
<b>Long-distance national or international travel</b>				
Airplane	5461 (2.0)	12,754 (4.1)	2.11 (2.04–2.18)	1.60 (1.55–1.66)
Train	10,971 (4.0)	18,408 (6.0)	1.51 (1.46–1.55)	1.11 (1.07–1.14)
Bus	2571 (0.9)	5659 (1.8)	1.95 (1.86–2.05)	1.11 (1.05–1.17)
Cruise ship	657 (0.2)	1559 (0.5)	2.06 (1.88–2.59)	1.14 (1.04–1.26)
<b>Private gathering</b>				
Ceremony (marriage, Funeral, etc.)	4251 (1.6)	5679 (1.8)	1.18 (1.14–1.23)	1.06 (1.02–1.11)
Meal, without special occasion	55,675 (20.4)	62,360 (20.2)	0.99 (0.97–1.00)	0.90 (0.89–0.92)
Coffee	24,836 (9.1)	29,709 (9.6)	1.06 (1.04–1.08)	0.97 (0.95–0.99)
Birthday	20,224 (7.4)	22,827 (7.4)	1.00 (0.98–1.02)	0.94 (0.92–0.96)
Family or friendly party	31,579 (11.5)	32,427 (10.5)	0.90 (0.88–0.91)	0.87 (0.86–0.89)
<b>Public gathering</b>				
School or university	17,105 (6.3)	21,351 (6.9)	1.19 (1.16–1.23)	1.21 (1.18–1.23)
Religious	9124 (3.3)	12,250 (4.0)	1.11 (1.09–1.13)	1.09 (1.06–1.13)
Retail, shops	186,598 (45.2)	226,128 (54.8)	1.26 (1.25–1.28)	1.19 (1.17–1.20)
<b>Cultural events</b>				
Yes	28,946 (10.6)	48,961 (15.8)	1.59 (1.56–1.61)	1.33 (1.31–1.36)
Theatre <sup>d</sup>	3873 (1.4)	6301 (2.0)	1.45 (1.39–1.51)	1.13 (1.08–1.18)
Cinema <sup>d</sup>	11,851 (4.4)	16,928 (5.5)	1.28 (1.25–1.31)	1.07 (1.05–1.10)
Museum <sup>d</sup>	3576 (1.3)	7132 (2.3)	1.78 (1.71–1.86)	1.14 (1.09–1.19)
Concert <sup>d</sup>	4274 (1.6)	8718 (2.8)	1.83 (1.76–1.89)	1.50 (1.44–1.56)
Festival <sup>d</sup>	3191 (1.6)	6814 (3.0)	1.94 (1.86–2.03)	1.52 (1.45–1.58)
Indoor sports	16,149 (5.9)	22,168 (7.2)	1.23 (1.20–1.26)	1.17 (1.14–1.19)
Bar or restaurants	72,623 (26.6)	110,510 (35.7)	1.54 (1.52–1.55)	1.39 (1.37–1.41)



**Table 2** (continued)

	<b>N (%) Source: known or suspected<sup>a</sup> (n = 273,497)</b>	<b>N (%) Source: not known<sup>a</sup> (n = 309,334)</b>	<b>Univariable analysis OR (95% CI)</b>	<b>Multivariable analysis Adjusted OR (95% CI)<sup>b</sup></b>
Nightclub or private parties				
Yes	26,284 (9.6)	33,732 (10.9)	1.15 (1.13–1.17)	0.98 (0.97–1.01)
Nightclub <sup>c</sup>	3188 (1.6)	8165 (3.7)	2.35 (2.26–2.45)	1.56 (1.49–1.63)
Privates parties <sup>e</sup>	27,062 (12.2)	27,062 (12.2)	1.06 (1.04–1.07)	0.89 (0.87–0.91)

<sup>a</sup> 2015 participants were excluded from the model due to missing data, resulting in a total effective sample size of 582,831

<sup>b</sup> Multivariable model adjusted for all variables shown in the model, as well as region of residency, population density of the place of residence, comorbidities (diabetes mellitus, hypertension, coronary artery disease, chronic respiratory disease,), body-mass index, smoking status, calendar week, housing type, history of COVID-19 and prevention measures (mask-wearing, hand-washing, physical distancing)

<sup>c</sup> The questionnaire was modified on June 29, 2021 to obtain detailed information on the type of car-pooling (with relatives or on a platform). Odds ratios for other variables are those estimated in a model containing car-pooling as a binary variable so that all observations could be kept in the model. Odds ratios for specific cultural events were estimated in a distinct multivariable model on 452,631 observations with information on the type of car-pooling (results for other estimates are not shown here)

<sup>d</sup> The questionnaire was modified on December 16, 2020, to obtain detailed information on the type of cultural event. Odds ratios for other variables are those estimated in a model containing cultural events as a binary variable so that all observations could be kept in the model. Odds ratios for specific cultural events were estimated in a distinct multivariable model on 580,025 observations with information on the type of cultural event (results for other estimates are not shown here)

<sup>e</sup> The questionnaire was modified on July 28, 2021, to detail the type of party. Odds ratios for other variables are those estimated in a model containing parties as a binary variable so that all observations could be kept in the model. Odds ratios for a specific party type (nightclub or private party) were estimated in a distinct multivariable model on 422,698 observations with information on the type of party (results for other estimates are not shown here)

(46.9%), or a specific event was suspected (22.6%). When the source of infection was known, household members were the most frequent source (45.7%), followed by extended family (16.8%), workplace (13.0%), and friends (9.7%). When the source of infection was unknown (30.5% of all cases), participants were more likely to have visited places involving high rates of contacts with unrelated or unknown people, such as places of public recreation or public transportation, than other participants. The beginning of the study was characterized by stringent non-pharmaceutical interventions (closures, curfews, and lockdowns), which translated into fewer suspicious events and more infections at home compared to periods when restrictions were eased. Social interactions likely increased, making the identification of potential sources more complex. However, the distribution of settings of transmission were overall stable, with the household remaining the main setting of known transmissions.

Households were the main drivers of infection, representing approximately 45.7% of all infections with a known source and at least 21.4% of all infections (30.5% of all infections were of unknown origin and some may have been due to household transmission). Several previous studies have shown the high transmissibility of SARS-CoV-2 in household settings [19–21]. Sun et al. found that the risk of transmission was highest among household contacts, followed by extended family, social, and community contacts [22]. A systematic review and meta-analysis of household transmission of SARS-CoV-2 found an overall secondary attack rate (SAR) of 18.9% (95% CI, 16.2%–22.0%), with a higher estimate for the omicron variant (42.7%, 95% CI 35.4%–50.4%) [23].

Infection in the household for our adult participants was predominantly from the spouse or partner at the beginning of the pandemic, but we noted an increase in the proportion of infections by children, who became the most frequent source of household contamination during the omicron BA.1 wave. Thus The emergence of more transmissible variants (first delta and then omicron) in a population with relatively low pre-existing immunity, combined with the lifting of health restrictions and the progress of the adult vaccination campaign, is likely to have encouraged more efficient circulation in these age groups from summer 2021 [17, 24]. The following decrease in the proportion of infection by children in the last period of the study may reflect transient herd immunity in children following the intense circulation of the Omicron BA.1 variant in the winter of 2022.

Private gatherings with family or friends were the second most common circumstance of infection in our study population. They represented 26.5% of infections with a known source and at least 18.5% of all infections. Contacts at social events with family and friends have been shown to be associated with a higher risk of transmission than other low-risk casual contacts, with a documented SAR of 5.9% [20]. These gatherings often included meals and masks were not worn in more than 90% of single encounters that resulted in transmission (Figure S3). End-of-the-year celebrations were also reported as important sources of transmission, particularly at the end of 2021, when they occurred during the omicron BA.1 wave and incidence rates were particularly high.

The workplace was the third most common location associated with transmission, representing 13.0%



of infections with a known source and at least 10.4% of all infections. Offices and cafeterias were the locations associated with most transmission events when the source was known. It is noteworthy that the proportion of encounters without masks associated with transmission at work increased from 40 to 50% in 2021 to 70% in the spring of 2022 and 85% in the summer of 2022 (mask mandates at work ended on March 12, 2022).

We were able to obtain information on a large number (>60,000) of single encounters that resulted in transmission. It suggests that prolonged (>15 min) interactions without masks in indoor settings resulted in the largest number of infections, consistent with the existing literature (19,20), although it's observed that brief encounters (<5 min) still contribute to 20% of infections, and this proportion increases even more within a workplace context. However, up to 20% of transmission events still took place outdoors during the summer months, although misclassification of the setting or infecting source cannot be excluded in some cases. In 35% of such encounters, the source of infection was symptomatic. Conversely, this figure suggests that two thirds of transmission events were caused by individuals who were asymptomatic at the time of transmission, whether they were in the pre-symptomatic phase or remained asymptomatic for the duration of the infection. This figure is consistent with those of other published articles, which highlight a significant proportion of infections among asymptomatic individuals [25–28], but should be considered with caution, as symptoms in the source case may have been missed by the index case, this could be attributed to either mild symptoms or difficulties in accurately identifying them. It is nevertheless troubling to realize that many transmission events took place involving infected individuals who were symptomatic at the time of transmission and unmasked, some in the work setting.

Our findings are subject to some limitations due to the study design. The very large number of cases available for analysis should not hide the low (5.9%) response rate to the online questionnaire. The study population was more highly female, aged 30 to 49 years, with few people aged 70 and above (possibly due to the study being conducted online) and had more post-secondary education than the group registered in the SI-DEP cases database, thus suggesting the possibility of a selection bias and potentially affecting the generalizability of the findings [29]. We relied on the interpretation of the transmission chain by the participants. It is plausible that some interpretations were erroneous, given possible multiple sources of exposure, particularly during the Omicron waves in 2022, when the incidence was very high. We were unable to further validate the correct identification of the source case. It is, however, reassuring that participants reported a positive SARS-CoV-2 test (PCR or rapid antigen test) for 88.0% of the

source cases that infected them. Symptomatic status of the source case was not a requirement for the identification of the transmission: transmission from asymptomatic sources could be identified for instance if the source case developed symptoms and tested positive little after the contact resulting in transmission. This explains why we identified close to 64.8% of asymptomatic sources when transmission happened during single encounters. It is also expected that the description of the circumstances of infection may, at least partially, reflect the knowledge and beliefs of the participants on the determinants of SARS-CoV-2 transmission. Thus, we may have missed some transmission events that occurred in circumstances generally recognized as unusual (eg, outdoors, during brief encounters) and that would not have been identified by the participants.

Few studies have used a similar approach to estimate the relative contribution of different settings to the sources of SARS-CoV-2 transmission. Vaux et al. and Thompson et al. have also identified the predominant role of the household and the workplace [20, 30]. However, our approach, involving the evaluation of different phases of the epidemic based on criteria such as epidemic waves, the presence of variants, and control measures, enhances the understanding of contamination circumstances. This study provides novel insights, notably the observation that half of the individuals infected outside the household contracted the virus during a single encounter. Moreover, it allows for the introduction of nuanced perspectives, particularly regarding the role of enclosed spaces during summer periods.

This study provides a picture, albeit imperfect, of the most relevant settings that public health strategies should target to mitigate transmission of SARS-CoV-2, namely households, as well as private gatherings with family or friends and the workplace. This is important, as it is possible that with aerosol transmission, the number of places at risk might have increased to the point that transmission would no longer be traceable. These results complement previous findings from the same study, which identified an increased risk of SARS-CoV-2 infection associated with an increasing number of household members, the attendance of bars or restaurants, and professional meetings, amongst others [7, 12].

Our study offers valuable insights into the circumstances of SARS-CoV-2 infection and, as such, should help guide public health policies aimed at mitigating SARS-CoV-2 transmission. By understanding these factors, public health policies can be tailored to address the identified sources of transmission. This could involve focused interventions, such as advocating specific hygiene practices, implementing social distancing measures in particular settings, or enhancing air quality in specific locations like workplaces. Moreover, our results also provide data for improving pandemic preparedness strategies.



## Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12889-024-17772-y>.

### Additional file 1.

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### Authors' contributions

AF, SG, TC, FO, CD and AM designed the investigation. SG, TC, AF and AM developed the study questionnaire. FO, CD, and SM managed the online data collection. OC, SG and TC oversaw the adherence of the study to regulatory requirements. TC oversaw the collection of the data and maintained the database. AR, SG, TC and AF performed the statistical analyses. AR, SG and AF drafted the first versions of the manuscript. AR, SG, TC and AF had full access to the data reported in this study. AR and AF take responsibility for the integrity of the data and the accuracy of the data analysis. Alex Edelman contributed to the article as a professional medical writer. All authors critically reviewed and approved the final version of the manuscript.

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### Availability of data and materials

The data that support the findings of this study are available at Institut Pasteur. Restrictions apply to the availability of these data, which were used under authorized agreement for this study from the data protection authority, the Commission Nationale de l'Informatique et des Libertés (CNIL). Access to these data would therefore require prior authorization by the CNIL. Contact the corresponding author (Arnaud Fontanet, [arnaud.fontanet@pasteur.fr](mailto:arnaud.fontanet@pasteur.fr)) for requests.

### Declarations

#### Ethics approval and consent to participate

This study was performed in line with the principles of the Declaration of Helsinki. This study received ethics approval from the ethics committee *Comité de Protection des Personnes Sud Ouest et Outre Mer 1* on September 21, 2020, as required by French regulation on clinical research. Informed consent was obtained from all participants included in the study. The study is registered with ClinicalTrials.gov under the identifier NCT04607941 (registration date 29/10/2020).

#### Consent for publication

Not applicable (NA).

#### Competing interests

The authors have no relevant financial or non-financial interests to disclose.

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## **Case-control and case series approaches**

Those two papers display two approaches for the analysis of the settings of transmission. The case-control approach is well suited to identify community settings associated with an increased risk of transmission. It provided information on settings where the identification of the source case can be challenging, such as night clubs, or public transport.

Conversely, the case series approach provides an understanding (although imperfect due to limitations detailed in the paper) of the relative contribution of different settings. It showcases the importance of household transmission, which the case-control approach could not do.

We logically found that several community settings associated with an increased risk of transmission in the case-control approach were associated with higher odds of not identifying the source case in the case series. This implies that some of the cases who could not identify the source case were likely infected in those settings, illustrating the complementarity of both approaches, and suggesting that the relative contribution of community settings might have been more markedly underestimated than that of household transmission.

While the case-control approach cannot inform the relative contribution of the household in the overall burden of SARS-CoV-2, it can provide valuable information into one specific aspect of household transmission: the role of children.



## **Risk of SARS-CoV-2 infection among households with children in France, 2020-2022**

Early in 2020, while there was evidence to a very low risk of severe COVID-19 in children, close contacts of children with their relatives might make them particularly prone to transmit SARS-CoV-2 to other household members. The effectiveness of school closures to limit the contacts of children and the global transmission of influenza was well documented before the emergence of SARS-CoV-2 (250,251). This led many countries, including France, to close schools in March 2020. These school closures came at the cost of high impacts on education and mental health, particularly in families with low socio-economic status (252). To help characterize the trade-off between the mitigation of transmission in households and the negative impact in children of school closures, it is necessary to document and quantify the role that children play in onward transmission in households.

Beyond school closures, other mitigation strategies were implemented specifically for children in schools, such as testing or mask-wearing. In France, COVID-19 vaccine roll-out in children took place in the summer and fall of 2021, mainly in teenagers: the first-dose coverage reached 70% in the 15-17-year-olds, 47% in those aged 11-14 years in January 2022. The coverage never exceeded 5% for those aged 5-9 years and remained virtually null for those aged under 5 years. During the study period, these mitigation strategies evolved significantly, potentially impacting the risk of viral circulation among children and subsequently in the households. Furthermore, transmission from children to adults, as in the general population, might have been impacted by the changes in the circulating strain.

The initial analyses of the ComCor study reported an increased risk for people living with children (65,66). While the analysis in October – November 2020 found increased risk for children of all school levels except for those attending middle school, the updated assessment between May and August 2021 found increased risk for all school levels except high school.

For this work, we relied on the case-control analysis, comparing the odds of living with a child between cases and controls. We complemented this analysis with a descriptive case series approach: we estimated the proportion of cases who reported a transmission from a child within their household and how this proportion evolved through the course of the study. To understand the evolution of the risk through the course of the study, we used the same division into nine periods as described previously. This analysis is presented in the following article.



Original Investigation | Public Health

# Risk of SARS-CoV-2 Infection Among Households With Children in France, 2020-2022

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## Abstract

**IMPORTANCE** Understanding the contribution of children to SARS-CoV-2 circulation in households is critical for designing public health policies and mitigation strategies.

**OBJECTIVE** To identify temporal changes in the risk of SARS-CoV-2 infection in people living with children.

**DESIGN, SETTING, AND PARTICIPANTS** This case-control study included online questionnaire responses from French adults between October 2020 and October 2022. Eligible cases were adults with ongoing SARS-CoV-2 infection with an email address on record with the national health insurance system, which centralized all new diagnoses in France. Eligible controls were adults who had never tested positive for SARS-CoV-2 until February 2021, when eligibility was extended to all adults without ongoing SARS-CoV-2 infection.

**EXPOSURE** Transmission of SARS-CoV-2 from a child (aged under 18 years) within the household in the descriptive analysis, as reported by the participating case. Sharing household with a child (of any age or broken down by school level) in the case-control analysis.

**MAIN OUTCOME AND MEASURES** Ongoing SARS-CoV-2 infection diagnosed by reverse transcription-polymerase chain reaction or supervised rapid antigen test (ie, not self-tests).

**RESULTS** A total of 682 952 cases were included for the descriptive analysis (68.8% female, median [IQR] age, 44 [34-55] years). Among those, 45 108 (6.6%) identified a household child as the source case; this proportion peaked at 10.4% during the Omicron BA.1 wave (December 20, 2021, to April 8, 2022). For the case-control analysis, we matched 175 688 cases (with a 4:1 ratio) for demographic characteristics with 43 922 controls. In multivariable logistic regression analysis, household exposure to children was associated with an increased risk of infection mainly at the end of summer 2021 (receding Delta wave) and during winter 2022 (Omicron BA.1 wave). In subgroup analysis by school level of the child, living with children under the age of 6 was associated with increased odds of infection throughout the study period, peaking at an odds ratio (OR) 1.8 (95% CI, 1.6-2.1) for children looked after by professional in-home caregivers, 1.7 (95% CI, 1.5-1.7) for children in day care facilities, and 1.6 (95% CI, 1.4-1.8) for children in preschool. The ORs associated with household exposure to children aged 6 to 14 years increased during the Delta (August 14, 2021, to December 19, 2021) and Omicron BA.1 waves, reaching 1.6 (95% CI, 1.5-1.7) for primary school children and 1.4 (95% CI, 1.3-1.5) for middle school children. Exposure to older children aged 15 to 17 years was associated with a moderate risk until April 2021, with an OR of 1.2 (95% CI, 1.2-1.3) during curfew in early 2021 (December 4, 2020, to April 8, 2021).

(continued)

## Key Points

**Question** How did the risk of SARS-CoV-2 infection in people living with children evolve through the pandemic in France?

**Findings** In this case-control study, people living with children were at an increased risk of infection. An association with higher risk was consistent through most of the pandemic for households with young children up to 6 years of age, during most of the Delta and Omicron BA.1 waves for households with children of primary school and middle school age, and until vaccination for households with high school students.

**Meaning** These results provide guidance for policies focusing on children, particularly very young children, and immunocompromised members of their households.

## + Supplemental content

Author affiliations and article information are listed at the end of this article.

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September 15, 2023 1/14

Abstract (continued)

**CONCLUSIONS AND RELEVANCE** The presence of children, notably very young ones, was associated with an increased risk of SARS-CoV-2 infection in other household members, especially during the Delta and Omicron BA.1 waves. These results should help to guide policies targeting children and immunocompromised members of their household.

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## Introduction

The COVID-19 pandemic toll had reached an estimated 18.2 million excess deaths worldwide by the end of 2021.<sup>1</sup> France was highly affected with approximately 174 000 confirmed COVID-19 deaths by July 1, 2023.<sup>2</sup> This stresses the necessity to better understand the main drivers of SARS-CoV-2 transmission, including the contribution of children to transmission within households to assess the relevance of child-targeted interventions, such as vaccination, mask-wearing, ventilation, repeated testing, hybrid education, or school closures.<sup>3-6</sup> However, such assessments are difficult, given the large proportion of children with asymptomatic infections who remain undetected.<sup>7-11</sup>

The early evidence suggested that children were less susceptible than adults to infection given lower seroprevalence<sup>12,13</sup> (1.6% in 0-to-9-year-olds vs above 3% for all other age groups in May 2020 in France<sup>14</sup>). Later assessments, on the other hand, found similar susceptibility based on systematic screening or seroprevalence in settings where in-person schooling had resumed (US, Switzerland, Canada, including as the earlier studies both rural and urban settings).<sup>11,15,16</sup> The emergence of the more transmissible Delta and Omicron variants might also account for these discrepancies.<sup>17</sup>

Children were also initially found less prone to transmit SARS-CoV-2 in household-based studies: a meta-analysis found SARS infections in households of 4.4% for index cases of children and adolescents aged 0 to 19 years and 10.0% for index cases from individuals aged 20 years or older.<sup>18</sup> However, after the emergence of variants of concern, children have shown similar SARS infections as adults: the ratio of SARS infections for child index cases vs adult index cases was 0.98 in a meta-analysis.<sup>19</sup> More detailed analysis of the child's age found that younger children were more likely than older children to transmit SARS-CoV-2: the risk ratio of secondary transmission from index cases of children aged under 12 years compared with older children was estimated at 1.46 in the same meta-analysis.<sup>19</sup> This may reflect differences in the contact pattern with other household members depending in the child's age.

Several studies have reported an increased risk of infection for the members of households with children.<sup>20-24</sup> Measuring the risk of infection for members of households with children can identify associations regardless of the likelihood of the child being tested and changes in school testing policies, but these associations can evolve following changes in vaccine coverage, the strains circulating in the population, and the interventions focusing on children. We used this approach in the ComCor case-control study,<sup>25,26</sup> further analyses of which are presented here. We hypothesized that adults sharing a household with children could be exposed to an increased risk of SARS-CoV-2 infection through transmission by the children. Our objective was to assess changes in the associations of the risk of SARS-CoV-2 infection with sharing a household with children of any age in this nationwide case-control study performed among adults in mainland France from October 2020 to October 2022.

## Methods

The design of the ComCor case-control study has been described elsewhere.<sup>25,26</sup> Cases were identified once weekly through the nationwide information system for positive SARS-CoV-2 tests (reverse transcription-polymerase chain reaction or supervised antigenic rapid diagnostic tests, ie,



not self-tests) which was centralized by the national health insurance system (Caisse nationale de l'assurance maladie [CNAM]). After information and online consent, participants completed an online questionnaire on sociodemographic factors, health status, recent activities, and locations visited and provided a description of their household, including whether they lived with a child or a student with optional questions on the school level of that child. Individuals in the case cohort were also asked if they knew how they were infected, who had transmitted SARS-CoV-2 to them, and the age of that person. After screening of the cases' profiles, a market research company recruited controls (adults who never tested positive for SARS-CoV-2 up to February 2021, without ongoing SARS-CoV-2 infection afterwards) matched via a frequency-matching procedure, for age (ages 18 to 28, 29 to 58, and 59 years and older), sex, region, and the size of the population in the area of residence, in order to limit selection bias. These controls completed the same online questionnaire (except for questions on the circumstances of infection). The participation to the study included this single questionnaire without any follow-up. Further information on study design are available in eMethods in Supplement 1.

This study received ethics approval from the ethics committee Comité de Protection des Personnes Sud Ouest et Outre Mer 1 as required by French regulation on clinical research. The data protection authority, the Commission Nationale de l'Informatique et des Libertés (CNIL), authorized the processing of data on October 21, 2020. Written informed consent was obtained from all participants. This report follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline for observational studies.

We excluded participants with a reported history of infection in the last 2 months (other than the infection for which they were contacted for the study) and those in the case cohort who completed the questionnaire more than 30 days after the onset of symptoms or testing (if asymptomatic) to limit recall errors.

Between October 27, 2020, to October 2, 2022, we investigated temporal changes in the risk of infection associated with living with children, by dividing the study period into 9 shorter periods based on changes in incidence, principal strain in circulation, and major nonpharmaceutical restrictions (eMethods in Supplement 1).

Data on vaccination and incidence in the various age groups were provided by the French government, and by the CNAM for vaccination coverage in 11- to 17-year-olds, as defined on January 1, 2022.<sup>27</sup> Vaccine coverage remained extremely low for children aged 5 to 10 years, and reached 49% for the second dose in February 2022 for 11-to-14-year-olds and 72% for 15-to-17-year-olds (eMethods in Supplement 1). The proportion of circulating SARS-CoV-2 strains are provided by Santé Publique France and obtained from sequencing studies conducted weekly or fortnightly on a random sample of positive tests.<sup>28</sup> Data on the demographic structure of the general population in France were obtained from the INSEE (National Institute of Statistics and Economic Studies) online data sets for 2021 (data for people aged 20 years and older were used for approximation of the total adult population).<sup>29</sup>

### Statistical Analysis

We described the proportion of cases reporting transmission from a child aged 17 years or younger living in their household. We also considered the various age categories equivalent to the different school levels (under 3 years for day care or professional in-home caregiver, 3 to 5 years for preschool, 6 to 10 years for primary school, 11 to 14 years for middle school, 15 to 17 years for high school), after the exclusion of cases with inconsistencies between the reported test and symptom onset dates for themselves and the source case.

We analyzed the association between the risk of SARS-CoV-2 infection and living in a household with children by performing an additional exact matching procedure to match more accurately for age (using finer 10-year age categories) and the timing of exposure, as controls were initially enrolled during the week following the inclusion of matched cases. Given the higher number of cases than controls, we matched 4 cases with 1 control for age, sex, region of residence, population size, and

calendar week (except for the first period, during which matching was based on whether participants were questioned about exposure before or during the second lockdown). We accounted for the random selection of cases (as there were more than 4 times as many cases than controls) by generating 100 databases of matched sets of 4 cases and 1 control by bootstrapping with replacement, for each period. For each database, we applied a multivariable logistic regression model for the risk of SARS-CoV-2 infection (outcome, ie, case or control status), which included the main exposures of interest, ie, living with a child, either altogether or broken down by school level in a separate model. Beyond matching variables, to account for confounding the model also included sociodemographic characteristics (education level, housing type, number of people in the household, professional category), health status (body mass index, immunosuppression, diabetes, hypertension, chronic respiratory disease), smoking status, COVID-19 vaccination status (number of doses and time since last dose), attendance of private or professional meetings, use of public transportation, travel abroad, sports activities, visits to retail facilities, restaurants, bars, or parties, and health care worker status. Data on race and ethnicity were not available. The choice of the adjusting variables was guided by subject matter knowledge to include all measured causes of the exposure (sharing household with children), the outcome (SARS-CoV-2 infection), or both, relying on the disjunctive cause criterion<sup>30</sup> (eFigure 1 in Supplement 1). We then extracted the odds ratios (ORs) and the population attributable fraction (PAF) of the 100 models in each period and calculated the median OR and the 2.5th and 97.5th percentiles, for estimation of the 95% confidence intervals. We considered  $P < .05$  to be statistically significant and all tests were 2-sided (eMethods in Supplement 1). Data analysis was performed with Stata/SE version 16.0 (StataCorp).

## Results

From October 27, 2020, to October 2, 2022, 11 612 450 people with recent SARS-CoV-2 infection were invited to participate. A total of 691 454 cases (6.0%) participated in the study, as well as 57 065 controls (Figure 1).

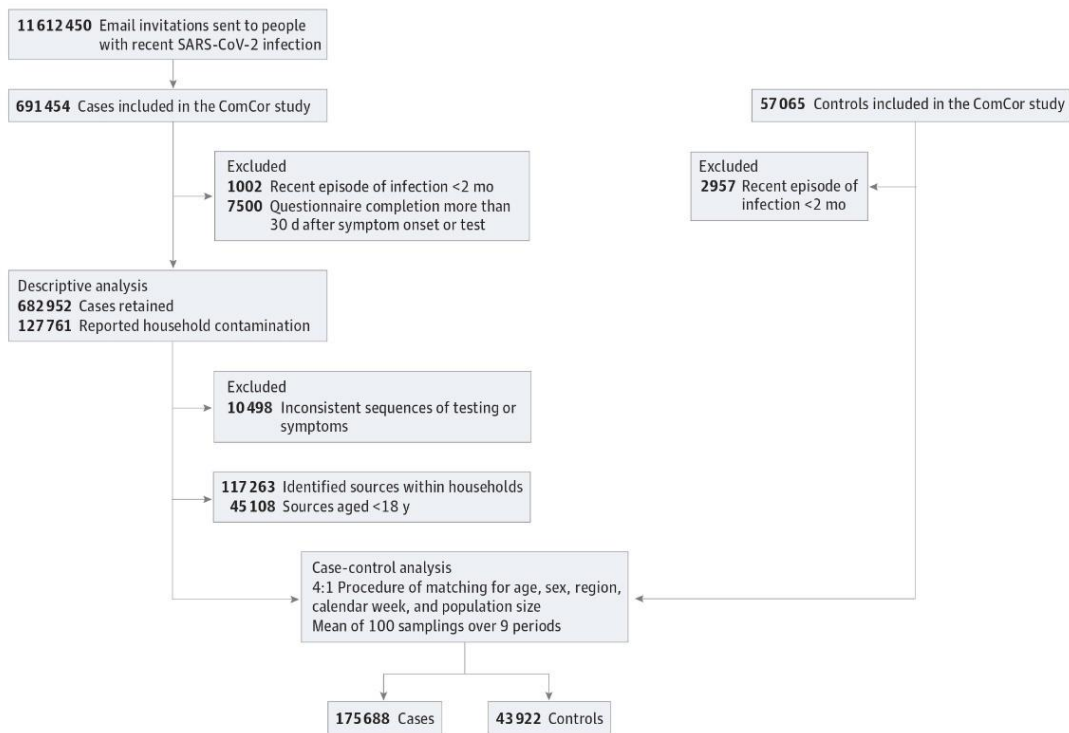
### Description of Intra-household Transmissions From a Child

After the exclusion of cases with an inconsistent reported history of SARS-CoV-2 infection and with questionnaires completed more than 30 days after symptom onset or testing, we included 682 952 cases for the descriptive analysis (median [IQR] age, 44 [34-55] years; 469 579 female [68.8%]). In total, 254 401 of these cases (37.3%) were able to identify the source of their contamination, and 117 263 (17.2%) identified someone from their household as the probable source (Figure 1). We identified 45 108 cases (6.6%) for whom the source case was a member of the household under the age of 18 years. This group of cases had a higher frequency of women than the rest of the cases (35 153 [77.9%] vs 434 426 [68.1%];  $P < .001$ ) and was also younger (median [IQR] age, 41 [37-45] years vs 45 [34-55] years;  $P < .001$ ). The proportion of cases identifying a child as the source case varied over the course of the study (Table 1). It remained below 5% between October 2020 and the summer of 2021 (periods 1 to 4). It then increased to 7.7% in August-September 2021 (period 5, receding Delta wave) and reached a maximum of 10.4% in the winter of 2021-2022 (period 7, Omicron BA.1 wave), before decreasing again to 3.0% in the summer of 2022 (period 9, Omicron BA.4/BA.5 wave). Considerable variations were observed over time for age groups 3 to 5 years, 6 to 10 years, and 11 to 14 years (Table 1). These changes paralleled the increase in the proportion of school-aged children among all cases diagnosed in the fall of 2021 according to the national database (eFigures 2 and 3 in Supplement 1) (eg, children aged 6-10 years accounted for up to 13.7% of all positive tests in France in period 6<sup>27</sup>).

### Case-Control Analysis on the Association of Sharing Household With a Child With the Risk of Infection

After the matching and bootstrapping process, we included 175 688 cases and 43 922 controls (sum of the mean values for the 100 databases for each period) in the case-control analysis for the risk associated with living with a child (Figure 1). The population included in this analysis had a higher proportion of women (66.2% vs 52.4% in the general population aged 20 and over in France), the most frequently represented age group was 40 to 49 years (26.8% vs 16.7%), and a moderately higher proportion of residents of the Ile-de-France region (where Paris is located) (22.1% vs 18.3%) (Table 2). Close to half of all participants reported sharing the household with a child of any age or

Figure 1. Study Flowchart



Descriptive analysis was conducted on cases for which the source case lived in the same household and was aged <18 years. Study conducted in mainland France between October 2020 and October 2022.

Table 1. Proportion of Cases Living in the Same Household as Child or Adolescent Who Was Source Case

Age group of the source case, y	Cases, %									Total
	1	2	3	4	5	6	7	8	9	
0-2	0.1	0.3	0.5	0.2	0.6	0.4	0.8	0.6	0.4	0.5
3-5	0.2	0.5	0.7	0.3	1.3	1.2	2.0	0.9	0.6	1.1
6-10	0.4	1.1	1.3	1.0	3.5	4.8	3.9	2.8	1.1	2.5
11-14	0.7	1.2	1.1	1.1	1.4	1.7	2.2	1.8	0.6	1.5
15-17	0.9	1.1	1.1	1.3	0.9	0.5	1.5	1.0	0.3	1.0
Total	2.4	4.4	4.7	3.9	7.7	8.6	10.4	7.0	3.0	6.6

Analysis of a case-control study conducted in mainland France between October 2020 and October 2022. Individuals in the case cohort were asked if they knew the source of the infection. Study period divided according to changes in incidence, predominant circulating strain, and major nonpharmaceutical interventions. The start dates for the

periods were as follows: (1) October 1, 2020; (2) December 4, 2020; (3) April 9, 2021; (4) June 14, 2021; (5) August 14, 2021; (6) October 2, 2021; (7) December 20, 2021; (8) March 18, 2022; (9) May 20, 2022 (study end date: October 2, 2022). No period could be defined for 2309 cases for whom dates of symptom onset and testing were unavailable.



Table 2. Study Population Characteristics

Variable	Participants, No. (%) <sup>a</sup>		P value
	Cases	Controls	
Total	175 688	43 922	
Sex			
Female	116 308 (66.2)	29 077 (66.2)	>.99
Male	59 380 (33.8)	14 845 (33.8)	
Age, y			
18-29	21 244 (12.1)	5311 (12.1)	>.99
30-39	31 888 (18.2)	7972 (18.2)	
40-49	47 032 (26.8)	11 758 (26.8)	
50-59	37 960 (21.6)	9490 (21.6)	
60-69	24 796 (14.1)	6199 (14.1)	
≥70	12 768 (7.3)	3192 (7.3)	
Population in the area of residence			
<5000 inhabitants	44 828 (25.5)	11 207 (25.5)	>.99
5000-19 999 inhabitants	13 984 (8.0)	3496 (8.0)	
20 000-99 999 inhabitants	17 800 (10.1)	4450 (10.1)	
Over 100 000 inhabitants	61 956 (35.3)	15 489 (35.3)	
Greater Paris area	37 120 (21.1)	9280 (21.1)	
Region of residence			
Ile-de-France	39 848 (22.7)	9962 (22.7)	>.99
Auvergne-Rhône-Alpes	23 384 (13.3)	5846 (13.3)	
Occitanie	17 860 (10.2)	4465 (10.2)	
Provence-Alpes-Côte d'Azur and Corsica	15 788 (9.0)	3947 (9.0)	
Nouvelle-Aquitaine	15 132 (8.6)	3783 (8.6)	
Grand Est	15 336 (8.7)	3834 (8.7)	
Hauts-de-France	14 800 (8.4)	3700 (8.4)	
Pays de la Loire	8580 (4.9)	2145 (4.9)	
Bretagne	8324 (4.7)	2081 (4.7)	
Normandie	6124 (3.5)	1531 (3.5)	
Bourgogne-Franche-Comté	5876 (3.3)	1469 (3.3)	
Centre-Val de Loire	4636 (2.6)	1159 (2.6)	
Education level			
No diploma	3682 (2.1)	767 (1.7)	<.001
Pre-high school diploma	25 982 (14.8)	7722 (17.6)	
High school diploma	31 763 (18.1)	10 559 (24.0)	
Bachelor's degree	62 869 (35.8)	16 340 (37.2)	
Master's degree or higher	51 392 (29.3)	8534 (19.4)	
Health care worker	19 400 (11.0)	3021 (6.9)	<.001
Health conditions			
Diabetes	6149 (3.5)	2304 (5.2)	<.001
Hypertension	20 480 (11.7)	5773 (13.1)	<.001
Chronic respiratory disease	14 639 (8.3)	3132 (7.1)	<.001
Body mass index <sup>b</sup>			
Healthy weight (≥18.5 or <25)	89 350 (50.9)	20 909 (47.6)	<.001
Underweight (<18.5)	5414 (3.1)	1880 (4.3)	
Overweight (≥25 & <30)	52 848 (30.1)	13 111 (29.9)	
Obesity (≥30)	28 074 (16)	8022 (18.3)	
Housing			
Individual house	106 790 (60.8)	25 775 (58.7)	<.001
Apartment	68 217 (38.8)	18 004 (41.0)	
Other	681 (0.4)	143 (0.3)	

(continued)

Table 2. Study Population Characteristics (continued)

Variable	Participants, No. (%) <sup>a</sup>		P value
	Cases	Controls	
Sharing household with a child of any age and school level	82 484 (46.9)	19 652 (44.7)	<.001
Sharing household with a child, by school level			
Daycare	4946 (2.8)	928 (2.1)	<.001
Professional in-home caregiver	5779 (3.3)	904 (2.1)	<.001
Preschool	16 478 (9.4)	3327 (7.6)	<.001
Primary school	29 039 (16.5)	6185 (14.1)	<.001
Middle school	26 790 (15.2)	6183 (14.1)	<.001
High school	21 989 (12.5)	5447 (12.4)	.54
Study period (onset date) <sup>c</sup>			
1 (October 1, 2020)	7308 (4.2)	1827 (4.2)	
2 (December 4, 2020)	19 636 (11.2)	4909 (11.2)	
3 (April 9, 2021)	9008 (5.1)	2252 (5.1)	
4 (June 14, 2021)	11 264 (6.4)	2816 (6.4)	
5 (August 14, 2021)	4820 (2.7)	1205 (2.7)	
6 (October 02, 2021)	11 248 (6.4)	2812 (6.4)	
7 (December 20, 2021)	44 136 (25.1)	11 034 (25.1)	
8 (March 18, 2022)	39 652 (22.6)	9913 (22.6)	
9 (May 20, 2022-October 2, 2022)	28 616 (16.3)	7154 (16.3)	

<sup>a</sup> Cases were adults recently diagnosed with ongoing SARS-CoV-2 infection who were invited by email by the national health insurance system. The controls are adults from the general population matched for age, sex, size of the population in the area of residence, region, and calendar week, who had never tested positive for SARS-CoV-2 until February 2021, when eligibility was extended to all adults without ongoing SARS-CoV-2 infection. One control was matched with 4 cases on age, sex, region, population size of the area of residence, and week of exposure with a bootstrapping procedure to generate 100 databases for each of the study periods to account for the random selection of cases. The numbers indicated are the means for the 100 databases generated for each period by bootstrapping with replacement of sets of 1 control for 4 cases, summed over the 9 periods.

<sup>b</sup> Calculated as weight in kilograms divided by height in meters squared.

<sup>c</sup> Study periods based on changes in incidence, the principal circulating strain, and major nonpharmaceutical interventions.

school level: 82 484 (46.9%) of cases and 19 652 (44.7%) of controls. The most frequently reported school levels were primary school (29 039 cases [16.5%]; 6185 controls [14.1%]) and middle school (26 790 cases [15.2%]; 6183 controls [14.1%]) (Table 2). Further description of the population for the case-control analysis are provided in the supplement (eTable in Supplement 1).

The risk of SARS-CoV-2 infection associated with living with a child changed over the course of the study (Figure 2, Table 3). The largest increases in risk for living with a child of any age or school level were found during the receding of the Delta wave at the end of summer 2021 (period 5: OR, 1.4; 95% CI, 1.3-1.5) and during the Omicron BA.1 wave in the winter of 2022 (period 7: OR, 1.3; 95% CI, 1.3-1.3), whereas there was no increase in risk during periods 1 (second wave; historical strain), 4 (summer 2021; emergence of the Delta variant), and 6 (fall 2021, Delta variant) (Table 3; eFigure 4 in Supplement 1).

When broken down by school level, we identified that people living with children in the youngest age groups (under 6 years of age) had increased odds of infection, particularly for those living with children looked after by a professional in-home caregiver (eg, period 1: OR, 1.8; 95% CI, 1.6-2.1), and remained relatively stable throughout the study. The proportion of participants with children in these age groups being low, the PAFs remained usually below 2% (Table 3).

People living with children attending primary school (ages 6 to 10 years) initially had lower odds of infection. They increased notably from August to September 2021 (period 5) onwards during the Delta and Omicron BA.1 waves (eg, period 4: OR, 1.0; 95% CI, 0.9-1.0 vs period 5: OR, 1.4; 95% CI, 1.2-1.5). The proportion of people living with children attending primary school being high (approximately 15% of controls), the PAFs obtained for this age group were the highest for any age group during the Delta and Omicron BA.1 waves (period 6: 7.6%; 95% CI, 6.6%-8.8%).

For people living with children attending middle school (ages 11 to 14 years), the increase in risk varied over the study period, with OR point estimates peaking at 1.3-1.4 during the second wave of the historical strain (period 1: OR, 1.3; 95% CI, 1.3-1.3), the receding of the Delta wave at the end of summer 2021 (period 5: OR, 1.4; 95% CI, 1.3-1.5), and the Omicron BA.1 wave in winter 2022 (period 7: OR, 1.3; 95% CI, 1.2-1.3). As the ORs were lower than for children attending primary school, the PAFs were lower for this age group despite similar proportion of population exposed (Table 3). For people living with children attending high school (ages 15 to 17 years), increases in risk were limited and observed only



during the historical strain and Alpha wave (period 1: OR, 1.2; 95% CI, 1.1-1.3) up to the third and last lockdown in April 2021 (period 2: OR, 1.2; 95% CI, 1.2-1.3).

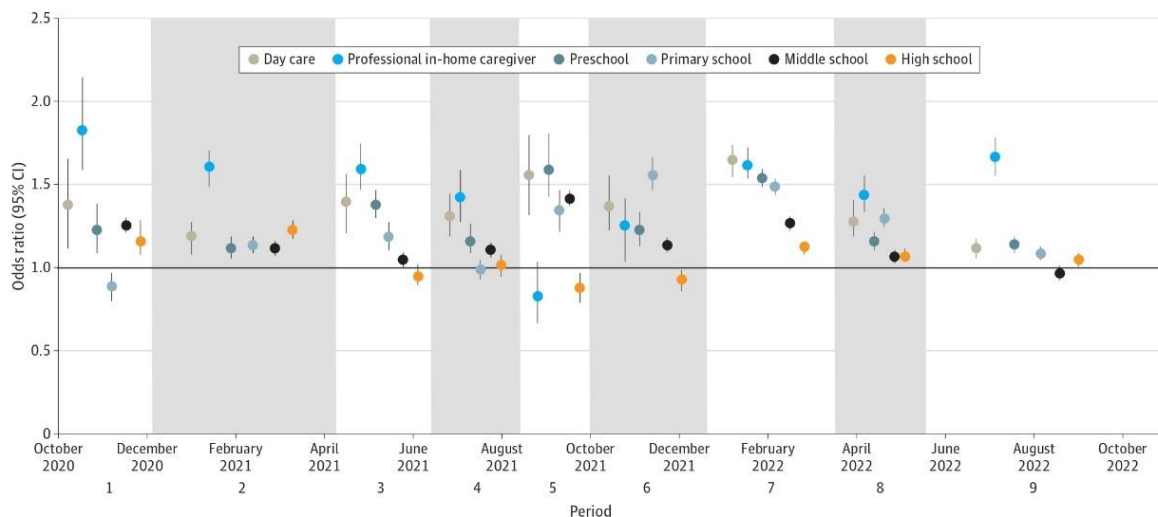
Following the BA.1 wave, SARS-CoV-2 incidence fell in children during subsequent waves (BA.2 and BA.4/BA.5) (eFigures 2 and 3 in Supplement 1). Odds of infection decreased substantially for people sharing household of children of all age groups, except for children looked after by a professional in-home caregiver (eg, period 9: OR, 1.7; 95% CI, 1.6-1.8).

**Discussion**

This nationwide case-control study provides a temporal perspective on the transmission of SARS-CoV-2 from children to other members of their households. It covers the emergence of more transmissible variants (notably the Delta and Omicron variants) and the introduction of vaccination for children. We found that people living with children often had a higher risk of SARS-CoV-2 infection (with highest effect sizes during the receding Delta wave in the summer of 2021, and the Omicron BA.1 wave in the winter of 2022), suggesting transmission probably from children to adults in the household. The risk associated with living with younger children (under the age of 6 years) was consistently high throughout the study, particularly for children looked after by a professional in-home caregiver. The risk associated with living with children attending primary school materialized only with the emergence of more transmissible variants, such as the Delta and Omicron variants, in a context in which the adult population was largely vaccinated; this situation was associated with the highest PAF. The risk associated with children attending middle and high school was moderate at the start of the study; it subsequently varied for children of middle-school age but declined for children of high-school age. The risk associated with children of any age decreased for members of households in the spring and summer of 2022.

Surveillance-based studies often fail to highlight the risk for people living with youngest children due to the high proportion of asymptomatic infections in those and a probable reluctance to test

**Figure 2. Risk of SARS-CoV-2 Infection in People Living With Children by Age and School Level**



Odds ratios in fitted multivariable logistic regression models. The periods were defined on the basis of changes in SARS-CoV-2 incidence, predominant circulating strain, and major nonpharmaceutical interventions (the periods are indicated by shaded gray areas), with start dates as follows: (1) October 1, 2020; (2) December 4, 2020; (3) April 9, 2021; (4) June 14, 2021; (5) August 14, 2021; (6) October 2, 2021; (7) December 20, 2021; (8) March 18, 2022; (9) May 20, 2022 (study end date: October 2, 2022). Multivariable

logistic regression models are adjusted for sociodemographic characteristics, health status (body mass index, immunosuppression, diabetes, hypertension, chronic respiratory disease), smoking status, COVID-19 vaccination status (number of doses and time since last dose), attendance of private or professional meetings, use of public transportation, travel abroad, sports activities, visits to retail facilities, restaurants, bars, or parties, and health care worker status.

Table 3. Prevalence of Exposure to a Child in the Household by School Level and Age Group

Households with a child <sup>a</sup>	Period	No. (%)		Odds of infection, OR (95% CI)		Attributable fraction (95% CI)
		Prevalence in cases	Prevalence in controls	Unadjusted	Adjusted	
Any age or school level	1	3678 (50.3)	833 (45.6)	1.2 (1.2-1.3)	0.9 (0.9-1.0)	NA <sup>b</sup>
	2	10703 (54.5)	2426 (49.4)	1.2 (1.2-1.3)	1.1 (1.1-1.2)	6.9 (4.2-9.2)
	3	5233 (58.1)	1213 (53.9)	1.2 (1.2-1.2)	1.1 (1.1-1.2)	7.8 (4.7-11.5)
	4	5252 (46.6)	1451 (51.6)	0.8 (0.8-0.8)	1.0 (0.9-1.1)	NA <sup>b</sup>
	5	2575 (53.5)	594 (49.3)	1.2 (1.1-1.2)	1.4 (1.3-1.5)	15.8 (11.6-21.4)
	6	5351 (47.9)	1270 (45.2)	1.1 (1.1-1.1)	1.0 (1.0-1.1)	1.1 (NA <sup>b</sup> -3.7)
	7	20350 (46.1)	4452 (40.4)	1.3 (1.3-1.3)	1.3 (1.3-1.4)	11.4 (10.1-12.8)
	8	16915 (42.7)	4134 (41.7)	1.0 (1.0-1.1)	1.1 (1.1-1.2)	5.5 (3.8-6.9)
	9	12427 (43.4)	3278 (45.8)	0.9 (0.9-0.9)	1.1 (1.0-1.1)	3.6 (1.3-4.9)
Attending day care	1	160 (2.2)	27 (1.5)	1.5 (1.3-1.7)	1.4 (1.1-1.7)	0.6 (0.2-1.0)
	2	619 (3.2)	122 (2.5)	1.3 (1.2-1.4)	1.2 (1.1-1.3)	0.5 (0.2-0.7)
	3	329 (3.7)	58 (2.6)	1.4 (1.3-1.6)	1.4 (1.2-1.6)	1.1 (0.6-1.5)
	4	419 (3.7)	90 (3.2)	1.2 (1.1-1.3)	1.3 (1.2-1.4)	0.9 (0.6-1.2)
	5	168 (3.5)	30 (2.5)	1.4 (1.3-1.6)	1.6 (1.3-1.8)	1.2 (0.8-1.7)
	6	294 (2.6)	55 (2.0)	1.3 (1.2-1.5)	1.4 (1.2-1.6)	0.7 (0.5-1.0)
	7	1220 (2.8)	183 (1.7)	1.7 (1.6-1.8)	1.7 (1.5-1.7)	1.1 (0.9-1.2)
	8	965 (2.4)	183 (1.8)	1.3 (1.2-1.4)	1.3 (1.2-1.4)	0.5 (0.4-0.7)
	9	771 (2.7)	180 (2.5)	1.1 (1.0-1.1)	1.1 (1.1-1.2)	0.3 (0.1-0.5)
Looked after by a professional in-home caregiver	1	217 (3.0)	25 (1.4)	2.2 (1.9-2.4)	1.8 (1.6-2.1)	1.4 (1.0-1.7)
	2	795 (4.0)	111 (2.3)	1.8 (1.7-1.9)	1.6 (1.5-1.7)	1.6 (1.2-1.8)
	3	402 (4.5)	58 (2.6)	1.8 (1.7-1.9)	1.6 (1.5-1.7)	1.7 (1.4-2.1)
	4	292 (2.6)	66 (2.3)	1.1 (1.0-1.2)	1.4 (1.3-1.6)	0.8 (0.5-1.0)
	5	102 (2.1)	32 (2.7)	0.8 (0.7-0.9)	0.8 (0.7-1.0)	NA <sup>b</sup>
	6	292 (2.6)	54 (1.9)	1.4 (1.2-1.5)	1.3 (1.0-1.4)	0.5 (0.1-0.8)
	7	1499 (3.4)	214 (1.9)	1.8 (1.7-1.9)	1.6 (1.5-1.7)	1.3 (1.1-1.5)
	8	1263 (3.2)	206 (2.1)	1.5 (1.5-1.6)	1.4 (1.3-1.6)	1.0 (0.8-1.2)
	9	918 (3.2)	138 (1.9)	1.7 (1.6-1.8)	1.7 (1.6-1.8)	1.3 (1.1-1.5)
Attending preschool	1	562 (7.7)	103 (5.6)	1.4 (1.3-1.5)	1.2 (1.1-1.4)	1.4 (0.6-2.3)
	2	2122 (10.8)	435 (8.9)	1.2 (1.2-1.3)	1.1 (1.1-1.2)	1.1 (0.6-1.8)
	3	1203 (13.4)	216 (9.6)	1.5 (1.4-1.5)	1.4 (1.3-1.5)	3.8 (3.0-4.6)
	4	942 (8.4)	227 (8.1)	1.0 (1.0-1.1)	1.2 (1.1-1.3)	1.2 (0.7-1.8)
	5	610 (12.7)	91 (7.6)	1.8 (1.7-1.9)	1.6 (1.4-1.8)	4.8 (3.7-6.1)
	6	1119 (9.9)	218 (7.8)	1.3 (1.2-1.4)	1.2 (1.1-1.3)	1.9 (1.1-2.7)
	7	4441 (10.1)	759 (6.9)	1.5 (1.5-1.6)	1.5 (1.5-1.6)	3.6 (3.3-3.9)
	8	3104 (7.8)	695 (7.0)	1.1 (1.1-1.2)	1.2 (1.1-1.2)	1.1 (0.7-1.5)
	9	2374 (8.3)	583 (8.1)	1.0 (1.0-1.1)	1.1 (1.1-1.2)	1.0 (0.7-1.3)
Attending primary school	1	1103 (15.1)	258 (14.1)	1.1 (1.0-1.1)	0.9 (0.8-1.0)	NA <sup>b</sup>
	2	3632 (18.5)	763 (15.5)	1.2 (1.2-1.3)	1.1 (1.1-1.2)	2.3 (1.5-3.1)
	3	1940 (21.5)	391 (17.4)	1.3 (1.3-1.4)	1.2 (1.1-1.3)	3.6 (2.0-4.9)
	4	1648 (14.6)	451 (16.0)	0.9 (0.9-0.9)	1.0 (0.9-1.0)	NA
	5	1044 (21.7)	197 (16.3)	1.4 (1.3-1.5)	1.4 (1.2-1.5)	5.8 (3.9-7.4)
	6	2293 (20.4)	389 (13.9)	1.6 (1.5-1.6)	1.6 (1.5-1.7)	7.6 (6.6-8.8)
	7	7663 (17.4)	1397 (12.7)	1.4 (1.4-1.5)	1.5 (1.4-1.5)	5.9 (5.4-6.4)
	8	5865 (14.8)	1304 (13.2)	1.1 (1.1-1.2)	1.3 (1.2-1.4)	3.5 (3.0-4.0)
	9	3850 (13.5)	1035 (14.5)	0.9 (0.9-0.9)	1.1 (1.0-1.1)	1.1 (0.6-1.6)

(continued)

Table 3. Prevalence of Exposure to a Child in the Household by School Level and Age Group (continued)

Households with a child <sup>a</sup>	Period	No. (%)		Odds of infection, OR (95% CI)		Attributable fraction (95% CI)
		Prevalence in cases	Prevalence in controls	Unadjusted	Adjusted	
Attending middle school	1	1301 (17.8)	244 (13.4)	1.4 (1.3-1.5)	1.3 (1.2-1.4)	3.8 (2.8-5.2)
	2	3557 (18.1)	755 (15.4)	1.2 (1.2-1.2)	1.1 (1.1-1.2)	2.0 (1.3-2.7)
	3	1750 (19.4)	398 (17.7)	1.1 (1.1-1.2)	1.0 (1.0-1.1)	0.9 (NA <sup>b</sup> -2.0)
	4	1726 (15.3)	422 (15.0)	1.0 (1.0-1.1)	1.1 (1.0-1.2)	1.5 (0.6-2.2)
	5	847 (17.6)	164 (13.6)	1.4 (1.3-1.4)	1.4 (1.3-1.5)	5.4 (4.0-6.5)
	6	1781 (15.8)	391 (13.9)	1.2 (1.1-1.2)	1.1 (1.0-1.2)	1.9 (0.7-3.0)
	7	6796 (15.4)	1404 (12.7)	1.2 (1.2-1.3)	1.3 (1.2-1.3)	3.3 (2.9-3.8)
	8	5433 (13.7)	1365 (13.8)	1.0 (1.0-1.0)	1.1 (1.0-1.1)	0.9 (0.5-1.4)
	9	3600 (12.6)	1040 (14.5)	0.8 (0.8-0.9)	1.0 (0.9-1.0)	NA <sup>b</sup>
Attending high school	1	1252 (17.1)	252 (13.8)	1.3 (1.2-1.4)	1.2 (1.1-1.3)	2.5 (1.2-4.0)
	2	3162 (16.1)	654 (13.3)	1.2 (1.2-1.3)	1.2 (1.2-1.3)	3.1 (2.4-3.8)
	3	1366 (15.2)	353 (15.7)	1.0 (0.9-1.0)	1.0 (0.9-1.0)	NA <sup>b</sup>
	4	1427 (12.7)	381 (13.5)	0.9 (0.9-1.0)	1.0 (1.0-1.1)	0.3 (NA <sup>b</sup> -1.0)
	5	611 (12.7)	163 (13.5)	0.9 (0.9-1.0)	0.9 (0.8-1.0)	NA <sup>b</sup>
	6	1288 (11.4)	355 (12.6)	0.9 (0.9-0.9)	0.9 (0.9-1.0)	NA <sup>b</sup>
	7	5257 (11.9)	1251 (11.3)	1.1 (1.0-1.1)	1.1 (1.1-1.2)	1.3 (0.9-1.7)
	8	4420 (11.1)	1157 (11.7)	1.0 (0.9-1.0)	1.1 (1.0-1.1)	0.8 (0.4-1.2)
	9	3207 (11.2)	881 (12.3)	0.9 (0.9-0.9)	1.0 (1.0-1.1)	0.5 (0.1-0.9)

Abbreviation: NA, not applicable.

<sup>a</sup> For each school level, the reference category is not living with a child of that same school level. The study period was divided into 9 periods according to changes in incidence, predominant circulating strain, and major nonpharmaceutical interventions. The start dates for the periods were as follows: (1) October 1, 2020; (2) December 4, 2020; (3) April 9, 2021; (4) June 14, 2021; (5) August 14, 2021; (6) October 2, 2021; (7) December 20, 2021; (8) March 18, 2022; (9) May 20, 2022 (study end date: October 2, 2022). Multivariable logistic regression models are adjusted for sociodemographic characteristics, health status (body mass index, immunosuppression, diabetes

mellitus, hypertension, chronic respiratory disease), smoking status, COVID-19 vaccination status (number of doses and time since last dose), attendance of private or professional meetings, use of public transport, travel abroad, sports activities, visits to retail facilities, restaurants, bars, or parties, and health care worker status. The choice of the adjusting variables was guided by subject-matter knowledge to include all measured causes of the exposure (sharing household with children), the outcome (SARS-CoV-2 infection), or both.

<sup>b</sup> Point estimate negative.

them in cases of exposure. This finding is consistent with previous reports of greater infectiousness in very young children than in adolescents.<sup>19,31,32</sup> More frequent symptomatic infections than in older children, and closer contacts between children and with other household members, particularly parents, may account for this higher risk.<sup>33</sup> The observed differences between day care centers and in-home caregivers probably reflect differences in child supervision and care.

From the summer and fall of 2021 onwards, we observed an increase in risk for the members of households including children attending primary school, and to a lesser extent, middle school. The emergence of the more transmissible Delta and Omicron variants in a population with relatively low preexisting immunity while the immunization campaign for adults was underway probably contributed to more effective circulation in these age groups and transmission to other members of their households.<sup>14</sup> A similar shift was observed in England, where the proportion of index cases of individuals aged 5 to 15 years in household clusters increased strongly after the reopening of schools following the summer school holidays in 2021.<sup>34</sup> Hughes et al<sup>35</sup> have shown viral load was lower in children aged 5 to 18 years than in adults for the wild-type and Alpha variants, but similar for the Delta variant, potentially accounting for this increase in infectiousness over time.

Members of household including children attending middle or high school presented a moderate increase in the risk of infection, as observed in the US and England in the fall of 2020 and winter of 2021.<sup>23,24</sup> The observed decrease in risk over subsequent periods, particularly for members of households including children attending high school, probably reflects the greater use of hybrid schooling methods in high schools and a high degree of vaccine coverage, particularly for the group



aged 15 to 17 years. The recurrence of an increased risk for the members of households including children attending middle school during the Omicron BA.1 wave may reflect lower vaccine coverage and a waning of immunity, favoring the circulation of this variant with high immune escape capacity.

In the final months of the study, the risk decreased for the members of households including children of all age groups (except those looked after by an in-home caregiver). This probably reflects transient herd immunity in this population following the intense circulation of SARS-CoV-2 observed in the winter of 2022 (Omicron BA.1 wave).

The impact on the population of viral circulation among children depends on the increase in risk associated with exposure to children from a particular age category, and the proportion exposed to children of that age category in the population, as shown by the calculation of population-attributable fractions (Table 3). The PAFs obtained were highest for exposure to primary school-aged children during the Omicron wave. The absolute number of infections resulting from exposure to primary school-aged children during this period was increased further by the unprecedented size of the Omicron wave. Nevertheless, PAFs should be interpreted with caution here due to the inherent limitations of case-control studies, such as recruitment bias or residual confounding, for the inference of causality.

### Limitations

This study had several limitations. One major limitation of this study is the low participation rate (6.0%) among all invited cases, which resulted in the inclusion of a study population with a female preponderance, of intermediate age, and with a level of education higher than that of the overall population of individuals affected by SARS-CoV-2. The analysis was matched or adjusted for these criteria, which limits the risk of selection bias. Nonetheless, this decreases the generalizability of our results. There were probably some errors in the identification of the source case given possible multiple concurrent exposures (particularly during the periods of intense SARS-CoV-2 circulation, for instance during the Omicron BA.1 wave, ie, period 7), and child source cases were likely frequently unidentified due to high proportion of asymptomatic infections in children. Nevertheless, the findings of the descriptive analysis were consistent with those of the case-control analysis, which should not have been affected by changes in testing practices in children: both approaches revealed a similar shift in the fall of 2021, suggesting an increase in transmission from children in primary or middle school to other members of their households.

Our approach based on the measurement of risk in people living with children does not provide direct information about the role of schools in SARS-CoV-2 transmission, which is why we did not study the impact of school closures on transmission. The specific investigation of transmission in schools will require school-centered studies. Our case-control analysis is also subject to potential unmeasured confounding: parents may for instance be more likely to interact with other parents in ways that our model might have only partially accounted for, and thus be more exposed to infection, other adults acting as drivers of transmission in this hypothesis. Our descriptive analysis showing how children gradually became a prominent source of transmission suggests nonetheless that at least part of the increased risk of infection for adults sharing a household with children was driven directly by the presence of children. Our questionnaire did not include information on the number of children in the household, which could have impacted the risk of infection. Future studies will also be required to assess how the risk for people living with children evolved after the end of the study period, as immunity wanes in children.

### Conclusions

This case-control study suggests that children have contributed to the transmission of SARS-CoV-2 to other household members in France. As new generations of young children who are not yet immunized gradually join community care settings, they may continue to represent a risk of transmission to other members of their households, with a particular impact on

immunocompromised adults. The vaccination of children aged between 6 months and 5 years, which was shown to reduce the risk of infection by 50.6% during the period in which the Omicron strain predominated, might have a determinant effect, decreasing this impact on the population.<sup>36</sup>

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#### SUPPLEMENT 1.

##### eMethods.

**eTable.** Description of Cases and Controls in an Online Case-Control Study in Mainland France (October 2020 to October 2022)

**eFigure 1.** Directed Acyclic Graph Representing the Causal Assumptions Underlying the Model Construction to Study the Effect of Sharing Household With Children on the Risk of SARS-CoV-2 Infection

**eFigure 2.** Incidence in Children by Age Group, France, October 2020-October 2022 (New Daily Cases)

**eFigure 3.** Proportion of Positive Tests by Pediatric Age Group Among All Positive Tests, France, October 2020-October 2022

**eFigure 4.** SARS-CoV-2 Daily Incidence (per 100,000) and Proportions of the Circulating Strains According to the Flash Sequencing Studies

#### SUPPLEMENT 2.

##### Data Sharing Statement

## **Reduction of SARS-CoV-2 intra-household child-to-parent transmission associated with ventilation: results from a case-control study**

After identifying that children likely transmitted SARS-CoV-2 to other household members, we wished to further investigate the transmission events from children to adults within the household. Child-to-parent transmission may be particularly difficult to mitigate given high proximity of contacts between parents and their children, particularly the younger ones. Providing evidence on the effectiveness of isolation measures within the household is thus crucial to guide advice to the public. This can be of particular interest for fragile or immunocompromised people, who are at higher risk of severe COVID-19, and who live with children and are thus exposed to an increased risk of infection. Isolation in the household can be difficult to sustain through the course of a SARS-CoV-2 infection, stressing the need for evidence-based information on its most effective components. Given high proximity and the frequent infectiousness before symptom onset, one might even wonder if isolation in the household is relevant at all. We thus aimed to evaluate the adherence to isolation of children with SARS-CoV-2 infection from adults in the household and the reduction in risk associated with this isolation, both overall and for specific isolation measures (mask-wearing, hand washing, ventilation of indoor areas, etc.).

To do so, we relied on two approaches. First, we provided an in-depth description of cases who reported a transmission from someone in their household to estimate the proportion being infected from a child within the household. We also assessed the compliance with isolation measures within the household. Second, we enrolled an additional control arm: we gave the option to cases at the end of the questionnaire to invite another uninfected household member by providing that person's email address. We then sent an invitation to a similar questionnaire to the relative while asking them to provide the result of the SARS-CoV-2 test performed within contact tracing. We thus identified non-infected household members whom we analysed as related controls. In this work, we focused on households where a child was the primary source case, while the participating case in the study and the related control were the child's parents. We compared adherence to recommended isolation measures between the adult case and the related control. We present this work in the following paper.



RESEARCH

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# Reduction of SARS-CoV-2 intra-household child-to-parent transmission associated with ventilation: results from a case–control study

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## Abstract

**Purpose** Our objective was to describe circumstances of SARS-CoV-2 household transmission and to identify factors associated with a lower risk of transmission in a nationwide case–control study in France.

**Methods** In a descriptive analysis, we analysed cases reporting transmission from someone in the household (source case). Index cases could invite a non-infected household member to participate as a related control. In such situations, we compared the exposures of the index case and related control to the source case by conditional logistic regression matched for household, restricted to households in which the source case was a child, and the index case and related control were the infected child's parents.

**Results** From October 27, 2020 to May 16, 2022, we included 104 373 cases for the descriptive analysis with a documented infection from another household member. The source case was mostly the index case's child (46.9%) or partner (45.7%). In total, 1026 index cases invited a related control to participate in the study. In the case–control analysis, we included 611 parental pairs of cases and controls exposed to the same infected child. COVID-19 vaccination with 3 + doses versus no vaccination (OR 0.1, 95%CI: 0.04–0.4), isolation from the source case (OR 0.6, 95%CI: 0.4–0.97) and the ventilation of indoor areas (OR 0.6, 95%CI: 0.4–0.9) were associated with lower risk of infection.

**Conclusion** Household transmission was common during the SARS-CoV-2 pandemic in France. Mitigation strategies, including isolation and ventilation, decreased the risk of secondary transmission within the household.

**Trial registration** ClinicalTrials.gov registration number: NCT04607941.

**Keywords** SARS-CoV-2, Home environment, Family, Patient isolation, Ventilation

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### Introduction

The household transmission of SARS-CoV-2 has been a crucial issue since the emergence of the disease, given the difficulty of isolating cases from other household members. Studies on household transmission have reported increasing secondary attack rates (SARs) with the emergence of more transmissible variants of concern (VOCs). An early meta-analysis found the SAR to be 16.6% before the emergence of VOCs [1]. Updated estimates for specific VOCs have revealed higher SARs for the B.1.1.7 (alpha), B.1.351 (beta) and B.1.617.2 (delta) VOCs (ranging from 21.0% to 36.4%, depending on the estimate) [2, 3], although temporal differences in prior immunity levels and home isolation recommendations make comparisons difficult. Higher SARs (up to 53%) have been reported for the B.1.1.529 (omicron) variant [2–6]. Comparisons with other settings, such as social events with family and friends have revealed that households are particularly prone to internal transmission events, due to the continuous nature of the exposure of household members in a closed environment [7, 8].

Nevertheless, much less evidence is available concerning the relative contribution of household transmission to the overall SARS-CoV-2 circulation and the circumstances of transmission within households (e.g., relationship between source case and secondary case, isolation measures). Furthermore, there has been little documentation of adherence to isolation measures within households, and few assessments have been made of the efficacy of specific isolation measures, such as mask-wearing, surface disinfection, and the ventilation of indoor areas [4, 9–11].

We aimed to describe circumstances of SARS-CoV-2 household transmission and to identify factors associated with a lower risk of transmission in a nationwide case–control study in France.

### Methods

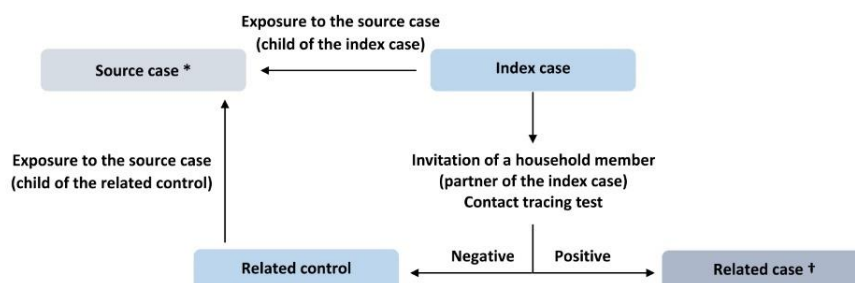
The methodology of this present case–control study (ComCor project) has been described elsewhere [12–14]. The ComCor study is a nationwide case–control study that began on October 27, 2020. Individuals diagnosed with SARS-CoV-2 infection and, identified through the *Caisse Nationale d'Assurance Maladie* (CNAM, a nationwide public health insurance organization) database, which is notified of all such diagnoses in France, are invited to participate by e-mail. Non-infected controls are selected from a panel representative of the French population by Ipsos, a company specializing in market research and public opinion polls. These controls were not included in the study described here.

#### Descriptive analysis

For the descriptive analysis of the present work focusing on household transmission, we selected cases (hereafter referred to as index cases) who reported being infected by another household member, hereafter designated the “source” case, with compatible sequences in symptoms and testing between the participant and that household member.

#### Case–control analysis

After completing the questionnaire, the index cases were offered the possibility of inviting another household member without ongoing SARS-CoV-2 infection (preferably their partner) to participate in the study. They were asked to indicate the e-mail address of the person they wished to invite, and this household member received an e-mail invitation and was asked to provide the result of the test performed during contact tracing to ensure that they remained free of SARS-CoV-2 infection (see Fig. 1). For the case–control analysis, we included invited household members who tested negative during contact tracing, hereafter referred to as “related controls”. We considered adherence to isolation measures and the



**Fig. 1** Study design of the inclusion of index cases and related controls for the case–control analysis on household contamination

Legend: \* The source cases in the household did not participate in the study; † related cases were not included in this analysis; online nationwide study conducted in France between October 2020 and May 2022



quality of their implementation to be highly dependent on the relationship between the household members involved. As a means of avoiding highly diverse situations that could not be adequately captured by our questionnaire, and of limiting the risk of unmeasured confounding due to differences in interactions between the source case, the index case and the related control, we restricted the study population to households in which the source case was a child, and the index case and related control were the child's parents (see Fig. 1).

All participants completed a questionnaire covering sociodemographic characteristics, relationships between household members, exposure information, circumstances of infection, isolation measures, testing and vaccination details. We focused on isolation between the source case and the participant (index case or related control). The question on overall isolation was phrased as follows (English translation of the original French phrasing): "Did you implement isolation measures between yourself and that person [the source of your contamination] (e.g., mask-wearing, door handle disinfection, sleeping separately, etc.)?". Further questions on specific mitigation measures were phrased as follows: "What isolation measures were implemented? Separate meals, separate toilet and bathroom, mask-wearing, surface and door handle cleaning with a disinfecting product, ventilation of areas for 10–15 min at least twice per day" with a "yes" or "no" answer for each measure. We excluded index cases who were tested or had a symptom onset more than 21 days after testing or symptom onset in the source case. We excluded pairs of index cases and related controls who reported source cases of different ages or sexes. Questionnaire conduction online did not allow to skip any questions, thus we had no missing data.

### Statistical analysis

We used medians and interquartile ranges to describe the population of index cases with a documented case source within the household. We performed univariable and multivariable conditional logistic regression analyses on household-matched cases and controls, with variable selection based on p-values and changes in parameter estimates [15]. We included the following exposures of interest: age, sex, vaccination status (number of doses received: 1, 2, or 3+), history of past SARS-CoV-2 infection, and underlying conditions (chronic respiratory disease, diabetes mellitus, hypertension, coronary artery disease). We studied the impact of isolating the participant from the source case, by including either overall isolation or individual mitigation measures. We investigated how the time at which transmission occurred might have affected the

findings by studying the interaction of the ventilation of indoor spaces with either seasonality or predominance of the omicron strain in two additional multivariable models. We defined the season according to the month in which symptom onset of the source case occurred (or the month of the diagnostic test if the timing of symptom onset was not indicated), with October to March defining the colder months and April to September the warmer months. We defined the time of predominance of the omicron strain from December 20, 2021 until the end of the study [16].

We tested the robustness of our findings in a series of sensitivity analyses. In the first, we fitted a model without any variable selection, i.e., retaining all individual mitigation measures, as well as age, sex, vaccination status, history of infection and underlying conditions [17]. Furthermore, we assessed the risk that unmeasured confounding could explain the association between the main exposures of interest (isolation overall and the mitigation measures) and the risk of infection using the e-value, both for the point estimates and the upper limit of the 95% confidence intervals. The e-value is defined as the minimum strength of association, on a risk ratio scale, that an unmeasured confounder would need to have with the exposure and the risk of infection to fully explain the association [18]. Lastly, to investigate how the selection of households (parental pairs exposed to one infected child) impacted our findings, we performed additional analyses including all eligible households regardless of the relationship between the source case, the index case, and the related control. As for the main analysis, we fitted two models using a variable selection procedure based on p-value and changes in estimates (one including isolation overall and one including individual mitigation measures), and one model without any variable selection, adding a variable defining the relationship between the source case and the participant, categorised as child, parent, sibling, partner, or other.

All analyses were performed with Stata/SE 16.0 software (College Station, Texas, USA).

### Ethical considerations

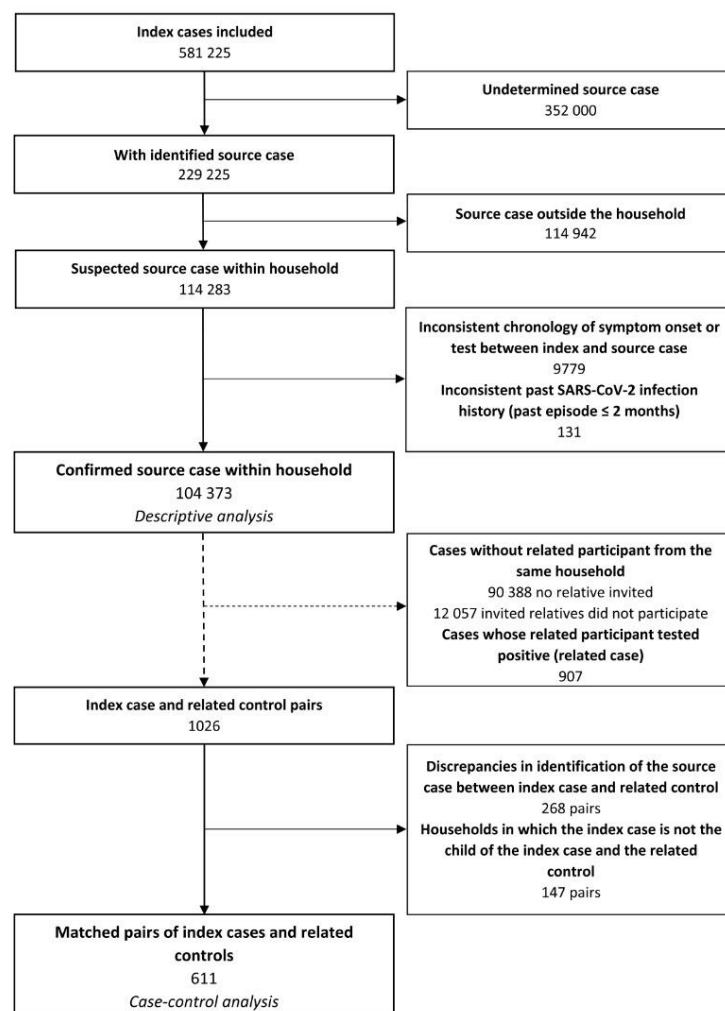
This study received ethics approval from the *Comité de Protection des Personnes Sud Ouest et Outre Mer 1* on September 21, 2020. The *Commission Nationale de l'Informatique et des Libertés* (CNIL, the French national data protection agency) authorized data processing for this study on October 21, 2020. Informed consent was obtained from all participants. The study is registered with ClinicalTrials.gov under the identifier NCT04607941 (registration date 29/10/2020).

**Results**

**Descriptive analysis**

Between October 27, 2020 and May 16, 2022, 581 225 index cases were included in the study, including 229 225 (39.4%) with an identified source of contamination. We included 104 373 index cases with documented intra-household contamination for the descriptive analysis. These represent 18.0% of all cases, and 45.5% of those with an identified source of infection (Fig. 2). The main characteristics of the index cases with documented intra-household contamination and of the reported source cases are summarized in Table 1. The study population was predominantly female (73.5%), often with a higher education diploma (70.1% with post-secondary education

qualifications). The source case was frequently symptomatic (87.5%) and was predominantly the participant's child (46.9%) or partner (45.7%). Most source cases (54.1%) had isolated themselves from the index case, often after test results (33.8%) or after symptom onset (17.9%). Isolation between the source case and the index case was less frequently implemented when the source case was the index case's child (50.0%) or partner (55.9%) than when the source case was a sibling (72.4%), mother or father (71.8%) or other member of the household (64.3%) (Pearson's chi-squared test:  $p < 0.001$ ). Adherence to isolation from the source case decreased over the study period: 57.4% of index cases reported isolation between themselves and the source case in the last



**Fig. 2** Flow chart for the identification of cases of SARS-CoV-2 infection with a confirmed source case within the household for the descriptive analysis and the selection of pairs of index cases and related controls for the case–control analysis Online nationwide study conducted in France between October 2020 and May 2022



**Table 1** Study population of the descriptive analysis of index cases of SARS-CoV-2 infection with a confirmed source case within their households

<b>TOTAL</b>	<b>104,373</b>
<b>Age – median [IQR] (years)</b>	42 [36–50]
<b>Female</b>	76,664 (73.5%)
<b>Education level</b>	
No diploma	1687 (1.6%)
Pre-high school diploma	11,778 (11.3%)
High-school diploma	17,513 (16.8%)
Bachelor's degree	39,281 (37.4%)
Master's degree or higher	34,114 (32.7%)
<b>Underlying conditions</b>	
Chronic respiratory disease	8223 (7.9%)
Hypertension	7541 (7.2%)
Diabetes mellitus	2315 (2.2%)
Coronary artery disease	578 (0.6%)
<b>COVID-19 vaccination status</b>	
Unvaccinated	40,529 (38.8%)
1 dose	2294 (2.2%)
2 doses	26,597 (25.5%)
3 doses	34,752 (33.3%)
4 doses	201 (0.2%)
<b>Symptomatic COVID-19</b>	90,371 (86.6%)
<b>Variant</b>	
Original strain	3219 (3.1%)
Alpha	10,625 (10.2%)
Beta/Gamma	916 (0.9%)
Delta	10,098 (9.7%)
Omicron	12,511 (12.0%)
Other	144 (0.1%)
Undetermined	66,860 (64.1%)
<b>Number of household members (median [IQR])</b>	4 [3, 4]
<b>SOURCE CASE</b>	
<b>Age – median [IQR] (years)</b>	26 [11–45]
<b>Female</b>	41,245 (39.5%)
<b>Symptomatic</b>	91,302 (87.5%)
<b>Isolation overall from the index case</b>	56,415 (54.1%)
<b>Isolation timing</b>	
From symptom onset	18,688 (17.9%)
From test results	35,278 (33.8%)
Other timing	2449 (2.4%)
<b>Mitigation measures</b>	
Ventilation (10–15 min at least twice/day)	52,150 (50.0%)
Mask-wearing	45,310 (43.4%)
Surface disinfection	41,734 (40.0%)
Separate bathrooms	21,970 (21.1%)
Separate meals	40,706 (39.0%)
<b>Relationship of the source case to the index case</b>	
Child	48,971 (46.9%)
Partner	47,726 (45.7%)
Mother/father	3013 (2.9%)
Sibling	1462 (1.4%)
Other	3201 (3.1%)

Legend: Online nationwide study conducted in France between October 2020 and May 2022. Doses of COVID-19 vaccine were counted if they occurred at least 14 days before symptom onset (or testing if asymptomatic) for the first dose, or at least 7 days before symptom onset or testing (if asymptomatic) for the second, third or fourth dose

quarter of 2020, 63.0% reported such isolation in the first quarter of 2021, decreasing to 47.8% in the first quarter of 2022 (odds test for trend:  $p < 0.001$ ).

### Case-control analysis

A small proportion (13,990/104,373, 13.4%) of the index cases invited a household member to participate in the study and 1933 (13.8%) of the invited relatives participated in the study. After excluding related participants who subsequently tested positive (related cases, 903), we identified a related control for 1026 index cases. After the elimination of pairs with discrepancies in source case identification and the selection of pairs in which the index case was a parent of the source case and the partner of the related control, we retained 611 matched pairs of index cases and related controls for the case-control analysis (Fig. 2), of whom 597 (97.7%) index cases reported that the source case tested positive for SARS-CoV-2. SARS-CoV-2 infection was confirmed (for cases) or excluded (for controls) using an RT-PCR in respectively 332 (54.3%) and 325 (53.2%) participants (others had a rapid antigenic test – information is missing for 48 cases and 48 controls included before January 2021 when rapid antigenic tests were largely unavailable). The median age of the source case was 11 years (IQR 8–16). For the index cases whose source case was their own child, we found few differences between the 611 index cases with a related control and the overall population of 48,971 index cases included in the main study (online resource, Table S1): the population with a related control was less predominantly female (64.5% vs. 77.1% overall), had a higher education level (80.6% with post-secondary education vs. 70.2%), and reported higher levels of adherence to isolation from the source case, both overall (56.8% vs. 50.0%) and for specific mitigation measures (e.g., 52.5% for the ventilation of indoor areas vs. 46.4%). Differences were otherwise minimal.

The characteristics of index cases and related controls, and conditional logistic regression in univariable and multivariable analyses are described in Table 2. The median time between the participation of the index case and the participation of the related control was 2 days (interquartile range (IQR): 1–4 days). Related controls tested negative for SARS-CoV-2 in median 2 days (IQR 0–4 days) and participated in median 10 days (IQR 7–14 days) after symptom onset in the index case (or test if asymptomatic). There was a strong female preponderance among index cases (64.5% of index cases vs. 35.8% of related controls were women).

After matching for household and adjustment for age and sex, a history of past SARS-CoV-2 infection (OR 0.1, 95% CI: 0.1–0.3) and COVID-19 vaccination

**Table 2** Description of pairs of index cases and related controls and factors associated with the risk of SARS-CoV-2 infection within the household in a household-matched conditional logistic regression analysis

	Index cases		Related controls		Univariable analysis		Multivariable analysis		Model with variable selection including specific mitigation measures		Model without variable selection and including specific mitigation measures	
	<i>n</i>	%	<i>n</i>	%	Odds ratio	95% CI	Odds ratio	95% CI	Odds ratio	95% CI	Odds ratio	95% CI
	<i>n</i> = 611	<i>n</i> = 611	<i>n</i> = 611	<i>n</i> = 611								
<b>Age, median [interquartile range] (years)</b>	44 [40–49]	45 [40–50]	1	-	1	-	1	-	1	-	1	-
18–39 years	143 (23.4%)	146 (23.9%)	1.1	0.7–1.8	1.5	0.9–2.5	1.5	0.9–2.5	1.4	0.8–2.5	1.4	0.8–2.5
40–59 years	448 (73.3%)	438 (71.7%)	0.5	0.2–1.5	1.2	0.4–3.7	1.2	0.4–3.8	1.2	0.4–3.7	1.2	0.4–3.7
≥ 60 years	20 (3.3%)	27 (4.4%)	1.8	1.5–2.1	1.9	1.5–2.2	1.9	1.5–2.2	1.9	1.5–2.2	1.9	1.6–2.3
<b>Female</b>	394 (64.5%)	219 (35.8%)	1	-	1	-	1	-	1	-	1	-
<b>Vaccination status</b>	181 (29.6%)	171 (28.0%)	0.4	0.1–1.1	0.6	0.2–1.7	0.6	0.2–1.7	0.6	0.2–1.7	0.6	0.2–1.8
Unvaccinated	15 (2.5%)	20 (3.3%)	0.5	0.2–1.2	0.5	0.2–1.4	0.5	0.2–1.4	0.5	0.2–1.4	0.5	0.2–1.3
1 dose	195 (31.9%)	161 (26.4%)	0.2	0.1–0.4	0.1	0.04–0.4	0.1	0.04–0.4	0.1	0.04–0.3	0.1	0.04–0.3
2 doses	220 (36.0%)	259 (42.4%)	0.2	0.1–0.5	0.1	0.1–0.3	0.1	0.1–0.3	0.1	0.1–0.3	0.1	0.1–0.3
3–4 doses <sup>a</sup>	26 (4.3%)	52 (8.5%)	0.8	0.5–1.3	-	-	-	-	-	-	-	-
<b>History of prior SARS-CoV-2 infection</b>	33 (5.4%)	40 (6.6%)	1.2	0.7–1.8	-	-	-	-	-	-	-	-
<b>Underlying conditions</b>	50 (8.2%)	44 (7.2%)	0.3	0.1–0.9	-	-	-	-	-	-	-	-
Chronic respiratory disease	5 (0.8%)	14 (2.3%)	1	0.3–4.0	-	-	-	-	-	-	-	-
Hypertension	4 (0.7%)	4 (0.7%)	0.6	0.4–0.8	0.6	0.4–0.97	0.6	0.4–0.97	-	-	-	-
Diabetes mellitus	347 (56.8%)	378 (61.9%)	0.6	0.4–0.9	-	-	0.6	0.4–0.9	0.5	0.3–0.9	0.5	0.3–0.9
Coronary artery disease	305 (49.9%)	318 (52.1%)	0.8	0.5–1.1	-	-	-	-	1.0	0.6–1.8	1.0	0.6–1.8
<b>Isolation from the source case</b>	258 (42.2%)	255 (41.7%)	1.1	0.7–1.5	-	-	-	-	1.6	1.0–2.6	1.6	1.0–2.6
Isolation overall	165 (27.0%)	176 (28.8%)	0.8	0.5–1.2	-	-	-	-	0.9	0.6–1.5	0.9	0.6–1.5
<b>Specific mitigation measures</b>	274 (44.8%)	279 (45.7%)	0.9	0.5–1.4	-	-	-	-	1.2	0.6–2.2	1.2	0.6–2.2
Ventilation of indoor areas	321 (52.5%)	350 (57.3%)	0.6	0.4–0.9	-	-	0.6	0.4–0.9	0.5	0.3–0.9	0.5	0.3–0.9
Mask-wearing	305 (49.9%)	318 (52.1%)	0.8	0.5–1.1	-	-	-	-	1.0	0.6–1.8	1.0	0.6–1.8
Surface disinfection	258 (42.2%)	255 (41.7%)	1.1	0.7–1.5	-	-	-	-	1.6	1.0–2.6	1.6	1.0–2.6
Separate bathrooms	165 (27.0%)	176 (28.8%)	0.8	0.5–1.2	-	-	-	-	0.9	0.6–1.5	0.9	0.6–1.5
Separate meals	274 (44.8%)	279 (45.7%)	0.9	0.5–1.4	-	-	-	-	1.2	0.6–2.2	1.2	0.6–2.2

Legend: a: only 3 participants (2 controls and 1 case) had received four doses of COVID-19 vaccines. We therefore grouped these participants with those who had received 3 doses; CI: confidence interval



(for 3–4 doses versus no vaccination, OR 0.1, 95% CI: 0.04–0.4) were associated with a lower risk of infection (Table 2). Overall isolation from the source case was also associated with a lower risk of infection (OR 0.6, 95% CI: 0.4–0.97). The e-values for overall isolation were 2.7 for the point estimate and 1.2 for the upper limit of the confidence interval. We investigated isolation in more detail, by introducing individual mitigation measures into a separate model that did not include overall isolation: the ventilation of indoor areas (OR 0.6, 95% CI: 0.4–0.9) was significantly associated with a lower risk of infection, whereas none of the other components of isolation — mask-wearing, surface disinfection, the use of separate bathroom or eating separately — remained in the model following variable selection (Table 2). The e-values for ventilation were 3.4 for the point estimate and 1.5 for the upper limit of the confidence interval. Source case infection occurred in the colder months for 527 households (86.3%) and in the warmer months for 84 households (13.7%). When we considered the interaction of ventilation with seasonality and with the predominance of the omicron strain, we found that ventilation was associated with a lower risk of infection for exposure during the colder months (OR 0.6, 95% CI: 0.4–0.9) but not during the warmer months (OR 1.1, 95% CI 0.4–3.3), and the association was significant before the emergence of omicron (OR 0.5, 95% CI 0.3–0.9) but not afterwards (OR 0.9, 95% CI 0.5–1.6), although neither of the interaction terms were significant ( $p=0.220$  and  $p=0.179$  for seasonality and omicron predominance, respectively).

In a sensitivity analysis fitting a conditional logistic regression model without variable selection, ventilation of indoor areas remained the only isolation measure significantly associated with a lower risk of infection (OR 0.5; 95% CI: 0.3;0.9) (Table 2) (e-values 3.4 for the point estimate and 1.5 for the upper limit of the confidence interval). When we included all households regardless of the relationship between the source case, the index case, and the related control, we found comparable results for the variables of interest, in particular ventilation of indoor areas: OR 0.7 (95% CI 0.5–0.9) in the model with variable selection, and OR 0.6 (96% CI 0.4–1.0) in the model without variable selection (see online resource, Table S2 for further results).

## Discussion

This study highlights the frequency of household transmission of SARS-CoV-2 in France and the reduction of the risk of transmission within the household associated with isolation measures, particularly the strict application of ventilation measures for indoor areas.

The key role of household transmission has already been reported [7, 8, 19]. We found that household transmission represents a significant proportion of SARS-CoV-2 infections: cases infected within the household represented 18.0% of all cases, likely an underestimation as some household transmissions probably remained undetected, and 45.5% of those reporting an identified source. This underscores the importance of preventing household transmission for comprehensive mitigation policies. Partners and children were the most frequent (over 90%) source of contamination, mirroring the situation of household in France, but this finding may also reflect the poorer application of isolation measures when the source case is a partner or a child, resulting in higher levels of transmission [20].

Adherence to the overall isolation of cases within the household decreased considerably over the study period, probably due to increasing vaccine coverage, and possibly due to some degree of pandemic fatigue. When implemented, isolation from the source case was more frequently applied following test results than at symptom onset, in both index cases and related controls. These findings raise concerns about compliance with public health measures regarding case isolation within households. They also indicate potential targets for improving campaigns for preventing household transmission.

Our analysis of specific mitigation measures highlighted the importance of ventilating indoor areas. We found an interaction of the effect of ventilation with seasonality, with a strong association restricted to the colder months and no significant association during the warmer months. Windows are more likely to be opened in the warmer months, regardless of the infection status of household members, lessening the difference between cases and controls. More generally, while it is conceivable that two adults interacted somewhat differently with the sick child, including on the habits of window opening (when visiting the child's bedroom for instance), we cannot rule out the possibility that some mitigation measures, including ventilation, had at least a partial effect on the related control when applied by the index case or vice versa. If such an effect occurred, it would have led to an underestimation of the association between various mitigation measures and the risk of infection, thus the magnitude of the odds ratios should be interpreted cautiously. Studies comparing transmission between households might help further assess the impact of these household-level measures on secondary transmission. The fact that ventilation nevertheless remained associated with a lower risk of infection, the sensitivity analysis identifying ventilation as the only significant mitigation measure in a model without variable selection, and the results showing that this effect predominated in the colder months



increase our confidence in these findings concerning the importance of ventilation.

Published evidence concerning the efficacy of ventilating indoor areas in the household is particularly scarce. One case–control study in Spain found lower odds of secondary transmission in households with a temperature deemed pleasant despite ventilation [11]. This approximation of ventilation habits differs from that in our study, but the findings are nevertheless consistent. Other school-based studies have reported lower risk of SARS-CoV-2 transmission in schools where improved ventilation systems have been implemented [21, 22]. The ventilation of indoor areas is an interesting target for strategies aiming to reduce household transmission, as its implementation is not limited by housing capacity. The results of the CoviPrev studies conducted on an iterative basis by Santé Publique France to monitor the level of adherence to various risk mitigation strategies in the general public, suggest that ventilation is implemented less during the winter months (e.g., 36.2% of respondents reported systematically ventilating their dwelling at least twice daily in December 2021, whereas this proportion reached 43.1% in May 2022) [23]. Levels of adherence to this measure nevertheless remain quite low overall. We hope that our results will contribute to the design of evidence-based strategies for increasing the use of ventilation measures, particularly in the colder months.

We found no decrease in the risk of transmission due to other isolation measures, such as mask-wearing or eating meals separately, although the lack of significance may result from low power due to the limited sample size. Mask-wearing has been shown to be associated with a lower risk of infection in a number of studies [10, 11, 24, 25], including one by the US Centers for Disease Control and Prevention in which attack rates were lower in households in which index cases reported wearing a mask during the infectious period (39.5% vs. 68.9%) [4]. Our findings for mask-wearing may also reflect difficulties complying with this measure in the household setting, in which the continual correct wearing of a mask may be particularly arduous.

Women were markedly overrepresented among the cases, consistent with the composition of the case population of the ComCor study: women accounted for 68.8% of all cases included during the study period, but only 53% of all notified cases in France over the same period [26]. There was therefore a selection bias in our study with a corresponding overrepresentation of men in the group of related controls (these controls being the partners of the index cases in this study). The higher risk of household transmission for women should, therefore, be interpreted with particular caution. Interestingly, the proportion of women was higher in the subpopulation

of index cases reporting their child as the source case (77.1%) than in the total population of index cases infected within the household (73.5%), potentially reflecting women having more contact than men with their children in French households [27].

This study has several limitations, including the self-declared nature of the data, leaving little possibility for verification. Identification of the source case was likely mistaken in some of the cases, particularly given high share of asymptomatic infections in children and possible multiple exposure [28, 29]. We implemented several coherence checks on contamination chain analysis and adherence to design for the intrahousehold analysis, and almost all index cases indicated that the source case had a positive SARS-CoV-2 test. The description of isolation and mitigation measures had to be kept at a level of detail appropriate for a self-administered questionnaire, which might have particularly affected the question on overall isolation: isolation as a bundle of mitigation measures might be diversely understood. Thus, findings on this item should be interpreted with caution. Index cases had the option of inviting another household member to participate, but there was no obligation. As a result, such invitations occurred in only a small proportion of cases, resulting in a selection of the households included in the case–control analysis. It is difficult to speculate on how this selection process might have affected study findings concerning isolation or the ventilation of indoor areas, for example. The selection of a more female, more educated study population may however limit the generalizability of our results. Furthermore, some descriptive indicators might be overestimated, such as adherence to the mitigation measures, in this selected population.

Owing to the relatively small sample size, we could not investigate all the potential changes of associations through time (for instance depending on non-pharmaceutical interventions or the circulating strain).

Validity of the variable selection procedure in model selection is debated, but our results remained unchanged in the sensitivity analysis based on a fitted model without any variable selection [17].

We had limited data concerning the other members of the household (potentially also infected by SARS-CoV-2) who might represent additional exposures, and impact the associations observed in unpredictable manner. While the *e*-values for the point estimates are quite high, they are relatively low for the upper limit of the confidence intervals. Although it is unclear which confounding factor would not be accounted for in the analyses, these *e*-values illustrate the possibility that unmeasured confounding might explain the associations between isolation or ventilation and the risk of infection, stressing the need to confirm these findings in other studies.



Finally, we cannot exclude the possibility that the related control was ultimately infected, as related controls tested negative quite early after symptom onset in the index case, and close to 40% of them used a rapid antigenic test which is less sensitive than RT-PCR. However, related controls participated a median 10 days after symptom onset in the index case and were still likely asymptomatic by then as they confirmed absence of transmission.

Overall, this study provides evidence of the prominent role of household transmission in SARS-CoV-2 circulation in France and of the benefits associated with implementing mitigation measures in the household, including the ventilation of indoor areas in particular. These findings will be useful for the design of public health mitigation strategies targeting households and informing the public about the importance of ventilating indoor areas, alongside other pharmaceutical and non-pharmaceutical measures.

### Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12889-023-16144-2>.

**Additional file 1: Table S1.** Index cases reporting household contamination from their child, both overall and restricted to the subpopulation of index cases with a partner participating in this study as a related control.  
**Table S2.** Sensitivity analysis including in the study population the households other than parental pairs exposed to the same infected child and exposures associated with the risk of SARS-CoV-2 infection.

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### Authors' contributions

AF, SG, TC, LS, FO, FC and AM designed the investigation. SG, TC, LS, AF and AM developed the study questionnaire. FO and SM managed the data collection online. OC, SG and TC oversaw the adherence of the study to regulatory requirements. TC, YM and LS oversaw the collection of the data and maintained the database. SG, YM, AR and AF performed the statistical analyses. SG and AF drafted the first versions of the manuscript. SG, TC, YM, AR, LS and AF had full access to the data reported in this study. SG, YM and AF accessed and verified the data. All authors critically reviewed and approved the final version of the manuscript.

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### Availability of data and materials

The data that support the findings of this study are available at Institut Pasteur. Restrictions apply to the availability of these data, which were used under authorized agreement for this study from the data protection authority, the *Commission Nationale de l'Informatique et des Libertés* (CNIL). Access to these data would therefore require prior authorization by the CNIL. Contact the corresponding author (Arnaud Fontanet, [fontanet@pasteur.fr](mailto:fontanet@pasteur.fr)) for requests.

### Declarations

#### Ethics approval and consent to participate

This study was performed in line with the principles of the Declaration of Helsinki. This study received ethics approval from the ethics committee *Comité de Protection des Personnes Sud Ouest et Outre Mer 1* on September 21, 2020, as required by French regulation on clinical research. Informed consent was obtained from all participants included in the study.

#### Consent for publication

Not applicable.

#### Competing interests

FC receives consulting fees from Sanofi.

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## **Evidence since publication and further perspectives**

This study suggests that, despite high proximity in the household and the possibility for pre-symptomatic transmission, implementing isolation measures likely helps mitigate onward transmission in the household, as was already shown in other household-based studies (233,253). It provides further insight on the protection, or lack thereof associated with specific isolation measures, including the disinfection of surfaces or the ventilation of indoor areas.

The role of fomites in the transmission of SARS-CoV-2, and the need to disinfect surfaces, has been debated since early in the pandemic (254). The epidemiological evidence linking fomite contamination or disinfection with the risk of infection remains scarce (255). Most of the evidence derives from virus identification on fomites, whether viral RNA or viable virus obtained in cultures (256). One observational study in households in the UK found a greater risk of transmission in households where SARS-CoV-2 RNA was detectable on hands and surfaces (257), suggesting that transmission through fomites is possible although other transmission routes could not be ruled out.

Since the publication of the present paper, no further study has been published on the effectiveness of ventilation to mitigate SARS-CoV-2 transmission. A scoping review conducted until October 2022 included 8 observational studies in community non-healthcare settings (schools, public transport, workplaces), showing overall a decreased risk of infection in settings with improved ventilation, but the whole body of evidence remains thin (258).

The question of the quality of ventilation of indoor areas goes well beyond the mitigation of SARS-CoV-2 transmission within the household. Indoor air quality is involved in the transmission of respiratory viruses but also in the exposure to air pollution and its health consequences, both respiratory and extra-respiratory. This topic is of particular concern in schools. Frequent and close contacts make schools favourable hotspots for several respiratory viruses, exposing both children and their household members to health hazards. Other respiratory hazards such as asthma have also been attributed to air pollution in schools (259). Given the potential implications for building renovations in schools in France, it is crucial to further investigate the effectiveness on indoor air quality improvement strategies on various outcomes.

# **SARS-CoV-2 incubation period across variants of concern, individual factors, and circumstances of infection in France: a case series analysis from the ComCor study**

The incubation period of the SARS-CoV-2 infection is essential to contact tracing and infectious diseases modelling. Determining the duration of the incubation period requires the identification of the source case, of the timings of the transmission event and of the symptom onset. As for the settings of transmission, we hypothesized that the incubation period might have changed through the course of the study, as new variants emerged. Early reports on the Omicron variant quickly indicated that the incubation period seemed shorter than that of previous strains (227,228). Other individual factors might also impact the duration of the incubation period: age, vaccine status, circumstances of infection, etc. Identifying the effect of the variant independently of these potential confounding factors requires multivariable analysis. Beyond mere adjustment purposes, we were interested in determining the association of these individual factors with the incubation period, a current knowledge gap.

Using the case series of the ComCor study, we relied, as in Paper 2, on the cases with an identified source case and a transmission during a unique encounter, thus allowing to identify the timing of transmission. We identified the variant of SARS-CoV-2 based on the screening of the positive test of the participant which was provided for some of them along with the test result, or on the matching of the timing of the test with the predominance of a specific variant. We reported in a previous paper our findings on the incubation period of the Delta variant (mean 4.3 days) compared to that of other variants, including the historical strain (mean 5.0 days) (66). We extended our analyses here to include the Omicron variant. We leveraged the availability of individual-level data in the questionnaire to study the effect of age, vaccine status, or circumstances of infection, and account for these potential confounding factors on the association of the variant with the incubation period. Finally, we aimed to account for an observed over-declaration of incubation periods of 7 days (likely an artefact of rounding the answer to “one week”).

The results of these analyses are presented in the following paper.





# SARS-CoV-2 incubation period across variants of concern, individual factors, and circumstances of infection in France: a case series analysis from the ComCor study

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## Summary

**Background** The incubation period of SARS-CoV-2 has been estimated for the known variants of concern. However, differences in study designs and settings make comparing variants difficult. We aimed to estimate the incubation period for each variant of concern compared with the historical strain within a unique and large study to identify individual factors and circumstances associated with its duration.

**Methods** In this case series analysis, we included participants (aged  $\geq 18$  years) of the ComCor case-control study in France who had a SARS-CoV-2 diagnosis between Oct 27, 2020, and Feb 4, 2022. Eligible participants were those who had the historical strain or a variant of concern during a single encounter with a known index case who was symptomatic and for whom the incubation period could be established, those who reported doing a reverse-transcription-PCR (RT-PCR) test, and those who were symptomatic by study completion. Sociodemographic and clinical characteristics, exposure information, circumstances of infection, and COVID-19 vaccination details were obtained via an online questionnaire, and variants were established through variant typing after RT-PCR testing or by matching the time that a positive test was reported with the predominance of a specific variant. We used multivariable linear regression to identify factors associated with the duration of the incubation period (defined as the number of days from contact with the index case to symptom onset).

**Findings** 20413 participants were eligible for inclusion in this study. Mean incubation period varied across variants: 4.96 days (95% CI 4.90–5.02) for alpha (B.1.1.7), 5.18 days (4.93–5.43) for beta (B.1.351) and gamma (P.1), 4.43 days (4.36–4.49) for delta (B.1.617.2), and 3.61 days (3.55–3.68) for omicron (B.1.1.529) compared with 4.61 days (4.56–4.66) for the historical strain. Participants with omicron had a shorter incubation period than participants with the historical strain ( $-0.9$  days, 95% CI  $-1.0$  to  $-0.7$ ). The incubation period increased with age (participants aged  $\geq 70$  years had an incubation period 0.4 days [0.2 to 0.6] longer than participants aged 18–29 years), in female participants (by 0.1 days, 0.0 to 0.2), and in those who wore a mask during contact with the index case (by 0.2 days, 0.1 to 0.4), and was reduced in those for whom the index case was symptomatic ( $-0.1$  days,  $-0.2$  to  $-0.1$ ). These data were robust to sensitivity analyses correcting for an over-reporting of incubation periods of 7 days.

**Interpretation** SARS-CoV-2 incubation period is notably reduced in omicron cases compared with all other variants of concern, in young people, after transmission from a symptomatic index case, after transmission to a maskless secondary case, and (to a lesser extent) in men. These findings can inform future COVID-19 contact-tracing strategies and modelling.

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## Introduction

Assessing the incubation period of SARS-CoV-2 throughout emergences of variants of concern is crucial to establish duration of quarantine, advise testing strategy of contacts, enable contact tracing, and inform epidemic modelling. Initial estimates based on meta-analyses of the incubation period of SARS-CoV-2, before the emergence of variants of concern, ranged between 5.1 and 6.5 days.<sup>1–4</sup> The incubation period has been shown to differ between variants of concern, with

a notably reduced incubation for people with the delta (B.1.617.2) variant.<sup>5–7</sup> Cluster investigations published in 2021 report an even shorter incubation period in people with the omicron (B.1.1.529) variant.<sup>8,9</sup>

The effect of individual factors, such as age, sex, COVID-19 vaccine status, or underlying conditions, on the length of the incubation period remains largely unestablished. The incubation period is reported to vary with age, with some studies finding an increase in incubation with age. However, a study based on

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**Research in context****Evidence before this study**

Iterative assessment of the SARS-CoV-2 incubation period is necessary throughout emergences of variants of concern to adapt mitigation strategies and inform epidemic modelling. A previous meta-analysis of 99 studies last updated in January, 2021, estimated that the mean incubation period was 6–38 days. We searched PubMed without any language restrictions for studies published between Jan 1, 2021, and March 23, 2022, using the keywords “COVID-19” AND “incubation”. We included epidemiological studies reporting an estimate of the mean or median SARS-CoV-2 incubation period with a minimum sample size of ten. The search retrieved 670 results, of which 16 reports of 13 studies (with sample sizes between ten and 1676 participants) were eligible for inclusion. Six studies had data on variants of concern (four studies on the delta [B.1.617.2] variant, one on the alpha [B.1.1.7] variant, and one on the beta [B.1.351] variant). Most studies were rated as good or fair in the quality assessment. Four studies investigated the effects of age or initial viral load on duration of the incubation period. We did not find any studies on the effects of other individual factors, such as sex, vaccine status, mask wearing at the time of contact with an index case, symptomatic status of the index case, or setting where transmission occurred.

**Added value of this study**

We analysed data from a nationwide study conducted in France that used consistent methods throughout the

emergence of multiple variants of concern, allowing comparison between variants. Our study provides evidence of a reduced incubation period for the omicron (B.1.1.529) variant of concern compared with all previously predominant variants while adjusting for individual factors (eg, age and vaccine status). We found evidence for a reduced incubation period in younger people and in situations of high viral inoculum (ie, not wearing a mask during contact or when the index case was symptomatic).

**Implications of all the available evidence**

Evidence of a notably reduced SARS-CoV-2 incubation period of the currently globally predominant omicron variant compared with the historical strain and other variants of concern has important implications for adapted contact-tracing strategies, which should aim to reduce the time from symptom onset to contact tracing as much as possible to achieve containment. The evidence can also inform infectious disease modelling, which is crucial in estimations of the upcoming effects of COVID-19 on health-care systems in many countries. Although evidence indicates an effect of age on the incubation period, with a shorter incubation period in younger people, the effects of vaccine status and mask wearing at the time of contact with the index case warrant further investigation.

contact-tracing conducted in China found people aged 41–60 years had a shorter incubation period than younger and older people.<sup>10–12</sup> External factors, such as the environment of transmission, the nature of contact with the index case, or the viral load of the index case, might also contribute (possibly through the viral inoculum, which has been shown to affect secondary transmission risk),<sup>13,14</sup> but there is no evidence about how these external factors might affect duration of the incubation period.

To assess the relative contribution of factors affecting the SARS-CoV-2 incubation period, data documenting incubation periods for a large number of cases, reported over long time periods, and with a stable study design would ideally be used. However, this approach is rarely possible. Meta-analyses have mostly relied on studies with relatively small sample sizes and different study designs. The few studies with more than 1000 participants often date back to the early months of the COVID-19 pandemic.<sup>15,16</sup>

In this study, we analysed a dataset documenting incubation periods of SARS-CoV-2 among participants of the large ComCor study, a nationwide case-control study conducted in France for 16 months (October, 2020, to February, 2022). We aimed to characterise the determinants of the SARS-CoV-2 incubation period, including variants of concern, individual factors, and circumstances of infection.

**Methods****Study design and participants**

The methods of the ComCor study have been described elsewhere.<sup>6,17,18</sup> Briefly, the ComCor study is a nationwide case-control study of adults aged 18 years or older with a SARS-CoV-2 diagnosis (cases) identified via the *Caisse Nationale de l'Assurance Maladie* (National Health Insurance Fund) database, which stores all diagnoses of SARS-CoV-2 in France, and control participants (ie, individuals who had never tested positive for SARS-CoV-2 up to February, 2021, when eligibility was broadened to include all adults without ongoing SARS-CoV-2 infection), selected from a representative panel of the French population by Ipsos, a market and opinion research company. Participants receive information about the study online before completing a questionnaire.

For this case series analysis of the ComCor study, we only analysed people who had SARS-CoV-2 after a single encounter with a known index case (ie, cases, not controls) between Oct 27, 2020, and Feb 4, 2022. We excluded participants who tested positive for SARS-CoV-2 after intrahousehold transmission (they were assumed to have had repeated contact with the index case, preventing the incubation period from being established), had an incubation period that could not be defined (including



those who were asymptomatic by study completion), had an incubation period longer than 15 days,<sup>1,3,19</sup> did not report doing a reverse-transcription-PCR (RT-PCR) test, or had an unidentified or non-variant-of-concern non-historical strain of SARS-CoV-2 and tested positive outside periods of large predominance of one strain.

For cases included in our analysis, the incubation period was defined as the number of days from contact with the index case to symptom onset.

We obtained informed consent from all participants. The ComCor study received ethical approval from *Comité de Protection des Personnes Sud Ouest et Outre Mer* (the Committee for the Protection of Persons South West and Overseas) on Sept 21, 2020. The data protection authority *Commission Nationale de l'Informatique et des Libertés* (the National Commission on Informatics and Liberty) authorised the processing of ComCor study data on Oct 21, 2020. The ComCor study is registered with ClinicalTrials.gov (NCT04607941).

### Procedures

Sociodemographic characteristics, exposure information, circumstances of infection if the index case was identified, testing (ie, RT-PCR or supervised rapid antigen test, not self-tests), COVID-19 vaccination details, smoking status, information about underlying health conditions (eg, diabetes, chronic respiratory disease, hypertension, or coronary artery disease), and BMI were obtained via the online questionnaire between Oct 27, 2020, and Feb 4, 2022 (appendix p 12). Sex data were self-reported, with the options “Female” or “Male” provided.

Variants were established either through variant typing after RT-PCR testing, or by matching the time that a positive test was reported with the predominance of a specific variant at that time. Variant typing was implemented in France by Santé Publique France for most positive RT-PCR tests from January, 2021, onwards. Individual test data were provided by participants if available. Details of mutations used to identify the alpha (B.1.1.7), beta (B.1.351), gamma (P.1), and delta (B.1.617.2) variants via RT-PCR screening are available elsewhere.<sup>6,18</sup> This strategy did not allow for differentiation between the beta and the gamma variants. However, FLASH sequencing studies conducted once per week or once every 2 weeks since January, 2021, on a random sample of positive SARS-CoV-2 tests in France showed that the beta variant largely predominated among tests with a positive result for beta or gamma after screening (eg, on March 2, 2021, beta represented 5·6% of positive samples and gamma represented 0·1%).<sup>20</sup> Between Dec 1, 2021, and Jan 16, 2022, we defined cases included in the study with tests showing omicron (B.1.1.529)-specific screening targets (ie, 69–70del, Lys417Asn, Ser371Leu and Ser373Pro, or Gln493Arg), or without the Glu484Lys or the Leu425Arg mutations, as omicron cases. According to FLASH

studies, the B.1.640 variant, which has neither the Glu484Lys or the Leu452Arg mutations, represented less than 1% of positive samples in December, 2021, and January, 2022. The routine variant typing strategy did not allow for differentiation between the BA.1 and BA.2 omicron subvariants. The FLASH studies found that BA.1 was largely predominant during the study period; in France, it represented 99·7% of positive samples on Jan 3, 2022, and 90·9% of samples on Jan 31, 2022.<sup>21</sup> Because of the absence of variant typing before early 2021 and the reduced proportion of samples typed in periods of high incidence—particularly during the omicron wave in the winter of 2021–22 or in periods of large predominance of one strain—we assumed that people with an unestablished variant had the predominant strain: historical strain for tests conducted before Jan 7, 2021; delta variant for tests conducted between Sept 1, 2021, and Nov 30, 2021; and omicron variant for tests conducted between Jan 17, 2022, and Feb 4, 2022. A predominance period was not defined for the alpha, beta, and gamma variants as they circulated mostly concomitantly during the first 6 months of 2021.<sup>22</sup>

### Statistical analysis

We used ordinary least-squares multivariable linear regression to estimate associations with the incubation period, with adjustment for the covariables of age, sex, underlying conditions (ie, diabetes, hypertension, chronic respiratory disease, coronary artery disease, or underweight defined as a BMI <18·5 kg/m<sup>2</sup>), smoking status, COVID-19 vaccine status (ie, number of injections and time elapsed since last injection in three categories: <90 days, 90–179 days, and ≥180 days), and characteristics of the index case and onward transmission (ie, symptoms of the index case, duration of the interaction, outdoor or indoor setting, and mask wearing by the participant and the person identified as the index case) in all eligible cases included in this study. During the study period, vaccines available in France were mRNA vaccines (ie, BNT162b2 [Pfizer–BioNTech] and mRNA-1273 [Moderna]) and viral vector vaccines (ie, ChAdOx1 nCoV-19 [AstraZeneca] and Ad26.CoV2.S [Johnson & Johnson]). We applied robust standard errors to account for possible heteroscedasticity. Because of the large sample size, we considered the model to be too robust to violate the normality of residuals' distribution.

We estimated the probability distribution of the true incubation period after correction for probable over-reporting at 7 days due to self-reported data. This calculation was done by estimating the probability of reporting 7 days if the true incubation period was 6 or 8 days ( $p_1$ ) or 5 or 9 days ( $p_2$ ). Poisson, negative-binomial, log-normal, and gamma distributions were considered. We considered one scenario in which  $p_2$  was estimated and one scenario in which  $p_2=0$ . We estimated parameters of each distribution jointly with  $p_1$  and  $p_2$  using a Monte Carlo Markov Chains algorithm. The

See Online for appendix

deviance information criterion (DIC) was used for model selection (appendix p 12).

We did several sensitivity analyses to test the validity of our results. The first aimed to examine the effect of over-reporting incubation periods of 7 days in the analysis of factors associated with the incubation period. In this analysis, we randomly reassigned 7-day incubation periods to a number of days between 5 days and 9 days using probabilities derived from the distribution retained after model selection on DIC, and did the linear regression analysis. This process was repeated 15 times, and the coefficients and 95% CIs of the 15 regression analyses were averaged for comparison with the initial linear regression analysis results. The second sensitivity analysis aimed to compare the results of a Poisson regression with those of the normal linear regression as the dependent variable, the incubation period, takes only discrete values from 1 to 15. The third sensitivity analysis consisted of restricting the analysis to participants

whose index cases were confirmed by a positive SARS-CoV-2 test.

The questionnaire did not allow advancement to the next question unless the previous questions were answered. Therefore, we had no missing data for any items except one. We analysed participants with missing information regarding date of last vaccine dose in a separate category.

Statistical analyses were done with Stata (version 16.0) and R (version 4.2.1).

#### Role of the funding source

The funders had no role in the study design, collection, analysis and interpretation of data, writing of the report, or decision to submit for publication.

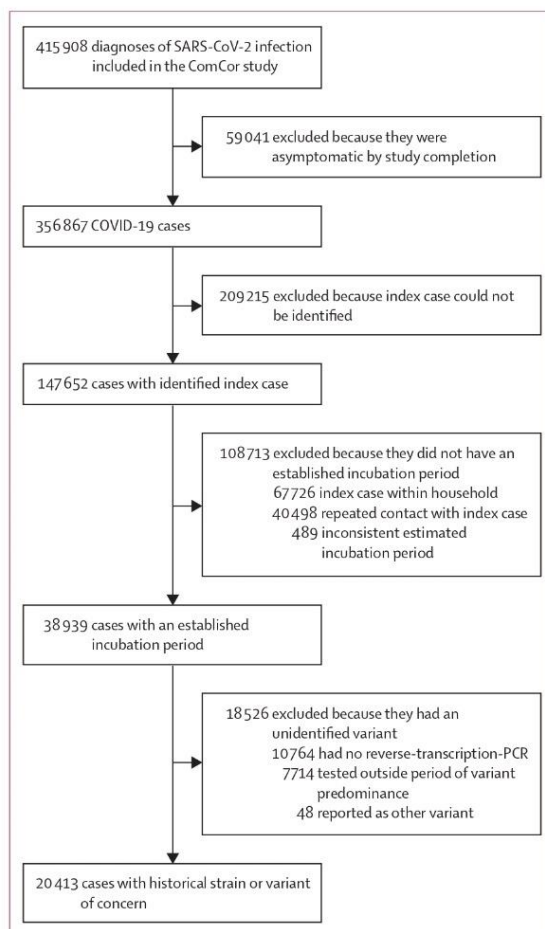
#### Results

356867 COVID-19 cases were included in the ComCor study (figure 1) between Oct 27, 2020, and Feb 4, 2022. Among these participants, the incubation period could be defined in 38939 (10.9%) participants who had a single encounter with the index case outside the household. After excluding participants who did not report an RT-PCR and participants with an undetermined or non-variant-of-concern, non-historical strain who tested outside periods of large predominance of one strain, we included 20413 participants who had the historical strain, alpha variant, beta variant, gamma variant, delta variant, or omicron variant. Variant was established through variant typing on RT-PCR for 13665 participants and by matching with the predominant strain at the time of the test for 6748 participants.

The study population ( $n=20413$ ) was predominantly women and young (ie, aged  $\leq 49$  years), with few participants older than 70 years (table 1). The most frequent underlying conditions were chronic respiratory disease and hypertension. Approximately a third of participants reported that the index case was symptomatic at the time of contact. A large majority of participants reported a positive test in the index case. Most often, neither the participant or the index case wore a mask during their interaction (table 1). Further demographic description across different variants is provided in the appendix (p 2).

Overall, mean incubation time was 4.54 days (95% CI 4.51–4.57) and varied across different variants of concern (table 2). Compared with the historical strain (4.61 days, 4.56–4.66), the alpha (4.96 days, 4.90–5.02) and beta or gamma (5.18 days, 4.93–5.43) variants of concern were associated with a longer incubation period, whereas participants infected by the delta (4.43 days, 4.36–4.49) and omicron (3.61 days, 3.55–3.68) variants of concern had shorter incubation periods (non-parametric Kruskal–Wallis test  $p=0.0001$ ).

The gamma distribution corrected for  $p_1$  and  $p_2$  was selected on the basis of deviance information criterion (appendix p 3). The distribution of the incubation period by variant, both observed and corrected for the 7-day



**Figure 1: Selection of SARS-CoV-2 cases**

The ComCor case-control study was conducted in France between October, 2020, and February, 2022.



	Participants (n=20 413)
Health-care worker	2766 (13.6%)
Sex	
Female	13760 (67.4%)
Male	6653 (32.6%)
Variant	
Historical	7539 (36.9%)
Alpha	5133 (25.1%)
Beta or gamma	453 (2.2%)
Delta	4606 (22.6%)
Omicron	2682 (13.1%)
Age, years	
18–29	4269 (20.9%)
30–39	5526 (27.1%)
40–49	4235 (20.7%)
50–59	3436 (16.8%)
60–69	2228 (10.9%)
≥70	719 (3.5%)
Smoking status	
Non-smoker, no nicotine substitution	16 465 (80.7%)
Non-smoker, nicotine substitution	169 (0.8%)
Non-smoker, electronic cigarette only	801 (3.9%)
<10 cigarettes per day	1537 (7.5%)
10–20 cigarettes per day	1019 (5.0%)
>20 cigarettes per day	422 (2.1%)
Underlying conditions	
Chronic respiratory disease	1666 (8.2%)
Hypertension	1657 (8.1%)
Underweight	667 (3.3%)
Diabetes	459 (2.2%)
Coronary artery disease	165 (0.8%)
COVID-19 vaccine status	
Unvaccinated	13 868 (67.9%)
One dose, <90 days since last injection	354 (1.7%)
One dose, 90–179 days since last injection	143 (0.7%)
One dose, ≥180 days since last injection	97 (0.5%)
Two doses, <90 days since last injection	642 (3.1%)
Two doses, 90–179 days since last injection	3266 (16.0%)
Two doses, ≥180 days since last injection	942 (4.6%)
Three doses, <90 days since last injection	903 (4.4%)
Three doses, 90–179 days since last injection	42 (0.2%)
Three doses, ≥180 days since last injection	16 (0.1%)
Four doses, <90 days since last injection	3 (<0.1%)
Undated last dose of vaccine	137 (0.7%)

(Table 1 continues in next column)

	Participants (n=20 413)
(Continued from previous column)	
Previous SARS-CoV-2 infection	
No	19 744 (96.7%)
Yes, virologically or serologically confirmed	512 (2.5%)
Yes, diagnosed on clinical evaluation only	157 (0.8%)
Symptoms in index case	6819 (33.4%)
Positive test for index case	18 005 (88.2%)
Mask wearing	
Neither participant or index case	15 911 (77.9%)
Index case only	495 (2.4%)
Participant only	1694 (8.3%)
Both participant and index case	2313 (11.3%)
Setting of transmission	
Indoors with closed windows	15 117 (74.1%)
Indoors with open windows	4036 (19.8%)
Outdoors	1260 (6.2%)

Data are n (%). COVID-19 cases included in the ComCor case-control study between October, 2020, and February, 2022.

**Table 1: Demographic data for participants with COVID-19 with identified incubation period and variant**

effect (applying  $p_1$  and  $p_2$ ), and the gamma distribution corrected for  $p_1$  and  $p_2$  by variant are shown (figure 2; appendix p 3). After correction for the 7-day effect, estimates of mean incubation period were shorter overall (4.50 days, 4.47–4.53) and for each variant than before correction for the 7-day effect (table 2).

In the multivariable linear regression analysis, the incubation period was shorter in people with omicron

and was longer in people with the alpha or beta or gamma variants than in people with the historical strain after adjustment for age, sex, smoking status, COVID-19 vaccine status, and setting of transmission (table 3). The incubation period increased with increasing age, with the oldest participants (age ≥70 years) having an incubation period 0.4 days (0.2 to 0.6) longer on average than the youngest participants (age 18–29 years). The incubation period was reduced if the index case had symptoms of COVID-19 at the time of the contact, but was moderately increased in settings where either the participant or both the participant and the index case wore a mask. Female participants had a longer incubation period than male participants. Smoking was associated with an increased incubation period, with an effect increasing with daily cigarette count; the same effect was not observed with nicotine substitution.

In an alternative regression model, we analysed the effect of the type of interaction environment (eg, friends, family, or sports activity) on the incubation period. We identified a shorter incubation period in participants infected within a group of friends than in people infected in a family environment (ie, the index case was a family member; -0.2 days, -0.3 to -0.1; appendix pp 4–5).

We did several sensitivity analyses to test the validity of our results. Regarding the effect of redistributing the observed incubation periods of 7 days over days 5 to 9 using probabilities derived from the distribution corrected for  $p_1$  and  $p_2$ , differences between the initial estimates and the redistributed estimates were minimal (appendix p 6). In the sensitivity analyses comparing a

	N	Observed, days		Correction for days 5 to 9, days	
		Mean (95% CI)	SD	Mean (95% credible interval)	SD
Historical	7539	4.61 (4.56–4.66)	2.24	4.57 (4.52–4.62)	2.22
Alpha	5133	4.96 (4.90–5.02)	2.32	4.92 (4.85–4.98)	2.31
Beta or gamma	453	5.18 (4.93–5.43)	2.72	5.15 (4.90–5.40)	2.72
Delta	4606	4.43 (4.36–4.49)	2.19	4.40 (4.33–4.46)	2.17
Omicron	2682	3.61 (3.55–3.68)	1.82	3.58 (3.52–3.65)	1.77
Total	20 413	4.54 (4.51–4.57)	2.25	4.50 (4.47–4.53)	2.23

A gamma distribution was fitted to estimate probability of rounding the estimation to 7 days if the underlying incubation period was 6 days or 8 days, or 5 days or 9 days. The included variants are alpha (B.1.1.7), beta (B.1.351), gamma (P.1), delta (B.1.617.2), and omicron (B.1.1.529).

Table 2: SARS-CoV-2 incubation period by variant, observed and corrected for day 5 to day 9

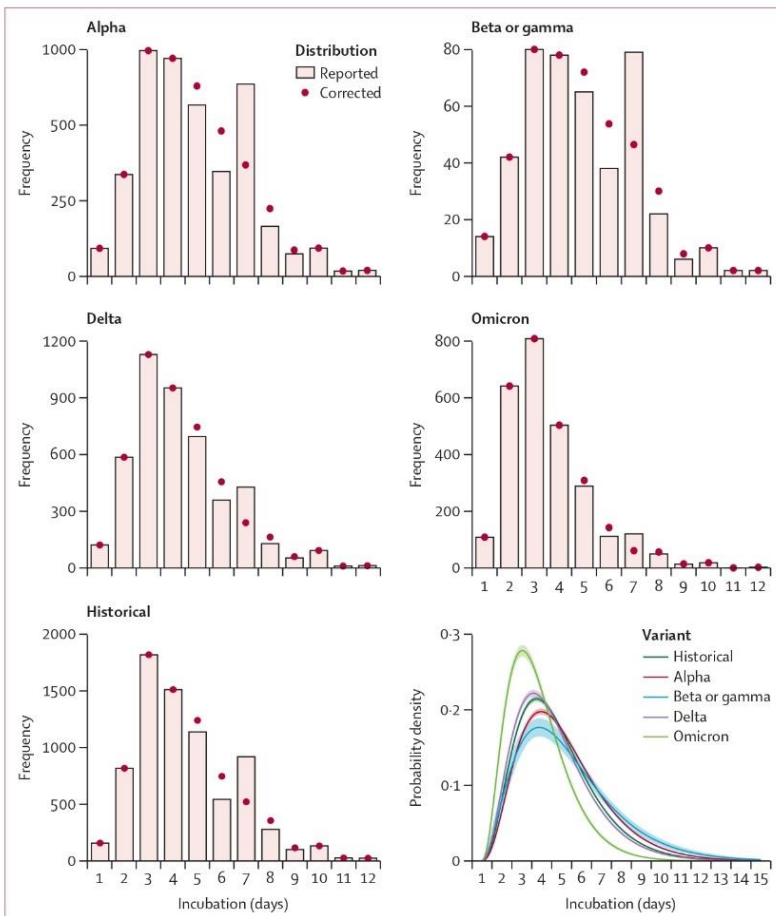


Figure 2: SARS-CoV-2 incubation period by variant responsible for infection, observed and corrected for day 5 to day 9 of incubation

Estimation obtained from 20 413 COVID-19 cases included in the ComCor case-control study between October, 2020, and February, 2022, with an identified incubation period and variant. Gamma distribution parameters and probabilities of rounding to the nearest week (ie, 7 days) if the incubation period was 6 days or 8 days (probability  $p_1$ ) or 5 days or 9 days (probability  $p_2$ ) were jointly estimated by fitting the model to data with a Monte Carlo Markov Chains algorithm. Probabilities  $p_1$  and  $p_2$  were applied to establish corrected distributions. The included variants are alpha (B.1.1.7), beta (B.1.351), gamma (P.1), delta (B.1.617.2), and omicron (B.1.1.529).

Poisson regression model with a linear regression model for the multivariable analysis, the Poisson regression model gave identical results to the linear regression model, expressing the difference in incubation periods between the reference category and comparison category as a ratio of number of days rather than as a difference in number of days (appendix pp 7–9). As a difference in number of days provides a more readily interpretable comparison between the two groups than a ratio, we favoured the linear regression for the presentation of our results. Finally, the analysis restricted to the 18 005 (88.2%) of 20 413 participants for whom the person identified as index case had a positive test provided similar results for the mean (4.52 days [SD 2.22], 95% CI 4.49–4.55) of the incubation period. Results of the univariable and multivariable linear regression analyses in these participants were consistent with those of the main analysis (appendix pp 10–11).

### Discussion

To our knowledge, our analysis is the largest study to date to evaluate the incubation period of SARS-CoV-2 with consistent data collection methods used throughout the emergence of consecutive variants of concern. We found a reduced incubation period for the omicron variant, in younger people, in men (to a lesser extent), in participants who did not smoke, in participants not wearing a mask when transmission occurred, or if the index case was symptomatic. These results remained after adjusting for several individual factors, including COVID-19 vaccine status.

The association of the incubation period with mask wearing and symptomatic status of the index case leads to important questions about the role of viral inoculum in the natural history of SARS-CoV-2 infection, considering mask wearing in individuals exposed to SARS-CoV-2 is associated with reduced viral inoculum<sup>23,24</sup> and symptomatic status is associated with increased viral inoculum.<sup>13</sup> Increased viral load in index cases has been documented to increase the risk of secondary transmission<sup>13,14</sup> but not the severity of secondary cases,<sup>25</sup> whereas the effect on incubation period remains largely undocumented. A study of a series of clusters of COVID-19 found evidence of a reduced incubation period in secondary cases who had an increased viral load, but high viral load in these participants was not associated with high viral load in the index cases.<sup>13</sup> We did not have any further details on the type of masks worn during the contact or on the quality of mask wearing. The increased incubation period observed with smoking and electronic cigarette use in our study could be related to reduced viral inoculum if confounded by improved ventilation habits among smokers.

Our findings about the omicron variant having a shorter incubation period than other variants are consistent with available data on an omicron outbreak in a restaurant in



Norway and on a cluster in Nebraska, USA, for which the median incubation period was 3 days.<sup>8,9</sup> However, sample sizes in these studies were small and recruitment of participants among clusters might have biased the estimation, as suggested by our findings showing that the incubation period is reduced when transmission occurs among a group of friends. The shortening of the incubation period of the delta variant compared with the historical strain was less substantial than previously estimated in a Chinese contact-tracing study.<sup>7</sup> However, that study was conducted on the wild-type virus, whereas the historical strain in France contained the Asp614Gly mutation, possibly affecting comparability.<sup>26</sup> A human challenge study conducted in previously uninfected and unvaccinated healthy young adults showed COVID-19 symptom onset from 2 days after inoculation in some infected participants, with an increase in symptom score until 4 days after inoculation.<sup>27</sup> This relatively short incubation period compared with our findings, although coherent with a reduced incubation period in younger populations, could be partly explained by the prospective and protocol-driven recording of symptoms in the human challenge study.

Our study found an association between age and incubation period, with increased incubation periods in the oldest individuals (aged  $\geq 60$  years), which is consistent with previous findings. Tan and colleagues<sup>10</sup> found an incubation period of 8 days for people aged 70 years or older compared with an incubation period of 5 days for people younger than 70 years, and Li and colleagues<sup>12</sup> reported a positive correlation between age and duration of the incubation period. We did not find, as Cheng and colleagues<sup>11</sup> did in a population of 218 participants in China in 2020, a reduced incubation period for people aged 41–60 years. Different methods and a smaller sample size might explain those discrepancies.

One of the limitations of our study is that we obtained data from self-reported questionnaires. We restricted our analysis to incubation periods within a realistic range (up to 15 days) and most (88.2%) participants reported a positive SARS-CoV-2 test in the person identified as the index case. Results were almost identical after restricting the analysis to people who reported a positive test in the index case (appendix pp 10–11). The identification of the index case might have been erroneous for some of the participants due to the possibility of asymptomatic transmission or exposure to multiple sources of infection. Nonetheless, we believe this limitation affected the computation of the incubation period for only a small number of participants. The overrepresentation of incubation periods of 7 days is probably a consequence of questionnaire design, as many participants who had an incubation period between 5 days and 9 days might have biased their answer to 7 days (ie, 1 week). This bias seemed more prevalent among participants infected with the alpha, beta, or gamma variant than in those infected with the delta or omicron variant. This discrepancy was most probably

	Univariable analysis	Multivariable analysis
<b>Sex</b>		
Male	0 (ref)	0 (ref)
Female	0.04 (-0.03 to 0.1)	0.1 (0.02 to 0.2)
<b>Variant</b>		
Historical strain	0 (ref)	0 (ref)
Alpha	0.3 (0.3 to 0.4)	0.3 (0.3 to 0.4)
Beta or gamma	0.6 (0.3 to 0.8)	0.6 (0.3 to 0.8)
Delta	-0.2 (-0.3 to -0.1)	-0.1 (-0.2 to 0.03)
Omicron	-1.0 (-1.1 to -0.9)	-0.9 (-1.0 to -0.7)
<b>Age, years</b>		
18–29	0 (ref)	0 (ref)
30–39	0.1 (-0.01 to 0.2)	0.1 (0.00 to 0.2)
40–49	0.2 (0.1 to 0.3)	0.2 (0.1 to 0.3)
50–59	0.2 (0.1 to 0.3)	0.2 (0.1 to 0.3)
60–69	0.4 (0.3 to 0.5)	0.4 (0.3 to 0.5)
$\geq 70$	0.3 (0.1 to 0.5)	0.4 (0.2 to 0.6)
<b>Smoking status</b>		
Non-smoker, no nicotine substitution	0 (ref)	0 (ref)
Non-smoker, nicotine substitution	-0.2 (-0.5 to 0.2)	-0.2 (-0.5 to 0.2)
Non-smoker, electronic cigarette only	0.1 (-0.1 to 0.3)	0.2 (0.00 to 0.3)
<10 cigarettes per day	0.1 (-0.04 to 0.2)	0.1 (0.02 to 0.3)
10–20 cigarettes per day	0.2 (0.02 to 0.3)	0.2 (0.1 to 0.4)
>20 cigarettes per day	0.3 (0.1 to 0.5)	0.4 (0.1 to 0.6)
<b>COVID-19 vaccine status</b>		
Unvaccinated	0 (ref)	0 (ref)
One dose, <90 days since last injection	-0.2 (-0.5 to 0.02)	-0.2 (-0.4 to 0.1)
One dose, 90–179 days since last injection	-0.9 (-1.3 to -0.6)	-0.3 (-0.7 to 0.1)
One dose, $\geq 180$ days since last injection	-1.0 (-1.4 to -0.6)	-0.5 (-0.9 to -0.1)
Two doses, <90 days since last injection	-0.2 (-0.4 to -0.1)	0.1 (-0.1 to 0.3)
Two doses, 90–179 days since last injection	-0.6 (-0.7 to -0.5)	-0.1 (-0.3 to -0.03)
Two doses, $\geq 180$ days since last injection	-0.7 (-0.8 to -0.5)	-0.2 (-0.4 to -0.05)
Three doses, <90 days since last injection	-0.8 (-0.1 to -0.7)	0.01 (-0.2 to 0.2)
Three doses, 90–179 days since last injection	-0.8 (-1.5 to -0.2)	-0.3 (-0.9 to 0.3)
Three doses, $\geq 180$ days since last injection	-1.2 (-2.3 to -0.1)	-0.6 (-1.3 to 0.1)
Four doses, <90 days since last injection	-0.4 (-2.3 to 2.1)	0.5 (-2.3 to 3.3)
Undated last dose of vaccine	-0.2 (-0.6 to 0.2)	0.2 (-0.3 to 0.7)
<b>Previous SARS-CoV-2 infection</b>		
No	0 (ref)	0 (ref)
Yes, virologically or serologically confirmed	-0.5 (-0.7 to -0.3)	0.01 (-0.2 to 0.2)
Yes, diagnosed on clinical evaluation only	-0.1 (-0.5 to 0.2)	-0.02 (-0.4 to 0.3)
<b>Symptoms in index case</b>		
No	0 (ref)	0 (ref)
Yes	-0.1 (-0.2 to -0.1)	-0.1 (-0.2 to -0.1)
<b>Mask wearing</b>		
Neither participant or index case	0 (ref)	0 (ref)
Index case only	0.1 (-0.2 to 0.3)	-0.01 (-0.2 to 0.2)
Participant only	0.3 (0.2 to 0.5)	0.2 (0.1 to 0.4)
Both participant and index case	0.2 (0.1 to 0.3)	0.1 (0.03 to 0.2)
<b>Setting of transmission</b>		
Indoors with closed windows	0 (ref)	..
Indoors with open windows	0.00 (-0.1 to 0.1)	..
Outdoors	0.1 (-0.1 to 0.2)	..

(Table 3 continues on next page)

	Univariable analysis	Multivariable analysis
(Continued from previous page)		
<b>Underlying conditions</b>		
Chronic respiratory disease	0.1 (-0.1 to 0.2)	..
Hypertension	0.2 (0.04 to 0.3)	..
Underweight	-0.2 (-0.4 to -0.1)	..
Diabetes	0.2 (-0.1 to 0.4)	..
Coronary artery disease	0.03 (-0.3 to 0.4)	..

Data are coefficient (95% CI). The multivariable linear regression model was adjusted for all variables in the table. Underlying conditions and setting of transmission were not included in the multivariable model due to the absence of statistical significance. Robust SEs were applied to account for potential heteroscedasticity.

**Table 3: Factors and their association with duration (days) of SARS-CoV-2 incubation period in univariable and multivariable linear regression models**

a consequence of an increased underlying mean incubation period in participants infected with the alpha, beta, or gamma variant, leading to an increased number of participants likely to round their answer to 1 week. We found no significant differences among populations infected with different variants that could otherwise explain differences in self-reporting quality, although we cannot rule out association with an unmeasured confounder. We developed models of distribution of the incubation period to consider this bias and obtained a slightly lower corrected mean than the observed distribution. We noted only minor changes in the estimates of the linear regression model for the factors associated with the incubation period in the analysis correcting for this bias (appendix p 6).

During the omicron wave between December, 2021, and February, 2022, the proportion of undiagnosed infections probably increased because of the increase in incidence, leading to a high burden on testing platforms, and because of an increased number of infections leading to no symptoms or mild symptoms.<sup>28</sup> This increase affected recruitment for our study during that period, and it is difficult to speculate how the impact on recruitment might have affected our findings with regard to the incubation period and its determinants. However, we found no particular differences in the populations across variants (appendix p 2), except for a young age (<40 years) in people infected with the omicron variant.

The over-representation of women (67%) in our study compared with the proportion of women in the French Screening Information System database of SARS-CoV-2-positive cases during the study period (53%) is similar to figures found earlier in the ComCor study<sup>6,17</sup> and might be related to the increased willingness of women to respond to a health survey compared with men, or to the high proportion (14%) of health-care workers in the study population. This over-representation could affect generalisation of our results to under-represented groups (eg, men older than 70 years).

Our variant-typing strategy did not include all cases and could not differentiate between the beta and gamma variants, or between the BA.1 and BA.2 subvariants

of the omicron variant. However, evidence from sequencing surveillance in France shows that beta and BA.1 were generally more prominent than gamma and BA.2 during the study period.<sup>21</sup>

Future research is required to understand the mechanisms underlying differences of duration of incubation period depending on sex, age, and mask wearing during transmission. As predominant strains of SARS-CoV-2 keep changing globally, iterative assessments of incubation period and its associated factors will be necessary.

Our results indicate that the SARS-CoV-2 incubation period is notably shorter with the omicron variant, as well as in younger participants and settings of high viral inoculum. These data should help inform SARS-CoV-2 contact-tracing strategies and modelling. Particular efforts should be made to reduce the number of days from symptom onset to contact tracing and isolation in a context of global predominance of the omicron variant of concern.

#### Contributors

AF, SG, TCh, LS, FO, CD, FC, SC, and AM designed the study. SG, TCh, LS, AF, and AM developed the study questionnaire. FO, CD, AL, and SM managed the data collection online. OC, CvP, and TCh oversaw the adherence of the study to the regulatory requirements. TCh and LS oversaw the collection of data and maintained the database. SG, TCo, SC, and AF did the statistical analysis. SG, TCo, SC, and AF drafted the first version of the manuscript. To comply with the data processing authorisation granted by the *Commission Nationale de l'Informatique et des Libertés* (the French National Commission on Informatics and Liberty), SG, TCh, LS, and AF had full access to the data reported in this study. SG and AF accessed and verified the data. All authors reviewed and approved the final manuscript and had final responsibility for the decision to submit for publication.

#### Declaration of interests

FC receives consulting fees from Sanofi. All other authors declare no competing interests.

#### Data sharing

The participant data (with identifiers) of this study are available from the French National Health Insurance Fund and from Ipsos. Restrictions apply to the availability of these data, which were used under authorised agreement for this study by the French data protection authority *Commission Nationale de l'Informatique et des Libertés* (CNIL; the French National Commission on Informatics and Liberty). Access to these data would therefore require previous authorisation by the CNIL. The study protocol and informed consent form will be made available (in French) upon request. The data will be available as soon as access is granted by the CNIL and for the duration authorised by the CNIL, which will entirely determine the beginning and end date of availability for authorised researchers.

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## **Evidence since publication**

Since the publication of this paper, Wu et al. have published a meta-analysis combining available data as of February 2022, that is, not including the present findings (260). Their results are overall consistent with ours: they found an incubation period of 4.41 days for the Delta variant, and 3.42 days for the Omicron variant. They also reported an effect of age, with a longer (though not statistically significant) incubation period of people aged 60 years or more at 7.43 days compared with 6.65 days for the younger population.

The present work has been used in models to predict the short-term burden of SARS-CoV-2, illustrating the contribution of thorough assessments of these important epidemiological parameters to pandemic response (261).

## Discussion

In this thesis dedicated to the analysis of a case-control study conducted in mainland France between October 2020 and October 2022, we have studied the transmission of SARS-CoV-2 both in community settings and in households. By matching 175,688 cases with 43,922 controls on age, sex, region, population size, and week, we could assess how the odds ratios of SARS-CoV-2 infection evolved through the course of the study for numerous community and household exposures. We identified increased odds of infection associated with in-person office work, particularly in open-space settings, long-distance trains, airplanes, concerts, and night clubs, where the odds ratios went as high as 2.95 for some periods of the study. We found no increased odds of infection associated with the use of short-distance shared transport, supermarkets and malls, hairdressers, museums, movie theatres, or outdoor sports practice. While the odds ratios remained quite stable through the course of the study for most settings, we observed a decreasing trend for restaurants, as well as in bars where the increased odds ratios remained mainly in people aged under 40. Among the 46.9% of cases who could identify the source case, most reported transmission from another household member (45.7%) (mostly the partner or a child), extended family (16.8%), colleagues (13.0%), or friends (9.7%). The household and the workplace were hotspots of transmission particularly during periods of high stringency of restrictions, potentially owing to a lower propensity to inter-personal contacts with friends or extended family in leisure settings, in times of stay-at-home orders or curfew. The analysis of transmission events during a single encounter underscored the predominance of indoor settings and asymptomatic transmissions as they represented 91.6% and 64.9% of these events, respectively, although the latter may be an underestimate given our study design.

Within households, we identified increased odds of infection for adults living with children through most of the study, suggesting that children effectively transmitted SARS-CoV-2 to other household members. While the increase was notable mainly for people living with children aged under 6 until the summer of 2021, the odds ratios later increased for all age categories and reached at least 1.5 for all children until primary-school age during the Omicron BA.1 wave in early 2022, before decreasing again during the Omicron BA.2 and BA.4/5 waves. The study of households where one child transmitted SARS-CoV-2 to one parent but not the other enabled us to study the role of in-home isolation. We provided evidence that isolation from the child during the infection was associated with a decreased risk of infection (OR 0.6).

Among individual isolation measures, only ventilation of indoor areas was significantly associated with a decreased risk of infection (OR 0.6).

Finally, a further analysis of transmission events during a single encounter provided a unique opportunity to study the incubation period and its determinants: we identified a notably shorter incubation period for the omicron variant (3.61 days) (mainly the BA.1 subvariant) compared with the historical strain (4.61 days). In a multivariable regression model, we could identify the association of sex, age, and circumstances of transmission with the incubation period: the incubation period was moderately shorter in young people, men, and when the transmission occurred without masks or from a symptomatic source case. The duration of the incubation period of the omicron variant remained 0.9 days shorter than the historical strain after adjustment on these factors as well as the vaccine status, highlighting fundamental differences in natural history of the infection between variants.

The role of children in within-household transmission, and the increased odds ratios of infection for community settings such as bars, restaurants, offices, or long-distance transport had been reported in two previous analyses of the ComCor study: one conducted in October – November 2020, when the historical strain was predominant, covering the beginning of the second lockdown (65), and one in May – August 2021, when the Alpha and then Delta variant circulated, and main countermeasures were gradually being relaxed (66). The present work represents an extension of these analyses and provides further insight on community settings of transmission. The differences that we observed through time, between these two publications, but also through the two years of the study, as highlighted in Papers 1, 2, and 3, illustrate how settings of transmission and the role of children in household transmission are dynamic processes that were probably affected by the circulating strain and its transmissibility, the restrictions that impacted the settings of inter-personal contacts, and potentially stochastic epidemiological circumstances, such as the intense circulation of SARS-CoV-2 among children during the Omicron BA.1 wave in early 2022. The approaches developed in Papers 2, 4, and 5, relying on the analysis of the case series (specifically cases reporting transmissions during a unique encounter with the source case, for the analysis of the incubation period) and the enrolment of an additional intra-household control present further additional contributions of the present study. They illustrate how case-control studies can be leveraged to provide evidence on transmission beyond the case-control analysis itself.

## **Contribution of the study on community settings**

As highlighted in the rapid review presented in introduction, numerous other studies have studied community settings at risk of SARS-CoV-2 transmission. Most of them relied on cross-sectional seroprevalence estimates or retrospective cohorts, and focused on occupational exposures, travel and transport, and leisure activities. The results of the present study are generally in line with the results of other studies with similar aims. As reported by others, we have shown the importance, among community settings, of indoor closed environments, with high proximity, low mask-wearing and little air renewal in the risk of transmission. This is consistent with fundamental knowledge on the mechanisms of transmission (35).

The present study presents several distinctive contributions to the knowledge on the settings of SARS-CoV-2 transmission. Its stable design throughout most of the SARS-CoV-2 pandemic in France has allowed the assessment of settings of transmission through time, as stressed above. Only a handful of other studies continued the assessment of community exposures at risk into 2022 (78,117,138,147,175,189). Our findings pertaining to 2022 are thus one of the few available regarding periods characterized by the predominance of the Omicron variant and a wide relaxation of most restrictions. Our analysis of several exposures of interest provides an indirect comparison of the risk between settings: our findings indicate that, while the risk was increased in most of these settings, the increase was likely more pronounced through most of the study in night-clubs, bars, concerts, or long-distance trains, when compared with the metro, indoor sports activities, professional meetings, or convenience stores. Our fine matching process on region, the size of the population in the area of residence, and the week of exposure considerably limits the risk of recruitment bias that might result from exposure to different incidence levels between cases and controls. Unlike cross-sectional studies on the exposures associated with positive testing for anti-SARS-CoV-2 antibodies, which make up most of the studies in the rapid review, our case-control design avoids the risk of reverse exposure-outcome sequence.

An important limitation that several studies included in the review seem to have encountered was a lack of statistical power resulting from limited sample size. Many of the exposures of interest are relatively rare in the general population: in the present study for instance, the use of the metro, long-distance trains, or working remotely, were reported by fewer than 10% of participants. Furthermore, the associations were often of low magnitude, exposing

studies with smaller sample size to imprecisions in the estimates affecting statistical inference. We could study various exposures individually, in multivariable models limiting the risk of confounding bias, given the very large sample size which provided us with significant power. Unlike several other studies, we did not need to group exposures of interest such as different public transport modes, dining settings, or cultural activities, thus providing more detailed evidence (44,45).

### **Choosing an auto-questionnaire**

Relying on an online auto-questionnaire in our study was essential to reaching a substantial sample size. We were initially uncertain on the reliability of the data we would collect through this method. We tried to keep the questionnaire as understandable as possible to include the widest possible population. We implemented a series of coherence checks to exclude inconsistent questionnaires, particularly for analyses relying on the correct analysis of the transmission chain: we excluded reported intra-household transmissions with inconsistent sequences in symptoms or testing, or inconsistent durations of the incubation period. Findings pertaining to the reported transmission chains should nonetheless be interpreted with caution. For instance, the relative contribution of transmissions in the household compared with community settings as detailed in Paper 2 might be overestimated: source cases were probably less easily identified when the transmission took place in the community than in households, as suggested by the association of several community exposures with not identifying the source case.

COVID-19 presents several specificities that further supported the choice of an auto-questionnaire. The SARS-CoV-2 pandemic, by making headlines essentially through the entire duration of the study, was quite unique in that non-professionals were unusually well informed about transmission routes, compatible symptoms, or even to the analysis of transmission chains. This level of scientific knowledge in the population allowed us to ask participants about the circumstances of transmission, which might not be possible for less well-known infectious diseases. The extensive availability of tests throughout the study, the relatively low level of stigma associated with the disease, along with a general understanding on the importance of limiting transmission chains, increased participants' ability to identify their source case. Many cases had already undergone phone-based contact tracing conducted by the CNAM by the time



they participated, which likely strengthened the accuracy in the identification of the transmission chain.

The consistency of the study's findings with that of other studies speaks for the reliability of this strategy when investigating relatively straightforward exposures or well-known infectious diseases. This data collection method, along with the choice of a case-control study design, helped us provide results soon after the study began, which proved essential to advise public health policy.

This methodological choice and other aspects of the study design nonetheless raise several methodological challenges which we will present in further details below.

## **The study population**

As mentioned in the papers of this thesis, the final population of cases represented only 6% of all invitations that were initially sent by the CNAM (Ipsos could not provide the number of invitations sent to potential controls over the complete course of the study). While this low rate still enabled us to reach an important sample size, it impacts the validity and the generalizability of our results. To further investigate this concern, we looked in more details at the socio-demographic structure of our study population and how it differed from that of the general French population. While the source population of our work was the population of adults with a diagnosis of recent SARS-CoV-2 infection in mainland France rather than the general adult population, no socio-demographic description is available for the former besides age in 10-year age categories. We thus relied on the structure of the general adult population in France to approximate the main discrepancies between our study population and the source population.

The population of the study is notably younger than the overall French adult population (data in January 2021), with the notable overrepresentation of age groups 30-39, 40-49, and 50-59, while younger (18-29) and older adults (60 and above) were far less represented (Table 2). The most striking characteristic is the near absence in our study of participants aged 80 years and above, while those represented 7.9% of the French adult population, and 5.2% of all positive tests in people aged 20 years and above. This likely results from the choice of online auto-questionnaires which required both the use of an email address to be eligible and ease with online tools to participate. Another important feature is that our study population skewed

strongly towards women: they amounted to 68.4% of participants, whereas sex balance is quite even in the general adult population (51.6% of women). This imbalance has been reported in online questionnaire-based studies in other fields of research as well (248,262). The most represented regions were the Ile-de-France region (where Paris is) and the Auvergne-Rhône-Alpes region (which includes Lyon). While these two regions are the most populated in the country, their slight over-representation compared with the general population might reflect selection bias based on education (see below) or simply the increased risk observed in urban areas (263).

One important difference between our study population and the general population lies in the education level: we included a population with a markedly higher education level on average than the adult working-age French population, with 45.8% of participants with a degree above 2-years post-secondary education (“*Baccalauréat +2*”) compared with 27.1% in the French population. Accordingly, we included a higher proportion of senior executives (37.0%) compared with 21.6% in the general population, and a much lower proportion of workers (“*ouvriers*”) (5.9% vs 19.1%). While our analyses took these sociodemographic factors into account through matching (for age, sex, region) or adjustment (for education or socio-professional category), they do lead to results being more generalizable to a well-educated, middle-aged, female population. This illustrates the difficulty to reach specific segments of the population in health-related investigations, particularly when conducted online, such as older adults or people with lower socioeconomic background. The study design did not allow for any reminder to potential cases, which might have been useful to include less health-conscious populations. Other study designs, such as phone-based or in-person questionnaires, might be more effective to reach these populations.

**Table 2: Comparison of main socio-demographic characteristics of the study population with that of the general adult population in France (data for 2021)**

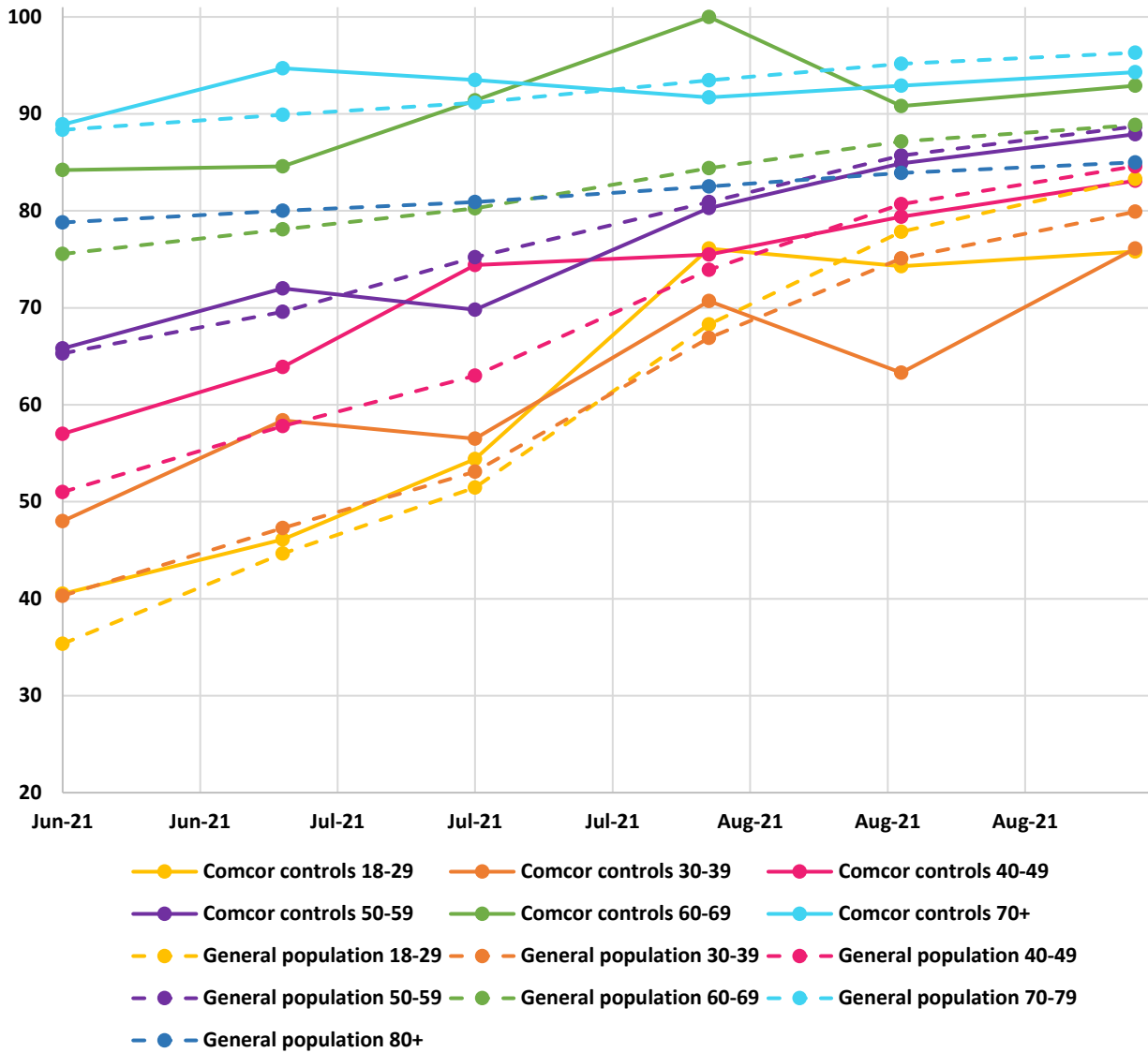
	ComCor			Population in France	Cases in general population
	Cases	Controls	Total		
<b>Age (years)</b>				Among 18+	Among 20+
<b>Median (IQR)</b>	44 (34-55)	44 (35-55)	44 (35-55)		
<b>Mean (SD)</b>	44.99 (13.84)	45.21 (13.95)	45.21 (13.95)	50.55	
18-29	14.2	12.7	14.1	17.4	19.2*
30-39	23.8	17.2	23.3	15.6	21.5
40-49	25.6	25.4	25.6	16.2	19.7
50-59	20.2	20.4	20.2	16.6	16.1
60-69	11.3	14.3	11.6	15.1	11.0
70-79	4.3	9.4	4.7	11.3	7.4
80+	0.6	0.7	0.6	7.9	5.2
<b>Female sex</b>	68.8	63.2	68.4	51.6	
<b>Region of residence (% of population in mainland France)</b>					
Ile-de-France	20.5	19.9	20.5	18.3	
Auvergne-Rhône-Alpes	14.3	12.4	14.2	12.3	
Occitanie	9.4	10	9.4	9.4	
Provence-Alpes-Côte d'Azur and Corsica	8.7	8.7	8.7	8.6	
Grand Est	8.8	8.8	8.8	8.6	
Nouvelle-Aquitaine	8.4	8.7	8.4	9.5	
Hauts-de-France	8.4	8.5	8.4	8.9	
Pays de la Loire	5.4	5.5	5.4	5.8	
Bretagne	4.6	5.5	4.6	5.2	
Normandie	4.1	4.4	4.1	5.1	
Bourgogne-Franche-Comté	4.2	4.0	4.1	4.3	
Centre-Val de Loire	3.4	3.7	3.4	4.0	
<b>Education level (age 25-64)</b>					
No diploma	4.3	4.3	4.3	16.6	
Pre-high school diploma	12.5	14.8	12.7	22.9	
High-school diploma	18.1	18.6	24.4	18.7	
Up to 2 years post-secondary education	18.4	22.1	18.6	14.4	
Over 2 years post-secondary education	46.7	34.4	45.8	27.1	
<b>Socioprofessional category (excluding</b>					

<b>retired, inactive, students)</b>					
Employee	24.7	33.9	25.3	26.2	
Senior executive	37.8	26.3	37.0	21.6	
Intermediate profession	27.6	26.7	27.5	24.7	
Workers	5.7	7.7	5.9	19.1	
Farmers	0.1	0.5	0.1	1.5	
Independent professions	4.1	4.9	4.2	6.5	
<b>Medical conditions</b>					
Diabetes	3.0	5.6	3.2	5.4	
Hypertension	9.7	14.0	10.0	30.6	
Obesity	15.8	18.3	16.0	15.7	
<b>Household</b>					
Living alone	18.2	20.8	18.4	36	

Legend: \* Age category is 20-29 as provided by the SI-DEP database which collects data on all positive SARS-CoV-2 tests (RT-PCR or antigen tests, when supervised, i.e., not self-tests)

**The estimation of vaccine effectiveness**

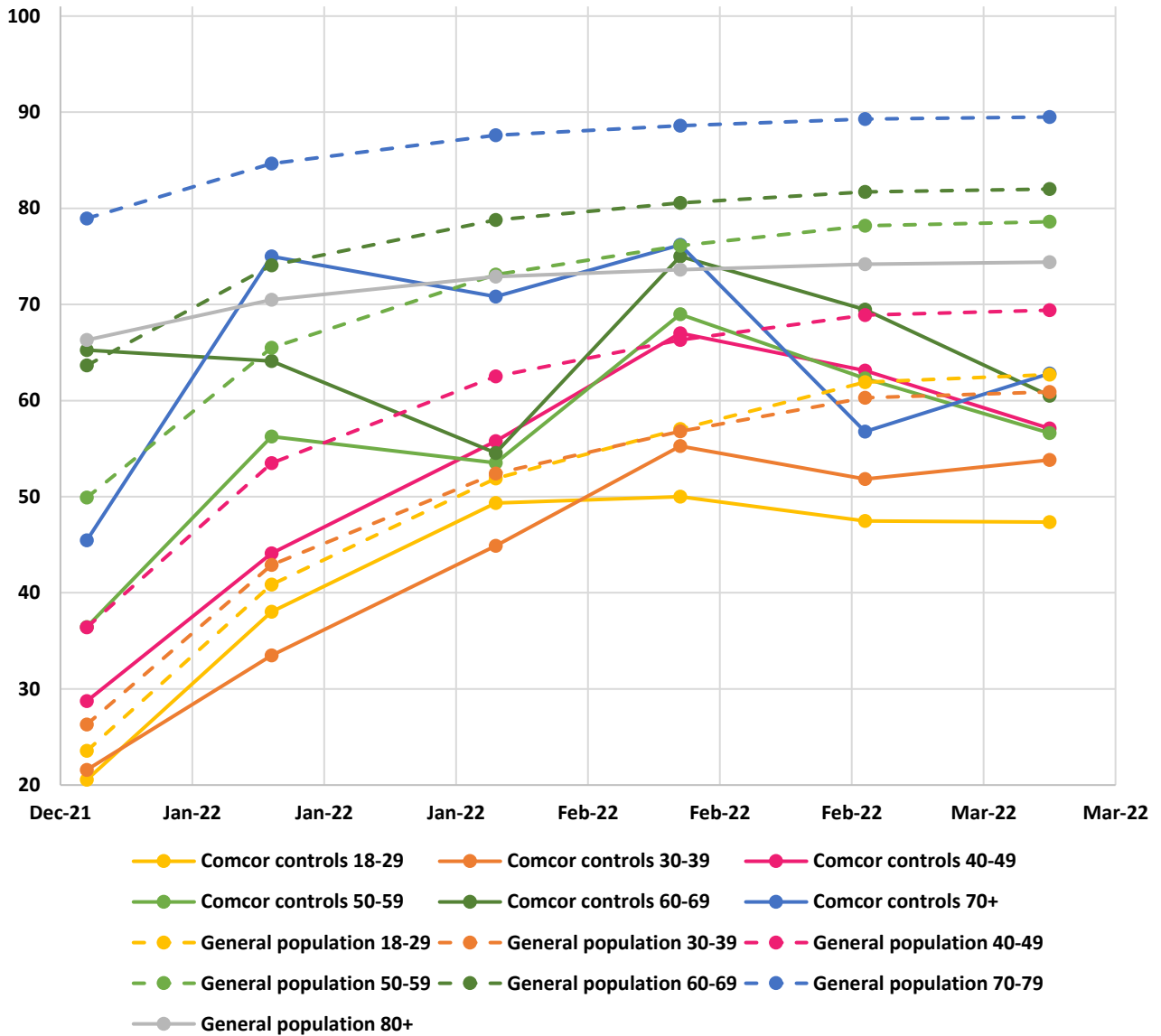
While we were able to evaluate vaccine effectiveness with this case-control study in the early months of the vaccine campaign in 2021 (66,240), this possibility was increasingly affected by a notable phenomenon: compared with the vaccine coverage of the general population, the coverage among the controls was on par for the first dose, but trailed behind for booster doses. The figures 3 and 4 present the vaccine coverage among controls compared with that of the general population by age group, for the first dose (figure 3) and the booster dose (figure 4). Consequently, our estimate for vaccine effectiveness gradually became negative, a finding that was both counter-intuitive and contradicted by numerous other studies specifically designed for the estimation of vaccine effectiveness.



**Figure 3: Proportion of COVID-19 vaccine uptake (first dose) among controls in the study and in the general population**

Legend: For each time point (every 2 weeks), we retained the vaccine coverage of controls enrolled during the preceding week and the following week. Oldest age group for the ComCor controls is 70 years and older given a limited sample size above 80 years old.





**Figure 4: Proportion of COVID-19 vaccine uptake (booster dose) among controls in the study and in the general population**

Legend: For each time point (every 2 weeks), we retained the vaccine coverage of controls enrolled during the preceding week and the following week. Oldest age group for the ComCor controls is 70 years and older given a limited sample size above 80 years old.

## **Potential further biases**

This problem illustrates one notable other limitation of the present study, which is the possibility of recruitment bias. Given the study design, we had to rely on two distinct processes to include cases and controls. Thus, one of the important features of case-control studies, that is enrolling cases and controls from a similar source population, might not entirely hold in the present case. This could explain some of the unexpected results, for instance the increased risk of infection during some periods of the study for people working completely remotely, or the decreased risk associated with the use of trams or short-distance buses. Any reason in the enrolment process that would make our control population less likely to work completely remotely, or more likely to use this type of public transport, might lead to these findings. While we have easily accessible and reliable data on the evolution of the vaccine uptake in the general population helping us investigate the unexpected findings regarding vaccine effectiveness, that is not the case for other community exposures such as the use of public transport.

Beyond recruitment bias (enrolment of controls from a source population that differs from that of the cases), these unexpected findings may also result from residual confounding if people who are more likely to take the tram for instance were also less exposed to SARS-CoV-2 in ways that our multivariable regression models could not account for.

While these limitations stress the need for cautious interpretation, they should not disqualify the findings of the study, which are in the vast majority consistent with fundamental knowledge on SARS-CoV-2 transmission and with findings of other studies.

## **Protective measures**

One important question of interest at the beginning of the study was to estimate the protection associated with the use of protective measures such as mask-wearing, hand-washing, or physical distancing. Our findings on these measures were unexpected: we found increased odds of infection associated with higher compliance with these measures. These results were found both in univariable and multivariable models, thus held even after adjustment on multiple other exposures associated with the risk of infection and potential confounders. These findings contradicted both expectations based on the mechanisms of transmission and the results from other studies on mask-wearing or the limitation of gatherings (264–266). This may result from residual confounding: people most prone to respect these protective measures were likely more

exposed to SARS-CoV-2 in ways that our multivariable analysis could not account for, amounting to a reverse causality relationship between mask-wearing and risk of SARS-CoV-2 infection. Another observational study has reported similar findings (267). Considering that we could not gather informative data from these items, we chose not to adjust our analyses on the reported compliance. In a sensitivity analysis, we explored how choosing to leave the protective measures out of the multivariable models on the settings of transmission affected our findings. We analysed the factors associated with the risk of infection in two models: one containing the protective measures (mask-wearing where mandatory, hand-washing frequency, maintaining physical distance of at least 1 meter), and one without them. For these exploratory analyses, we performed simple logistic regression models without the bootstrapping and exact matching of four cases for one control processes that we described above. We applied this to three of the study periods previously defined. When comparing the odds ratios in both models, we found similar results, suggesting our findings were not confounded by differences in protective behaviours (see Annex page 53).

## **Further perspectives**

This study was initiated when the impact of the SARS-CoV-2 was at a peak. Identifying and quantifying where and under what circumstances the transmission of SARS-CoV-2 took place was essential evidence to tailor public health policy given their substantial societal impacts, and often used by the government in choosing places where to apply restrictions. The initial results of the study were largely covered by national media, illustrating the importance of these findings to the French society (268–271).

Even as the impact of the pandemic has gradually receded in France as in most countries, this scientific evidence has multiple other applications. Information to people with comorbidities, for instance in periods of intense circulation of respiratory viruses, or who live with children, can help them mitigate their individual risk of severe COVID-19 by adapting individual protection practices. Preparedness plans to an emerging respiratory pathogen (e.g., new coronavirus, pandemic influenza) pandemic will benefit from including evidence-based social distancing recommendations (272,273). Community settings that were identified as important hotspots of transmission, such as bars, night clubs, or long-distance trains, can use these data to warrant mitigation efforts, either through distancing protocols or structural improvement of air quality, whether it be within pandemic preparedness efforts or to mitigate

the circulation of existing respiratory viruses. Identifying the role of children in onward transmission can help direct resources to mitigation strategies within schools, such as the improvement of indoor air quality. Quantifying the importance of household transmission and providing evidence on effective ways to mitigate it is essential to weigh benefits and risks associated with social distancing policies, and to advise the general population on effective isolation practices.

## **Conclusion**

This thesis provides a wide perspective on the transmission of SARS-CoV-2 by identifying the main settings of transmission both in the community and the household during most of the SARS-CoV-2 pandemic in mainland France, as well as studying the determinants of household transmission from children to adults and characterizing the incubation period of SARS-CoV-2 infection and its main determinants. This case-control study provides precious elements to guide public health policy both today and for future pandemics in the event of an emerging respiratory virus. We hope this evidence will contribute to limiting the necessity of wide-reaching restrictions that helped contain the impact of SARS-CoV-2 for most of 2020 and 2021 but came at tremendous costs. The flexible design of the study enabled us to several diverse aspects of SARS-CoV-2 transmission. We hope it will act as a blueprint for future studies on the transmission of respiratory pathogens.



## Supplementary information

### Publications on the ComCor study

- Galmiche S, Charmet T, Schaeffer L, Paireau J, Grant R, Chény O, Von Platen C, Maurizot A, Blanc C, Dinis A, Martin S, Omar F, David C, Septfons A, Cauchemez S, Carrat F, Mailles A, Levy-Bruhl D, Fontanet A. Exposures associated with SARS-CoV-2 infection in France: A nationwide online case-control study. *Lancet Reg Health Eur.* 2021 Aug. PMID: 34124709.
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- Grant R, Charmet T, Schaeffer L, Galmiche S, Madec Y, Von Platen C, Chény O, Omar F, David C, Rogoff A, Paireau J, Cauchemez S, Carrat F, Septfons A, Levy-Bruhl D, Mailles A, Fontanet A. Impact of SARS-CoV-2 Delta variant on incubation, transmission settings and vaccine effectiveness: Results from a nationwide case-control study in France. *Lancet Reg Health Eur.* 2022 Feb. PMID: 34849500.
- Belan M, Charmet T, Schaeffer L, Tubiana S, Duval X, Lucet JC, Fontanet A, Birgand G, Kernéis S. SARS-CoV-2 exposures of healthcare workers from primary care, long-term care facilities and hospitals: a nationwide matched case-control study. *Clin Microbiol Infect.* 2022 Nov. PMID: 35777605.
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- Galmiche S, Charmet T, Madec Y, Rakover A, Schaeffer L, Chény O, Omar F, Martin S, Mailles A, Carrat F, Fontanet A. Reduction of SARS-CoV-2 intra-household child-to-parent transmission associated with ventilation: results from a case-control study. *BMC Public Health*. 2023 Jun. PMID: 37365557.
- Galmiche S, Charmet T, Rakover A, Schaeffer L, Chény O, von Platen C, Omar F, David C, Mailles A, Carrat F, Fontanet A. Risk of SARS-CoV-2 Infection Among Households With Children in France, 2020-2022. *JAMA Netw Open*. 2023 Sep. PMID: 37713194.
- Rakover A, Galmiche S, Charmet T, Chény O, Omar F, David C, Martin S, Mailles A, Fontanet A. Source of SARS-CoV-2 infection: results from a series of 584,846 cases in France from October 2020 to August 2022. *BMC Public Health*. 2024 Jan. PMID: 38287286.

## Resume of the candidate

### **2015 – 2021 Residency in internal medicine, Ile-de-France region (Paris area)**

Rotations (6 months each) in academic hospitals in the Paris area, in various medical departments including internal medicine, infectious diseases, and clinical research.

**2019 – 2020 Master of Public Health**, Institut Pasteur, Conservatoire National des Arts et Métiers.

### **2009 – 2015 Paris Descartes Medical school (Paris Cité University)**

2015: National ranking exam, ranked 25/8878.

2010: Admission exam, ranked 21/2279.

**Reviewer** for NEJM, CMI, JAMA Network Open, Influenza & other respiratory viruses, Infectious Diseases Now, BMJ Open, Clinical and Experimental Medicine, Building and Environment, and JMIR PHS.

Member of the **scientific committee** “Transmission of respiratory viruses of the ANRS | MIE (National research agency on AIDS, viral hepatitis, and emerging infectious diseases).

**Oral communications:** conference of American College of Rheumatology (2022), Institut Pasteur’s global health department meeting (2022) congress of the National French society of Internal Medicine (2020, 2017, 2016).

**Posters:** European Congress of Clinical Microbiology and Infectious Diseases (2024), Institut Pasteur’s global health department meeting (2023).

**Awards and recognition:** One of the top reviewers in 2023 for the journal *Clinical Microbiology and Infection*. Best oral communication award (global health department meeting, 2022).

## Other publications

**Galmiche S**, Thoreau B, ..., Terrier B. Invasive fungal diseases in patients with autoimmune diseases: data from the French RESSIF network. *RMD Open*, 2023.

**Galmiche S**, Fernandes-Pellerin S, ..., Hoen B. High negative predictive value of RT-PCR in patients with high likelihood of SARS-CoV-2 infection. *Infectious Diseases Now*, 2022 (*Letter*).

**Galmiche S**, Luong Nguyen LB, ..., Launay O. Immunological and clinical efficacy of COVID-19 vaccines in immunocompromised populations: a systematic review. *Clinical*

*Microbiology and Infection*, 2021. Among the 10 most cited papers of the journal in 2022. Awarded the *Prix de la Collégiale* for the best specialty thesis in internal medicine in the Ile-de-France region (among 25 theses).

**Galmiche S**, Bruel T, ..., Fontanet A. Characteristics associated with olfactory and taste disorders in COVID-19. *Neuroepidemiology*, 2021.

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Lièvre G, Sicsic J, **Galmiche S**, ..., Mueller J. Are the 7C psychological antecedents associated with COVID-19 vaccine behaviours beyond intentions? A cross-sectional study. *Submitted*.

Lièvre G, Sicsic J, **Galmiche S**, ... Mueller J. Are psychological attitudes towards vaccination an expression of personality? A cross-sectional study on COVID-19 vaccination in France? *Submitted*.

Perrey C, ..., **Galmiche S**, ... Jauffret-Roustide M. Contributions of the Qualitative Qualicor Study Embedded in a Cohort Study on the Circumstances of SARS-CoV-2 Infection in France. *Submitted*.

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**Identification des lieux à risque de transmission du SARS-CoV-2, du rôle des enfants dans la transmission intra-domiciliaire et de la période d'incubation des principaux variants dans une étude cas-témoins menée en ligne en France**

Résumé : Notre objectif était d'identifier, pour l'infection à SARS-CoV-2, les lieux de transmission, le rôle des enfants dans la transmission intra-domiciliaire et la période d'incubation. Dans une étude cas-témoins en France métropolitaine incluant des adultes avec infection récente et des témoins non infectés appariés sur l'âge, le sexe, la région, la taille de population, et la semaine, nous avons estimé les odds ratios d'infection par le SARS-CoV-2 pour certains lieux d'intérêt, comportements, activités et la présence d'enfants au domicile. Nous avons analysé les circonstances de transmission décrites par les cas. Nous avons étudié l'effet de l'isolement entre un enfant infecté et les parents au sein des foyers, et la période d'incubation pour différents variants.

D'octobre 2020 à octobre 2022, nous avons inclus 691454 cas et 57065 témoins. Après appariement de 175688 cas avec 43922 témoins (4 :1) durant l'étude divisée en neuf périodes, nous avons identifié un risque augmenté d'infection associé aux bureaux partagés, transports en commun et lieux de loisirs. Parmi les cas ayant identifié la source de transmission, celles-ci avaient lieu principalement dans les foyers, auprès de la famille élargie ou d'amis, ou sur le lieu de travail. Les personnes vivant avec des enfants avaient un risque augmenté d'infection, mais l'isolement d'un enfant infecté (notamment l'aération des espaces clos) était associé à une diminution de la transmission. La période d'incubation du variant omicron était environ 1 jour plus courte que pour le variant historique.

Cette étude apporte des éléments de preuve sur la transmission du SARS-CoV-2 qui contribueront à la préparation aux prochaines pandémies.

Mots clés : SARS-CoV-2 ; COVID-19 ; transmission ; domicile ; incubation ; aération

**Identifying the settings at risk of transmission of SARS-CoV-2, the role of children in household transmission, and the incubation period of the main variants in an online case-control study in France**

Abstract: We aimed to identify the community settings associated with the risk of SARS-CoV-2 infection, the role of children in household transmission, and the incubation period of the SARS-CoV-2 infection. In a case-control study conducted in mainland France among adults with recent infection and uninfected controls matched on age, sex, region, population size, and calendar week, we estimated the odds ratios of SARS-CoV-2 infection for community settings, behaviours, activities, and children presence in the household. We leveraged the case series to describe the circumstances of transmission. We studied the effect of intra-household isolation from a child with ongoing infection. We determined the incubation period across variants of SARS-CoV-2.

Between October 2020 and October 2022, we included 691,454 cases and 57,065 controls. After matching 175,688 cases with 43,922 controls (4:1) across the study divided into nine periods, we identified the risk associated with shared offices, shared transport, and leisure activities. Among the cases who could identify the source of transmission, the most reported transmissions took place in the household, with extended family or friends, or in the workplace. People living with children were at increased risk of infection, but isolation from an infected child (particularly ventilation of indoor areas) was associated with decreased transmission. The incubation period of the omicron variant was shorter by approximately 1 day compared with the historical strain.

The evidence provided by this study on the transmission of SARS-CoV-2 will help design mitigation strategies in the context of pandemic preparedness.

Keywords: SARS-CoV-2; COVID-19; transmission; household; incubation; ventilation

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## Rapid review

### Pubmed search

("Sports"[Mesh] OR "Restaurants"[Mesh] OR "Museums"[Mesh] OR "Public Facilities"[Mesh] OR "Private Facilities"[Mesh] OR "Sports and Recreational Facilities"[Mesh] OR "Occupations"[Mesh] OR "Occupational exposure"[Mesh] OR "Work"[Mesh] OR "Workplace"[Mesh] OR "Professional Practice"[Mesh] OR "Supermarkets"[Mesh] OR "Small business"[Mesh] OR "Transportation facilities"[Mesh] OR "Railroads"[Mesh] OR "Aircraft"[Mesh] OR "Travel"[Mesh] OR "Sport\*"[Title/Abstract] OR "restaurant\*"[Title/Abstract] OR "bar"[Title/Abstract] OR "club\*"[Title/Abstract] OR "gym"[Title/Abstract] OR "movie\*"[Title/Abstract] OR "theater\*"[Title/Abstract] OR "theatre\*"[Title/Abstract] OR "museum\*"[Title/Abstract] OR "occupation\*"[Title/Abstract] OR "workplace\*"[Title/Abstract] OR "profession\*"[Title/Abstract] OR "retail\*"[Title/Abstract] OR "shop\*"[Title/Abstract] OR "store\*"[Title/Abstract] OR "supermarket\*"[Title/Abstract] OR "market\*"[Title/Abstract] OR "transport\*"[Title/Abstract] OR "subway"[Title/Abstract] OR "metro\*"[Title/Abstract] OR "train\*"[Title/Abstract] OR "bus"[Title/Abstract] OR "airport\*"[Title/Abstract] OR "aircraft\*"[Title/Abstract] OR "airplane\*"[Title/Abstract] OR "travel"[Title/Abstract] OR "religious gather\*"[Title/Abstract])

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("Case-Control Studies"[Mesh] OR "Cohort Studies"[Mesh] OR "Cross-Sectional Studies"[Mesh] OR "Seroepidemiologic Studies"[Mesh] OR "case control"[Title/Abstract] OR "cohort"[Title/Abstract] OR "seroepidemiologic\*"[Title/Abstract] OR "sero-epidemiologic\*"[Title/Abstract] OR "seroprevalence"[Title/Abstract])

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AND

("SARS-CoV-2"[Mesh] OR "SARS-CoV-2"[Title/Abstract] OR "COVID-19"[Mesh] OR "COVID-19"[Title/Abstract])

# **Paper 1: Risk of SARS-CoV-2 infection in professional settings, shops, shared transport, and leisure activities in France, 2020-2022**

## **Supplementary methods**

### **Details on important non-pharmaceutical interventions during the study period in France**

The sanitary pass was enforced from August 9, 2021, to March 14, 2022: a proof of COVID-19 vaccination or past infection, or a recent negative SARS-CoV-2 test was required to visit a series of places (long-distance shared transport, restaurants, bars, cultural venues, night-clubs, etc.). A recent negative test was no longer accepted between January 24, 2022 and March 14, 2022 (“vaccine pass”). Night-clubs were closed from the beginning of the study to July 9, 2021, and from December 10, 2021 to February 16, 2022.

### **Description of the delimitation of the nine shorter periods used to describe changes through the study**

Period 1 began on October 1, 2020, corresponding to the start of the study period and covered the second wave (historical D614G strain) and the second stay-at-home orders (start on October 30, 2020, less stringent than the first stay-at-home orders). Period 2 began on December 4, 2020 and covered the third wave (alpha variant) and curfew restrictions. Period 3 began on April 9, 2021 and covered the receding alpha wave and the third lockdown (less stringent than the previous two). Period 4 began on June 14, 2021 and covered the fourth wave and the emergence of the delta variant. Period 5 began on August 14, 2021 after implementation of the sanitary pass and covered the receding fourth wave (delta variant). Period 6 began on October 2, 2021 and covered the start of the fifth wave (delta variant). Period 7 began on December 20, 2021 and covered the fifth wave, during which the omicron variant (BA.1 subvariant) predominated. Period 8 began on March 18, 2022 (following the lifting of the mask mandate in most indoor spaces) and covered the omicron BA.2 wave. Period 9 began on May 19, 2022 (following the



lifting of the mask mandate in public transport) and covered the omicron BA.4/BA.5 wave, extending to the end of the study period on October 2, 2022.

We added a five- or four-day delay (depending on the predominant strain) between important shifts and the start of the new period to account for the incubation period.

### **Data for the general population in France**

Data on the demographic structure of the general population in France in 2021 were obtained from the national institute of statistics and economic studies (data for people aged 20 and over used as approximation of the total adult population) (170).

### **Further description of statistical analysis**

During the first period of the study, the timing of exposure used for matching was before or during the second stay-at-home orders. For matching, we used finer age categories (18-29, then 10-year-age categories, until  $\geq 70$ ) than the ones used for initial enrollment of controls (18-29, 29-58,  $\geq 59$ ), along with sex, region, and size of population in the area of residence.

The multivariable models included, beyond the exposures of interest, variables on health status (diabetes, hypertension, respiratory disease, coronary artery disease, immunosuppressive treatment, body-mass index categorized as  $<18.5$  kg/m<sup>2</sup>,  $[18.5-25[$ ,  $[25-30[$ , and  $\geq 30$  kg/m<sup>2</sup>), COVID-19 vaccine status (categorized as number of doses and time since last dose as  $<90$  days, 90-179 days,  $\geq 180$  days, with a specific category for participants with missing data for the date of the last dose), past SARS-CoV-2 infection (categorized as 61-180 days prior or over 180 days prior), smoking status, level of education, professional category (of the person in the household with the highest income for the first two periods, of the participant for the following periods), and household description (housing type, number of people in the household, presence of children).

The questionnaire required answer to the previous questions before advancing. Therefore, we had no missing data, except for the date of the last vaccine injection for some participants (analysed in a separate category).

For the sensitivity analysis regarding airplane travel, we retained the mean incidence rate in the country with the highest incidence if multiple countries were visited and introduced the incidence rate (categorized as  $\leq 100$  cases per million, ]100-200], ]200-300], ]300-400], and  $> 400$  cases per million) in a similar logistic regression model.

**Table S2: Exposure prevalence, odds ratios of SARS-CoV-2 infection in univariable and multivariable estimates in a case-control study conducted in mainland France (2020-2022) – Results for the first three periods of the study (October 1, 2020 to June 13, 2021)**

Period (onset date)	1: 10/01/2020				2: 12/04/2020				3: 04/09/2021			
	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)
Male sex	2516 (34.4)	629 (34.4)	1.00 (1.00-1.00)	1.06 (1.02-1.09)	5904 (30.1)	1476 (30.1)	1.00 (1.00-1.00)	1.04 (1.02-1.07)	2440 (27.1)	610 (27.1)	1.00 (1.00-1.00)	1.12 (1.09-1.15)
<b>Age (years)</b>												
18-29	1376 (18.8)	344 (18.8)	1 (ref)		3720 (18.9)	930 (18.9)	1 (ref)	1 (ref)	1980 (22.0)	495 (22.0)	1 (ref)	1 (ref)
30-39	832 (11.4)	208 (11.4)	1.00 (1.00-1.00)	0.80 (0.75-0.86)	3448 (17.6)	862 (17.6)	1.00 (1.00-1.00)	0.74 (0.71-0.76)	1912 (21.2)	478 (21.2)	1.00 (1.00-1.00)	0.85 (0.82-0.88)
40-49	2256 (30.9)	564 (30.9)	1.00 (1.00-1.00)	0.81 (0.76-0.87)	5972 (30.4)	1493 (30.4)	1.00 (1.00-1.00)	0.76 (0.74-0.79)	3060 (34.0)	765 (34.0)	1.00 (1.00-1.00)	1.02 (0.98-1.08)
50-59	1656 (22.7)	414 (22.7)	1.00 (1.00-1.00)	1.04 (0.98-1.10)	4088 (20.8)	1022 (20.8)	1.00 (1.00-1.00)	0.91 (0.88-0.94)	1512 (16.8)	378 (16.8)	1.00 (1.00-1.00)	1.23 (1.15-1.29)
60-69	568 (7.8)	142 (7.8)	1.00 (1.00-1.00)	1.74 (1.57-1.91)	1348 (6.9)	337 (6.9)	1.00 (1.00-1.00)	1.33 (1.25-1.43)	220 (2.4)	55 (2.4)	1.00 (1.00-1.00)	3.86 (3.23-4.39)
70+	620 (8.5)	155 (8.5)	1.00 (1.00-1.00)	2.06 (1.77-2.32)	1060 (5.4)	265 (5.4)	1.00 (1.00-1.00)	1.46 (1.35-1.57)	324 (3.6)	81 (3.6)	1.00 (1.00-1.00)	6.33 (5.04-7.72)
<b>Population in the area of residence</b>												
<5000 inhabitants	2016 (27.6)	504 (27.6)	1 (ref)		5096 (26.0)	1274 (26.0)	1 (ref)	1 (ref)	1972 (21.9)	493 (21.9)	1 (ref)	1 (ref)
5000 – 19,999 inhabitants	668 (9.1)	167 (9.1)	1.00 (1.00-1.00)	1.09 (1.04-1.13)	1524 (7.8)	381 (7.8)	1.00 (1.00-1.00)	1.01 (0.98-1.04)	392 (4.4)	98 (4.4)	1.00 (1.00-1.00)	1.06 (1.01-1.11)
20,000 – 99,999 inhabitants	1004 (13.7)	251 (13.7)	1.00 (1.00-1.00)	1.10 (1.04-1.14)	1976 (10.1)	494 (10.1)	1.00 (1.00-1.00)	1.05 (1.03-1.08)	568 (6.3)	142 (6.3)	1.00 (1.00-1.00)	1.09 (1.04-1.14)
Over 100,000 inhabitants	2712 (37.1)	678 (37.1)	1.00 (1.00-1.00)	1.18 (1.14-1.24)	6840 (34.8)	1710 (34.8)	1.00 (1.00-1.00)	1.11 (1.09-1.14)	2912 (32.3)	728 (32.3)	1.00 (1.00-1.00)	1.08 (1.05-1.11)
Greater Paris area	908 (12.4)	227 (12.4)	1.00 (1.00-1.00)	1.23 (1.12-1.39)	4200 (21.4)	1050 (21.4)	1.00 (1.00-1.00)	1.08 (1.04-1.14)	3164 (35.1)	791 (35.1)	1.00 (1.00-1.00)	0.96 (0.90-1.03)
<b>Region of residence</b>												
Ile-de-France	1072 (14.7)	268 (14.7)	1 (ref)		4684 (23.9)	1171 (23.9)	1 (ref)	1 (ref)	3376 (37.5)	844 (37.5)	1 (ref)	1 (ref)
Auvergne-Rhône-Alpes	1072 (14.7)	268 (14.7)	1.00 (1.00-1.00)	0.98 (0.89-1.08)	3276 (16.7)	819 (16.7)	1.00 (1.00-1.00)	0.98 (0.93-1.01)	1296 (14.4)	324 (14.4)	1.00 (1.00-1.00)	0.94 (0.88-0.99)
Occitanie	380 (5.2)	95 (5.2)	1.00 (1.00-1.00)	0.93 (0.83-1.02)	1356 (6.9)	339 (6.9)	1.00 (1.00-1.00)	0.96 (0.91-1.00)	532 (5.9)	133 (5.9)	1.00 (1.00-1.00)	0.94 (0.87-1.02)
Provence-Alpes-Côte d'Azur and Corsica	484 (6.6)	121 (6.6)	1.00 (1.00-1.00)	0.98 (0.89-1.08)	2104 (10.7)	526 (10.7)	1.00 (1.00-1.00)	0.95 (0.91-0.98)	588 (6.5)	147 (6.5)	1.00 (1.00-1.00)	0.94 (0.88-1.02)
Grand Est	1336 (18.3)	334 (18.3)	1.00 (1.00-1.00)	0.95 (0.87-1.05)	2020 (10.3)	505 (10.3)	1.00 (1.00-1.00)	0.94 (0.89-0.98)	420 (4.7)	105 (4.7)	1.00 (1.00-1.00)	1.05 (0.98-1.12)
Nouvelle-Aquitaine	360 (4.9)	90 (4.9)	1.00 (1.00-1.00)	0.91 (0.82-1.03)	1144 (5.8)	286 (5.8)	1.00 (1.00-1.00)	0.96 (0.92-1.01)	520 (5.8)	130 (5.8)	1.00 (1.00-1.00)	0.99 (0.93-1.06)
Hauts-de-France	572 (7.8)	143 (7.8)	1.00 (1.00-1.00)	0.95 (0.87-1.10)	1828 (9.3)	457 (9.3)	1.00 (1.00-1.00)	0.93 (0.89-0.97)	824 (9.1)	206 (9.1)	1.00 (1.00-1.00)	0.94 (0.88-1.00)
Pays de la Loire	392 (5.4)	98 (5.4)	1.00 (1.00-1.00)	0.90 (0.80-0.99)	700 (3.6)	175 (3.6)	1.00 (1.00-1.00)	0.94 (0.89-0.98)	368 (4.1)	92 (4.1)	1.00 (1.00-1.00)	0.97 (0.90-1.04)
Bretagne	244 (3.3)	61 (3.3)	1.00 (1.00-1.00)	0.85 (0.78-0.96)	404 (2.1)	101 (2.1)	1.00 (1.00-1.00)	0.94 (0.89-1.00)	236 (2.6)	59 (2.6)	1.00 (1.00-1.00)	0.91 (0.86-0.99)
Normandie	360 (4.9)	90 (4.9)	1.00 (1.00-1.00)	0.94 (0.85-1.08)	740 (3.8)	185 (3.8)	1.00 (1.00-1.00)	0.96 (0.91-1.00)	316 (3.5)	79 (3.5)	1.00 (1.00-1.00)	0.99 (0.93-1.05)
Bourgogne-Franche-Comté	828 (11.3)	207 (11.3)	1.00 (1.00-1.00)	0.99 (0.91-1.10)	848 (4.3)	212 (4.3)	1.00 (1.00-1.00)	0.95 (0.91-1.00)	276 (3.1)	69 (3.1)	1.00 (1.00-1.00)	0.94 (0.86-1.02)
Centre-Val de Loire	208 (2.8)	52 (2.8)	1.00 (1.00-1.00)	0.97 (0.85-1.12)	532 (2.7)	133 (2.7)	1.00 (1.00-1.00)	0.94 (0.90-0.99)	256 (2.8)	64 (2.8)	1.00 (1.00-1.00)	0.91 (0.86-0.98)
<b>Education level</b>												
No diploma	32 (0.4)	7 (0.4)	-	-	523 (2.7)	66 (1.3)	1 (ref)	1 (ref)	279 (3.1)	39 (1.7)	1 (ref)	1 (ref)
Pre-high school diploma	223 (3.0)	54 (3.0)	-	-	3434 (17.5)	791 (16.1)	0.55 (0.51-0.59)	0.52 (0.48-0.57)	1393 (15.5)	289 (12.8)	0.67 (0.63-0.74)	0.65 (0.59-0.73)
High-school diploma	242 (3.3)	76 (4.2)	-	-	4168 (21.2)	1166 (23.8)	0.45 (0.42-0.49)	0.43 (0.39-0.48)	1893 (21.0)	553 (24.6)	0.48 (0.45-0.52)	0.46 (0.41-0.52)
Bachelor's degree	425 (5.8)	152 (8.3)	-	-	7250 (36.9)	2016 (41.1)	0.46 (0.42-0.49)	0.38 (0.34-0.42)	3207 (35.6)	916 (40.7)	0.49 (0.45-0.55)	0.42 (0.37-0.47)

Period (onset date)	1: 10/01/2020				2: 12/04/2020				3: 04/09/2021			
	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)
Master's degree or higher	174 (2.4)	60 (3.3)	-	-	4261 (21.7)	870 (17.7)	0.62 (0.58-0.66)	0.47 (0.42-0.52)	2236 (24.8)	455 (20.2)	0.69 (0.64-0.75)	0.55 (0.47-0.62)
Missing	6213 (85.0)	1478 (80.9)	-	-								
<b>Health conditions</b>												
Diabetes mellitus	259 (3.5)	97 (5.3)	0.66 (0.58-0.72)	0.70 (0.62-0.78)	572 (2.9)	185 (3.8)	0.77 (0.72-0.81)	0.74 (0.69-0.79)	177 (2.0)	64 (2.8)	0.69 (0.61-0.75)	0.76 (0.68-0.85)
Hypertension	795 (10.9)	211 (11.5)	0.93 (0.88-1.00)	1.02 (0.96-1.12)	1741 (8.9)	462 (9.4)	0.93 (0.90-0.97)	0.94 (0.90-1.00)	607 (6.7)	188 (8.3)	0.79 (0.75-0.84)	0.85 (0.79-0.91)
Chronic respiratory disease	642 (8.8)	146 (8)	1.11 (1.01-1.19)	1.19 (1.10-1.31)	1542 (7.9)	345 (7.0)	1.13 (1.08-1.17)	1.24 (1.18-1.28)	751 (8.3)	164 (7.3)	1.16 (1.08-1.23)	1.22 (1.14-1.31)
Coronary artery disease	85 (1.2)	16 (0.9)	1.32 (1.11-1.60)	1.40 (1.10-1.66)	182 (0.9)	32 (0.7)	1.43 (1.27-1.58)	1.52 (1.33-1.73)	30 (0.3)	8 (0.4)	0.94 (0.66-1.19)	1.28 (0.74-1.70)
<b>Body-mass index (kg/m<sup>2</sup>)</b>												
Healthy weight (≥18.5 & <25)	3713 (50.8)	906 (49.6)	1 (ref)		10221 (52.1)	2530 (51.5)	1 (ref)	1 (ref)	4759 (52.8)	1160 (51.5)	1 (ref)	1 (ref)
Underweight (<18.5)	217 (3.0)	75 (4.1)	0.70 (0.61-0.81)	0.77 (0.68-0.89)	642 (3.3)	227 (4.6)	0.70 (0.65-0.74)	0.71 (0.66-0.77)	280 (3.1)	120 (5.3)	0.57 (0.52-0.61)	0.57 (0.51-0.62)
Overweight (≥25 & <30)	2184 (29.9)	524 (28.7)	1.02 (0.97-1.07)	1.04 (0.99-1.10)	5619 (28.6)	1369 (27.9)	1.02 (0.99-1.04)	1.03 (0.99-1.06)	2547 (28.3)	572 (25.4)	1.08 (1.04-1.12)	1.12 (1.06-1.17)
Obesity (≥30)	1194 (16.3)	322 (17.6)	0.91 (0.85-0.96)	0.99 (0.93-1.05)	3153 (16.1)	783 (16)	1.00 (0.96-1.03)	1.03 (0.99-1.07)	1422 (15.8)	400 (17.8)	0.87 (0.82-0.90)	0.92 (0.86-0.98)
<b>Housing</b>												
Individual house	4652 (63.7)	1062 (58.1)	1 (ref)		11617 (59.2)	2752 (56.1)	1 (ref)	1 (ref)	4656 (51.7)	1142 (50.7)	1 (ref)	1 (ref)
Apartment	2612 (35.7)	756 (41.4)	0.79 (0.76-0.82)	0.95 (0.89-1.02)	7867 (40.1)	2135 (43.5)	0.87 (0.86-0.89)	1.02 (0.99-1.06)	4291 (47.6)	1104 (49)	0.95 (0.93-0.97)	1.05 (1.00-1.10)
Shelter	39 (0.5)	8 (0.4)	1.10 (0.88-1.41)	1.58 (1.15-2.20)	122 (0.6)	20 (0.4)	1.45 (1.24-1.67)	1.85 (1.45-2.27)	52 (0.6)	6 (0.3)	2.13 (1.67-2.63)	2.75 (2.06-4.24)
Nursing home	5 (0.1)	1 (0.1)	1.14 (0.45-2.07)	0.77 (0.26-1.70)	30 (0.2)	2 (0)	3.65 (2.71-4.38)	1.61 (1.00-2.45)	9 (0.1)	0 (0)	1.00 (1.00-1.00)	1.00 (1.00-1.00)
<b>Workplace</b>												
No remote office, no open space	809 (11.1)	181 (9.9)	1 (ref)		1986 (10.1)	489 (10)	1 (ref)	1 (ref)	867 (9.6)	203 (9.0)	1 (ref)	1 (ref)
No remote office, open space	461 (6.3)	84 (4.6)	1.22 (1.11-1.41)	1.33 (1.18-1.54)	1080 (5.5)	263 (5.4)	1.01 (0.94-1.08)	1.12 (1.05-1.2)	563 (6.2)	95 (4.2)	1.38 (1.29-1.54)	1.36 (1.24-1.50)
Not working	1617 (22.1)	538 (29.4)	0.67 (0.63-0.73)	0.60 (0.53-0.68)	3887 (19.8)	1263 (25.7)	0.76 (0.73-0.79)	0.70 (0.66-0.75)	1454 (16.1)	475 (21.1)	0.72 (0.67-0.77)	0.83 (0.74-0.89)
Working in a non-office setting	2892 (39.6)	597 (32.7)	1.09 (1.01-1.15)	0.97 (0.88-1.06)	8026 (40.9)	1650 (33.6)	1.2 (1.15-1.26)	1.04 (0.99-1.10)	3344 (37.1)	809 (35.9)	0.97 (0.92-1.03)	0.90 (0.83-0.96)
Partial remote office, no open space	489 (6.7)	132 (7.2)	0.83 (0.72-0.92)	0.77 (0.69-0.86)	1501 (7.6)	421 (8.6)	0.88 (0.83-0.93)	0.86 (0.80-0.91)	832 (9.2)	230 (10.2)	0.85 (0.78-0.91)	0.76 (0.68-0.83)
Partial remote office, open space	379 (5.2)	90 (4.9)	0.94 (0.85-1.04)	0.89 (0.79-1.06)	1020 (5.2)	341 (6.9)	0.74 (0.68-0.79)	0.72 (0.67-0.78)	651 (7.2)	182 (8.1)	0.84 (0.77-0.91)	0.74 (0.65-0.81)
Complete remote office	661 (9.0)	205 (11.2)	0.72 (0.65-0.78)	0.67 (0.60-0.74)	2136 (10.9)	482 (9.8)	1.09 (1.03-1.15)	0.95 (0.89-1.00)	1298 (14.4)	258 (11.5)	1.18 (1.12-1.26)	0.84 (0.78-0.90)
On leave during the period of interest												
<b>Gatherings</b>												
Professional meeting	2121 (29.0)	410 (22.4)	1.42 (1.35-1.47)	1.14 (1.07-1.19)	4820 (24.5)	1184 (24.1)	1.02 (0.99-1.06)	1.01 (0.97-1.05)	2053 (22.8)	546 (24.2)	0.92 (0.89-0.96)	0.96 (0.92-1.02)
Private meeting	3280 (44.9)	598 (32.7)	1.67 (1.61-1.73)	1.75 (1.67-1.85)	9287 (47.3)	2551 (52.0)	0.83 (0.81-0.85)	0.91 (0.88-0.93)	4130 (45.8)	1183 (52.5)	0.76 (0.74-0.79)	0.84 (0.81-0.88)
Religious gathering	222 (3.0)	46 (2.5)	1.21 (1.07-1.40)	1.01 (0.88-1.15)	596 (3.0)	162 (3.3)	0.91 (0.86-0.98)	1.00 (0.92-1.08)	307 (3.4)	92 (4.1)	0.83 (0.76-0.91)	1.00 (0.90-1.12)
<b>Retail, shops</b>												

Period (onset date)	1: 10/01/2020				2: 12/04/2020				3: 04/09/2021			
	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)
Any shop	5864 (80.2)	1498 (82.0)	0.89 (0.85-0.94)	0.83 (0.79-0.88)	13460 (68.5)	3951 (80.5)	0.53 (0.51-0.54)	0.56 (0.54-0.57)				
Mall									535 (5.9)	244 (10.8)	0.52 (0.49-0.55)	0.66 (0.61-0.73)
Market									964 (10.7)	344 (15.3)	0.66 (0.63-0.70)	0.84 (0.78-0.90)
Convenience store									2461 (27.3)	798 (35.4)	0.69 (0.66-0.71)	0.92 (0.86-0.96)
Supermarket									3999 (44.4)	1392 (61.8)	0.49 (0.48-0.51)	0.57 (0.55-0.59)
Other shop									231 (2.6)	107 (4.8)	0.53 (0.48-0.57)	0.62 (0.54-0.68)
Hairdresser									668 (7.4)	336 (14.9)	0.46 (0.43-0.48)	0.52 (0.48-0.55)
Take-away delivery									3667 (40.7)	993 (44.1)	0.87 (0.84-0.90)	0.97 (0.92-1.01)
Home delivery									2797 (31.1)	673 (29.9)	1.06 (1.02-1.09)	1.13 (1.08-1.19)
<b>Shared transport</b>												
Metro	549 (7.5)	164 (9.0)	0.83 (0.77-0.88)	0.92 (0.82-1.02)	1774 (9.0)	583 (11.9)	0.74 (0.71-0.77)	1.00 (0.94-1.05)	1337 (14.8)	376 (16.7)	0.87 (0.83-0.91)	1.19 (1.12-1.28)
Tram	309 (4.2)	126 (6.9)	0.59 (0.54-0.65)	0.72 (0.63-0.80)	794 (4.0)	338 (6.9)	0.57 (0.54-0.60)	0.77 (0.72-0.83)	487 (5.4)	182 (8.1)	0.65 (0.60-0.70)	0.88 (0.79-0.95)
Short-distance bus	544 (7.4)	227 (12.4)	0.57 (0.52-0.61)	0.65 (0.58-0.72)	1644 (8.4)	716 (14.6)	0.53 (0.51-0.56)	0.65 (0.61-0.68)	1013 (11.2)	387 (17.2)	0.61 (0.58-0.64)	0.63 (0.59-0.68)
Short-distance train	378 (5.2)	101 (5.5)	0.93 (0.84-1.03)	0.91 (0.76-1.03)	950 (4.8)	393 (8.0)	0.59 (0.55-0.61)	0.64 (0.60-0.70)	479 (5.3)	232 (10.3)	0.49 (0.45-0.53)	0.46 (0.41-0.50)
Airplane travel	91 (1.2)	19 (1.0)	1.21 (1.00-1.43)	0.69 (0.50-0.89)	230 (1.2)	55 (1.1)	1.04 (0.91-1.16)	1.78 (1.51-2.12)	115 (1.3)	27 (1.2)	1.07 (0.92-1.22)	1.35 (1.10-1.73)
Boat travel	9 (0.1)	2 (0.1)	1.06 (0.37-2.00)	0.58 (0.13-1.20)	9 (0)	3 (0.1)	0.75 (0.33-1.17)	0.83 (0.34-1.71)	10 (0.1)	3 (0.1)	0.87 (0.42-1.33)	0.98 (0.39-1.68)
Long-distance bus travel	38 (0.5)	8 (0.4)	1.16 (0.87-1.63)	1.23 (0.78-1.83)	71 (0.4)	43 (0.9)	0.41 (0.32-0.50)	0.64 (0.51-0.86)	34 (0.4)	21 (0.9)	0.39 (0.31-0.52)	0.70 (0.52-0.92)
Long-distance train travel	245 (3.3)	48 (2.6)	1.28 (1.16-1.44)	1.41 (1.14-1.81)	648 (3.3)	180 (3.7)	0.90 (0.84-0.96)	1.86 (1.72-2.06)	321 (3.6)	97 (4.3)	0.82 (0.76-0.88)	1.88 (1.63-2.17)
Car-pooling	654 (8.9)	107 (5.9)	1.58 (1.47-1.68)	1.47 (1.35-1.60)	1753 (8.9)	298 (6.1)	1.51 (1.46-1.57)	1.74 (1.68-1.85)	1929 (21.4)	523 (23.2)	0.90 (0.87-0.93)	1.06 (1.02-1.11)
Taxi									393 (4.4)	99 (4.4)	0.99 (0.90-1.08)	1.29 (1.08-1.39)
<b>Leisure activities</b>												
Any cultural venue	403 (5.5)	85 (4.7)	1.19 (1.09-1.33)	0.94 (0.83-1.05)	53 (0.3)	31 (0.6)	0.41 (0.34-0.53)	0.61 (0.49-0.81)				
Indoor sports practice	382 (5.2)	65 (3.6)	1.50 (1.36-1.62)	1.23 (1.11-1.36)					73 (0.8)	30 (1.3)	0.60 (0.49-0.71)	1.19 (0.89-1.47)
Swimming pool	137 (1.9)	32 (1.8)	1.07 (0.88-1.22)	0.87 (0.72-1.07)					62 (0.7)	31 (1.4)	0.50 (0.42-0.59)	0.58 (0.48-0.70)
Outdoor sports practice									2395 (26.6)	758 (33.7)	0.72 (0.69-0.74)	0.72 (0.69-0.75)
Bar or restaurant	1902 (26.0)	286 (15.7)	1.90 (1.81-1.97)	1.97 (1.84-2.07)								
Party	153 (2.1)	27 (1.5)	1.43 (1.23-1.63)	1.15 (0.90-1.41)	196 (1.0)	50 (1.0)	0.98 (0.85-1.13)	1.66 (1.42-1.94)	136 (1.5)	30 (1.3)	1.14 (1.00-1.30)	1.84 (1.52-2.20)

Legend: Adjusted odds ratios estimated in models adjusted for all variables shown in the table, as well as week of exposure, health status (diabetes, hypertension, respiratory disease, coronary artery disease, immunosuppressive treatment, body-mass index categorized as <18.5 kg/m<sup>2</sup>, [18.5-25[, [25-30[, and ≥30 kg/m<sup>2</sup>), COVID-19 vaccine status (categorized as number of doses and time since last dose as <90 days, 90-179 days, ≥180 days, with a specific category for participants with missing data for the date of the last dose), past SARS-CoV-2 infection (categorized as 61-180 days prior or over 180 days prior), smoking status, level of education, professional category (of the person in the household with the highest income for the first two periods, of the participant for the following periods), and household description (housing type, number of people in the household, presence of children). Empty cells reflect changes of the questionnaire or periods when specific settings were closed.

**Table S2: Exposure prevalence, odds ratios of SARS-CoV-2 infection in univariable and multivariable estimates in a case-control study conducted in mainland France (2020-2022) – Results for the fourth, fifth, and sixth periods of the study (June 14 to December 19, 2021)**

Period (onset date)	4: 06/14/2021				5: 08/14/2021				6: 10/02/2021			
	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)
Male sex	2744 (24.4)	686 (24.4)	1.00 (1.00-1.00)	1.08 (1.04-1.12)	1316 (27.3)	329 (27.3)	1.00 (1.00-1.00)	0.99 (0.95-1.05)	3756 (33.4)	939 (33.4)	1.00 (1.00-1.00)	1.11 (1.08-1.15)
<b>Age (years)</b>												
18-29	3212 (28.5)	803 (28.5)	1 (ref)	1 (ref)	1104 (22.9)	276 (22.9)	1 (ref)	1 (ref)	1108 (9.9)	277 (9.9)	1 (ref)	1 (ref)
30-39	2172 (19.3)	543 (19.3)	1.00 (1.00-1.00)	1.12 (1.07-1.18)	888 (18.4)	222 (18.4)	1.00 (1.00-1.00)	0.76 (0.71-0.83)	2044 (18.2)	511 (18.2)	1.00 (1.00-1.00)	0.84 (0.80-0.90)
40-49	3472 (30.8)	868 (30.8)	1.00 (1.00-1.00)	1.44 (1.37-1.52)	1528 (31.7)	382 (31.7)	1.00 (1.00-1.00)	0.84 (0.79-0.92)	3316 (29.5)	829 (29.5)	1.00 (1.00-1.00)	0.92 (0.87-0.98)
50-59	1900 (16.9)	475 (16.9)	1.00 (1.00-1.00)	1.73 (1.64-1.83)	908 (18.8)	227 (18.8)	1.00 (1.00-1.00)	1.21 (1.12-1.32)	2408 (21.4)	602 (21.4)	1.00 (1.00-1.00)	1.15 (1.09-1.25)
60-69	348 (3.1)	87 (3.1)	1.00 (1.00-1.00)	2.79 (2.52-3.22)	132 (2.7)	33 (2.7)	1.00 (1.00-1.00)	2.91 (2.11-3.95)	1828 (16.3)	457 (16.3)	1.00 (1.00-1.00)	1.38 (1.27-1.52)
70+	160 (1.4)	40 (1.4)	1.00 (1.00-1.00)	2.51 (2.11-3.06)	260 (5.4)	65 (5.4)	1.00 (1.00-1.00)	2.63 (1.92-3.58)	544 (4.8)	136 (4.8)	1.00 (1.00-1.00)	1.63 (1.46-1.81)
<b>Population in the area of residence</b>												
<5000 inhabitants	1796 (15.9)	449 (15.9)	1 (ref)	1 (ref)	692 (14.4)	173 (14.4)	1 (ref)	1 (ref)	2528 (22.5)	632 (22.5)	1 (ref)	1 (ref)
5000 – 19,999 inhabitants	548 (4.9)	137 (4.9)	1.00 (1.00-1.00)	0.99 (0.94-1.03)	176 (3.7)	44 (3.7)	1.00 (1.00-1.00)	0.98 (0.90-1.05)	620 (5.5)	155 (5.5)	1.00 (1.00-1.00)	0.98 (0.94-1.02)
20,000 – 99,999 inhabitants	668 (5.9)	167 (5.9)	1.00 (1.00-1.00)	1.03 (0.99-1.07)	292 (6.1)	73 (6.1)	1.00 (1.00-1.00)	0.99 (0.93-1.06)	868 (7.7)	217 (7.7)	1.00 (1.00-1.00)	1.02 (0.99-1.06)
Over 100,000 inhabitants	4744 (42.1)	1186 (42.1)	1.00 (1.00-1.00)	0.98 (0.95-1.02)	2180 (45.2)	545 (45.2)	1.00 (1.00-1.00)	1.05 (1.00-1.11)	4104 (36.5)	1026 (36.5)	1.00 (1.00-1.00)	1.03 (1.00-1.06)
Greater Paris area	3508 (31.1)	877 (31.1)	1.00 (1.00-1.00)	0.87 (0.82-0.93)	1480 (30.7)	370 (30.7)	1.00 (1.00-1.00)	0.88 (0.79-0.95)	3128 (27.8)	782 (27.8)	1.00 (1.00-1.00)	0.90 (0.82-1.00)
<b>Region of residence</b>												
Ile-de-France	3564 (31.6)	891 (31.6)	1 (ref)	1 (ref)	1500 (31.1)	375 (31.1)	1 (ref)	1 (ref)	3244 (28.8)	811 (28.8)	1 (ref)	1 (ref)
Auvergne-Rhône-Alpes	1284 (11.4)	321 (11.4)	1.00 (1.00-1.00)	1.01 (0.95-1.08)	660 (13.7)	165 (13.7)	1.00 (1.00-1.00)	0.81 (0.75-0.88)	1728 (15.4)	432 (15.4)	1.00 (1.00-1.00)	0.97 (0.89-1.06)
Occitanie	1880 (16.7)	470 (16.7)	1.00 (1.00-1.00)	0.92 (0.86-0.99)	672 (13.9)	168 (13.9)	1.00 (1.00-1.00)	0.81 (0.73-0.87)	932 (8.3)	233 (8.3)	1.00 (1.00-1.00)	0.96 (0.86-1.05)
Provence-Alpes-Côte d'Azur and Corsica	1388 (12.3)	347 (12.3)	1.00 (1.00-1.00)	0.92 (0.85-0.98)	1032 (21.4)	258 (21.4)	1.00 (1.00-1.00)	0.76 (0.67-0.82)	1072 (9.5)	268 (9.5)	1.00 (1.00-1.00)	0.94 (0.86-1.03)
Grand Est	524 (4.7)	131 (4.7)	1.00 (1.00-1.00)	1.04 (0.97-1.11)	232 (4.8)	58 (4.8)	1.00 (1.00-1.00)	0.85 (0.76-0.94)	840 (7.5)	210 (7.5)	1.00 (1.00-1.00)	1.04 (0.94-1.14)
Nouvelle-Aquitaine	1208 (10.7)	302 (10.7)	1.00 (1.00-1.00)	1.04 (0.97-1.12)	300 (6.2)	75 (6.2)	1.00 (1.00-1.00)	0.87 (0.78-0.96)	976 (8.7)	244 (8.7)	1.00 (1.00-1.00)	1.07 (0.97-1.16)
Hauts-de-France	396 (3.5)	99 (3.5)	1.00 (1.00-1.00)	1.08 (1.00-1.17)	232 (4.8)	58 (4.8)	1.00 (1.00-1.00)	0.94 (0.84-1.04)	828 (7.4)	207 (7.4)	1.00 (1.00-1.00)	1.02 (0.93-1.12)
Pays de la Loire	356 (3.2)	89 (3.2)	1.00 (1.00-1.00)	1.04 (0.95-1.14)	76 (1.6)	19 (1.6)	1.00 (1.00-1.00)	1.21 (1.07-1.35)	636 (5.7)	159 (5.7)	1.00 (1.00-1.00)	0.98 (0.89-1.06)
Bretagne	304 (2.7)	76 (2.7)	1.00 (1.00-1.00)	0.96 (0.88-1.02)	24 (0.5)	6 (0.5)	1.00 (1.00-1.00)	0.89 (0.71-1.05)	356 (3.2)	89 (3.2)	1.00 (1.00-1.00)	0.94 (0.87-1.03)
Normandie	256 (2.3)	64 (2.3)	1.00 (1.00-1.00)	0.95 (0.87-1.02)	44 (0.9)	11 (0.9)	1.00 (1.00-1.00)	0.92 (0.80-1.02)	240 (2.1)	60 (2.1)	1.00 (1.00-1.00)	1.09 (0.98-1.20)
Bourgogne-Franche-Comté	48 (0.4)	12 (0.4)	1.00 (1.00-1.00)	1.23 (1.08-1.36)	40 (0.8)	10 (0.8)	1.00 (1.00-1.00)	1.02 (0.89-1.17)	192 (1.7)	48 (1.7)	1.00 (1.00-1.00)	1.01 (0.90-1.12)
Centre-Val de Loire	56 (0.5)	14 (0.5)	1.00 (1.00-1.00)	1.45 (1.32-1.59)	8 (0.2)	2 (0.2)	1.00 (1.00-1.00)	1.21 (0.96-1.53)	204 (1.8)	51 (1.8)	1.00 (1.00-1.00)	0.84 (0.76-0.93)
<b>Education level</b>												
No diploma	266 (2.4)	38 (1.3)	1 (ref)	1 (ref)	152 (3.2)	19 (1.6)	1 (ref)	1 (ref)	204 (1.8)	50 (1.8)	1 (ref)	1 (ref)
Pre-high school diploma	1339 (11.9)	310 (11)	0.62 (0.56-0.69)	0.60 (0.51-0.69)	666 (13.8)	173 (14.4)	0.48 (0.42-0.55)	0.52 (0.45-0.61)	1670 (14.8)	445 (15.8)	0.92 (0.81-1.02)	0.90 (0.77-1.01)
High-school diploma	2179 (19.3)	692 (24.6)	0.45 (0.41-0.49)	0.44 (0.37-0.50)	961 (19.9)	288 (23.9)	0.42 (0.37-0.47)	0.47 (0.40-0.54)	1863 (16.6)	656 (23.3)	0.69 (0.62-0.78)	0.69 (0.59-0.79)



Period (onset date)	4: 06/14/2021				5: 08/14/2021				6: 10/02/2021			
	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)
Bachelor's degree	4135 (36.7)	1144 (40.6)	0.51 (0.47-0.57)	0.51 (0.43-0.59)	1735 (36.0)	455 (37.8)	0.47 (0.41-0.53)	0.53 (0.46-0.62)	4128 (36.7)	1123 (40.0)	0.91 (0.79-1.00)	0.78 (0.66-0.89)
Master's degree or higher	3346 (29.7)	632 (22.4)	0.76 (0.69-0.83)	0.71 (0.60-0.83)	1306 (27.1)	270 (22.4)	0.61 (0.52-0.68)	0.61 (0.51-0.71)	3384 (30.1)	538 (19.1)	1.55 (1.36-1.69)	1.18 (0.99-1.33)
<b>Health conditions</b>												
Diabetes mellitus	228 (2.0)	71 (2.5)	0.80 (0.72-0.88)	0.89 (0.76-1.05)	111 (2.3)	43 (3.6)	0.64 (0.54-0.72)	0.67 (0.57-0.79)	301 (2.7)	152 (5.4)	0.48 (0.44-0.53)	0.56 (0.50-0.62)
Hypertension	561 (5.0)	182 (6.5)	0.76 (0.71-0.81)	0.82 (0.75-0.87)	344 (7.1)	109 (9.0)	0.77 (0.71-0.84)	0.76 (0.67-0.88)	1163 (10.3)	368 (13.1)	0.76 (0.73-0.80)	0.87 (0.82-0.93)
Chronic respiratory disease	839 (7.5)	176 (6.3)	1.21 (1.15-1.27)	1.18 (1.11-1.27)	404 (8.4)	73 (6.1)	1.42 (1.30-1.52)	1.58 (1.41-1.80)	836 (7.4)	184 (6.5)	1.15 (1.07-1.21)	1.33 (1.23-1.44)
Coronary artery disease	72 (0.6)	12 (0.4)	1.50 (1.29-1.73)	1.57 (1.12-1.96)	31 (0.7)	8 (0.7)	0.97 (0.78-1.22)	0.70 (0.54-0.9)	104 (0.9)	24 (0.9)	1.08 (0.9-1.24)	1.25 (1.01-1.48)
<b>Body-mass index (kg/m<sup>2</sup>)</b>												
Healthy weight ( $\geq 18.5$ & $< 25$ )	6764 (60.1)	1573 (55.9)	1 (ref)	1 (ref)	2764 (57.4)	595 (49.4)	1 (ref)	1 (ref)	6170 (54.9)	1375 (48.9)	1 (ref)	1 (ref)
Underweight ( $< 18.5$ )	544 (4.8)	168 (6.0)	0.75 (0.71-0.80)	0.72 (0.66-0.78)	218 (4.5)	65 (5.4)	0.72 (0.64-0.82)	0.67 (0.58-0.78)	402 (3.6)	123 (4.4)	0.73 (0.66-0.80)	0.79 (0.72-0.88)
Overweight ( $\geq 25$ & $< 30$ )	2691 (23.9)	678 (24.1)	0.92 (0.89-0.95)	1.05 (1.00-1.09)	1231 (25.5)	335 (27.8)	0.79 (0.75-0.83)	0.80 (0.74-0.85)	3194 (28.4)	816 (29)	0.87 (0.84-0.90)	0.97 (0.92-1.02)
Obesity ( $\geq 30$ )	1265 (11.2)	397 (14.1)	0.74 (0.71-0.78)	0.94 (0.87-0.99)	607 (12.6)	210 (17.4)	0.62 (0.59-0.67)	0.64 (0.59-0.70)	1482 (13.2)	498 (17.7)	0.66 (0.63-0.70)	0.76 (0.71-0.81)
<b>Housing</b>												
Individual house	4935 (43.8)	1328 (47.2)	1 (ref)	1 (ref)	2172 (45.1)	544 (45.1)	1 (ref)	1 (ref)	6406 (56.9)	1579 (56.2)	1 (ref)	1 (ref)
Apartment	6246 (55.5)	1473 (52.3)	1.14 (1.11-1.17)	1.07 (1.02-1.13)	2619 (54.3)	658 (54.6)	1.00 (0.97-1.03)	1.11 (1.05-1.20)	4803 (42.7)	1228 (43.7)	0.96 (0.95-0.98)	1.06 (1.01-1.12)
Shelter	82 (0.7)	12 (0.4)	1.84 (1.45-2.22)	2.21 (1.69-3.05)	24 (0.5)	3 (0.2)	2.02 (1.35-2.71)	1.59 (0.93-2.38)	37 (0.3)	5 (0.2)	1.82 (1.33-2.29)	1.73 (1.24-2.43)
Nursing home	1 (0.0)	3 (0.1)	0.18 (0.09-1.00)	0.07 (0.03-1.00)	5 (0.1)	0 (0)	1.00 (1.00-1.00)	1.00 (1.00-1.00)	0	0		
<b>Workplace</b>												
No remote office, no open space	1271 (11.3)	340 (12.1)	1 (ref)	1 (ref)	529 (11.0)	148 (12.3)	1 (ref)	1 (ref)	1418 (12.6)	371 (13.2)	1 (ref)	1 (ref)
No remote office, open space	895 (7.9)	166 (5.9)	1.45 (1.35-1.54)	1.57 (1.41-1.74)	354 (7.3)	79 (6.6)	1.25 (1.13-1.36)	1.47 (1.33-1.64)	879 (7.8)	192 (6.8)	1.20 (1.13-1.29)	1.26 (1.16-1.37)
Not working	2187 (19.4)	521 (18.5)	1.12 (1.06-1.20)	1.59 (1.46-1.76)	1129 (23.4)	272 (22.6)	1.17 (1.08-1.26)	1.86 (1.61-2.06)	2669 (23.7)	759 (27.0)	0.92 (0.88-0.98)	1.52 (1.37-1.70)
Working in a non-office setting	3848 (34.2)	978 (34.7)	1.05 (1.00-1.11)	1.07 (1.00-1.15)	1785 (37.0)	420 (34.9)	1.19 (1.09-1.27)	1.19 (1.08-1.31)	3438 (30.6)	852 (30.3)	1.06 (1.01-1.11)	1.18 (1.10-1.26)
Partial remote office, no open space	772 (6.9)	293 (10.4)	0.70 (0.66-0.75)	0.76 (0.69-0.83)	273 (5.7)	108 (9.0)	0.71 (0.63-0.79)	0.72 (0.61-0.81)	992 (8.8)	258 (9.2)	1.01 (0.94-1.07)	0.77 (0.70-0.84)
Partial remote office, open space	1126 (10)	291 (10.3)	1.04 (0.97-1.10)	1.01 (0.91-1.12)	343 (7.1)	113 (9.4)	0.85 (0.77-0.93)	0.85 (0.72-0.98)	1188 (10.6)	240 (8.5)	1.30 (1.22-1.38)	1.09 (1.01-1.19)
Complete remote office	1164 (10.3)	227 (8.1)	1.37 (1.29-1.47)	1.15 (1.05-1.27)	408 (8.5)	65 (5.4)	1.76 (1.60-1.92)	1.64 (1.45-1.88)	662 (5.9)	140 (5.0)	1.23 (1.12-1.37)	1.01 (0.91-1.14)
<b>Gatherings</b>												
Professional meeting	2524 (22.4)	703 (25.0)	0.87 (0.84-0.90)	0.88 (0.84-0.93)	1037 (21.5)	317 (26.3)	0.77 (0.73-0.81)	0.94 (0.86-1.00)	4154 (36.9)	860 (30.6)	1.33 (1.28-1.38)	1.25 (1.19-1.32)
Private meeting	6192 (55.0)	1704 (60.5)	0.80 (0.78-0.82)	0.78 (0.75-0.82)	2386 (49.5)	763 (63.3)	0.57 (0.55-0.60)	0.66 (0.62-0.70)	6460 (57.4)	1677 (59.6)	0.91 (0.88-0.95)	0.87 (0.83-0.91)
Religious gathering	322 (2.9)	119 (4.2)	0.67 (0.62-0.71)	0.90 (0.81-0.98)	170 (3.5)	59 (4.9)	0.71 (0.64-0.79)	0.74 (0.64-0.83)	514 (4.6)	125 (4.4)	1.03 (0.94-1.11)	1.16 (1.02-1.27)
<b>Retail, shops</b>												
Mall	2383 (21.2)	833 (29.6)	0.64 (0.62-0.66)	0.77 (0.73-0.81)	890 (18.5)	346 (28.7)	0.56 (0.53-0.59)	0.73 (0.67-0.79)	2456 (21.8)	837 (29.8)	0.66 (0.63-0.68)	0.72 (0.68-0.74)
Market	1574 (14.0)	503 (17.9)	0.75 (0.71-0.78)	0.91 (0.85-0.97)	696 (14.4)	220 (18.3)	0.76 (0.71-0.80)	0.91 (0.82-0.98)	1717 (15.3)	494 (17.6)	0.85 (0.81-0.89)	0.90 (0.84-0.96)
Convenience store	4226 (37.5)	1069 (38)	0.98 (0.95-1.01)	1.23 (1.17-1.29)	1714 (35.6)	461 (38.3)	0.89 (0.86-0.93)	1.25 (1.16-1.34)	4665 (41.5)	1045 (37.2)	1.20 (1.17-1.24)	1.44 (1.37-1.51)

Period (onset date)	4: 06/14/2021				5: 08/14/2021				6: 10/02/2021			
	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)
Supermarket	5125 (45.5)	1783 (63.3)	0.48 (0.47-0.50)	0.52 (0.50-0.53)	2201 (45.7)	780 (64.7)	0.46 (0.44-0.48)	0.54 (0.51-0.58)	5890 (52.4)	1861 (66.2)	0.56 (0.54-0.58)	0.58 (0.55-0.60)
Other shop	310 (2.8)	144 (5.1)	0.52 (0.48-0.56)	0.51 (0.46-0.56)	156 (3.2)	52 (4.3)	0.74 (0.66-0.84)	0.72 (0.59-0.85)	404 (3.6)	151 (5.4)	0.66 (0.60-0.71)	0.61 (0.55-0.68)
Beauty salon	938 (8.3)	240 (8.5)	0.98 (0.93-1.02)	1.12 (1.04-1.18)	328 (6.8)	110 (9.1)	0.72 (0.66-0.79)	0.84 (0.76-0.96)	512 (4.6)	202 (7.2)	0.62 (0.57-0.66)	0.69 (0.62-0.75)
Hairdresser	992 (8.8)	416 (14.8)	0.56 (0.52-0.58)	0.61 (0.57-0.65)	485 (10.1)	221 (18.3)	0.50 (0.47-0.53)	0.56 (0.50-0.60)	1107 (9.8)	473 (16.8)	0.54 (0.51-0.56)	0.61 (0.57-0.65)
Take-away delivery	4353 (38.6)	1132 (40.2)	0.94 (0.91-0.97)	1.07 (1.03-1.12)	1743 (36.2)	445 (36.9)	0.97 (0.93-1.01)	1.19 (1.14-1.26)	3848 (34.2)	942 (33.5)	1.03 (1.00-1.07)	1.13 (1.08-1.21)
Home delivery	2881 (25.6)	694 (24.6)	1.05 (1.02-1.09)	1.01 (0.96-1.06)	1093 (22.7)	290 (24.1)	0.93 (0.87-0.97)	0.99 (0.91-1.07)	2205 (19.6)	605 (21.5)	0.89 (0.86-0.92)	0.82 (0.78-0.87)
<b>Shared transport</b>												
Metro	2207 (19.6)	587 (20.8)	0.92 (0.89-0.96)	1.02 (0.95-1.08)	756 (15.7)	227 (18.8)	0.81 (0.74-0.85)	1.07 (0.98-1.17)	2091 (18.6)	517 (18.4)	1.01 (0.97-1.05)	1.07 (1.00-1.14)
Tram	923 (8.2)	356 (12.6)	0.61 (0.59-0.65)	0.72 (0.67-0.77)	336 (7.0)	138 (11.5)	0.58 (0.53-0.63)	0.71 (0.64-0.81)	779 (6.9)	289 (10.3)	0.65 (0.61-0.69)	0.68 (0.62-0.75)
Short-distance bus	1841 (16.3)	632 (22.4)	0.67 (0.65-0.70)	0.75 (0.71-0.78)	666 (13.8)	259 (21.5)	0.59 (0.55-0.62)	0.58 (0.53-0.63)	1388 (12.3)	533 (19.0)	0.60 (0.58-0.63)	0.61 (0.57-0.65)
Short-distance train	1072 (9.5)	392 (13.9)	0.65 (0.62-0.68)	0.60 (0.55-0.64)	281 (5.8)	86 (7.1)	0.81 (0.72-0.89)	0.98 (0.81-1.10)	859 (7.6)	196 (7.0)	1.11 (1.04-1.16)	0.94 (0.86-1.02)
Airplane travel	698 (6.2)	96 (3.4)	1.87 (1.75-1.99)	1.67 (1.52-1.88)	325 (6.7)	62 (5.1)	1.33 (1.23-1.45)	1.20 (1.03-1.41)	493 (4.4)	85 (3.0)	1.47 (1.37-1.56)	1.44 (1.29-1.64)
Boat travel	77 (0.7)	18 (0.6)	1.07 (0.86-1.22)	0.90 (0.65-1.14)	58 (1.2)	10 (0.8)	1.43 (1.20-1.74)	1.80 (1.38-2.22)	29 (0.3)	9 (0.3)	0.81 (0.58-1.00)	0.61 (0.42-0.97)
Long-distance bus travel	214 (1.9)	71 (2.5)	0.75 (0.67-0.82)	0.72 (0.61-0.80)	86 (1.8)	27 (2.2)	0.79 (0.69-0.91)	1.18 (0.94-1.48)	155 (1.4)	46 (1.6)	0.85 (0.74-0.96)	0.88 (0.74-1.05)
Long-distance train travel	950 (8.4)	217 (7.7)	1.10 (1.04-1.16)	1.36 (1.25-1.46)	295 (6.1)	84 (7.0)	0.87 (0.80-0.95)	1.32 (1.12-1.50)	856 (7.6)	142 (5.0)	1.55 (1.45-1.67)	1.80 (1.63-1.94)
Car-pooling with relatives	2996 (26.6)	669 (23.8)	1.16 (1.13-1.02)	1.27 (1.21-1.32)	1080 (22.4)	295 (24.5)	0.89 (0.84-0.95)	1.19 (1.07-1.29)	2914 (25.9)	561 (20.0)	1.40 (1.36-1.45)	1.68 (1.62-1.77)
Car-pooling booked through platform	180 (1.6)	80 (2.8)	0.55 (0.49-0.63)	0.48 (0.41-0.55)	58 (1.2)	30 (2.5)	0.48 (0.39-0.57)	0.48 (0.39-0.60)	115 (1.0)	58 (2.1)	0.49 (0.42-0.56)	0.45 (0.36-0.52)
Taxi	1110 (9.9)	162 (5.8)	1.79 (1.71-1.88)	1.54 (1.42-1.69)	367 (7.6)	60 (5.0)	1.57 (1.44-1.72)	1.89 (1.68-2.25)	845 (7.5)	156 (5.5)	1.38 (1.32-1.48)	1.22 (1.10-1.33)
<b>Leisure activities</b>												
Any cultural venue												
Movie theatre	841 (7.5)	365 (13.0)	0.54 (0.51-0.57)	0.66 (0.61-0.72)	285 (5.9)	131 (10.9)	0.52 (0.47-0.57)	0.66 (0.57-0.74)	1069 (9.5)	368 (13.1)	0.70 (0.66-0.73)	0.71 (0.65-0.75)
Concert	207 (1.8)	46 (1.6)	1.13 (0.99-1.23)	0.85 (0.70-0.94)	51 (1.1)	15 (1.2)	0.85 (0.66-1.05)	1.51 (1.18-2.03)	519 (4.6)	89 (3.2)	1.48 (1.36-1.60)	1.31 (1.21-1.44)
Museum	246 (2.2)	124 (4.4)	0.48 (0.44-0.53)	0.59 (0.52-0.67)	109 (2.3)	61 (5.1)	0.43 (0.36-0.50)	0.61 (0.48-0.72)	381 (3.4)	105 (3.7)	0.91 (0.82-0.97)	0.87 (0.76-0.97)
Theatre	134 (1.2)	49 (1.7)	0.68 (0.60-0.75)	0.85 (0.73-0.95)	47 (1.0)	15 (1.2)	0.76 (0.61-0.97)	1.03 (0.75-1.46)	451 (4.0)	86 (3.1)	1.33 (1.21-1.43)	1.45 (1.26-1.63)
Indoor sports practice	781 (6.9)	193 (6.9)	1.01 (0.95-1.08)	1.08 (0.98-1.16)	335 (7.0)	91 (7.6)	0.91 (0.84-0.99)	1.20 (1.01-1.36)	1233 (11)	296 (10.5)	1.05 (1.00-1.10)	1.05 (0.98-1.11)
Swimming pool	650 (5.8)	242 (8.6)	0.65 (0.61-0.69)	0.76 (0.69-0.83)	296 (6.1)	99 (8.2)	0.73 (0.67-0.79)	0.84 (0.73-0.95)	628 (5.6)	190 (6.8)	0.81 (0.76-0.88)	0.84 (0.76-0.92)
Indoor martial arts facility	34 (0.3)	27 (1.0)	0.31 (0.24-0.43)	0.42 (0.33-0.61)	19 (0.4)	17 (1.4)	0.29 (0.17-0.36)	0.44 (0.29-0.66)	159 (1.4)	52 (1.8)	0.76 (0.67-0.85)	0.85 (0.73-0.98)
Indoor gymnastics facility	119 (1.1)	41 (1.5)	0.72 (0.63-0.82)	0.92 (0.79-1.09)	93 (1.9)	32 (2.7)	0.72 (0.63-0.82)	0.71 (0.57-0.85)	577 (5.1)	166 (5.9)	0.86 (0.80-0.92)	0.84 (0.76-0.90)
Outdoor sports practice	2763 (24.5)	865 (30.7)	0.73 (0.70-0.75)	0.75 (0.72-0.78)	1183 (24.5)	363 (30.1)	0.75 (0.73-0.79)	0.78 (0.73-0.83)	2621 (23.3)	792 (28.2)	0.77 (0.75-0.80)	0.68 (0.65-0.71)
Bar	3480 (30.9)	650 (23.1)	1.49 (1.44-1.53)	1.57 (1.50-1.64)	907 (18.8)	259 (21.5)	0.85 (0.80-0.89)	1.28 (1.14-1.39)	1931 (17.2)	479 (17.0)	1.01 (0.97-1.04)	1.04 (0.98-1.10)
Restaurant	5311 (47.1)	1408 (50.0)	0.89 (0.86-0.92)	0.95 (0.89-0.99)	1830 (38.0)	580 (48.1)	0.66 (0.63-0.69)	0.93 (0.86-0.99)	4463 (39.7)	1188 (42.2)	0.90 (0.87-0.93)	0.88 (0.84-0.92)
Party	1888 (16.8)	216 (7.7)	2.42 (2.33-2.50)	2.66 (2.52-2.84)								
Night-club					302 (6.3)	44 (3.7)	1.77 (1.62-1.93)	2.34 (1.93-2.61)	551 (4.9)	72 (2.6)	1.96 (1.83-2.10)	2.95 (2.64-3.28)
Private party					427 (8.9)	190 (15.8)	0.52 (0.48-0.56)	0.65 (0.57-0.71)	1658 (14.7)	482 (17.1)	0.84 (0.79-0.88)	0.82 (0.76-0.87)

Legend: Adjusted odds ratios estimated in models adjusted for all variables shown in the table, as well as week of exposure, health status (diabetes, hypertension, respiratory disease, coronary artery disease, immunosuppressive treatment, body-mass index categorized as  $<18.5$  kg/m<sup>2</sup>,  $[18.5-25[$ ,  $[25-30[$ , and  $\geq 30$  kg/m<sup>2</sup>), COVID-19 vaccine status (categorized as number of doses and time since last dose as  $<90$  days,  $90-179$  days,  $\geq 180$  days, with a specific category for participants with missing data for the date of the last dose), past SARS-CoV-2 infection (categorized as 61-180 days prior or over 180 days prior), smoking status, level of education, professional category (of the person in the household with the highest income for the first two periods, of the participant for the following periods), and household description (housing type, number of people in the household, presence of children). Empty cells reflect changes of the questionnaire or periods when specific settings were closed.

**Table S3: Exposure prevalence, odds ratios of SARS-CoV-2 infection in univariable and multivariable estimates in a case-control study conducted in mainland France (2020-2022) – Results for the last three periods of the study (December 20, 2021 to October 2, 2022)**

Period (onset date)	7: 12/20/2021				8: 03/18/2022				9: 05/20/2022			
	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)
Male sex	16356 (37.1)	4089 (37.1)	1.00 (1.00-1.00)	1.12 (1.11-1.14)	16200 (40.9)	4050 (40.9)	1.00 (1.00-1.00)	1.10 (1.09-1.12)	8148 (28.5)	2037 (28.5)	1.00 (1.00-1.00)	1.16 (1.14-1.19)
<b>Age (years)</b>												
18-29	3640 (8.2)	910 (8.2)	1 (ref)	1 (ref)	3152 (7.9)	788 (7.9)	1 (ref)	1 (ref)	1952 (6.8)	488 (6.8)	1 (ref)	1 (ref)
30-39	7776 (17.6)	1944 (17.6)	1.00 (1.00-1.00)	0.67 (0.66-0.69)	7124 (18.0)	1781 (18.0)	1.00 (1.00-1.00)	0.72 (0.69-0.75)	5692 (19.9)	1423 (19.9)	1.00 (1.00-1.00)	0.83 (0.79-0.87)
40-49	10628 (24.1)	2657 (24.1)	1.00 (1.00-1.00)	0.72 (0.70-0.74)	9500 (24.0)	2375 (24.0)	1.00 (1.00-1.00)	0.68 (0.65-0.70)	7300 (25.5)	1825 (25.5)	1.00 (1.00-1.00)	0.86 (0.83-0.91)
50-59	9616 (21.8)	2404 (21.8)	1.00 (1.00-1.00)	0.97 (0.94-1.00)	9204 (23.2)	2301 (23.2)	1.00 (1.00-1.00)	0.73 (0.71-0.76)	6668 (23.3)	1667 (23.3)	1.00 (1.00-1.00)	0.81 (0.77-0.85)
60-69	8588 (19.5)	2147 (19.5)	1.00 (1.00-1.00)	1.29 (1.22-1.35)	6900 (17.4)	1725 (17.4)	1.00 (1.00-1.00)	0.92 (0.88-0.97)	4864 (17.0)	1216 (17.0)	1.00 (1.00-1.00)	0.95 (0.89-1.00)
70+	3888 (8.8)	972 (8.8)	1.00 (1.00-1.00)	1.24 (1.17-1.31)	3772 (9.5)	943 (9.5)	1.00 (1.00-1.00)	0.96 (0.90-1.02)	2140 (7.5)	535 (7.5)	1.00 (1.00-1.00)	0.92 (0.85-0.98)
<b>Population in the area of residence</b>												
<5000 inhabitants	12564 (28.5)	3141 (28.5)	1 (ref)	1 (ref)	11072 (27.9)	2768 (27.9)	1 (ref)	1 (ref)	7092 (24.8)	1773 (24.8)	1 (ref)	1 (ref)
5000 – 19,999 inhabitants	4160 (9.4)	1040 (9.4)	1.00 (1.00-1.00)	1.02 (1.00-1.04)	4100 (10.3)	1025 (10.3)	1.00 (1.00-1.00)	0.99 (0.98-1.01)	1796 (6.3)	449 (6.3)	1.00 (1.00-1.00)	1.01 (0.98-1.04)
20,000 – 99,999 inhabitants	4888 (11.1)	1222 (11.1)	1.00 (1.00-1.00)	1.09 (1.06-1.10)	4888 (12.3)	1222 (12.3)	1.00 (1.00-1.00)	1.04 (1.01-1.06)	2648 (9.3)	662 (9.3)	1.00 (1.00-1.00)	1.07 (1.04-1.09)
Over 100,000 inhabitants	15140 (34.3)	3785 (34.3)	1.00 (1.00-1.00)	1.00 (0.99-1.02)	13112 (33.1)	3278 (33.1)	1.00 (1.00-1.00)	0.95 (0.93-0.97)	10212 (35.7)	2553 (35.7)	1.00 (1.00-1.00)	0.97 (0.95-0.99)
Greater Paris area	7384 (16.7)	1846 (16.7)	1.00 (1.00-1.00)	0.91 (0.87-0.95)	6480 (16.3)	1620 (16.3)	1.00 (1.00-1.00)	0.78 (0.75-0.82)	6868 (24.0)	1717 (24.0)	1.00 (1.00-1.00)	0.86 (0.8-0.92)
<b>Region of residence</b>												
Ile-de-France	8012 (18.2)	2003 (18.2)	1 (ref)	1 (ref)	7252 (18.3)	1813 (18.3)	1 (ref)	1 (ref)	7144 (25.0)	1786 (25.0)	1 (ref)	1 (ref)
Auvergne-Rhône-Alpes	5308 (12.0)	1327 (12.0)	1.00 (1.00-1.00)	1.04 (1.00-1.09)	4916 (12.4)	1229 (12.4)	1.00 (1.00-1.00)	1.01 (0.96-1.05)	3844 (13.4)	961 (13.4)	1.00 (1.00-1.00)	0.99 (0.92-1.05)
Occitanie	4968 (11.3)	1242 (11.3)	1.00 (1.00-1.00)	1.04 (1.00-1.08)	4012 (10.1)	1003 (10.1)	1.00 (1.00-1.00)	1.02 (0.98-1.06)	3128 (10.9)	782 (10.9)	1.00 (1.00-1.00)	0.99 (0.93-1.05)
Provence-Alpes-Côte d'Azur and Corsica	3336 (7.6)	834 (7.6)	1.00 (1.00-1.00)	1.16 (1.11-1.21)	3208 (8.1)	802 (8.1)	1.00 (1.00-1.00)	1.10 (1.06-1.15)	2576 (9.0)	644 (9.0)	1.00 (1.00-1.00)	1.10 (1.03-1.20)
Grand Est	4012 (9.1)	1003 (9.1)	1.00 (1.00-1.00)	1.08 (1.04-1.13)	3596 (9.1)	899 (9.1)	1.00 (1.00-1.00)	1.01 (0.96-1.04)	2356 (8.2)	589 (8.2)	1.00 (1.00-1.00)	0.95 (0.9-1.02)
Nouvelle-Aquitaine	4640 (10.5)	1160 (10.5)	1.00 (1.00-1.00)	1.09 (1.04-1.13)	3360 (8.5)	840 (8.5)	1.00 (1.00-1.00)	1.01 (0.96-1.06)	2624 (9.2)	656 (9.2)	1.00 (1.00-1.00)	1.00 (0.92-1.06)
Hauts-de-France	3912 (8.9)	978 (8.9)	1.00 (1.00-1.00)	1.13 (1.08-1.18)	3764 (9.5)	941 (9.5)	1.00 (1.00-1.00)	1.02 (0.98-1.07)	2444 (8.5)	611 (8.5)	1.00 (1.00-1.00)	0.99 (0.93-1.05)
Pays de la Loire	2396 (5.4)	599 (5.4)	1.00 (1.00-1.00)	1.05 (1.00-1.10)	2468 (6.2)	617 (6.2)	1.00 (1.00-1.00)	1.02 (0.97-1.07)	1188 (4.2)	297 (4.2)	1.00 (1.00-1.00)	1.01 (0.92-1.07)
Bretagne	2800 (6.3)	700 (6.3)	1.00 (1.00-1.00)	0.98 (0.95-1.03)	2752 (6.9)	688 (6.9)	1.00 (1.00-1.00)	0.94 (0.89-0.97)	1204 (4.2)	301 (4.2)	1.00 (1.00-1.00)	1.02 (0.94-1.10)
Normandie	1716 (3.9)	429 (3.9)	1.00 (1.00-1.00)	1.08 (1.04-1.14)	1612 (4.1)	403 (4.1)	1.00 (1.00-1.00)	1.04 (0.99-1.10)	840 (2.9)	210 (2.9)	1.00 (1.00-1.00)	0.96 (0.88-1.02)
Bourgogne-Franche-Comté	1760 (4.0)	440 (4.0)	1.00 (1.00-1.00)	1.02 (0.98-1.06)	1260 (3.2)	315 (3.2)	1.00 (1.00-1.00)	1.00 (0.96-1.05)	624 (2.2)	156 (2.2)	1.00 (1.00-1.00)	0.93 (0.87-1.00)
Centre-Val de Loire	1276 (2.9)	319 (2.9)	1.00 (1.00-1.00)	1.00 (0.96-1.06)	1452 (3.7)	363 (3.7)	1.00 (1.00-1.00)	0.94 (0.90-0.99)	644 (2.3)	161 (2.3)	1.00 (1.00-1.00)	0.97 (0.90-1.05)
<b>Education level</b>												
No diploma	943 (2.1)	233 (2.1)	1 (ref)	1 (ref)	729 (1.8)	186 (1.9)	1 (ref)	1 (ref)	554 (1.9)	129 (1.8)	1 (ref)	1 (ref)
Pre-high school diploma	6975 (15.8)	2231 (20.2)	0.77 (0.73-0.82)	0.67 (0.63-0.72)	6158 (15.5)	2141 (21.6)	0.73 (0.69-0.78)	0.60 (0.55-0.65)	4139 (14.5)	1288 (18)	0.75 (0.70-0.80)	0.61 (0.56-0.66)

Period (onset date)	7: 12/20/2021				8: 03/18/2022				9: 05/20/2022			
	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)
High-school diploma	8006 (18.1)	2804 (25.4)	0.71 (0.66-0.74)	0.61 (0.57-0.65)	7321 (18.5)	2533 (25.6)	0.73 (0.70-0.79)	0.57 (0.53-0.63)	5108 (17.8)	1791 (25.0)	0.67 (0.62-0.72)	0.54 (0.49-0.59)
Bachelor's degree	16438 (37.2)	4080 (37.0)	1.00 (0.94-1.05)	0.74 (0.69-0.78)	14819 (37.4)	3665 (37)	1.03 (0.97-1.1)	0.70 (0.65-0.77)	10773 (37.6)	2788 (39.0)	0.90 (0.84-0.97)	0.65 (0.60-0.70)
Master's degree or higher	11773 (26.7)	1686 (15.3)	1.73 (1.63-1.82)	1.10 (1.03-1.18)	10626 (26.8)	1388 (14)	1.95 (1.84-2.09)	1.09 (1.01-1.20)	8043 (28.1)	1158 (16.2)	1.62 (1.51-1.73)	0.99 (0.90-1.08)
<b>Health conditions</b>												
Diabetes mellitus	1751 (4.0)	640 (5.8)	0.67 (0.65-0.70)	0.69 (0.67-0.73)	1660 (4.2)	637 (6.4)	0.64 (0.61-0.66)	0.70 (0.67-0.74)	1098 (3.8)	414 (5.8)	0.65 (0.61-0.69)	0.68 (0.64-0.72)
Hypertension	5907 (13.4)	1677 (15.2)	0.86 (0.84-0.88)	0.90 (0.88-0.93)	5662 (14.3)	1586 (16)	0.87 (0.85-0.90)	0.92 (0.89-0.95)	3696 (12.9)	989 (13.8)	0.92 (0.90-0.95)	0.94 (0.90-0.97)
Chronic respiratory disease	3632 (8.2)	806 (7.3)	1.14 (1.10-1.17)	1.30 (1.25-1.34)	3455 (8.7)	705 (7.1)	1.25 (1.21-1.28)	1.40 (1.36-1.47)	2547 (8.9)	533 (7.5)	1.21 (1.17-1.26)	1.34 (1.26-1.40)
Coronary artery disease	636 (1.4)	152 (1.4)	1.04 (0.98-1.13)	1.16 (1.05-1.29)	626 (1.6)	111 (1.1)	1.42 (1.33-1.50)	1.59 (1.44-1.70)	347 (1.2)	68 (1.0)	1.28 (1.18-1.39)	1.46 (1.29-1.63)
<b>Body-mass index (kg/m<sup>2</sup>)</b>												
Healthy weight (≥18.5 & <25)	22002 (49.9)	5060 (45.9)	1 (ref)	1 (ref)	18968 (47.8)	4322 (43.6)	1 (ref)	1 (ref)	14030 (49.0)	3387 (47.3)	1 (ref)	1 (ref)
Underweight (<18.5)	1192 (2.7)	448 (4.1)	0.61 (0.58-0.64)	0.60 (0.56-0.63)	1003 (2.5)	353 (3.6)	0.65 (0.61-0.68)	0.65 (0.60-0.70)	912 (3.2)	301 (4.2)	0.73 (0.70-0.77)	0.70 (0.66-0.74)
Overweight (≥25 & <30)	13865 (31.4)	3453 (31.3)	0.92 (0.91-0.94)	0.96 (0.94-0.98)	12878 (32.5)	3245 (32.7)	0.90 (0.89-0.92)	0.94 (0.91-0.96)	8616 (30.1)	2119 (29.6)	0.98 (0.96-1.00)	1.02 (1.00-1.05)
Obesity (≥30)	7077 (16.0)	2073 (18.8)	0.79 (0.77-0.80)	0.86 (0.83-0.88)	6803 (17.2)	1993 (20.1)	0.78 (0.76-0.79)	0.82 (0.79-0.84)	5058 (17.7)	1347 (18.8)	0.91 (0.89-0.93)	0.99 (0.96-1.03)
<b>Housing</b>												
Individual house	29262 (66.3)	6904 (62.6)	1 (ref)	1 (ref)	25967 (65.5)	6272 (63.3)	1 (ref)	1 (ref)	17120 (59.8)	4192 (58.6)	1 (ref)	1 (ref)
Apartment	14757 (33.4)	4101 (37.2)	0.85 (0.84-0.86)	0.96 (0.94-0.99)	13593 (34.3)	3608 (36.4)	0.91 (0.90-0.92)	0.99 (0.96-1.02)	11436 (40.0)	2942 (41.1)	0.95 (0.94-0.97)	0.95 (0.92-0.98)
Shelter	97 (0.2)	23 (0.2)	0.99 (0.85-1.18)	1.17 (0.98-1.52)	79 (0.2)	26 (0.3)	0.75 (0.58-0.88)	1.00 (0.66-1.38)	51 (0.2)	15 (0.2)	0.83 (0.67-1.05)	1.07 (0.86-1.42)
Nursing home	20 (0.0)	7 (0.1)	0.67 (0.50-0.81)	0.84 (0.55-1.23)	13 (0)	7 (0.1)	0.45 (0.24-0.73)	0.46 (0.22-0.76)	9 (0.0)	5 (0.1)	0.44 (0.20-0.69)	2.07 (0.49-6.51)
<b>Workplace</b>												
No remote office, no open space	4843 (11.0)	1221 (11.1)	1 (ref)	1 (ref)	4981 (12.6)	1043 (10.5)	1 (ref)	1 (ref)	3117 (10.9)	803 (11.2)	1 (ref)	1 (ref)
No remote office, open space	2566 (5.8)	625 (5.7)	1.04 (0.99-1.07)	1.19 (1.12-1.24)	2951 (7.4)	571 (5.8)	1.08 (1.04-1.13)	1.23 (1.17-1.31)	2099 (7.3)	427 (6.0)	1.26 (1.22-1.33)	1.33 (1.26-1.40)
Not working	11808 (26.8)	3901 (35.4)	0.76 (0.75-0.78)	0.85 (0.81-0.88)	10005 (25.2)	3465 (35)	0.60 (0.59-0.62)	0.58 (0.55-0.62)	6516 (22.8)	2233 (31.2)	0.75 (0.73-0.77)	0.84 (0.80-0.90)
Working in a non-office setting	11771 (26.7)	2694 (24.4)	1.10 (1.07-1.13)	1.31 (1.26-1.37)	10054 (25.4)	2532 (25.5)	0.83 (0.81-0.86)	1.19 (1.15-1.24)	6134 (21.4)	1464 (20.5)	1.08 (1.04-1.11)	1.35 (1.29-1.41)
Partial remote office, no open space	3391 (7.7)	786 (7.1)	1.09 (1.05-1.13)	0.90 (0.87-0.95)	2879 (7.3)	602 (6.1)	1.00 (0.96-1.04)	0.86 (0.81-0.91)	1737 (6.1)	431 (6.0)	1.04 (0.98-1.08)	0.86 (0.82-0.91)
Partial remote office, open space	3186 (7.2)	694 (6.3)	1.16 (1.11-1.20)	1.00 (0.94-1.04)	3330 (8.4)	598 (6.0)	1.17 (1.12-1.21)	0.98 (0.93-1.03)	2171 (7.6)	486 (6.8)	1.15 (1.10-1.20)	0.95 (0.91-1.01)
Complete remote office	2316 (5.2)	421 (3.8)	1.39 (1.32-1.44)	1.15 (1.09-1.20)	1577 (4.0)	286 (2.9)	1.16 (1.09-1.23)	1.00 (0.92-1.07)	1072 (3.7)	236 (3.3)	1.17 (1.10-1.24)	1 (0.92-1.09)
On leave during the period of interest	4254 (9.6)	691 (6.3)	1.55 (1.5-1.60)	1.82 (1.75-1.92)	3876 (9.8)	816 (8.2)	0.99 (0.96-1.04)	1.18 (1.13-1.25)	5771 (20.2)	1074 (15.0)	1.39 (1.34-1.43)	1.58 (1.53-1.67)
<b>Gatherings</b>												

Period (onset date)	7: 12/20/2021				8: 03/18/2022				9: 05/20/2022			
	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)
Professional meeting	11548 (26.2)	2401 (21.8)	1.28 (1.25-1.29)	1.14 (1.11-1.18)	12304 (31)	2419 (24.4)	1.39 (1.37-1.42)	1.11 (1.07-1.14)	7217 (25.2)	1463 (20.5)	1.31 (1.29-1.35)	1.31 (1.27-1.37)
Private meeting	19067 (43.2)	4933 (44.7)	0.94 (0.92-0.96)	0.93 (0.91-0.95)	16213 (40.9)	4610 (46.5)	0.80 (0.78-0.81)	0.82 (0.79-0.84)	11985 (41.9)	3386 (47.3)	0.80 (0.79-0.81)	0.82 (0.80-0.84)
Religious gathering	1715 (3.9)	423 (3.8)	1.01 (0.98-1.05)	1.05 (1.00-1.09)	1638 (4.1)	477 (4.8)	0.85 (0.81-0.89)	0.94 (0.89-0.99)	1036 (3.6)	327 (4.6)	0.78 (0.74-0.82)	0.96 (0.90-1.01)
<b>Retail, shops</b>												
Mall	6813 (15.4)	2550 (23.1)	0.61 (0.59-0.62)	0.68 (0.66-0.69)	5768 (14.5)	2147 (21.7)	0.62 (0.60-0.63)	0.72 (0.69-0.74)	5244 (18.3)	1726 (24.1)	0.70 (0.69-0.72)	0.79 (0.77-0.81)
Market	4557 (10.3)	1359 (12.3)	0.82 (0.80-0.84)	0.85 (0.83-0.88)	4010 (10.1)	1218 (12.3)	0.80 (0.78-0.82)	0.88 (0.84-0.92)	3831 (13.4)	1060 (14.8)	0.89 (0.87-0.91)	0.97 (0.93-1.01)
Convenience store	15459 (35.0)	3826 (34.7)	1.01 (1.00-1.03)	1.18 (1.15-1.2)	13589 (34.3)	3424 (34.5)	0.99 (0.97-1.00)	1.15 (1.12-1.18)	9844 (34.4)	2403 (33.6)	1.04 (1.02-1.06)	1.17 (1.13-1.20)
Supermarket	21721 (49.2)	7000 (63.4)	0.56 (0.55-0.57)	0.59 (0.58-0.60)	19430 (49.0)	6383 (64.4)	0.53 (0.52-0.54)	0.57 (0.56-0.59)	13834 (48.3)	4351 (60.8)	0.60 (0.59-0.61)	0.66 (0.64-0.67)
Other shop	1420 (3.2)	540 (4.9)	0.65 (0.62-0.67)	0.66 (0.62-0.69)	1339 (3.4)	472 (4.8)	0.70 (0.66-0.73)	0.71 (0.68-0.74)	1103 (3.9)	295 (4.1)	0.93 (0.89-0.97)	0.88 (0.83-0.95)
Beauty salon	1512 (3.4)	593 (5.4)	0.63 (0.59-0.66)	0.77 (0.72-0.81)	1320 (3.3)	529 (5.3)	0.61 (0.58-0.65)	0.72 (0.67-0.77)	1290 (4.5)	491 (6.9)	0.64 (0.61-0.67)	0.80 (0.76-0.85)
Hairdresser	3158 (7.2)	1434 (13.0)	0.52 (0.50-0.53)	0.57 (0.55-0.59)	2980 (7.5)	1279 (12.9)	0.55 (0.53-0.57)	0.64 (0.62-0.66)	2056 (7.2)	953 (13.3)	0.50 (0.48-0.52)	0.56 (0.54-0.59)
Take-away delivery	12548 (28.4)	3078 (27.9)	1.03 (1.01-1.04)	1.11 (1.08-1.13)	10864 (27.4)	2781 (28.0)	0.97 (0.95-0.99)	1.12 (1.09-1.14)	8109 (28.3)	1966 (27.5)	1.04 (1.02-1.07)	1.28 (1.23-1.31)
Home delivery	5388 (12.2)	1468 (13.3)	0.91 (0.89-0.93)	0.91 (0.88-0.94)	4623 (11.7)	1322 (13.3)	0.86 (0.83-0.88)	0.85 (0.82-0.89)	3221 (11.3)	994 (13.9)	0.79 (0.76-0.81)	0.80 (0.78-0.85)
<b>Shared transport</b>												
Metro	5139 (11.6)	1244 (11.3)	1.04 (1.01-1.06)	1.07 (1.03-1.11)	5097 (12.9)	1141 (11.5)	1.13 (1.10-1.16)	1.16 (1.12-1.20)	4414 (15.4)	1008 (14.1)	1.11 (1.09-1.15)	1.15 (1.1-1.2)
Tram	2447 (5.5)	776 (7.0)	0.78 (0.75-0.80)	0.87 (0.82-0.91)	2253 (5.7)	700 (7.1)	0.79 (0.76-0.82)	0.84 (0.80-0.89)	1844 (6.4)	589 (8.2)	0.77 (0.74-0.79)	0.84 (0.8-0.88)
Short-distance bus	4204 (9.5)	1415 (12.8)	0.71 (0.70-0.74)	0.80 (0.77-0.83)	4094 (10.3)	1299 (13.1)	0.76 (0.74-0.79)	0.79 (0.76-0.82)	3910 (13.7)	1116 (15.6)	0.86 (0.84-0.88)	0.85 (0.81-0.88)
Short-distance train	1987 (4.5)	521 (4.7)	0.95 (0.91-0.99)	0.91 (0.86-0.96)	2179 (5.5)	591 (6.0)	0.92 (0.88-0.95)	0.85 (0.80-0.89)	1945 (6.8)	480 (6.7)	1.01 (0.99-1.05)	0.91 (0.85-0.95)
Airplane travel	1066 (2.4)	243 (2.2)	1.10 (1.05-1.15)	1.07 (1.00-1.16)	1176 (3.0)	243 (2.5)	1.21 (1.16-1.27)	1.00 (0.94-1.10)	2127 (7.4)	261 (3.6)	2.12 (2.06-2.20)	1.53 (1.43-1.63)
Boat travel	114 (0.3)	19 (0.2)	1.44 (1.26-1.74)	1.50 (1.23-1.90)	135 (0.3)	25 (0.3)	1.32 (1.14-1.57)	1.20 (0.99-1.47)	427 (1.5)	51 (0.7)	2.11 (1.95-2.27)	1.40 (1.28-1.51)
Long-distance bus travel	569 (1.3)	125 (1.1)	1.14 (1.06-1.20)	1.29 (1.17-1.39)	612 (1.5)	140 (1.4)	1.10 (1.01-1.17)	1.25 (1.15-1.39)	965 (3.4)	161 (2.3)	1.52 (1.43-1.58)	1.20 (1.12-1.29)
Long-distance train travel	2064 (4.7)	318 (2.9)	1.65 (1.60-1.72)	1.61 (1.52-1.72)	1940 (4.9)	339 (3.4)	1.45 (1.39-1.51)	1.38 (1.30-1.50)	1758 (6.1)	327 (4.6)	1.36 (1.32-1.42)	1.25 (1.16-1.32)
Car-pooling												
Car-pooling with relatives	8737 (19.8)	2218 (20.1)	0.98 (0.97-1.00)	1.10 (1.08-1.14)	8044 (20.3)	2125 (21.4)	0.93 (0.91-0.95)	1.09 (1.05-1.12)	5832 (20.4)	1482 (20.7)	0.98 (0.96-1.00)	1.18 (1.15-1.21)
Car-pooling booked through platform	348 (0.8)	181 (1.6)	0.48 (0.44-0.52)	0.49 (0.45-0.55)	353 (0.9)	177 (1.8)	0.49 (0.45-0.54)	0.59 (0.53-0.66)	307 (1.1)	166 (2.3)	0.46 (0.42-0.49)	0.45 (0.40-0.50)
Taxi	1839 (4.2)	415 (3.8)	1.11 (1.07-1.15)	1.14 (1.10-1.20)	1721 (4.3)	371 (3.7)	1.17 (1.11-1.22)	1.11 (1.05-1.19)	1901 (6.6)	365 (5.1)	1.32 (1.29-1.37)	1.08 (1.03-1.15)
<b>Leisure activities</b>												
Movie theatre	2627 (6.0)	1007 (9.1)	0.63 (0.61-0.65)	0.66 (0.64-0.68)	2241 (5.7)	928 (9.4)	0.58 (0.56-0.60)	0.67 (0.65-0.71)	1269 (4.4)	647 (9.0)	0.47 (0.45-0.49)	0.53 (0.51-0.57)
Concert	1680 (3.8)	219 (2.0)	1.96 (1.89-2.03)	2.09 (1.97-2.20)	1965 (5.0)	297 (3.0)	1.69 (1.62-1.76)	1.68 (1.61-1.78)	661 (2.3)	119 (1.7)	1.40 (1.30-1.48)	1.45 (1.34-1.58)
Museum	963 (2.2)	248 (2.2)	0.97 (0.93-1.03)	0.91 (0.86-0.98)	915 (2.3)	221 (2.2)	1.04 (0.98-1.08)	1.13 (1.04-1.23)	1147 (4.0)	267 (3.7)	1.08 (1.03-1.13)	0.95 (0.89-1.01)
Theatre	1177 (2.7)	241 (2.2)	1.23 (1.16-1.30)	1.20 (1.13-1.28)	993 (2.5)	237 (2.4)	1.04 (0.99-1.12)	1.04 (0.96-1.11)	453 (1.6)	111 (1.6)	1.02 (0.93-1.10)	1.25 (1.11-1.35)
Indoor sports practice	4149 (9.4)	946 (8.6)	1.11 (1.08-1.14)	1.11 (1.07-1.14)	3507 (8.8)	880 (8.9)	1.00 (0.96-1.03)	1.02 (0.98-1.07)	1634 (5.7)	509 (7.1)	0.79 (0.76-0.83)	0.86 (0.81-0.90)
Swimming pool	2460 (5.6)	684 (6.2)	0.89 (0.87-0.92)	0.82 (0.79-0.85)	2261 (5.7)	612 (6.2)	0.92 (0.89-0.95)	0.97 (0.92-1.02)	2084 (7.3)	595 (8.3)	0.86 (0.84-0.90)	0.97 (0.92-1.02)



Period (onset date)	7: 12/20/2021				8: 03/18/2022				9: 05/20/2022			
	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)
Indoor martial arts facility	519 (1.2)	145 (1.3)	0.89 (0.83-0.95)	0.93 (0.86-0.99)	421 (1.1)	115 (1.2)	0.92 (0.84-0.98)	1.01 (0.91-1.10)	167 (0.6)	94 (1.3)	0.44 (0.39-0.50)	0.58 (0.51-0.67)
Indoor gymnastics facility	1980 (4.5)	509 (4.6)	0.97 (0.94-1.00)	0.92 (0.87-0.96)	1622 (4.1)	412 (4.2)	0.99 (0.94-1.03)	0.97 (0.91-1.02)	442 (1.5)	218 (3.0)	0.50 (0.47-0.53)	0.59 (0.54-0.63)
Outdoor sports practice	10074 (22.8)	2936 (26.6)	0.82 (0.80-0.83)	0.77 (0.75-0.79)	8997 (22.7)	2727 (27.5)	0.77 (0.76-0.79)	0.72 (0.70-0.74)	6365 (22.2)	1974 (27.6)	0.75 (0.73-0.77)	0.71 (0.69-0.73)
Bar	5696 (12.9)	1523 (13.8)	0.92 (0.90-0.95)	1.00 (0.97-1.03)	5493 (13.9)	1736 (17.5)	0.76 (0.74-0.77)	0.84 (0.82-0.87)	4902 (17.1)	1370 (19.2)	0.87 (0.86-0.89)	0.89 (0.86-0.92)
Restaurant	13790 (31.2)	3615 (32.8)	0.93 (0.92-0.95)	0.95 (0.93-0.97)	13777 (34.7)	3736 (37.7)	0.88 (0.86-0.90)	0.93 (0.91-0.95)	11357 (39.7)	3075 (43.0)	0.87 (0.86-0.89)	0.85 (0.83-0.88)
Night-club	1032 (2.3)	195 (1.8)	1.33 (1.26-1.40)	1.72 (1.59-1.85)	958 (2.4)	249 (2.5)	0.96 (0.91-1.01)	1.45 (1.34-1.57)	724 (2.5)	167 (2.3)	1.09 (1.02-1.14)	1.54 (1.41-1.66)
Private party	4739 (10.7)	1457 (13.2)	0.79 (0.76-0.81)	0.87 (0.84-0.90)	3467 (8.7)	1343 (13.5)	0.61 (0.60-0.63)	0.75 (0.72-0.78)	2183 (7.6)	873 (12.2)	0.60 (0.58-0.62)	0.65 (0.62-0.68)

Legend: Adjusted odds ratios estimated in models adjusted for all variables shown in the table, as well as week of exposure, health status (diabetes, hypertension, respiratory disease, coronary artery disease, immunosuppressive treatment, body-mass index categorized as <18.5 kg/m<sup>2</sup>, [18.5-25[, [25-30[, and ≥30 kg/m<sup>2</sup>), COVID-19 vaccine status (categorized as number of doses and time since last dose as <90 days, 90-179 days, ≥180 days, with a specific category for participants with missing data for the date of the last dose), past SARS-CoV-2 infection (categorized as 61-180 days prior or over 180 days prior), smoking status, level of education, professional category (of the person in the household with the highest income for the first two periods, of the participant for the following periods), and household description (housing type, number of people in the household, presence of children). Empty cells reflect changes of the questionnaire or periods when specific settings were closed.

**Table S4: Exposure prevalence, odds ratios of SARS-CoV-2 infection in univariable and multivariable estimates and *p*-value for interaction term for dining and partying-related exposures in a case-control study conducted in mainland France (2020-2022) – Results for the first three periods of the study (October 1, 2020 to June 13, 2021)**

Period (onset date)		1: 10/01/2020				2: 12/04/2020				3: 04/09/2021			
		Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)
Bar or restaurant	Age < 40	644 (29.2)	89 (16.1)	2.15 (1.96-2.31)	2.39 (2.10-2.67)								
	Age ≥ 40	1258 (24.7)	197 (15.5)	1.79 (1.70-1.89)	1.75 (1.64-1.87)								
<i>p</i> -value for interaction				0.2255	0.0588								
Party	Age < 40	110 (5.0)	17 (3.1)	1.68 (1.37-1.90)	1.33 (0.99-1.70)	175 (2.4)	34 (1.9)	1.29 (1.12-1.48)	2.17 (1.82-2.57)	130 (3.3)	26 (2.7)	1.25 (1.10-1.44)	1.98 (1.67-2.51)
	Age ≥ 40	43 (0.8)	10 (0.8)	1.08 (0.75-1.43)	0.73 (0.50-1.03)	21 (0.2)	16 (0.5)	0.33 (0.2-0.45)	0.57 (0.33-0.83)	7 (0.1)	4 (0.3)	0.44 (0.25-0.62)	0.74 (0.39-1.14)
<i>p</i> -value for interaction				0.3543	0.2013			0.0003	0.0016			0.098	0.2178

Legend: Adjusted odds ratios estimated in models similar to those displayed in supplementary tables 1-3. Empty cells reflect changes of the questionnaire or periods when specific settings were closed.

**Table S5: Exposure prevalence, odds ratios of SARS-CoV-2 infection in univariable and multivariable estimates and *p*-value for interaction term for dining and partying-related exposures in a case-control study conducted in mainland France (2020-2022) – Results for the fourth, fifth, and sixth periods of the study (June 14 to December 19, 2021)**

Period (onset date)		4: 06/14/2021				5: 08/14/2021				6: 10/02/2021			
		Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)
Bar	Age < 40	2446 (45.4)	367 (27.3)	2.22 (2.12-2.32)	2.17 (1.99-2.36)	496 (24.9)	129 (25.9)	0.95 (0.88-1.01)	1.23 (1.07-1.43)	875 (27.8)	168 (21.3)	1.42 (1.33-1.50)	1.60 (1.42-1.77)
	Age ≥ 40	1034 (17.6)	283 (19.3)	0.89 (0.86-0.93)	1.04 (0.96-1.11)	411 (14.5)	130 (18.4)	0.76 (0.69-0.80)	1.35 (1.16-1.46)	1056 (13.0)	311 (15.4)	0.83 (0.78-0.87)	0.85 (0.79-0.91)
<i>p</i> -value for interaction				< 0.0001	< 0.0001			0.1549	0.6733			< 0.0001	< 0.0001
Restaurant	Age < 40	2980 (55.3)	733 (54.5)	1.04 (0.99-1.08)	0.87 (0.8-0.92)	854 (42.9)	248 (49.8)	0.76 (0.70-0.83)	1.07 (0.96-1.20)	1374 (43.6)	371 (47.1)	0.87 (0.82-0.92)	0.76 (0.70-0.83)
	Age ≥ 40	2331 (39.6)	675 (45.9)	0.77 (0.74-0.81)	1.03 (0.98-1.09)	976 (34.5)	332 (47)	0.6 (0.57-0.63)	0.84 (0.77-0.91)	3090 (38.2)	817 (40.4)	0.91 (0.88-0.95)	0.93 (0.88-0.99)
<i>p</i> -value for interaction				0.0006	0.0748			0.0763	0.1278			0.5744	0.0706
Party	Age < 40	1462 (27.2)	135 (10.0)	3.34 (3.19-3.48)	3.24 (3.01-3.52)								
	Age ≥ 40	426 (7.2)	81 (5.5)	1.34 (1.23-1.42)	1.52 (1.33-1.64)								
<i>p</i> -value for interaction				< 0.0001	< 0.0001								
Night-club	Age < 40					229 (11.5)	36 (7.2)	1.68 (1.50-1.85)	2.13 (1.77-2.49)	332 (10.5)	45 (5.7)	1.95 (1.76-2.14)	2.36 (2.06-2.74)
	Age ≥ 40					73 (2.6)	8 (1.1)	2.32 (1.89-2.64)	2.91 (2.25-3.58)	219 (2.7)	27 (1.3)	2.06 (1.84-2.31)	3.08 (2.62-3.67)
<i>p</i> -value for interaction								0.4308	0.5134			0.8123	0.3932
Private party	Age < 40					270 (13.6)	107 (21.5)	0.57 (0.52-0.64)	0.69 (0.6-0.82)	711 (22.6)	180 (22.8)	0.99 (0.91-1.05)	0.91 (0.81-1.03)
	Age ≥ 40					157 (5.5)	83 (11.7)	0.44 (0.39-0.49)	0.58 (0.5-0.66)	947 (11.7)	302 (14.9)	0.75 (0.70-0.80)	0.75 (0.68-0.81)
<i>p</i> -value for interaction								0.1593	0.4451			0.0257	0.1543

Legend: Adjusted odds ratios estimated in models similar to those displayed in supplementary tables 1-3. Empty cells reflect changes of the questionnaire or periods when specific settings were closed.

**Table S6: Exposure prevalence, odds ratios of SARS-CoV-2 infection in univariable and multivariable estimates and *p*-value for interaction term for dining and partying-related exposures in a case-control study conducted in mainland France (2020-2022) – Results for the last three periods of the study (December 20, 2021 to October 2, 2022)**

Period (onset date)		7: 12/20/2021				8: 03/18/2022				9: 05/20/2022			
		Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)	Cases	Controls	OR (95% CI)	Adjusted OR (95% CI)
Bar	Age < 40	1993 (17.5)	463 (16.2)	1.09 (1.05-1.14)	1.31 (1.21-1.39)	1933 (18.8)	538 (20.9)	0.88 (0.84-0.91)	0.95 (0.90-1.02)	1533 (20.1)	416 (21.8)	0.90 (0.87-0.94)	0.95 (0.89-1.03)
	Age ≥ 40	3703 (11.3)	1060 (13.0)	0.86 (0.83-0.88)	0.90 (0.87-0.93)	3560 (12.1)	1198 (16.3)	0.71 (0.68-0.73)	0.81 (0.78-0.83)	3369 (16.1)	954 (18.2)	0.86 (0.84-0.88)	0.87 (0.84-0.91)
<i>p</i> -value for interaction				0.0003	< 0.0001			0.0014	0.0439			0.5259	0.3787
Restaurant	Age < 40	3637 (31.9)	1006 (35.2)	0.86 (0.83-0.89)	0.82 (0.78-0.86)	3738 (36.4)	1046 (40.7)	0.83 (0.80-0.86)	0.81 (0.78-0.86)	3186 (41.7)	928 (48.6)	0.76 (0.73-0.78)	0.72 (0.68-0.75)
	Age ≥ 40	10152 (31.0)	2609 (31.9)	0.96 (0.94-0.98)	1.00 (0.97-1.02)	10039 (34.2)	2690 (36.6)	0.90 (0.88-0.92)	0.97 (0.94-1.00)	8171 (39.0)	2147 (40.9)	0.92 (0.90-0.94)	0.90 (0.88-0.93)
<i>p</i> -value for interaction				0.0283	0.0013			0.1613	0.0043			0.0012	0.001
Night-club	Age < 40	446 (3.9)	111 (3.9)	1.00 (0.92-1.10)	1.23 (1.12-1.41)	538 (5.2)	123 (4.8)	1.10 (1.03-1.19)	1.76 (1.55-1.95)	411 (5.4)	96 (5.0)	1.07 (0.97-1.16)	1.46 (1.29-1.63)
	Age ≥ 40	586 (1.8)	84 (1.0)	1.76 (1.63-1.90)	2.17 (1.99-2.36)	421 (1.4)	126 (1.7)	0.84 (0.74-0.92)	1.15 (1.01-1.27)	313 (1.5)	71 (1.4)	1.10 (0.99-1.19)	1.67 (1.42-1.88)
<i>p</i> -value for interaction				0.0005	0.002			0.0607	0.0147			0.7948	0.5111
Private party	Age < 40	1695 (14.9)	492 (17.2)	0.84 (0.79-0.88)	0.96 (0.89-1.01)	1188 (11.6)	432 (16.8)	0.65 (0.60-0.68)	0.76 (0.71-0.82)	804 (10.5)	312 (16.3)	0.6 (0.56-0.64)	0.69 (0.62-0.74)
	Age ≥ 40	3044 (9.3)	965 (11.8)	0.77 (0.74-0.79)	0.83 (0.80-0.87)	2280 (7.8)	911 (12.4)	0.59 (0.57-0.62)	0.74 (0.71-0.78)	1379 (6.6)	561 (10.7)	0.59 (0.56-0.62)	0.64 (0.60-0.67)
<i>p</i> -value for interaction				0.1908	0.0756			0.2608	0.6694			0.6956	0.4368

Legend: Adjusted odds ratios estimated in models similar to those displayed in supplementary tables 1-3. Empty cells reflect changes of the questionnaire or periods when specific settings were closed.

**Paper 2: Source of SARS-CoV-2 infection: results from a series of 584,846 cases in France from October 2020 to August 2022**

**Table S1. Characteristics of 584,846 cases of SARS-CoV-2 infection between October 1, 2020, and August 29, 2022**

		N	(%)
Age (years)	18 – 29	69336	11.9%
	30 – 39	128556	22.0%
	40 – 49	148082	25.3%
	50 – 59	124130	21.2%
	60 – 69	77224	13.2%
	≥ 70	37518	6.4%
Gender	Female	386182	66.0%
Region of residence	Île-de-France	126500	21.6%
	Auvergne-Rhône-Alpes	83712	14.3%
	Occitanie	53889	9.2%
	Grand Est	50890	8.7%
	Provence-Alpes-Côte d'Azur and Corsica	50510	8.6%
	Nouvelle-Aquitaine	48012	8.2%
	Hauts-de-France	48001	8.2%
	Pays de la Loire	31224	5.3%
	Bretagne	25751	4.4%
	Bourgogne-Franche-Comté	23578	4.0%
	Normandie	23094	3.9%
Centre - Val de Loire	19685	3.4%	
Population of place of residence	Rural or < 5,000	146230	25.0%
	5,000 – 19,999	59244	10.1%
	20,000 – 99,999	69280	11.8%
	100,000 +	195997	33.5%
	Paris urban area	114095	19.5%
Professional category	Senior executives	176995	31.1%
	Intermediate profession	97984	17.2%
	Employees	117577	20.6%
	Worker/Farmer/ Independent Profession.	50662	8.9%
	Retired	81718	14.4%
	Unemployed or inactive	23826	4.2%
	Student	20876	3.7%
Level of education	No high school diploma	99717	17.1%
	High school diploma	106138	18.1%
	Bachelor's degree	195992	33.5%
	Master's degree	182999	31.3%
Living alone	Yes	107535	18.4%
	House	354835	60.7%
	Apartment	227422	38.9%
	Shelters and nursing homes	2589	0.4%
Comorbidities	Obesity	92862	15.9%
	Hypertension	59645	10.2%
	Chronic respiratory disease	48476	8.3%
	Immunosuppression	22499	4.0%
	Diabetes mellitus	18716	3.2%
Coronary artery disease	6012	1.0%	
Symptoms of COVID-19 (current episode)	Yes	519503	88.8%



**Table S2. Characteristics of 584,846 cases of SARS-CoV-2 infection by period**

	Period 1		Period 2		Period 3		Period 4		Period 5		Period 6		Period 7		Period 8		Period 9	
	10/01/20 to 12/03/20		12/04/20 to 04/08/21		04/09/21 to 06/13/21		06/14/21 to 08/13/21		08/14/21 to 10/01/21		10/02/21 to 12/19/21		12/20/21 to 03/17/22		03/18/22 to 05/19/22		05/20/22 to 08/29/22	
	N (45011)	%	N (86157)	%	N (26106)	%	N (14501)	%	N (9411)	%	N (56310)	%	N (179699)	%	N (81291)	%	N (84156)	%
Age (years)																		
18 – 29	6221	13.8%	12747	14.8%	4193	16.1%	3524	24.3%	1301	13.8%	6926	12.3%	23768	13.2%	5302	6.5%	4990	5.9%
30 – 39	9836	21.9%	20224	23.5%	6756	25.9%	3884	26.8%	2575	27.4%	14048	24.9%	43754	24.3%	14113	17.4%	12954	15.4%
40 – 49	11241	25.0%	22250	25.8%	6759	25.9%	3163	21.8%	2352	25.0%	15358	27.3%	48833	27.2%	19782	24.3%	17919	21.3%
50 – 59	9935	22.1%	17835	20.7%	5311	20.3%	2196	15.1%	1598	17.0%	10595	18.8%	34712	19.3%	19643	24.2%	21898	26.0%
60 – 69	5605	12.5%	9470	11.0%	2387	9.1%	1184	8.2%	1009	10.7%	6952	12.3%	19124	10.6%	14189	17.5%	16957	20.1%
≥ 70	2173	4.8%	3631	4.2%	700	2.7%	550	3.8%	576	6.1%	2431	4.3%	9508	5.3%	8262	10.2%	9438	11.2%
Gender																		
Female	28170	62.6%	53933	62.6%	16645	63.8%	9594	66.2%	6113	65.0%	35614	63.2%	122742	68.3%	56414	69.4%	55686	66.2%
Region of residence																		
Île-de-France	8652	19.2%	21048	24.4%	6838	26.2%	2570	17.7%	1984	21.1%	12972	23.0%	34407	19.1%	18078	22.2%	19489	23.2%
Auvergne-Rhône-Alpes	10148	22.5%	12666	14.7%	3646	14.0%	1880	13.0%	1219	13.0%	8962	15.9%	25589	14.2%	9484	11.7%	9796	11.6%
Occitanie	3161	7.0%	6300	7.3%	1926	7.4%	2523	17.4%	1077	11.4%	5361	9.5%	17259	9.6%	7300	9.0%	8789	10.4%
Grand Est	3718	8.3%	7388	8.6%	1820	7.0%	721	5.0%	643	6.8%	4410	7.8%	18557	10.3%	7140	8.8%	6276	7.5%
Provence-Alpes-Côte d'Azur and Corsica	3658	8.1%	8741	10.1%	1642	6.3%	2382	16.4%	1542	16.4%	5335	9.5%	14031	7.8%	6169	7.6%	6776	8.1%
Nouvelle-Aquitaine	2625	5.8%	5059	5.9%	1650	6.3%	1572	10.8%	684	7.3%	4768	8.5%	17339	9.6%	6177	7.6%	7983	9.5%
Hauts-de-France	4330	9.6%	8721	10.1%	2569	9.8%	696	4.8%	685	7.3%	4234	7.5%	13251	7.4%	7014	8.6%	6275	7.5%
Pays de la Loire	2094	4.7%	4044	4.7%	1622	6.2%	609	4.2%	391	4.2%	3048	5.4%	10028	5.6%	4524	5.6%	4773	5.7%
Bretagne	1160	2.6%	2388	2.8%	1069	4.1%	552	3.8%	409	4.3%	2071	3.7%	8898	5.0%	4655	5.7%	4493	5.3%
Bourgogne-Franche-Comté	2200	4.9%	3547	4.1%	993	3.8%	275	1.9%	285	3.0%	2046	3.6%	7589	4.2%	3403	4.2%	3146	3.7%
Normandie	1707	3.8%	3446	4.0%	1350	5.2%	478	3.3%	260	2.8%	1579	2.8%	6894	3.8%	3983	4.9%	3303	3.9%
Centre - Val de Loire	1558	3.5%	2809	3.3%	981	3.8%	243	1.7%	232	2.5%	1524	2.7%	5857	3.3%	3364	4.1%	3057	3.6%
Population of place of residence																		
Rural or < 5,000	11483	25.5%	21367	24.8%	6482	24.8%	3016	20.8%	1946	20.7%	13301	23.6%	46402	25.8%	20937	25.8%	20786	24.7%
5,000 - 19,999	4441	9.9%	8292	9.6%	2486	9.5%	1315	9.1%	851	9.0%	5301	9.4%	18921	10.5%	8627	10.6%	8773	10.4%
20,000 - 99,999	5513	12.2%	9952	11.6%	2898	11.1%	1671	11.5%	1137	12.1%	6210	11.0%	21308	11.9%	10214	12.6%	10100	12.0%
100,000 +	15767	35.0%	27676	32.1%	8137	31.2%	6142	42.4%	3649	38.8%	19573	34.8%	61995	34.5%	25321	31.1%	26964	32.0%
Paris urban area	7807	17.3%	18870	21.9%	6103	23.4%	2357	16.3%	1828	19.4%	11925	21.2%	31073	17.3%	16192	19.9%	17533	20.8%
Professional category																		
Senior executives	10517	35.1%	24394	28.3%	7423	28.4%	4031	27.8%	2557	27.2%	20244	36.0%	56213	31.3%	24978	30.7%	26274	31.1%
Intermediate profession	5466	18.2%	15418	17.9%	4495	17.2%	2355	16.2%	1565	16.7%	9412	16.7%	32544	18.2%	13275	16.4%	13151	17.2%
Employees	5534	18.5%	19861	23.1%	6447	24.7%	3389	23.4%	2105	22.4	10743	19.1%	38496	21.5%	15773	19.4%	14841	20.7%
Worker/Farmer/ Independent Profession.	2990	9.9%	9146	10.6%	3203	12.3%	1751	12.1%	1049	11.2%	5014	8.9%	16235	9.1%	5384	6.6%	5621	8.9%
Retired	4134	13.8%	9148	10.6%	2012	7.7%	1177	8.2%	1168	12.4%	6579	11.7%	20780	11.6%	16797	20.7%	19500	14.3%
Unemployed or inactive	727	2.4%	3863	4.5%	1183	4.5%	685	4.8%	606	6.4%	2195	3.9%	7431	4.1%	3561	4.4%	3402	4.2%
Student	626	2.1%	4327	5.0%	1343	5.1%	1113	7.8%	361	3.8%	2123	3.8%	8000	4.5%	1523	1.9%	1367	3.7%
Level of education																		
No high school diploma	1646	3.7%	18366	21.3%	5660	21.7%	2570	17.7%	2027	21.5%	9067	16.1%	30727	17.1%	14204	17.5%	14823	17.6%
High school diploma	1538	3.4%	18290	21.2%	5584	21.4%	3098	21.4%	1934	20.6%	9958	17.7%	34533	19.2%	15407	19.0%	15432	18.3%

Comorbidities	Bachelor's degree	2409	5.4%	29624	34.4%	8905	34.1%	5087	35.1%	3199	34.0%	19742	35.1%	65416	36.4%	30117	37.0%	31083	36.9%
	Master's degree	39418	87.6%	19877	23.1%	5957	22.8%	3746	25.8%	2251	23.9%	17543	31.2%	49023	27.3%	21563	26.5%	22818	27.1%
	Obesity	7276	16.2%	14049	16.3%	4362	16.7%	1740	12.0%	1324	14.1%	7433	13.2%	27066	15.1%	14214	17.5%	14993	17.8%
	Hypertension	4323	9.6%	7678	8.9%	2045	7.8%	920	6.3%	766	8.1%	4628	8.2%	15692	8.7%	11009	13.5%	12312	14.6%
	Chronic respiratory disease	3787	8.4%	6701	7.8%	2097	8.0%	1155	8.0%	789	8.4%	4033	7.2%	14976	8.3%	7232	8.9%	7484	8.9%
	Immunosuppression	1211	2.7%	2278	2.6%	689	2.6%	375	2.6%	287	3.0%	400	0.7%	7015	3.9%	4421	5.4%	4666	5.5%
	Diabetes mellitus	1512	3.4%	2583	3.0%	690	2.6%	329	2.3%	281	3.0%	1383	2.5%	4916	2.7%	3251	4.0%	3620	4.3%
Coronary artery disease	471	1.0%	759	0.9%	141	0.5%	105	0.7%	77	0.8%	477	0.8%	1593	0.9%	1084	1.3%	1260	1.5%	
Symptoms of COVID-19 (current episode) <sup>a</sup>																			
History of SARS-CoV-2 infection <sup>b</sup>	Yes	30676	68.2%	73757	85.6%	22564	86.4%	13190	91.0%	8431	89.6%	51858	92.1%	161175	89.7%	76197	93.7%	80327	95.5%
	Yes	/	/	/	/	645	2.5%	554	3.8%	340	3.6%	1961	3.5%	13233	7.4%	6076	7.5%	13232	15.7%

Legend: a: Collection of data concerning the symptomatic status of ongoing infections was introduced from period 2 onward. In period 1, participants were categorized as symptomatic only if their symptoms were the primary reason for the test; b: Until February 18, 2021, participants with a history of SARS-CoV-2 infection (virological or serological test) were not included in the study.

**Table S3. Characteristics of the source cases according to their origin between October 1, 2020, and August 29, 2022**

		<b>Household (n = 125 397)</b>		<b>Work (n = 35 627)</b>		<b>Family (n = 46 132)</b>		<b>Friend (n = 26 580)</b>		<b>P value</b>
Age (years) Median (IQR)		28 (11-48)		40 (30-50)		40 (26-60)		39 (28-55)		<i>&lt; 0.001</i>
Age category		N	%	N	%	N	%	N	%	
< 18 years		48115	38.4%	2063	5.8%	6296	13.6%	1277	4.8%	
18-29 years		16308	13.0%	5085	14.3%	7814	16.9%	6347	23.8%	
30-49 years		32544	26.0%	17079	47.9%	13842	30.0%	10028	37.7%	
50-69 years		24201	19.3%	10417	29.2%	11893	25.8%	6611	24.8%	
≥ 70 years		4229	3.4%	983	2.8%	6287	13.6%	2317	8.7%	
Gender										<i>&lt; 0.001</i>
Female		51128	40.8%	17787	49.9%	25592	55.5%	14381	54.1%	

**Table S4. Characteristics of single-encounter meetings during which SARS-CoV-2 infection took place according to the origin of the source case (household members excluded) and stratified by the symptomatic status of the source case between October 1, 2020 and August 29, 2022**

	Total				P value	Work				P value	Family				P value	Friends				P value	
	Symptomatic					Symptomatic					Symptomatic					Symptomatic					
	No		Yes			No		Yes			No		Yes			No		Yes			
	N	%	N	%		N	%	N	%		N	%	N	%		N	%	N	%		
	45259	64.8%	24529	35.1%		6798	55.9%	5366	44.1%		13289	61.3%	8379	38.7%		13094	72.1%	5070	27.9%		
Location of encounter				<0.001					< 0.001					0.020							0.316
Indoors with closed windows	31873	70.4%	17357	70.8%		5176	76.1%	4147	77.3%		9488	71.4%	5835	69.6%		9040	69.0%	3472	68.5%		
Indoors with open windows	9436	20.9%	5251	21.4%		1253	18.4%	1006	18.7%		3050	23.0%	2031	24.2%		3040	23.2%	1171	23.1%		
Outdoors	3944	8.7%	1919	7.8%		369	5.4%	213	4.0%		751	5.7%	513	6.1%		1014	7.7%	427	8.4%		
Duration of encounter				<0.001					0.002					< 0.001							0.346
Less than a minute	3831	8.5%	2519	10.3%		826	12.2%	702	13.1%		1046	7.9%	839	10.0%		979	7.5%	410	8.1%		
Less than 5 minutes	5441	12.0%	3247	13.2%		1103	16.2%	970	18.1%		1457	11.0%	1006	12.0%		1312	10.0%	537	10.6%		
5-15 minutes	6238	13.8%	3356	13.7%		1187	17.5%	953	17.8%		1657	12.5%	1024	12.2%		1477	11.3%	572	11.3%		
More than 15 minutes	23277	51.4%	11929	48.6%		2790	41.0%	2019	37.6%		6889	51.8%	4089	48.8%		7536	57.6%	2894	57.1%		
Unknown	6467	14.3%	3476	14.2%		892	13.1%	722	13.5%		2240	16.9%	1421	17.0%		1790	13.7%	657	13.0%		
Mask-wearing <sup>a</sup>				<0.001					< 0.001					< 0.001							< 0.001
Neither wore a mask	38568	85.2%	18762	76.5%		4262	62.7%	2907	54.2%		12479	93.9%	7272	86.8%		12646	96.6%	4718	93.1%		
By suspected source of infection only	968	2.1%	1120	4.6%		215	3.2%	328	6.1%		217	1.6%	381	4.5%		101	0.8%	126	2.5%		
By person infected only	2223	4.9%	2000	8.2%		772	11.4%	800	14.9%		293	2.2%	308	3.7%		156	1.2%	116	2.3%		
By both source case and participant	3494	7.7%	2645	10.8%		1549	22.8%	1331	24.8%		300	2.3%	418	5.0%		191	1.5%	110	2.2%		
<b>Total</b>	45254		24527			6798		5366			13289		8379			13094		5070			

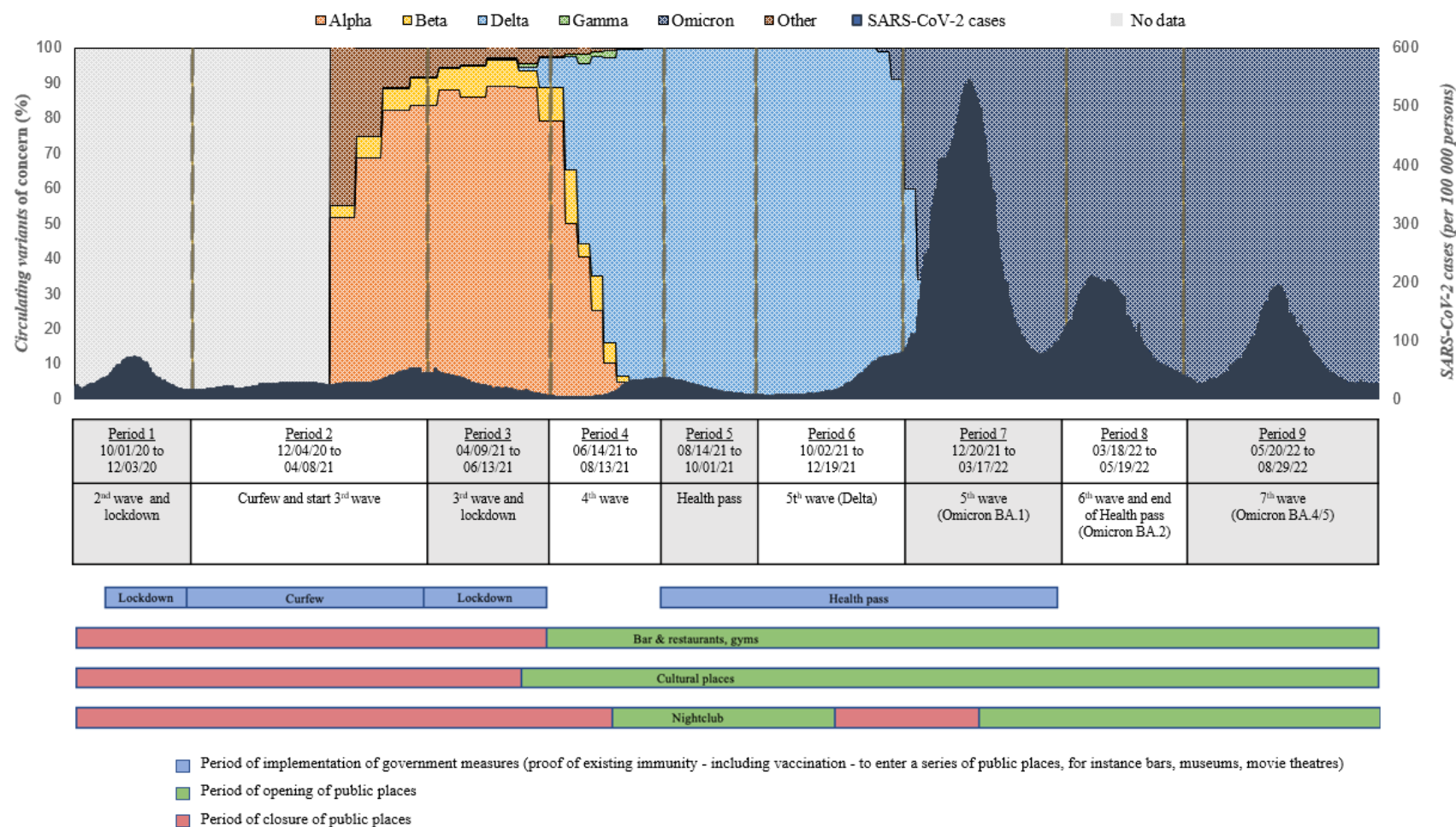
Legend: a: Mask-wearing during the last encounter with the source when multiple encounters occurred.

**Table S5. Characteristics of the suspected events (single suspicion) at the origin of the infection for participants without an identified source case between October 1, 2020, and August 29, 2022**

Source of infection for suspected events (N = 132 401) <sup>a</sup>		N	(%)
Setting of event	Work-related	25416	27.2%
	Friends	18130	19.4%
	Family	17491	18.8%
	Cultural/Entertainment	5984	6.4%
	Sports	4757	5.1%
	Religious	980	1.1%
	Other	20506	22.0%
	Type of event	Shared meal	16964
Meeting		9793	10.5%
Party		7312	7.8%
Public transportation		6836	7.3%
Show, entertainment venue		5316	5.7%
Visit to health care facility		5041	5.4%
Ceremony (wedding, baptism, graduation etc.)		3129	3.4%
Drink or coffee		2195	2.4%
Sports club/wellness area		1202	1.3%
Other event		35476	38.0%
Reason for suspicion		No physical distancing	45413
	None wore a mask	15388	16.5%
	Large number of people	11558	12.4%
	Other	20905	22.4%

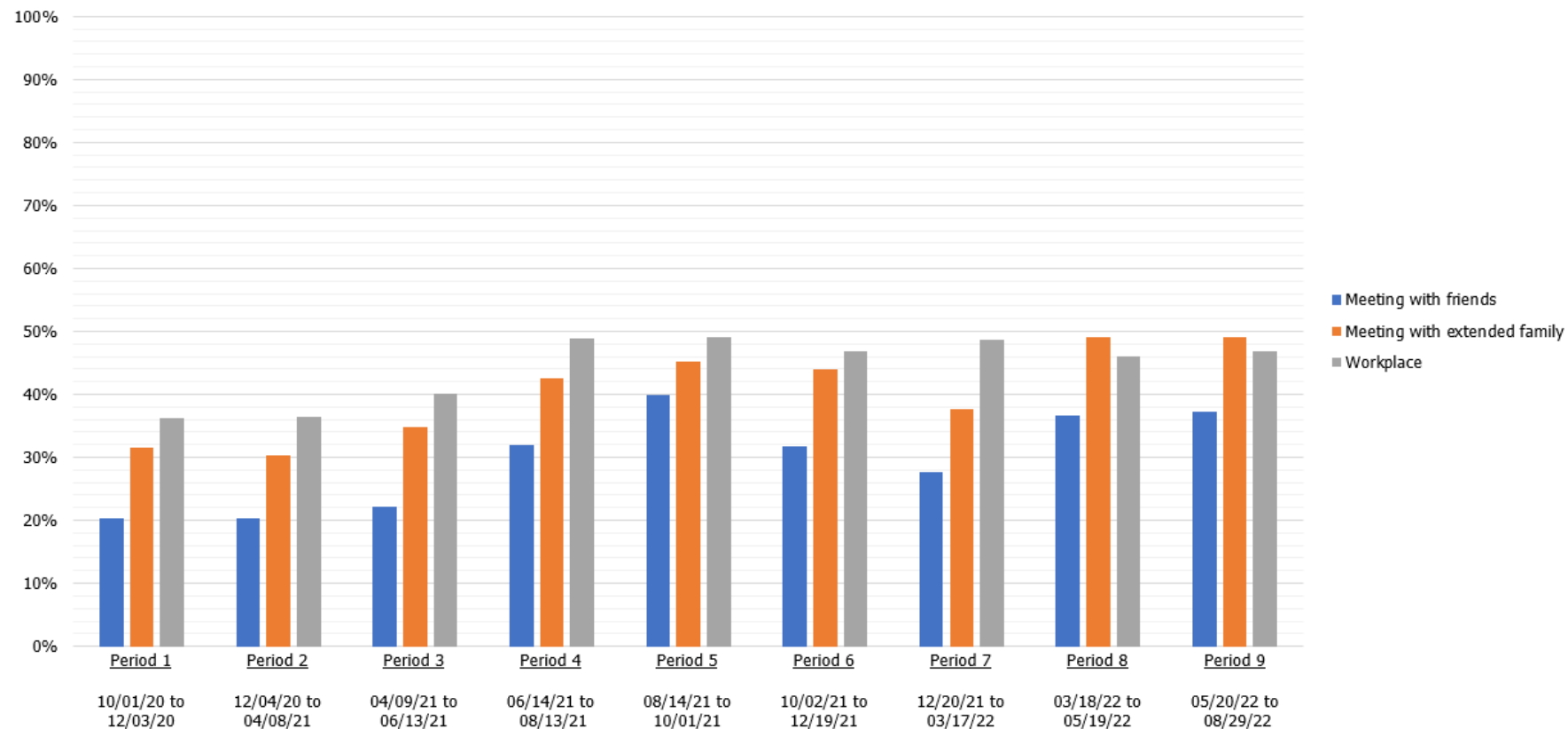
Legend: a: Suspicion of several events are excluded of the table n= 39137

**Figure S1. Presentation of the nine study periods according to government measures, epidemic waves, and variants between October 1, 2020, and August 29, 2022 (data on the incidence rate of SARS-CoV-2 infection and the prevalence of circulating strains were obtained from public data provided by *Santé publique France*)**

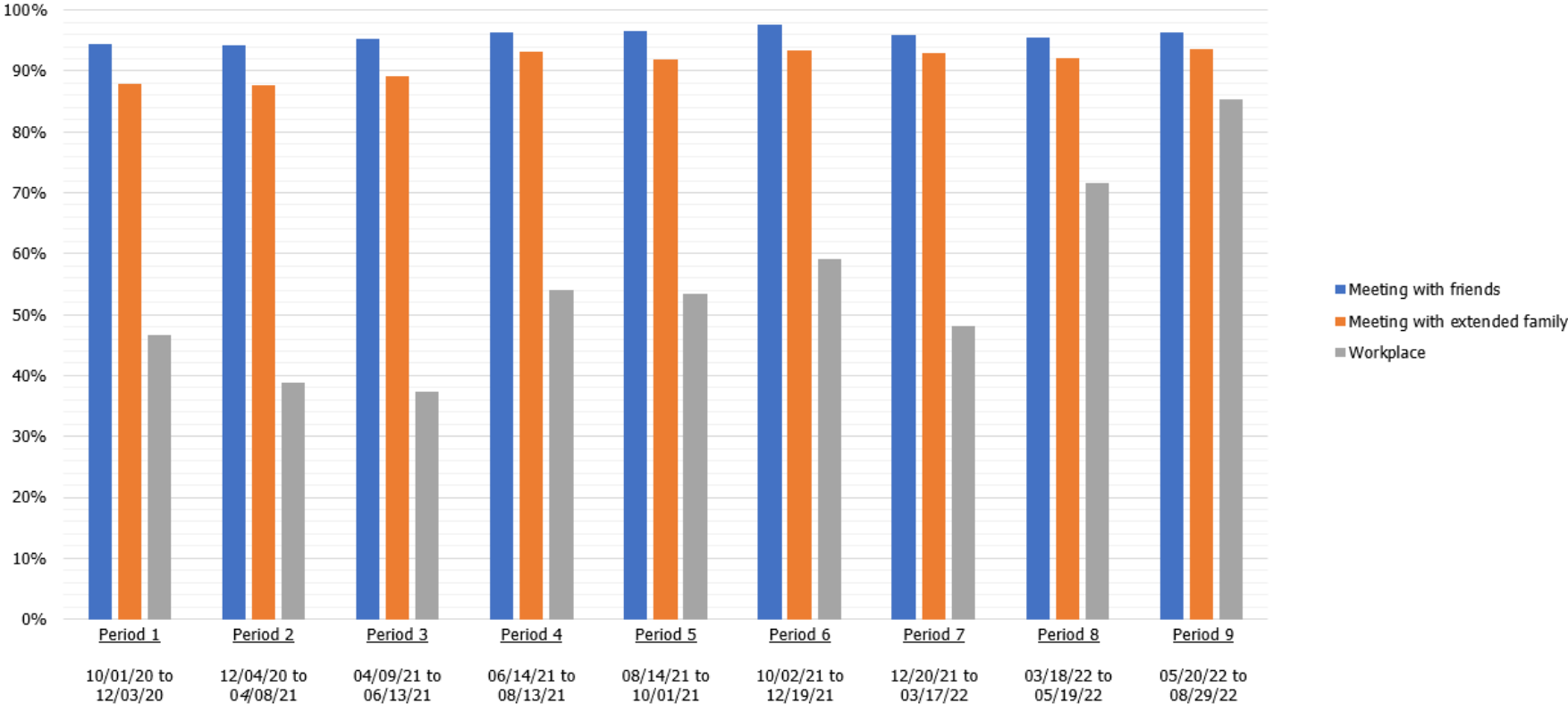




**Figure S2. Proportion of encounters for which the source case was symptomatic in the single encounter that caused infection according to the setting of the meeting by period**



**Figure S3. Proportion of encounters for which neither the source case nor the participants wore a mask during the single encounter that caused the infection according to the setting of the meeting by period**



## **Paper 3: Risk of SARS-CoV-2 infection among households with children in France, 2020-2022**

### **Additional description of the methods**

#### **Study design**

ComCor stands in French for “behaviours associated with the risk of SARS-CoV-2 infection”.

Once weekly, the CNAM sent invitations to participate in this study by e-mail to all people testing positive in the preceding week in mainland France (the CNAM has email addresses for approximately 55% of the individuals in France covered by this insurance, who represent approximately 89% of the population of mainland France). This centralized information system was the most reliable way to include a sample of cases that was as representative as possible of the whole adult population infected by SARS-CoV-2.

The controls were enrolled via Ipsos, a market research company. This panel was the most reliable way to include a non-infected population with characteristics that we could select for matching with cases.

The school levels of the child living with the participant were daycare, child professional in-home caregiver, preschool, primary school, middle school, or high school. This grouping was chosen considering that some school-specific interventions targeted only some school levels (for instance hybrid schooling was more prevalent in high schools).

The questionnaire investigated recent activities and locations visited during the 10 days preceding the onset of symptoms or testing for asymptomatic cases (this period was decreased to 7 days after emergence of the omicron variant, which has a shorter incubation period (1)).

#### **Statistical analysis**

The sample size was mainly determined by the number of available controls who did not meet exclusion criteria (reported history of infection in the last two months). Answer was required to move forward in the questionnaire, thus we had no missing data (except for the date of last COVID-19 vaccine injection which was not required, those with missing date of last injection were categorized together).

We calculated the population attributable fraction (PAF) for living with a child by school level and by period using the *punafcc* package in Stata, which was designed for case-control studies, with the median estimate and the 2.5<sup>th</sup> and 97.5<sup>th</sup> percentiles for estimation of the 95% confidence intervals (2). In the very few instances for which point estimates were negative, we chose not to produce an estimate rather than computing a preventive fraction, which would have had little meaning in this context.

#### **Description of the context of the SARS-CoV-2 epidemic in France**

Schools remained open according to the usual calendar during most of the study period, the major exception being the spring of 2021, when school holidays were extended, and hybrid schooling (a mixture of in-person and online teaching) was prevalent, particularly in high schools (3). Summer holidays cover most of July and August in France.

Vaccine administration began at the end of May 2021 for 12- to 17-year-olds and in December 2021 for 5- to 11-year-olds. With grouping into school-age groups, vaccine coverage reached a plateau in February 2022 at 49% for

the second dose and 4% for the third dose in the 11-14 years age group (middle school), and 72% for the second dose and 13% for the third dose in the 15-17 years age group (high school). Vaccine coverage remained very low in children aged 5-10 years (primary school) (below 10% for the second dose and close to zero for the booster). Vaccine coverage in people aged 18 or above was above 85% in February 2022 for a primary vaccine series and above 50% for the booster (4).

### **Description of the delimitation of the nine shorter periods used to describe changes through the study**

Period 1 began on October 1, 2020, corresponding to the start of the study period and covered the second wave (historical D614G strain) and the second lockdown. Period 2 began on December 4, 2020 and covered the third wave (alpha variant) and curfew restrictions. Period 3 began on April 9, 2021 and covered the receding alpha wave and third lockdown. Period 4 began on June 14, 2021 and covered the fourth wave and the emergence of the delta variant. Period 5 began on August 14, 2021 after implementation of the sanitary pass (proof of vaccine or past episode of infection, or recent negative SARS-CoV-2 test to enter a series of public places) and covered the receding fourth wave (delta variant). Period 6 began on October 2, 2021 and covered the start of the fifth wave (delta variant). Period 7 began on December 20, 2021 and covered the fifth wave, during which the omicron variant (BA.1 subvariant) predominated. Period 8 began on March 18, 2022 (following the lifting of obligation to wear a mask in schools and most indoor spaces) and covered the omicron BA.2 wave. Period 9 began on May 19, 2022 (following the lifting of the obligation to wear a mask on public transport) and covered the omicron BA.4/BA.5 wave, extending to the end of the study period on October 2, 2022.

We took the incubation period into account, by applying a four- or five-day lag period (depending on the predominant strain in circulation at the time) between the changes in restrictions and the start of the next period.

### **References**

1. Galmiche S, Cortier T, Charmet T, et al. SARS-CoV-2 incubation period across variants of concern, individual factors, and circumstances of infection in France: a case series analysis from the ComCor study. *The Lancet Microbe*. 2023;4(6):e409-e417. doi:10.1016/S2666-5247(23)00005-8
2. Newson RB. Attributable and Unattributable Risks and Fractions and other Scenario Comparisons. *The Stata Journal*. 2013;13(4):672-698. doi:10.1177/1536867X1301300402
3. Ministère de l'Éducation Nationale et de la Jeunesse. Préparer son plan de continuité pédagogique. éducol | Ministère de l'Éducation nationale et de la Jeunesse - Direction générale de l'enseignement scolaire. Accessed December 1, 2022. <https://eduscol.education.fr/2227/preparer-son-plan-de-continuite-pedagogique>
4. Données relatives aux personnes vaccinées contre la Covid-19 (VAC-SI) - data.gouv.fr. Accessed June 21, 2023. <https://www.data.gouv.fr/fr/datasets/donnees-relatives-aux-personnes-vaccinees-contre-la-covid-19-1/>

**eTable 1: Description of cases and controls in an online case-control study in mainland France (October 2020 to October 2022)**

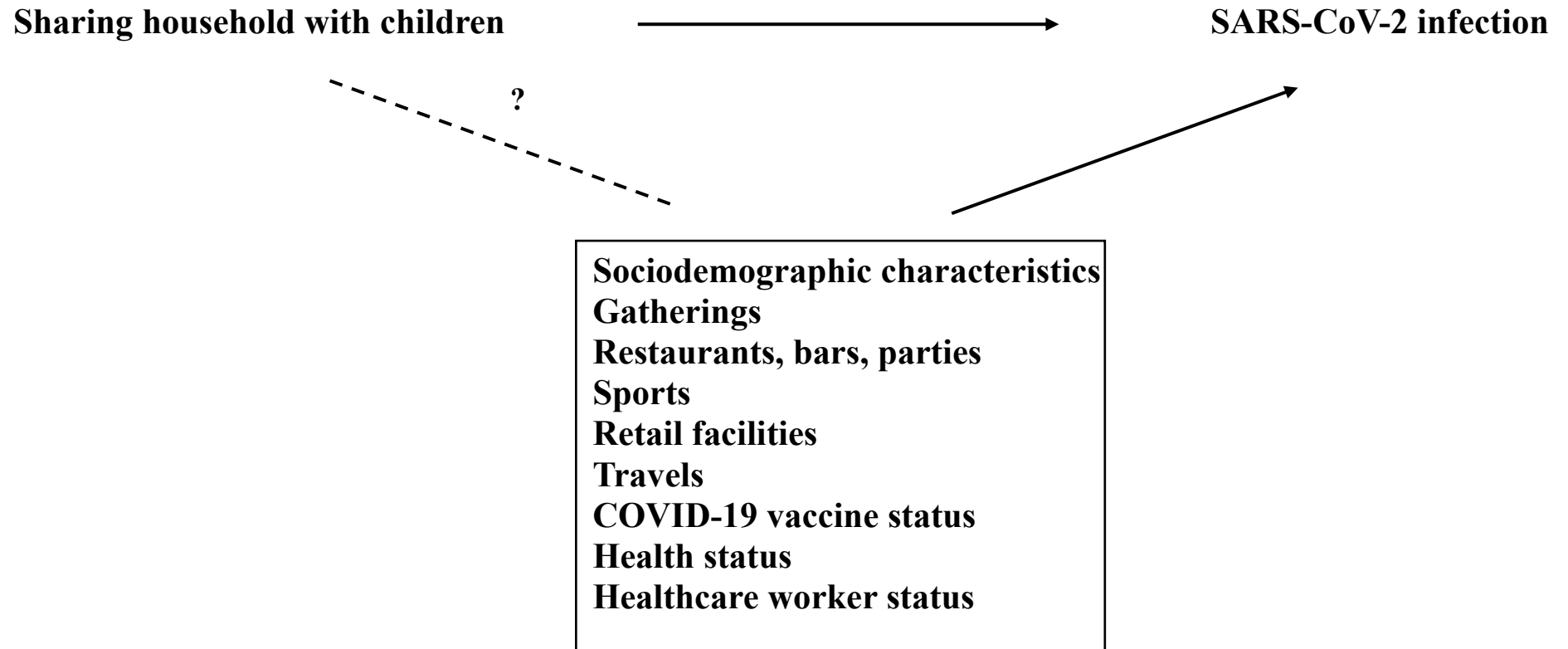
	<b>Cases</b>	<b>Controls</b>	<b>p-values<sup>a</sup></b>	<b>Periods<sup>b</sup></b>
	175,688	43,922		
<b>Comorbidities</b>				
<i>Immunosuppressive treatment</i>				
No immunosuppressor treatment	61,089/63,284 (96.5%)	15,286/15,821 (96.6%)	<0.001	1 to 6
Immunosuppressive treatment	1,685/63,284 (2.7%)	465/15,821 (2.9%)		
Did not reply	436/63,284 (0.7%)	69/15,821 (0.4%)		
<i>Any immune suppression</i>				
No immune suppression	63,952/68,268 (93.7%)	16,135/17,067 (94.5%)	<0.001	8 to 9
Immune suppression	3,545/68,268 (5.2%)	822/17,067 (4.8%)		
Did not reply	772/68,268 (1.1%)	110/17,067 (0.6%)		
<b>Smoking status</b>				
No smoking nor nicotine consumption	139,810 (79.6%)	33,284 (75.8%)	<0.001	
Smoker with or without nicotine consumption	27,072 (15.4%)	8,644 (19.7%)		
Nicotine consumption alone	8,807 (5.0%)	1,994 (4.5%)		
<b>COVID-19 vaccine status</b>				
Not vaccinated	42,665 (24.3%)	11,676 (26.6%)	<0.001	
1 dose <90 days	3,291 (1.9%)	870 (2.0%)		
1 dose 90-179 days	553 (0.3%)	260 (0.6%)		
1 dose ≥180 days	619 (0.4%)	264 (0.6%)		
2 doses <90 days	7,305 (4.2%)	3,024 (6.9%)		
2 doses 90-179 days	13,717 (7.8%)	3,150 (7.2%)		
2 doses ≥180 days	7,252 (4.1%)	2,091 (4.8%)		
3 doses <90 days	26,331 (15.0%)	6,794 (15.5%)		
3 doses 90-179 days	40,054 (22.8%)	6,810 (15.5%)		
3 doses ≥180 days	16,703 (9.5%)	2,925 (6.7%)		
4 doses <90 days	2,726 (1.6%)	560 (1.3%)		
Undated last dose of vaccine	7,161 (4.1%)	3,669 (8.4%)		
<b>Professional category ...</b>				
<i>... of the reference person in the household</i>				
Employee	4,397/26,944 (16.3%)	1,587/6,736 (23.6%)	<0.001	1 to 2
Intermediate profession	5,908/26,944 (21.9%)	1,452/6,736 (21.6%)		1 to 2
Independent profession	1,296/26,944 (4.8%)	241/6,736 (3.6%)		1 to 2
Senior executive	8,623/26,944 (32.0%)	1,618/6,736 (24.0%)		1 to 2
Worker	2,425/26,944 (9.0%)	523/6,736 (7.8%)		1 to 2
Retired	3,225/26,944 (12.0%)	906/6,736 (13.5%)		1 to 2
Unemployed or inactive people	1,071/26,944 (4.0%)	409/6,736 (6.1%)		1 to 2
<i>... of the participant</i>				
Employee	26,754/148,744 (18.0%)	8,794/37,186 (23.6%)	<0.001	3 to 9
Senior executive	45,919/148,744 (30.9%)	6,966/37,186 (18.7%)		3 to 9
Intermediate profession	29,304/148,744 (19.7%)	6,877/37,186 (18.5%)		3 to 9
Worker, farmer, independent profession	10,413/148,744 (7.0%)	3,382/37,186 (9.1%)		3 to 9
Retired	26,520/148,744 (17.8%)	7,175/37,186 (19.3%)		3 to 9
Unemployed or inactive people	5,619/148,744 (3.8%)	2,813/37,186 (7.6%)		3 to 9
Students	4,215/148,744 (2.8%)	1,180/37,186 (3.2%)		3 to 9
<b>Number of people in the household</b>				
1	34,687 (19.7%)	9,096 (20.7%)	<0.001	
2	58,982 (33.6%)	15,186 (34.6%)		
3	32,951 (18.8%)	8,451 (19.2%)		

	<b>Cases</b>	<b>Controls</b>	<b>p-values<sup>a</sup></b>	<b>Periods<sup>b</sup></b>
	175,688	43,922		
4	34,481 (19.6%)	7,897 (18.0%)		
5	10,946 (6.2%)	2,553 (5.8%)		
≥ 6	3,641 (2.1%)	739 (1.7%)		
<b>Work in the exposure period</b>				
No work	55,168 (31.4%)	16,009 (36.4%)	<0.001	
Non-office work	51,275 (29.2%)	11,996 (27.3%)		
Partially remote office work	26,269 (15.0%)	6,296 (14.3%)		
Completely remote office work	11,308 (6.4%)	2,320 (5.3%)		
On-site office work	31,668 (18.0%)	7,301 (16.6%)		
<b>Attendance of retail facility</b>				
Any retail facility	5,864/7,308 (80.2%)	1,498/1,827 (82.0%)	0.456	1
Supermarket	82,490/168,380 (49.0%)	26,702/42,095 (63.4%)	<0.001	2 to 9
Convenience store	58,873/168,380 (35.0%)	15,056/42,095 (35.8%)	0.013	2 to 9
Shopping mall	26,227/168,380 (15.6%)	9,433/42,095 (22.4%)	<0.001	2 to 9
Market	19,343/168,380 (11.5%)	5,897/42,095 (14.0%)	<0.001	2 to 9
Other retail facility	5,635/168,380 (3.3%)	2,012/42,095 (4.8%)	<0.001	2 to 9
<b>Public short-distance transport</b>				
Bus	19,285 (11.0%)	6,584 (15.0%)	<0.001	
Metro	23,348 (13.3%)	5,847 (13.3%)	0.907	
Train	10,140 (5.8%)	2,992 (6.8%)	<0.001	
Tram	10,184 (5.8%)	3,493 (8.0%)	<0.001	
<b>Long-distance travel</b>				
Travel outside region of residence	37,907 (21.6%)	9,804 (22.3%)	0.003	
Travel abroad	8,976 (5.1%)	1,779 (4.1%)	<0.001	
Train travel	9,087 (5.2%)	1,752 (4.0%)	<0.001	
Airplane travel	6,329 (3.6%)	1,091 (2.5%)	<0.001	
Bus travel	2,749 (1.6%)	642 (1.5%)	0.12	
<b>Car-pooling</b>				
Any carpooling	4,341/35,952 (12.1%)	928/8,988 (10.3%)	<0.001	1 to 3
With family and friends	29,620/139,736 (21.2%)	7,350/34,934 (21.0%)	0.567	4 to 9
Via car sharing platform	1,355/139,736 (1.0%)	692/34,934 (2.0%)	<0.001	4 to 9
<b>Gatherings</b>				
Private gathering	78,974 (45.0%)	21,405 (48.7%)	<0.001	
Professional meeting	47,777 (27.2%)	10,303 (23.5%)	<0.001	
Classes	10,498 (6.0%)	2,840 (6.5%)	<0.001	
Cultural gathering	26,003 (14.8%)	6,224 (14.2%)	0.002	
Religious gathering	6,510 (3.7%)	1,830 (4.2%)	<0.001	
<b>Sports</b>				
Swimming pool	8,680 (4.9%)	2,529 (5.8%)	<0.001	
Indoor sports	12,235 (7.0%)	3,060 (7.0%)	0.984	
<b>Leisure activities</b>				
Bar or restaurant	1,900/7,308 (26.0%)	286/1,827 (15.7%)	<0.001	1
Restaurant	51,212/168,380 (30.4%)	13,885/42,095 (33.0%)	<0.001	2 to 9
Bar	22,802/168,380 (13.5%)	6,156/42,095 (14.6%)	<0.001	2 to 9
Party	2,380/47,216 (5.0%)	323/11,804 (2.7%)	<0.001	1 to 4
Party in a private setting	12,486/128,472 (9.7%)	4,344/32,118 (13.5%)	<0.001	5 to 9
Night-club	3,558/128,472 (2.8%)	727/32,118 (2.3%)	<0.001	5 to 9

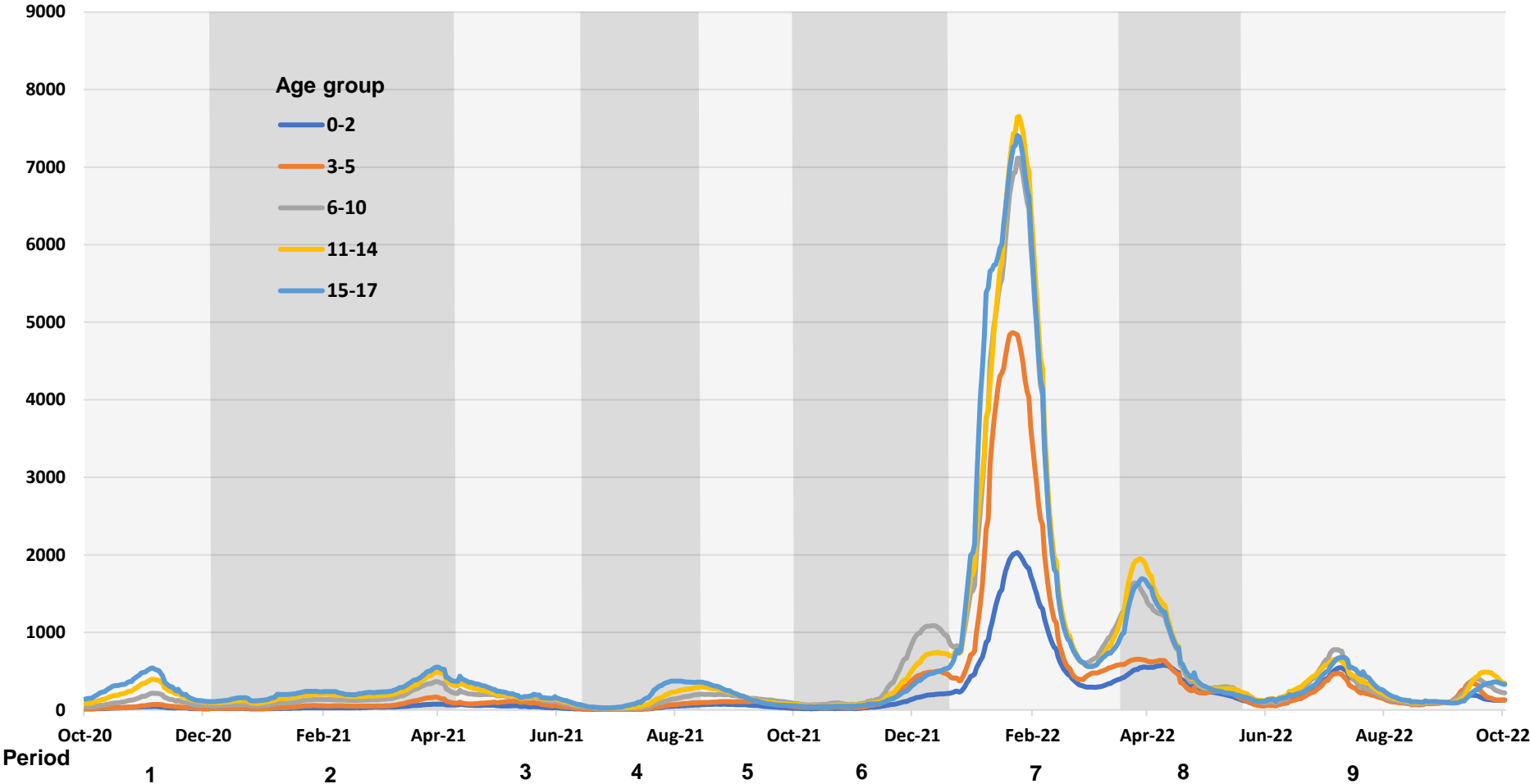
Legend: a: p-values: Chi-squared test; b: Periods: indicated when the variable was collected and introduced in the model in some of the periods only (denominator is indicated); blank means that the variable remained unchanged through the whole study period (denominator is the complete population of cases or controls). Numbers are sums over the nine periods of the study of the averages of the 100 databases generated for each period using a bootstrapping procedure.



**eFigure 1: Directed acyclic graph representing the causal assumptions underlying the model construction to study the effect of sharing household with children on the risk of SARS-CoV-2 infection**

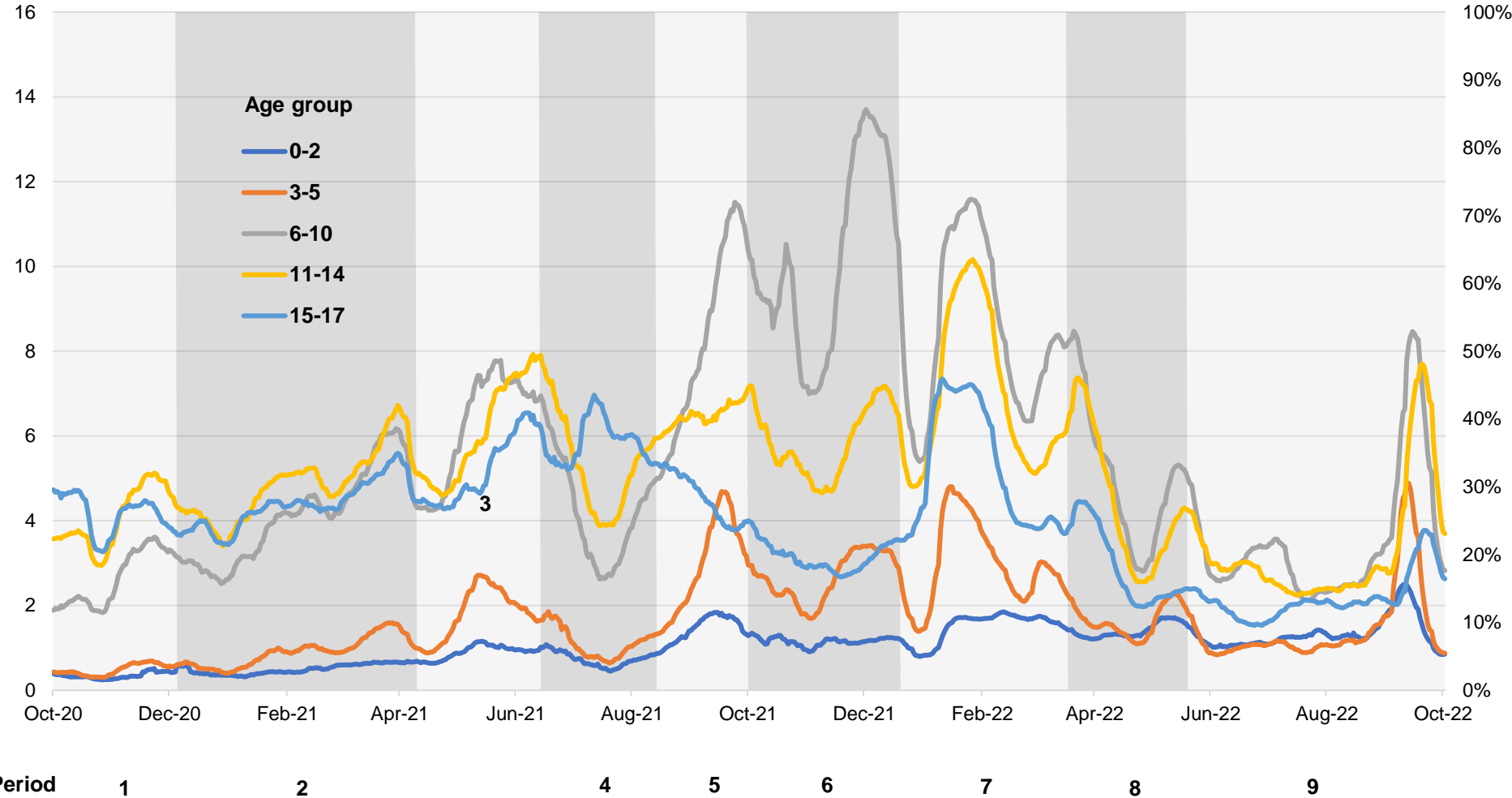


**eFigure 2: Incidence in children by age group, France, October 2020-October 2020 (new daily cases) (data provided by the French government)**



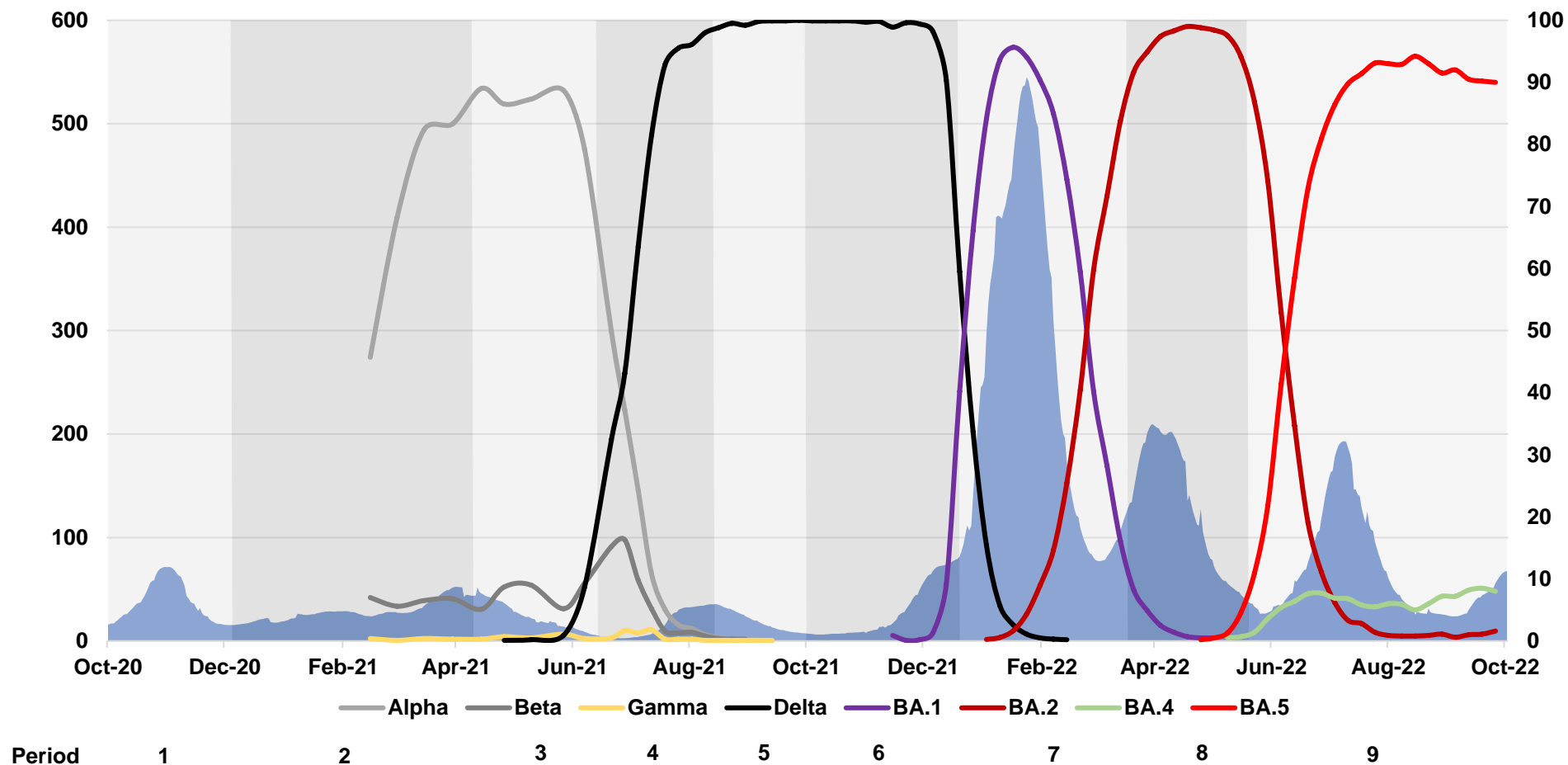
Legend: Study conducted in France between October 2020 and October 2022. The data on positive SARS-CoV-2 tests are public data provided by the French government. The areas shaded in gray indicate the 9 periods into which the study period was divided.

**eFigure 3: Proportion of positive tests by pediatric age group among all positive tests, France, October 2020-October 2022 (%) (data provided by the French government)**



Legend: Study conducted in France between October 2020 and October 2022. The data on positive SARS-CoV-2 tests are public data provided by the French government. The areas shaded in gray indicate the 9 periods into which the study period was divided.

**eFigure 4: SARS-CoV-2 daily incidence (per 100,000) and proportions of the circulating strains according to the Flash sequencing studies**



Legend: The Flash sequencing studies were conducted weekly on a random sample of SARS-CoV-2 tests. The periods were defined on the basis of changes in SARS-CoV-2 incidence, predominant circulating strain, and major non-pharmaceutical interventions (the periods are indicated by shaded gray areas).

**Paper 4: Reduction of SARS-CoV-2 household transmission associated with ventilation: results from a case-control study**

**Table S1: Index cases reporting household contamination from their child, both overall and restricted to the subpopulation of index cases with a partner participating in this study as a related control**

	Index cases with their child as the source case	Index cases with their child as the source case and their partner as a related control
<b>TOTAL</b>	<b>48971</b>	<b>611</b>
<b>Age, median [interquartile range] (years)</b>	42 [38-48]	44 [40-49]
<b>Female</b>	37769 (77.1%)	394 (64.5%)
<b>Education level</b>		
No diploma	889 (1.8%)	8 (1.3%)
Pre-high school diploma	5558 (11.4%)	56 (9.2%)
High-school diploma	8156 (16.7%)	54 (8.8%)
Bachelor's degree	19679 (40.2%)	208 (34.0%)
Master's degree or higher	14689 (30.0%)	285 (46.6%)
<b>Underlying conditions</b>		
Chronic respiratory disease	3987 (8.1%)	33 (5.4%)
Hypertension	3041 (6.2%)	50 (8.1%)
Diabetes mellitus	936 (1.9%)	5 (0.8%)
Coronary artery disease	195 (0.4%)	4 (0.7%)
<b>COVID-19 vaccination status</b>		
Unvaccinated	13705 (28.0%)	181 (29.6%)
1 dose	1124 (2.3%)	15 (2.5%)
2 doses	13992 (28.6%)	195 (31.9%)
3 doses	20059 (41.0%)	219 (35.8%)
4 doses	91 (0.2%)	1 (0.2%)
<b>Symptomatic COVID-19</b>	43614 (89.1%)	530 (86.7%)
<b>Variant</b>		
Original strain	1163 (2.4%)	18 (3.0%)
Alpha	3725 (7.6%)	65 (10.6%)
Beta/Gamma	279 (0.6%)	3 (0.5%)
Delta	5074 (10.4%)	93 (15.2%)
Omicron	6649 (13.6%)	70 (11.5%)
Other	58 (0.1%)	0
Undetermined	32023 (65.4%)	362 (59.2%)
<b>Number of household members (median [IQR])</b>	4 [3-4]	4 [3-4]
<b>SOURCE CASE</b>		
<b>Age, median [interquartile range] (years)</b>	10 [7-16]	11 [8-16]
<b>Female</b>	23078 (47.1%)	274 (44.8%)
<b>Symptomatic</b>	39903 (81.5%)	508 (83.1%)
<b>Isolation from the index case</b>	24459 (50.0%)	347 (56.8%)
<b>Isolation timing</b>		
From symptom onset	7737 (15.8%)	88 (14.4%)
From test results	15586 (31.8%)	242 (39.6%)
Other timing	1136 (2.3%)	17 (2.8%)
<b>Specific mitigation measures</b>		
Ventilation (10-15 min at least twice/day)	22696 (46.4%)	321 (52.5%)
Mask-wearing	20076 (41.0%)	305 (49.9%)
Surface disinfection	18508 (37.8%)	258 (42.2%)
Separate bathrooms	9713 (19.8%)	165 (27.0%)
Separate meals	18160 (37.1%)	274 (44.8%)

Legend: Doses of COVID-19 vaccine were counted if they occurred at least 14 days before symptom onset (or testing if asymptomatic) for the first dose or at least 7 days before symptom onset or testing (if asymptomatic) for the second, third or fourth dose.

**Table S2: Sensitivity analysis including in the study population the households other than parental pairs exposed to the same infected child and exposures associated with the risk of SARS-CoV-2 infection**

	Index cases	Related controls	Univariable analysis		Multivariable analysis					
					Model with variable selection including isolation overall only		Model with variable selection including specific mitigation measures		Model without variable selection and including specific mitigation measures	
					OR	95% CI	OR	95% CI	OR	95% CI
	<b>Cases</b>	<b>Controls</b>								
	<i>n</i> =758	<i>n</i> =758								
<b>Age. median (IQR)</b>	45 (40-51)	44 (38-49)								
18-39 years	182 (24.0%)	251 (33.1%)	1		1		1		1	
40-59 years	541 (71.4%)	464 (61.2%)	2.5	1.8-3.4	1.4	0.9-2.3	1.4	0.8-2.3	1.4	0.9-2.3
≥ 60 years	35 (4.6%)	43 (5.7%)	1.2	0.6-2.4	1.2	0.5-3.0	1.2	0.5-3.0	1.2	0.5-3.0
<b>Female</b>	510 (67.3%)	321 (42.3%)	1.8	1.5-2.1	1.8	1.5-2.2	1.8	1.5-2.2	1.9	1.6-2.2
<b>Vaccination status</b>										
Unvaccinated	253 (33.4%)	244 (32.2%)	1		1		1		1	
1 dose	18 (2.4%)	25 (3.3%)	0.4	0.2-1.1	0.6	0.2-1.8	0.6	0.2-1.8	0.6	0.2-1.7
2 doses	226 (29.8%)	185 (24.4%)	0.7	0.3-1.4	0.6	0.2-1.4	0.6	0.2-1.4	0.6	0.2-1.4
3-4 doses	261 (34.4%)	304 (40.1%)	0.2	0.1-0.6	0.1	0.04-0.4	0.1	0.04-0.3	0.1	0.04-0.3
<b>History of prior SARS-CoV-2 infection</b>	30 (4.0%)	64 (8.4%)	0.2	0.1-0.5	0.1	0.1-0.3	0.1	0.1-0.3	0.1	0.1-0.3
<b>Underlying conditions</b>										
Chronic respiratory disease	41 (5.4%)	46 (6.1%)	0.9	0.6-1.4		-		-	0.8	0.5-1.4
Diabetes mellitus	12 (1.6%)	20 (2.6%)	0.6	0.3-1.2		-		-	0.5	0.2-1.2
Hypertension	63 (8.3%)	54 (7.1%)	1.2	0.8-1.8		-		-	1.5	0.9-2.4
Coronary artery disease	5 (0.7%)	4 (0.5%)	1.3	0.3-4.7		-		-	1.7	0.4-7.4
<b>Mitigation measures from the source case</b>										
Overall isolation	455 (60.0%)	504 (66.5%)	0.5	0.3-0.7	0.6	0.4-0.8				
<b>Mitigation measures</b>										
Ventilation of indoor areas	421 (55.5%)	459 (60.6%)	0.6	0.4-0.8		-	0.6	0.4-0.9	0.6	0.4-1.0
Mask-wearing	403 (53.2%)	425 (56.1%)	0.7	0.5-1.0		-		-	1.0	0.6-1.7
Surface disinfection	339 (44.7%)	344 (45.4%)	0.9	0.7-1.3		-	1.4	0.9-2.1	1.4	0.9-2.2
Separate meals	367 (48.4%)	390 (51.5%)	0.6	0.4-0.9		-		-	0.9	0.5-1.6
Separate bathroom	212 (28.0%)	242 (31.9%)	0.7	0.5-0.9		-		-	0.9	0.6-1.4
<b>Source case is participant's...</b>										
Sibling	11 (1.5%)	26 (3.4%)	1		1		1		1	
Partner	65 (8.6%)	4 (0.5%)	24.1	3.0-194.2	14.9	1.8-124.2	17.4	2.1-147.0	13.5	1.5-121.0
Parent	16 (2.1%)	67 (8.8%)	1.6	0.2-10.8	1.0	0.1-7.2	1.1	0.2-8.1	0.9	0.1-6.9
Child	646 (85.2%)	615 (81.1%)	2.5	1.2-5.3	2.5	1.0-6.2	2.6	1.0-6.6	2.4	1.0-6.3



Other	20 (2.6%)	46 (6.1%)	0.6	0.2-1.9	0.9	0.3-3.1	0.9	0.3-3.3	0.8	0.2-3
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Legend: Case-control study conducted online in France between October 2020 and May 2022. Index cases were offered the possibility to invite a non-infected member of their household to participate, preferably their partner. Both the index cases and the related control shared the household with a source case (not included in the study). Conditional logistic regression univariable and multivariable models were matched on households.

**Paper 5: SARS-CoV-2 incubation period across variants of concern, individual factors, and circumstances of infection in France: a case series analysis from the ComCor study**

**Table S1: Demographic characteristics of participants depending on the variant responsible for infection**

Variant	Historical strain	Alpha	Beta/Gamma	Delta	Omicron	Total
<b>Total</b>	<b>7539</b>	<b>5133</b>	<b>453</b>	<b>4606</b>	<b>2682</b>	<b>20413</b>
<b>Female</b>	5072 (67.3%)	3455 (67.3%)	288 (63.6%)	3043 (66.1%)	1902 (70.9%)	<b>13760 (67.4%)</b>
<b>Age (years)</b>						
18-29	1625 (21.6%)	1129 (22.0%)	94 (20.8%)	740 (16.1%)	681 (25.4%)	<b>4269 (20.9%)</b>
30-39	1982 (26.3%)	1367 (26.6%)	129 (28.5%)	1235 (26.8%)	813 (30.3%)	<b>5526 (27.1%)</b>
40-49	1517 (20.1%)	1097 (21.4%)	108 (23.8%)	979 (21.3%)	534 (19.9%)	<b>4235 (20.8%)</b>
50-59	1279 (17.0%)	882 (17.2%)	60 (13.3%)	866 (18.8%)	349 (13.0%)	<b>3436 (16.8%)</b>
60-69	861 (11.4%)	520 (10.1%)	48 (10.6%)	575 (12.5%)	224 (8.4%)	<b>2228 (10.9%)</b>
≥70	275 (3.7%)	138 (2.7%)	14 (3.1%)	211 (4.6%)	81 (3.0%)	<b>719 (3.5%)</b>
<b>Healthcare worker</b>	1247 (16.5%)	592 (11.5%)	60 (13.2%)	547 (11.9%)	320 (11.9%)	<b>2766 (13.6%)</b>
<b>Smoking status</b>						
Non-smoker, no nicotine substitution	6284 (83.4%)	4104 (80.0%)	356 (78.6%)	3635 (78.9%)	2086 (77.8%)	<b>16465 (80.7%)</b>
Non-smoker, nicotine substitution	64 (0.9%)	40 (0.8%)	6 (1.3%)	37 (0.8%)	22 (0.8%)	<b>169 (0.8%)</b>
Non-smoker, electronic cigarette only	248 (3.3%)	223 (4.3%)	9 (2.0%)	203 (4.4%)	118 (4.4%)	<b>801 (3.9%)</b>
<10 cigarettes/day	478 (6.3%)	405 (7.9%)	47 (10.4%)	386 (8.4%)	221 (8.2%)	<b>1537 (7.5%)</b>
10-20 cigarettes/day	327 (4.3%)	243 (4.7%)	27 (6.0%)	248 (5.4%)	174 (6.5%)	<b>1019 (5.0%)</b>
>20 cigarettes/day	138 (1.8%)	117 (2.3%)	8 (1.8%)	97 (2.1%)	61 (2.3%)	<b>422 (2.1%)</b>
<b>Underlying conditions</b>						
Chronic respiratory disease	630 (8.4%)	443 (8.6%)	37 (8.2%)	350 (7.6%)	206 (7.7%)	<b>1666 (8.2%)</b>
Hypertension	627 (8.3%)	417 (8.1%)	30 (6.6%)	426 (9.3%)	157 (5.9%)	<b>1657 (8.1%)</b>
Underweight	236 (3.1%)	149 (2.9%)	8 (1.8%)	165 (3.6%)	109 (4.1%)	<b>667 (3.3%)</b>
Diabetes	173 (2.3%)	109 (2.1%)	6 (1.3%)	117 (2.5%)	54 (2.0%)	<b>459 (2.3%)</b>
Coronary artery disease	73 (1.0%)	30 (0.6%)	4 (0.9%)	38 (0.8%)	20 (0.8%)	<b>165 (0.8%)</b>

Legend: COVID-19 cases with identified incubation period and variant included via an online study in France (October 2020-February 2022).

**Table S2: Deviance information criterion (DIC) for various models fitted to data on incubation period**

Model	DIC	DIC(pois $p_1$ )-DIC
Poisson + $p_1$	86127.92	0
Negative-Binomial + $p_1$	85203.79	924.13
Log-Normal + $p_1$	84887.01	1240.91
Gamma + $p_1$	84565.98	1561.94
Poisson + ( $p_1, p_2$ )	86091.53	36.39
Negative-Binomial + ( $p_1, p_2$ )	85187.08	940.84
Log-Normal + ( $p_1, p_2$ )	84790.74	1337.18
Gamma + ( $p_1, p_2$ )	84522.35	1605.57

Legend: Probability models fitted using a Monte Carlo Markov Chains (MCMC) algorithm to the distribution of the incubation periods in the 20413 COVID-19 cases with identified incubation period and variant.

**Table S3: Estimation of parameters  $p_1$  (probability to report an incubation period of 7 days when the true incubation period duration is 6 or 8 days) and  $p_2$  (probability to report an incubation period of 7 days when the true incubation period duration is 5 or 9 days)**

Parameter	Estimation (95% credible interval)
$p_1$	0.25 (0.22-0.28)
$p_2$	0.09 (0.06-0.11)

Legend:  $p_1$  and  $p_2$  were estimated jointly with the parameters of the gamma distribution using a Monte Carlo Markov Chains algorithm.

**Table S4: Parameters of the gamma distribution of the model describing the incubation period corrected for days 5-9**

Variant	Mean (95% credible interval)	Standard deviation (95% credible interval)
Historical strain	4.07 (4.03-4.12)	2.12 (2.08-2.16)
Alpha	4.42 (4.35-4.48)	2.30 (2.25-2.36)
Beta or Gamma	4.66 (4.42-4.91)	2.65 (2.44-2.91)
Delta	3.89 (3.83-3.95)	2.06 (2.01-2.11)
Omicron	3.09 (3.02-3.15)	1.64 (1.59-1.70)

Legend: Correction for days 5-9 was done using parameters  $p_1$  (probability to report an incubation period of 7 days when the true incubation period duration is 6 or 8 days) and  $p_2$  (probability to report an incubation period of 7 days when the true incubation period duration is 5 or 9 days)

**Table S5: Factors associated with the incubation period in univariable and multivariable analyses, including type of interaction environment**

	N	%	Univariable analysis		Multivariable analysis	
			Coefficient	95% confidence interval	Coefficient	95% confidence interval
<b>Total</b>	<b>20413</b>					
<b>Female</b>	13760	67.4	0.04	0.03 ; 0.1	0.1	0.02 ; 0.2
<b>Variant</b>						
Historical variant	7539	36.9	0 (ref)	..	0 (ref)	..
Alpha	5133	25.1	0.4	0.3 ; 0.4	0.4	0.3 ; 0.4
Beta or Gamma	453	2.2	0.6	0.5 ; 0.8	0.6	0.3 ; 0.8
Delta	4606	22.6	- 0.2	- 0.3 ; - 0.1	- 0.1	- 0.2 ; 0.02
Omicron	2682	13.1	- 1.0	- 1.1 ; - 0.9	- 0.9	- 1.0 ; - 0.8
<b>Age (years)</b>						
18-29	4269	20.9	0 (ref)	..	0 (ref)	..
30-39	5526	27.1	0.1	- 0.01 ; 0.2	0.1	- 0.02 ; 0.1
40-49	4235	20.7	0.2	0.1 ; 0.3	0.2	0.1 ; 0.3
50-59	3436	16.8	0.2	0.1 ; 0.3	0.2	0.1 ; 0.3
60-69	2228	10.9	0.4	0.3 ; 0.5	0.4	0.3 ; 0.5
≥70	719	3.5	0.3	0.1 ; 0.5	0.4	0.2 ; 0.5
<b>Smoking status</b>						
Non-smoker, no nicotine substitution	16465	80.7	0 (ref)	..	0 (ref)	..
Non-smoker, nicotine substitution	169	0.8	- 0.2	- 0.5 ; 0.2	- 0.2	- 0.5 ; 0.2
Non-smoker, electronic cigarette only	801	3.9	0.1	- 0.1 ; 0.3	0.2	0.0 ; 0.3
<10 cigarettes/day	1537	7.5	0.1	- 0.04 ; 0.2	0.2	0.03 ; 0.3
10-20 cigarettes/day	1019	5.0	0.2	0.02 ; 0.3	0.2	0.1 ; 0.4
>20 cigarettes/day	422	2.1	0.3	0.1 ; 0.5	0.4	0.1 ; 0.6
<b>Vaccine status</b>						
Unvaccinated	13868	67.9	0 (ref)	..	0 (ref)	..
One dose <90 days since last injection	354	1.7	- 0.2	- 0.5 ; 0.0	- 0.2	- 0.4 ; 0.1
One dose 90-179 days since last injection	143	0.7	- 0.9	- 1.3 ; - 0.6	- 0.3	- 0.7 ; 0.1
One dose ≥180 days since last injection	97	0.5	- 1.0	- 1.4 ; - 0.6	- 0.5	- 0.9 ; - 0.1
Two doses <90 days since last injection	642	3.2	- 0.2	- 0.4 ; - 0.1	0.1	- 0.1 ; 0.3
Two doses 90-179 days since last injection	3266	16.0	- 0.6	- 0.7 ; - 0.5	- 0.1	- 0.3 ; - 0.02
Two doses ≥180 days since last injection	942	4.6	- 0.7	- 0.8 ; - 0.5	- 0.2	- 0.4 ; - 0.05
Three doses <90 days since last injection	903	4.4	- 0.8	- 0.1 ; - 0.7	0.0	- 0.2 ; 0.2
Three doses 90-179 days since last injection	42	0.2	- 0.8	- 1.5 ; 0.2	- 0.3	- 0.9 ; 0.3
Three doses ≥180 days since last injection	16	0.1	- 1.2	- 2.3 ; - 0.1	- 0.6	- 1.3 ; 0.1
Four doses <90 days since last injection	3	0.01	- 0.4	- 2.3 ; 2.1	0.5	- 2.4 ; 3.4
Undated last dose of vaccine	137	0.7	- 0.2	- 0.6 ; 0.2	0.2	- 0.3 ; 0.7
<b>Past episode of SARS-CoV-2 infection</b>						
No	19744	96.7	0 (ref)	..	0 (ref)	..
Yes, virologically or serologically confirmed	512	2.5	- 0.5	- 0.7 ; - 0.3	0.0	- 0.2 ; 0.2
Yes, diagnosed on clinical evaluation only	157	0.8	- 0.1	- 0.5 ; 0.2	0.0	- 0.4 ; 0.3

<b>Symptoms in index case</b>	6819	33.4	- 0.1	- 0.2 ; - 0.1	- 0.1	- 0.2 ; - 0.1
			<b>Univariable analysis</b>		<b>Multivariable analysis</b>	
	<b>N</b>	<b>%</b>	<b>Coefficient</b>	<b>95% confidence interval</b>	<b>Coefficient</b>	<b>95% confidence interval</b>
<b>Type of interaction environment</b>						
Family	7656	37.5	0 (ref)	..	0 (ref)	..
Friends	6526	32.0	- 0.2	- 0.3 ; - 0.2	- 0.2	- 0.3 ; - 0.1
Professional	4367	21.4	0.1	0.0 ; 0.2	0.03	- 0.1 ; 0.1
School/university	231	1.1	0.04	- 0.3 ; 0.3	0.1	- 0.2 ; 0.4
Sports activity	357	1.7	- 0.2	- 0.5 ; 0.03	- 0.1	- 0.3 ; 0.1
Cultural activity	146	0.7	- 0.2	- 0.6 ; 0.2	- 0.1	- 0.5 ; 0.2
Religious activity	31	0.2	0.4	- 0.4 ; 1.2	0.6	- 0.3 ; 1.4
Healthcare	172	0.8	0.1	- 0.3 ; 0.4	0.2	- 0.2 ; 0.6
Other environment	927	4.5	0.03	- 0.1 ; 0.2	0.0	- 0.2 ; 0.2

Legend: Multivariable analysis is adjusted on all variables presented in the table.

**Table S6: Factors associated with the incubation period in multivariable linear regression averaged over 15 resamplings of incubation periods of 7 days and assigned to figures between 5 and 9 following probabilities derived from the gamma distribution**

	Coefficient	95% confidence interval
<b>Female</b>	0.1	0.02 ; 0.1
<b>Variant</b>		
Historical variant	0 (ref)	..
Alpha	0.3	0.3 ; 0.4
Beta or Gamma	0.6	0.3 ; 0.8
Delta	- 0.1	- 0.2 ; 0.03
Omicron	- 0.9	- 1.0 ; - 0.7
<b>Age (years)</b>		
18-29	0 (ref)	..
30-39	0.1	0.0 ; 0.2
40-49	0.2	0.1 ; 0.3
50-59	0.2	0.1 ; 0.3
60-69	0.4	0.3 ; 0.5
≥70	0.4	0.2 ; 0.6
<b>Smoking status</b>		
Non-smoker, no nicotine substitution	0 (ref)	..
Non-smoker, nicotine substitution	- 0.2	- 0.5 ; 0.2
Non-smoker, electronic cigarette only	0.2	0.0 ; 0.3
<10 cigarettes/day	0.1	0.02 ; 0.2
10-20 cigarettes/day	0.2	0.1 ; 0.4
>20 cigarettes/day	0.4	0.1 ; 0.6
<b>Vaccine status</b>		
Unvaccinated	0 (ref)	..
One dose <90 days since last injection	- 0.2	- 0.4 ; 0.1
One dose 90-179 days since last injection	- 0.3	- 0.7 ; 0.1
One dose ≥180 days since last injection	- 0.5	- 0.9 ; - 0.1
Two doses <90 days since last injection	0.1	- 0.1 ; 0.3
Two doses 90-179 days since last injection	- 0.1	- 0.3 ; - 0.02
Two doses ≥180 days since last injection	- 0.2	- 0.4 ; - 0.05
Three doses <90 days since last injection	0.0	- 0.2 ; 0.2
Three doses 90-179 days since last injection	- 0.3	- 0.9 ; 0.3
Three doses ≥180 days since last injection	- 0.6	- 1.3 ; 0.0
Four doses <90 days since last injection	0.6	- 2.3 ; 3.3
Undated last dose of vaccine	0.2	- 0.3 ; 0.7
<b>Past episode of SARS-CoV-2 infection</b>		
No	0 (ref)	..
Yes, virologically or serologically confirmed	0.0	- 0.2 ; 0.2
Yes, diagnosed on clinical evaluation only	0.0	- 0.4 ; 0.4
<b>Symptoms in index case</b>	- 0.1	- 0.2 ; - 0.05
<b>Mask-wearing</b>		
Neither participant or index case	0 (ref)	..
Index case only	0.0	- 0.2 ; 0.2
Participant only	0.2	0.1 ; 0.3
Both participant and index case	0.1	0.02 ; 0.2



**Table S7: Factors associated with the incubation period in univariable and multivariable Poisson regression analyses**

	Univariable analysis		Multivariable analysis	
	Coefficient	95% confidence interval	Coefficient	95% confidence interval
<b>Female</b>	1.01	0.99 ; 1.02	1.02	1.01 ; 1.03
<b>Variant</b>				
Historical variant	1 (ref)	..	1 (ref)	..
Alpha	1.08	1.06 ; 1.09	1.08	1.06 ; 1.09
Beta or Gamma	1.12	1.07 ; 1.18	1.12	1.07 ; 1.18
Delta	0.96	0.94 ; 0.98	0.98	0.96 ; 1.01
Omicron	0.78	0.77 ; 0.80	0.80	0.77 ; 0.83
<b>Age (years)</b>				
18-29	1 (ref)	..	1 (ref)	..
30-39	1.02	1.00 ; 1.04	1.02	1.00 ; 1.04
40-49	1.05	1.03 ; 1.07	1.05	1.02 ; 1.07
50-59	1.05	1.03 ; 1.08	1.05	1.02 ; 1.07
60-69	1.09	1.06 ; 1.12	1.09	1.06 ; 1.12
≥70	1.07	1.03 ; 1.11	1.09	1.04 ; 1.13
<b>Smoking status</b>				
Non-smoker, no nicotine substitution	1 (ref)	..	1 (ref)	..
Non-smoker, nicotine substitution	0.97	0.90 ; 1.04	0.96	0.89 ; 1.04
Non-smoker, electronic cigarette only	1.02	0.98 ; 1.06	1.03	1.00 ; 1.07
<10 cigarettes/day	1.02	0.99 ; 1.04	1.03	1.00 ; 1.06
10-20 cigarettes/day	1.04	1.00 ; 1.07	1.05	1.02 ; 1.09
>20 cigarettes/day	1.06	1.01 ; 1.12	1.08	1.03 ; 1.13
<b>Vaccine status</b>				
Unvaccinated	1 (ref)	..	1 (ref)	..
One dose <90 days since last injection	0.95	0.90 ; 1.01	0.96	0.91 ; 1.01
One dose 90-179 days since last injection	0.80	0.73 ; 0.88	0.92	0.83 ; 0.92
One dose ≥180 days since last injection	0.77	0.70 ; 0.85	0.88	0.80 ; 0.98
Two doses <90 days since last injection	0.95	0.91 ; 0.99	1.03	0.99 ; 1.07
Two doses 90-179 days since last injection	0.87	0.85 ; 0.89	0.97	0.94 ; 0.99
Two doses ≥180 days since last injection	0.86	0.83 ; 0.89	0.95	0.92 ; 0.99
Three doses <90 days since last injection	0.83	0.80 ; 0.85	1.01	0.97 ; 1.05
Three doses 90-179 days since last injection	0.83	0.70 ; 0.97	0.94	0.80 ; 1.09
Three doses ≥180 days since last injection	0.75	0.62 ; 0.91	0.86	0.70 ; 1.04
Four doses <90 days since last injection	0.92	0.49 ; 1.70	1.15	0.60 ; 2.20
Undated last dose of vaccine	0.96	0.86 ; 1.07	1.05	0.95 ; 1.17
<b>Past episode of SARS-CoV-2 infection</b>				
No	1 (ref)	..	1 (ref)	..
Yes, virologically or serologically confirmed	0.89	0.85 ; 0.94	1.00	0.95 ; 1.06
Yes, diagnosed on clinical evaluation only	0.98	0.90 ; 1.06	1.00	0.92 ; 1.08

	Univariable analysis		Multivariable analysis	
	Coefficient	95% confidence interval	Coefficient	95% confidence interval
<b>Symptoms in index case</b>	0.97	0.96 ; 0.99	0.97	0.96 ; 0.99
<b>Mask-wearing</b>				
Neither participant nor index case	1 (ref)	..	1 (ref)	..
Index case only	1.01	0.96 ; 1.06	1.00	0.95 ; 1.05
Participant only	1.08	1.04 ; 1.10	1.05	1.03 ; 1.08
Both participant and index case	1.05	1.03 ; 1.08	1.03	1.01 ; 1.05

Legend: Multivariable analysis is adjusted on all variables presented in the table. Underlying conditions and indoors/outdoors setting variables were dropped from the multivariable model given absence of statistical significance.

**Table S8: Comparison of estimated incubation period durations after transformation of the coefficients of the linear regression and the Poisson models.**

Model	Estimated incubation period	
	Linear regression	Poisson
<b>Male</b>	4.5	4.5
<b>Female</b>	4.6	4.6
<b>Variant</b>		
Historical	4.6	4.6
Alpha	5.0	5.0
Beta or Gamma	5.2	5.2
Delta	4.5	4.5
Omicron	3.7	3.7
<b>Age</b>		
18-29	4.4	4.4
30-39	4.5	4.5
40-49	4.6	4.6
50-59	4.6	4.6
60-69	4.8	4.8
≥70	4.8	4.8
<b>Smoking status</b>		
Non-smoker, no nicotine substitution	4.5	4.5
Non-smoker, nicotine substitution	4.4	4.4
Non-smoker, electronic cigarette only	4.7	4.7
<10 cigarettes/day	4.7	4.7
10-20 cigarettes/day	4.8	4.8
>20 cigarettes/day	4.9	4.9
<b>Vaccine status</b>		
Unvaccinated	4.7	4.7
One dose <90 days since last injection	4.5	4.5
One dose 90-179 days since last injection	4.4	4.3
One dose ≥180 days since last injection	4.2	4.2
Two doses <90 days since last injection	4.9	4.9
Two doses 90-179 days since last injection	4.6	4.6
Two doses ≥180 days since last injection	4.5	4.5
Three doses <90 days since last injection	4.7	4.8
Three doses 90-179 days since last injection	4.4	4.4
Three doses ≥180 days since last injection	4.1	4.0
Four doses <90 days since last injection	5.3	5.4
Undated last dose of vaccine	5.0	5.0
<b>Past episode of SARS-CoV-2 infection</b>		
No	4.6	4.6
Yes, virologically or serologically confirmed	4.6	4.6
Yes, diagnosed on clinical evaluation only	4.5	4.5
<b>Symptoms in index case</b>		
No	4.6	4.6
Yes	4.5	4.5
<b>Mask-wearing</b>		
Neither participant or index case	4.5	4.5
Index case only	4.5	4.5
Participant only	4.7	4.7
Both participant and index case	4.6	4.6

Legend: Coefficients of respective models are described in tables 3 and S7.

**Table S9: Description of study population, linear regression model of factors associated with the incubation period in univariable and multivariable analyses when restricted to participants who report a positive test in the index case**

	N	%	Univariable analysis		Multivariable analysis	
			Coefficient	95% confidence interval	Coefficient	95% confidence interval
Total	18005					
Female	12238	68.0	0.1	0.0 ; 0.1	0.1	0.1 ; 0.2
Variant						
Historical variant	6619	36.8	0 (ref)	..	0 (ref)	..
Alpha	4642	25.8	0.3	0.3 ; 0.4	0.3	0.3 ; 0.4
Beta or Gamma	408	2.3	0.6	0.3 ; 0.8	0.6	0.3 ; 0.8
Delta	3918	21.8	- 0.2	- 0.3 ; - 0.1	- 0.1	- 0.2 ; 0.02
Omicron	2418	13.4	- 1.0	- 1.1 ; - 0.9	- 0.8	- 1.0 ; - 0.7
Age (years)						
18-29	3852	21.4	0 (ref)	..	0 (ref)	..
30-39	4974	27.6	0.1	- 0.01 ; 0.2	0.1	- 0.01 ; 0.2
40-49	3699	20.5	0.2	0.1 ; 0.3	0.2	0.1 ; 0.3
50-59	2977	16.5	0.2	0.1 ; 0.3	0.2	0.1 ; 0.3
60-69	1908	10.6	0.4	0.3 ; 0.5	0.4	0.3 ; 0.5
≥70	595	3.3	0.3	0.1 ; 0.5	0.4	0.2 ; 0.6
Smoking status						
Non-smoker, no nicotine substitution	14480	80.4	0 (ref)	..	0 (ref)	..
Non-smoker, nicotine substitution	143	0.8	- 0.1	- 0.5 ; 0.3	- 0.2	- 0.5 ; 0.2
Non-smoker, electronic cigarette only	713	4.0	0.1	- 0.1 ; 0.3	0.1	- 0.02 ; 0.3
<10 cigarettes/day	1380	7.7	0.1	- 0.02 ; 0.2	0.2	0.03 ; 0.3
10-20 cigarettes/day	921	5.1	0.2	0.04 ; 0.4	0.3	0.1 ; 0.4
>20 cigarettes/day	368	2.0	0.3	0.03 ; 0.5	0.3	0.1 ; 0.6
Vaccine status						
Unvaccinated	12298	68.30	0 (ref)	..	0 (ref)	..
One dose <90 days since last injection	320	1.78	- 0.2	- 0.5 ; 0.1	- 0.1	- 0.4 ; 0.1
One dose 90-179 days since last injection	131	0.73	- 1.0	- 1.3 ; - 0.6	- 0.4	- 0.8 ; - 0.05
One dose ≥180 days since last injection	85	0.47	- 1.2	- 1.6 ; - 0.9	- 0.7	- 1.1 ; - 0.3
Two doses <90 days since last injection	541	3.00	- 0.3	- 0.5 ; - 0.1	0.1	- 0.1 ; 0.3
Two doses 90-179 days since last injection	2841	15.78	- 0.6	- 0.7 ; - 0.5	- 0.2	- 0.3 ; - 0.03
Two doses ≥180 days since last injection	815	4.53	- 0.7	- 0.9 ; - 0.6	- 0.3	- 0.4 ; - 0.1
Three doses <90 days since last injection	812	4.51	- 0.9	- 1.0 ; - 0.7	- 0.1	- 0.2 ; 0.1
Three doses 90-179 days since last injection	36	0.20	- 0.9	- 1.6 ; - 0.3	- 0.4	- 1.0 ; 0.2
Three doses ≥180 days since last injection	15	0.08	- 1.2	- 1.9 ; - 0.4	- 0.6	- 1.4 ; 0.1
Four doses <90 days since last injection	3	0.02	- 0.4	- 3.1 ; 2.3	0.4	- 2.5 ; 3.3
Undated last dose of vaccine	108	0.60	- 0.1	- 0.7 ; 0.4	0.3	- 0.2 ; 0.8
Past episode of SARS-CoV-2 infection						
No	17395	96.6	0 (ref)	..		
Yes, virologically or serologically confirmed	473	2.6	- 0.5	- 0.7 ; - 0.3	0.1	- 0.1 ; 0.3
Yes, diagnosed on clinical evaluation only	137	0.8	- 0.1	- 0.5 ; 0.3	0.0	- 0.4 ; 0.4

Symptoms in index case	6023	33.5	- 0.2	- 0.2 ; - 0.1	- 0.1	- 0.2 ; - 0.1
			Univariable analysis		Multivariable analysis	
	N	%	Coefficient	95% confidence interval	Coefficient	95% confidence interval
<b>Mask-wearing</b>						
Neither participant or index case	14370	79.8	0 (ref)	..	0 (ref)	..
Index case only	407	2.3	0.1	- 0.1 ; 0.3	0.1	- 0.2 ; 0.3
Participant only	1350	7.5	0.3	0.2 ; 0.4	0.2	0.1 ; 0.3
Both participant and index case	1878	10.4	0.2	0.1 ; 0.3	0.1	0.01 ; 0.2
<b>Indoors/outdoors setting</b>						
Indoors with closed windows	13369	74.3	0 (ref)	..	..	..
Indoors with open windows	3584	19.9	0	- 0.1 ; 0.1	..	..
Outdoors	1052	5.8	0.1	- 0.1 ; 0.2	..	..
<b>Underlying conditions</b>						
Chronic respiratory disease	1425	7.9	0.1	- 0.03 ; 0.2	..	..
Hypertension	1397	7.8	0.2	0.03 ; 0.3	..	..
Underweight	590	3.3	- 0.3	- 0.4 ; - 0.1	..	..
Diabetes	385	2.1	0.1	- 0.2 ; 0.3	..	..
Coronary artery disease	138	0.8	- 0.1	- 0.4 ; 0.3	..	..

Legend: The population represented 18005 out of the 20413 (88.2%) participants (2059, 10.1% did not know if the index case had tested positive, the remaining 349, 1.7%, did not report a positive test in the index case despite identifying them as such). Multivariable analysis is adjusted on all variables presented in the table except underlying conditions which were dropped from the model given absence of statistical significance.

## Supplementary methods

### Incubation Model

- $X$  is the random variable of reported incubation periods
- $Y$  is the random variable of latent incubation periods following either a Poisson, Negative-binomial, discretised Log-normal or Gamma law.

### The log-likelihood

$$LL = (\sum_{i,j} N_{i,j} \log(P(X = i, \theta_j, p_1, p_2)))$$

$N_{i,j}$  is the number of cases with an incubation period of  $i$  days for variant  $j$

$\theta_j$  is the set of parameters for the  $j$ th variant

$P(p_1) = 1$  if  $p_1 \in [0,1]$  and 0 otherwise

$P(p_2) = 1$  if  $p_2 \in [0,1]$  and 0 otherwise

### Probabilities for reported incubation periods

- $\forall k \in N_+ \setminus \{5,6,7,8,9\}: P(X = k, \theta_j, p_1, p_2) = P(Y = k, \theta_j)$
- $P(X = 7, \theta_j, p_1, p_2) = P(Y = 7, \theta_j) + p_1 (P(Y = 6, \theta_j) + P(Y = 8, \theta_j)) + p_2 (P(Y = 5, \theta_j) + P(Y = 9, \theta_j))$
- $k \in \{6, 8\}: P(X = k, \theta_j, p_1, p_2) = (1 - p_1) P(Y = k, \theta_j)$
- $k \in \{5, 9\}: P(X = k, \theta_j, p_1, p_2) = (1 - p_2) P(Y = k, \theta_j)$

### Questionnaire phrasing

French original phrasing:

“Les questions suivantes concernent la personne à l’origine de votre contamination.” “Combien de jours se sont passés entre votre dernier contact avec cette personne et l’apparition de vos symptômes ?”

English translation:

“The following questions refer to the person at the origin of your contamination.” “How many days went by between your last contact with that person and the onset of your symptoms?”

*Number between 1 and 99 required as a response.*

**Discussion - Supplementary Table 1: Comparison of models assessing socio-demographic, comorbidities, household and community exposures associated with the risk of SARS-CoV-2 infection, either without or with adjustment on the level of compliance with protective measures.**

Results are shown for 3 periods of the study. Differences are in absolute values. Beyond variables shown in the tables, the models include the COVID-19 vaccine status, past episodes of SARS-CoV-2 infection, body-mass index, smoking status, degree level, professional category, housing type, number of people in the household. None of the differences for these exceeds 0.2.

	04/12/2020 - 08/04/2021			14/08/2021 - 01/10/2021			18/03/2022 - 18/05/2022		
	Without protective measures OR	With protective measures OR	Difference	Without protective measures OR	With protective measures OR	Difference	Without protective measures OR	With protective measures OR	Difference
<b>Mask-wearing where required</b>									
Never		1			1			1	
Rarely		1.05			2.37			1.41	
Regularly, less than half the time		2.34			4.47			1.86	
Regularly, at least half the time		3.49			6.02			2.32	
All the time		2.94			4.86			2.07	
I did not visit settings requiring mask-wearing								2.62	
<b>One-meter physical distance in private setting</b>									
Always		1			1			1	
Often		0.98			1.00			1.00	
Rarely		0.82			0.84			0.69	
Never		0.56			0.58			0.47	
<b>Hand-washing</b>									
Never		1			1			1	
1-4 times per day		1.60			0.98			1.59	
5-10 times per day		1.87			1.06			1.88	
Over 10 times per day		1.93			0.91			1.84	
<b>Male sex</b>	0.96	0.94	0.02	0.97	0.97	0.00	2.02	1.93	0.08
<b>Age category</b>									
18-29	1	1	0	1	1	0	1	1	0
30-39	1.19	1.13	0.06	2.58	2.52	0.06	0.84	0.78	0.05



40-49	0.70	0.64	0.05	1.16	1.10	0.05	0.84	0.74	0.09
50-59	0.85	0.77	0.08	1.71	1.61	0.09	0.91	0.79	0.12
60-69	1.53	1.38	0.14	6,76	6,09	0.66	1.03	0.87	0.15
70+	0.39	0.36	0.03	1.43	1.28	0.15	0.98	0.83	0.14
<b>Region of residence</b>									
Île-de-France	1	1	0	1	1	0	1	1	0
Centre - Val de Loire	1.24	1.25	0.01	1.20	1.22	0.01	1.06	1.07	0.00
Bourgogne -Franche-Comté	1.11	1.10	0.00	1.97	1.94	0.02	1.37	1.38	0.00
Normandie	1.22	1.23	0.01	0.95	0.94	0.01	1.26	1.28	0.01
Hauts-de-France	1.45	1.47	0.01	1.22	1.22	0.00	1.04	1.04	0.00
Grand Est	1.11	1.10	0.00	1.02	1.01	0.00	1.15	1.12	0.02
Pays de la Loire	1.51	1.54	0.02	1.46	1.45	0.01	0.96	0.97	0.01
Bretagne	1.26	1.26	0.00	1.31	1.27	0.03	0.86	0.86	0.00
Nouvelle-Aquitaine	1.37	1.39	0.02	1.05	1.03	0.01	0.99	1.01	0.01
Occitanie	1.47	1.50	0.02	0.82	0.81	0.00	1.00	1.03	0.02
Auvergne-Rhône-Alpes	1.29	1.32	0.02	1.05	1.03	0.01	1.05	1.07	0.02
Provence-Alpes-Côte d'Azur + Corse	1.42	1.44	0.01	0.87	0.88	0.00	1.09	1.10	0.01
<b>Population in the area of residence</b>									
<5000 inhabitants	1	1	0	1	1	0	1	1	0
5000 – 19,999 inhabitants	0.98	0.97	0.00	1.02	1.04	0.01	1.02	1.01	0.00
20,000 – 99,999 inhabitants	1.00	1.00	0.00	0.95	0.96	0.01	1.08	1.08	0.00
Over 100,000 inhabitants	1.01	1.01	0.00	1.17	1.17	0.00	1.03	1.04	0.00
Greater Paris area	1.50	1.52	0.02	1.35	1.33	0.01	1.16	1.18	0.01
<b>Workplace</b>									
No remote office, no open space	1	1	0	1	1	0	1	1	0
No remote office, open space	1.13	1.13	0.00	1.41	1.43	0.01	1.21	1.23	0.01
Not working	0.74	0.74	0.00	1.57	1.61	0.03	0.61	0.61	5,10
Working in a non-office setting	1.06	1.05	0.00	1.26	1.27	0.01	1.19	1.20	0.01
Partial remote office, no open space	0.86	0.86	0.00	0.70	0.71	0.00	0.86	0.84	0.01
Partial remote office, open space	0.74	0.74	0.00	0.92	0.91	0.01	0.98	0.98	0.00

Complete remote office	0.95	0.96	0.01	1.76	1.77	0.01	0.98	0.96	0.01
No work during the period of interest							1.17	1.16	0.01
<b>Underlying conditions</b>									
Diabetes mellitus	0.78	0.78	0.00	0.64	0.64	0.00	0.73	0.72	0.01
Hypertension	0.94	0.94	0.00	0.77	0.76	0.00	0.90	0.89	0.00
Chronic respiratory disease	1.17	1.17	0.00	1.36	1.36	0.00	1.37	1.34	0.02
Coronary artery disease	1.25	1.24	0.01	1.25	1.28	0.02	1.61	1.59	0.01
Living with a child...									
... attending day care	1.18	1.18	0.00	1.51	1.50	0.01	1.33	1.35	0.02
... attended for by a professional in-home caregiver	1.55	1.54	0.01	1.11	1.12	0.01	1.54	1.56	0.01
... attending preschool	1.10	1.10	0.00	1.61	1.63	0.01	1.24	1.27	0.02
... attending primary school	1.12	1.11	0.00	1.42	1.42	0.00	1.41	1.43	0.01
... attending middle school	1.10	1.10	0.00	1.40	1.39	0.00	1.13	1.12	0.00
... attending high school	1.19	1.19	0.00	0.96	0.98	0.01	1.08	1.09	0.00
... attending university	0.84	0.83	0.00	0.87	0.86	0.01	0.93	0.93	0.00
Professional meeting	1.02	1.02	0.00	0.88	0.88	0.00	1.10	1.10	0.00
Private gathering	0.90	0.94	0.03	0.72	0.74	0.01	0.79	0.84	0.04
Religious gathering	0.99	0.99	0.00	0.86	0.85	0.00	0.97	0.96	0.00
Lecture, course	0.64	0.63	0.00	0.88	0.87	0.01	0.97	0.99	0.01
Any cultural venue	0.62	0.62	0.00						
Theatre				0.77	0.77	0.00	1.04	1.05	0.00
Movie theatre				0.58	0.58	0.00	0.65	0.65	4.97
Museum				0.72	0.72	0.00	1.07	1.06	0.00
Concert				1.33	1.31	0.01	1.61	1.65	0.04
Car-pooling	1.68	1.69	0.01						
Car-pooling booked over platform				0.47	0.46	0.00	0.54	0.53	0.00
Car-pooling with relatives				1.22	1.24	0.02	1.10	1.14	0.04
Taxi				1.73	1.72	0.01	1.08	1.08	0.00
Short-distance bus	0.65	0.65	0.00	0.56	0.56	0.00	0.79	0.78	0.00
Tram	0.77	0.77	0.00	0.83	0.83	0.00	0.86	0.85	0.01

Metro	1.05	1.05	0.00	1.28	1.31	0.03	1.13	1.13	0.00
Short-distance train	0.67	0.66	0.00	0.93	0.95	0.02	0.88	0.88	0.00
Travel in different region	0.74	0.74	0.00	0.70	0.72	0.01	0.81	0.82	0.01
Travel abroad	1.30	1.30	0.00	1.68	1.68	0.00	1.15	1.18	0.02
Airplane	1.75	1.74	0.00	1.28	1.28	0.00	1.07	1.04	0.02
Long-distance train	1.83	1.84	0.00	1.42	1.39	0.02	1.38	1.38	0.00
Long-distance bus	0.68	0.69	0.01	1.07	1.08	0.00	1.29	1.32	0.03
Boat travel	1.38	1.38	0.00	1.27	1.19	0.07	1.31	1.34	0.03
Retail, shops	0.54	0.54	0.00						
Supermarket				0.55	0.56	0.00	0.57	0.57	0.00
Mall				0.77	0.78	0.00	0.73	0.74	0.01
Convenience store				1.11	1.11	0.00	1.16	1.17	0.00
Market				0.86	0.86	0.00	0.88	0.88	0.00
Other retail facility				0.76	0.78	0.01	0.70	0.71	0.00
Hairdresser				0.50	0.50	0.00	0.62	0.62	0.00
Beauty salon				0.81	0.82	0.00	0.74	0.75	0.00
Take-away order				1.25	1.23	0.01	1.13	1.13	0.00
Delivery order				0.92	0.91	0.00	0.84	0.84	0.00
Indoor sports	0.88	0.91	0.02	1.10	1.09	0.00	1.00	1.02	0.01
Gymnastics facility				0.66	0.64	0.01	0.95	0.95	0.00
Outdoor sports practice				0.74	0.73	0.01	0.73	0.72	0.00
Indoor martial arts facility				0.69	0.69	0.00	0.93	0.94	0.01
Swimming pool	0.59	0.60	0.01	0.90	0.92	0.02	0.93	0.95	0.01
Healthcare worker	2.65	2.56	0.08	1.46	1.47	0.00	1.08	1.03	0.05
Bar	0.53	0.56	0.02	1.04	1.07	0.03	0.82	0.87	0.04
Restaurant	0.44	0.45	0.01	0.88	0.87	0.00	0.92	0.94	0.02
Party	1.45	1.68	0.23						
Night-club				3.18	3.34	0.16	1.38	1.49	0.11
Private party				0.69	0.73	0.04	0.74	0.78	0.04

# ETUDE CAWI Hors panel

GAME CHANGERS



## CAS TEMOINS COVID-19

21-102540-01

INSTITUT PASTEUR

Version 14 du 14/04/22

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Ce questionnaire a été rédigé selon les standards Qualité d'Ipsos France.  
*Il a été relu et validé par* : Faïza Omar, Directrice d'Etudes



24/03/2022

**QUESTIONNAIRE PRINCIPAL****A TOUS****SINGLE****QCIBLE**

1. CIBLE A = CAS INDEX (Recrutés par la CNAM)
2. CIBLE B = PROCHES (Invités par le cas)
3. CIBLE C = TEMOIN DISTANT (Recrutés par Ipsos)
4. CIBLE D = TEMOIN PERSONNEL SOIGNANT

**POSER SI CIBLE A (QCIBLE =1)****SINGLE****INTRO**

Bonjour,

Nous vous sollicitons aujourd'hui pour participer à une étude scientifique réalisée par l'équipe de recherche de l'Institut Pasteur. Cette étude est menée en partenariat avec la Caisse Nationale d'Assurance Maladie (CNAM), Santé Publique France et l'institut Ipsos.

Votre participation est importante pour aider à mieux comprendre comment les personnes atteintes par la COVID-19 ont été infectées. Nous posons les mêmes questions à des personnes atteintes par la COVID-19 et à des personnes qui ne le sont pas.

Avant de répondre au questionnaire, nous vous invitons à lire la note d'information et à indiquer votre accord pour y participer. Vous devrez confirmer avoir pris connaissance de la note d'information et accepter de participer à l'étude pour continuer vers le questionnaire.

Afin de pouvoir répondre au questionnaire, l'utilisation de l'un des navigateurs internet suivants est indispensable : Chrome, Firefox, Edge ou Safari.

**INSERTION DE LA NOTE D'INFORMATION AVEC POSSIBILITE DE LA TELECHARGER**

1. Je confirme avoir pris connaissance de la note d'information et accepte de participer à l'étude.

**A TOUS (QCIBLE =1)****SINGLE****Q0A**

Avez-vous déjà répondu à ce questionnaire au cours des 2 derniers mois ?

 Une seule réponse possible

1. Oui → **STOP INTERVIEW ALLER A « FINQ0 »**
2. Non

**A TOUS (QCIBLE =1)**

SINGLE

**Q0A\_2**

Faites-vous l'objet d'une mesure de protection juridique (sauvegarde de justice, curatelle, curatelle renforcée, tutelle, ...) ?

 Une seule réponse possible

1. Oui → **STOP INTERVIEW ALLER A « QFINA »**
2. Non

**A TOUS (QCIBLE =1)**

SINGLE

**Q0A\_3**

La personne positive au Covid-19 (pour qui vous remplissez le questionnaire ou vous-même) est-elle majeure ?

 Une seule réponse possible

1. Oui
2. Non → **STOP INTERVIEW ALLER A « QFINA »**

**REPRISE DE LA QDROIT ACTUALISEE****A TOUS (QCIBLE=1, CAS)**

SINGLE

**QDROITA**

Voici votre numéro identifiant. Merci de le conserver précieusement.

**[affichage de l'identifiant]-ComCor**

Il est indispensable dans l'hypothèse où vous souhaiteriez exercer vos droits sur vos données à caractère personnel, sans celui-ci nous ne pourrions pas identifier votre questionnaire. Il devra être précisé avec l'objet de votre demande dans le cas où vous prendriez contact avec le délégué à la protection des données de l'Institut Pasteur :

par voie postale à l'adresse suivante :

Institut Pasteur Direction juridique  
28 rue du Docteur Roux  
75 724 Paris Cedex 15 France

OU par courriel adressé à [dpo@pasteur.fr](mailto:dpo@pasteur.fr)

Souhaitez-vous recevoir votre identifiant par courriel ? Votre adresse électronique sera supprimée dès l'envoi de votre identifiant.

1. Oui

2. Non

**REPRISE DE LA QDROIT ACTUALISEE**  
**SI QDROITA = 1 (OUI)**

MAIL

QDROIT2A

Merci de bien vouloir indiquer votre adresse électronique afin que nous puissions vous envoyer votre identifiant par courriel dans les 24 heures :

- SQ1. Veuillez saisir votre adresse électronique  
SQ2. Veuillez de nouveau saisir votre adresse électronique

**SI ADRESSE SQ1 <> SQ2 ALORS AFFICHER**

« Les adresses électroniques sont différentes. Merci de bien vouloir saisir à nouveau votre adresse électronique. »

**ENVOI MAIL AUTOMATIQUE AVEC ID**

**PARTIE I : QUESTIONNAIRE PRELIMINAIRES**

**POSER SI QCIBLE=1, CAS INDEX**

**A : QUESTIONS AUPRES DES CAS INDEX**

**A TOUS (QCIBLE=1, CAS INDEX)**

SINGLE

CA1

EN DEHORS DE VOTRE EPISODE ACTUEL DE COVID-19 : Avez-vous, par le passé, déjà été diagnostiqué positif/ve pour la maladie COVID-19 ?

 Une seule réponse possible

1. Oui
2. Non

**SI CA1 = 1**

TEXT

CA2

Vous avez déclaré avoir déjà été diagnostiqué positif/ve pour la maladie COVID-19.  
Les questions suivantes portent sur la/les contamination(s) AVANT celle(s) que vous avez actuellement.

**SI CA1= 1**

MULTIPLE

CA3

Vous avez déclaré avoir déjà été diagnostiqué(e) positif/ve par le passé, EN DEHORS DE VOTRE EPISODE ACTUEL DE COVID-19 : était-ce... ?

 Plusieurs réponses possibles





1. A la suite d'un test virologique sur prélèvement de nez ou de gorge ou salivaire
2. A la suite de recherches d'anticorps dans le sang (sérologie)
3. Après un avis médical sans confirmation biologique

**SI CA3= 1**

SINGLE

**CA4****CONCERNANT VOTRE ANCIEN EPISODE DE COVID-19 : Quand avez-vous réalisé le test virologique sur prélèvement de nez ou de gorge ou salivaire ?**

-  Si vous avez réalisé plusieurs tests, merci d'indiquer la date du test qui s'est révélé positif.
-  Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative



**Test de cohérence : la date indiquée doit être antérieure à la date du jour**

1. MM/ AAAA
2. Vous ne savez pas

**SI CA3= 2**

SINGLE

**CA5****CONCERNANT VOTRE ANCIEN EPISODE DE COVID-19 : Quand avez-vous réalisé la recherche d'anticorps dans le sang (sérologie) ?**

-  Si vous avez réalisé plusieurs tests, merci d'indiquer la date du test qui s'est révélé positif.
-  Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative



**Test de cohérence : la date indiquée doit être antérieure à la date du jour**

1. MM/ AAAA
2. Vous ne savez pas

**SI CA3= 3**

SINGLE

**CA6****CONCERNANT VOTRE ANCIEN EPISODE DE COVID-19 : Quand avez-vous eu l'avis médical (sans confirmation biologique) ?**

-  Si vous avez eu plusieurs épisodes, merci d'indiquer la date du premier épisode.
-  Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**Test de cohérence : la date indiquée doit être antérieure à la date du jour**

1. MM/ AAAA
2. Vous ne savez pas

**SI CA1= 1**

SINGLE

**CA6BIS****CONCERNANT VOTRE ANCIEN EPISODE DE COVID-19 : Votre état de santé a-t-il nécessité une hospitalisation ?**

1. Oui
2. Non

## SI Q0A\_2=1

TEXTE

## QFINA

Nous vous remercions de votre participation.  
Malheureusement, vous n'êtes pas éligible pour poursuivre l'étude.  
En vous renouvelant tous nos remerciements pour votre participation à cette étude.

## A TOUS (QCIBLE=1, CAS INDEX)

MULTIPLE

## CA6B

[Afficher si CA1=1 « Les questions suivantes portent sur votre contamination actuelle. »]  
Grâce à quel type de test diagnostique avez-vous été diagnostiqué ou dépisté positif de Covid-19 ?

 Plusieurs réponses possibles

## ROTATION ALEATOIRE CODES 1 ET 2


1. Test PCR (résultat généralement après plusieurs heures minimum)
2. Test Antigénique (résultat généralement après 15-30 minutes)
3. Vous ne savez pas [Exclusif]

## A TOUS (QCIBLE=1, CAS INDEX)

SINGLE

## CA6B\_2

[Afficher si CA1=1 « Les questions suivantes portent sur votre contamination actuelle. »]  
Avez-vous été contaminé(e) par ...?

 Une seule réponse possible

1. Le virus d'origine (celui qui est arrivé en France en 2020)
2. Le nouveau variant dit « Anglais »
3. Le nouveau variant dit « Sud africain/Brésilien »
6. Le nouveau variant dit « Indien »
5. Autre nouveau variant
4. Vous ne savez pas [Toujours à présenter en dernier]

## POSER SI CA6B=1

MULTIPLE

## CA6B\_3

[Afficher si CA1=1 « Les questions suivantes portent sur votre contamination actuelle. »]  
Par quel(le) variant/mutation avez-vous été contaminé(e) ?  
La spécificité de la mutation est indiquée sur la feuille de résultat. Cette information est très importante afin d'aider l'Institut Pasteur à mieux comprendre la transmission du virus.

Plusieurs réponses possibles

Un seul variant peut être sélectionné

**LES CODES 10, 11 ET 13 NE PAS PERMETTRE DE SELECTIONNER LES CODES 10, 11 ET 13. ILS SERVENT A ESPACER LES BLOCS D'ITEMS.**

10. SI LES RESULTATS SONT EXPRIMES SOUS FORME DE VARIANT : **(NE PAS VALIDER)**
1. Le virus d'origine (celui qui est arrivé en France en 2020)
  2. Le variant « Anglais » / variant Alpha
  3. Le variant Beta ou Gamma
  4. Le variant « Indien » / variants Delta ou Kappa
  14. Le nouveau variant Omicron
  8. Autre variant
11. SI LES RESULTATS SONT EXPRIMES SOUS FORME DE MUTATION : **(NE PAS VALIDER)**
5. La mutation E484K
  6. La mutation E484Q
  7. La mutation L452R
  15. Mutation(s) K417N et/ou DEL69/70 et/ou S371L-S373P et/ou Q493R
  12. Aucune mutation n'a été détectée **[EXCLUSIF]**
  13. CODE A BLANC **(NE PAS VALIDER)**
  9. Vous ne savez pas **[EXCLUSIF]**

**SI PLUSIEURS REPONSES PARMIS LES CODES 1, 2, 3, 4 OU 8 OU 14 ALORS FAIRE APPARAÎTRE LE MESSAGE SUIVANT : « VOUS NE POUVEZ PAS SELECTIONNER PLUSIEURS VARIANTES ».**

**NE PAS PASSER A LA QUESTION SUIVANTE SI PLUSIEURS REPONSES PARMIS LES CODES 1, 2, 3, 4 OU 8 OU 14**

**SI AU MOINS UNE REPONSE PARMIS LES CODES 1, 2, 3, 4 OU 8 OU 14 ET UNE REPONSE PARMIS LES CODES 5, 6, 7 OU 12 OU 15 ALORS FAIRE APPARAÎTRE LE MESSAGE SUIVANT : « VOUS NE POUVEZ PAS SELECTIONNER UN TYPE DE VARIANT ET UN TYPE DE MUTATION ».**

**NE PAS PASSER A LA QUESTION SUIVANTE SI UNE REPONSE PARMIS 1, 2, 3, 4 OU 8 OU 14 ET UNE REPONSE PARMIS 5, 6, 7 OU 12 OU 15**

### A TOUS (CIBLE A)

SINGLE

#### CA6B\_4

Avez-vous réalisé un ou plusieurs autotest(s) dans les 3 jours qui ont précédé votre test diagnostique en laboratoire ou en pharmacie ou chez un professionnel de santé ?

 Une seule réponse possible

1. Oui, un seul
2. Oui, plusieurs
3. Non

### SI CA6B\_4=1 OU 2

MULTIPLE

#### CA6B\_4

Pourquoi avez-vous réalisé **[Si CA6B\_4=1 alors afficher : cet autotest / Si CA6B\_4=2 alors afficher : ces autotests] ?**

 Plusieurs réponses possibles

#### ROTATION ALEATOIRE DES CODES 1 A 9

1. Car j'avais des symptômes

2. Car j'étais personne contact
3. Car je voulais participer à un événement
4. Car je voulais rencontrer des proches à risque
5. Car c'était demandé dans le cadre de mon travail
6. J'en fais régulièrement de façon systématique
7. Car le délai était trop long pour un test en pharmacie ou laboratoire
8. Car j'avais peur d'être contaminé(e) en pharmacie ou en laboratoire
9. Car j'avais peur de contaminer des personnes en allant en pharmacie ou en laboratoire
10. Pour une autre raison

**CA6B\_4=1 OU 2**

SINGLE

**CA6B\_5****[Si CA6B\_4=1 alors afficher : L'autotest / Si CA6B\_4=2 alors afficher : Un de ces autotests] était-il positif ?** Une seule réponse possible

1. Oui
2. Non

**CA6B\_5=1**

MULTIPLE

**CA6B\_6****Pourquoi avez-vous confirmé le ou les autotests positifs en laboratoire ou en pharmacie ou auprès d'un professionnel de santé ?** Plusieurs réponses**ROTATION ALEATOIRE DES CODES 1 A 5**

1. Pour une prise en charge médicale éventuelle
2. Pour m'isoler de mes proches
3. Pour l'inscrire dans mon pass sanitaire / vaccinal
4. Pour obtenir un arrêt de travail
5. Pour suivre les recommandations sanitaires
6. Pour une autre raison

**CA6B\_5=1**

SINGLE

**CA6B\_7****Combien de jours se sont-ils écoulés entre votre autotest positif et votre test de confirmation ?** Une seule réponse possible

1. Le jour même
2. Un jour
3. Deux jours
4. Trois jours
5. Plus de trois jours

**A TOUS (QCIBLE=1, CAS INDEX)**

SINGLE

**CA6\_2****[Afficher si CA1=1 « Les questions suivantes portent sur votre contamination actuelle. »]****Avez-vous présenté des symptômes évocateurs de COVID-19 (fièvre, toux, douleur de gorge, mal de tête, courbatures inhabituelles, perte de goût ou d'odorat, ...) ?** *Une seule réponse possible*

1. Oui
2. Non

**A TOUS (QCIBLE=1, CAS INDEX)**

MULTIPLE

**CA7****[Afficher si CA1=1 « Les questions suivantes portent sur votre contamination actuelle. »]****Pour quelles raisons avez-vous effectué un test diagnostique pour la Covid-19 ?** *Plusieurs réponses possibles*

1. Vous avez eu des symptômes évocateurs de COVID-19 (fièvre, toux, douleur de gorge, mal de tête, courbatures inhabituelles, perte de goût ou d'odorat, ...) **(afficher si CA6\_2=1)**
2. Vous avez été en contact avec une personne confirmée atteinte de COVID-19
3. Vous avez été en contact avec une personne suspecte de COVID-19
4. Vous avez réalisé un dépistage systématique (professionnel, voyage, aéroport, campagne de dépistage, dépistage préopératoire, etc.)
5. Pour vous rassurer et/ou rassurer vos proches
6. Vous avez été notifié par l'application Tous anti Covid
7. Pour d'autres raisons

**SI CA7 = 2**

SINGLE

**CA8****Vous avez déclaré avoir été en contact avec une personne confirmée atteinte de COVID-19.****La Caisse Nationale d'Assurance Maladie (CNAM) ou votre médecin traitant vous ont-t-ils contacté(e) pour vous prévenir que vous étiez personne contact?** *Une seule réponse possible*

1. Oui
2. Non

**A TOUS**

SINGLE

**CA8BIS****La Caisse Nationale d'Assurance Maladie (CNAM) ou votre médecin traitant vous ont-t-ils contacté(e) après avoir été déclaré positif au Covid-19 ?** *Une seule réponse possible*

1. Oui
2. Non

## NOUVELLE QUESTION

A TOUS

SINGLE

CA8C

Avez-vous utilisé le téléservice « lister mes cas contacts » pour déclarer en ligne vos cas contacts ?

1. Oui
2. Non

## NOUVELLE QUESTION

SI CA8C =1

MULTIPLE

CA8D1

Quelle appréciation portez-vous sur ce téléservice ?

 Plusieurs réponses possibles

1. Il est simple d'utilisation
2. Il est rapide d'utilisation
3. Il n'est pas simple d'utilisation.
4. Il n'est pas rapide d'utilisation.
5. Ne sait pas [EXCLUSIF]

NE PAS POUVOIR COCHER LES ITEMS 1 ET 3 EN MEME TEMPS ET PAREIL POUR LES ITEMS 2 ET 4

## NOUVELLE QUESTION

SI CA8D1 = 3 OU 4

NON OBLIGATOIRE

OPEN

CA8D2

Que faudrait-il améliorer ?

| \_\_\_\_\_ |

## NOUVELLE QUESTION

SI CA8C =2

MULTIPLE

CA8E

Pourquoi n'avez-vous pas utilisé ce téléservice ?

 Plusieurs réponses possibles

1. J'ai été appelé par l'Assurance Maladie
2. Je n'ai pas de cas contacts
3. Je ne savais pas que ce téléservice existait
4. Le téléservice est trop complexe
5. Son utilisation est trop longue
6. Autres raison, préciser : | \_\_\_\_\_ |
7. Ne sait pas [EXCLUSIF]

**A MASQUER****SI CA8BIS=1****SINGLE****CA8\_1**

Vous a-t-on proposé la visite à domicile d'un(e) infirmier(e) libéral(e) pendant votre isolement (appel de l'Assurance maladie, médecin traitant, pharmacien, etc.) ?

Une seule réponse possible

1.  Oui
2.  Non

**A MASQUER****SI CA8\_1=1****SINGLE****CA8\_2**

Avez-vous accepté cette visite à domicile ?

Une seule réponse possible

1.  Oui
2.  Non

**A MASQUER****SI CA8\_2=2****MULTIPLE****CA8\_2B**

Pourquoi avez-vous refusé cette visite à domicile ?

Plusieurs réponses possibles

**ROTATION ALEATOIRE CODES 2 A 6**

1.  Je suis personnel soignant [**EXCLUSIF**]
2.  Les consignes données au téléphone étaient claires
3.  Je vis seul(e) et n'ai pas besoin d'aide ou de conseil
4.  Je ne souhaite pas recevoir un(e) infirmier(e) à mon domicile
5.  Je suis conseillé(e) par mon médecin traitant
6.  Je ne compte pas respecter strictement la période d'isolement

**A MASQUER****SI CA8\_2=1****SINGLE****CA8\_3**

Cette visite à domicile a-t-elle eu lieu ?

Une seule réponse possible

1.  Oui
2.  Non



**A MASQUER****SI-CAS\_3=1****SINGLE****CAS\_4****Cette visite à domicile vous a-t-elle semblé utile ?** *Une seule réponse possible*

1. ~~Oui~~
2. ~~Non~~

**A MASQUER****SI-CAS\_4-1****MULTIPLE****CAS\_4A****Pour quelles raisons avez-vous trouvé cette visite à domicile utile ?** *Plusieurs réponses possibles***ROTATION ALEATOIRE CODES 1 A 4**

1. ~~L'infirmier(e) m'a donné des conseils utiles~~
2. ~~L'infirmier(e) a pu procéder aux tests des membres de ma famille~~
3. ~~L'infirmier(e) a pu me rassurer et lever mes craintes~~
4. ~~L'infirmier(e) m'a aidé(e) à identifier mes besoins d'accompagnement~~
5. ~~Autres raisons~~

**A MASQUER****SI-CAS\_4=2****MULTIPLE****CAS\_4B****Pour quelles raisons avez-vous trouvé cette visite à domicile inutile ?** *Plusieurs réponses possibles***ROTATION ALEATOIRE CODES 1 A 5**

1. ~~La visite de l'infirmier(e) est intervenue trop tard~~
2. ~~L'infirmier(e) n'a pas voulu procéder aux tests des membres de ma famille~~
3. ~~L'infirmier(e) n'a pas pu répondre à mes questions~~
4. ~~L'infirmier(e) ne m'a pas apporté d'informations nouvelles~~
5. ~~Je n'ai pas la possibilité de mettre en œuvre les recommandations de l'infirmier(e)~~
6. ~~Autres raisons~~

**A TOUS (QCIBLE=1, CAS INDEX)****SINGLE****CA9****Pourriez-vous nous indiquer la date [AFFICHAGE DES SOUS-QUESTIONS]** *Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative***PRESENTER EN SOUS QUESTION – POSSIBILITE DE CODER NSP**

- SQ1. d'apparition des premiers symptômes (**afficher si CA6\_2=1**)  
 SQ2. à laquelle vous avez été contacté par la Caisse Nationale d'Assurance Maladie (CNAM) ou par votre médecin traitant pour vous prévenir que vous étiez personne contact (**afficher si CA8=1**)  
 SQ3. à laquelle vous avez effectué le test  
 SQ4. des résultats du test  
 SQ5. de la notification par l'application Tous anti Covid (**afficher si CA7=6**)

1. JJ/MM/ AAAA
2. Vous ne savez pas

**SQ1 A SQ5: LA DATE DOIT ETRE ANTERIEURE A LA DATE DU JOUR**

**SQ4 : LA DATE DOIT ETRE POSTERIEURE A LA SQ3**

**A TOUS (QCIBLE=1, CAS INDEX)**

SINGLE

**CA9B**

**Avez-vous été vacciné contre la COVID-19 ?**

 Une seule réponse possible

1. ~~Oui, partiellement (une seule injection)~~
2. ~~Oui, avec un protocole complet (2 injections)~~
3. ~~Non~~
4. ~~Ne souhaite pas répondre~~

**A TOUS (QCIBLE=1, CAS INDEX)**

SINGLE

**CA9B2**

**Avez-vous été vacciné contre la COVID-19 ?**

 Une seule réponse possible

1. Oui
2. Non
3. Ne souhaite pas répondre

**SI CA9B2=1**

SINGLE

**CA9B3**

**Combien d'injections vaccinales contre COVID-19 avez-vous reçues?**

Une seule réponse possible

**MASQUER CODE 5**

1. Une seule injection
2. Deux injections
3. Trois injections
4. Quatre injections
5. Cinq injections

**SI CA9B=1 OU 2**

SINGLE

**CA9C**

Pourriez-vous nous indiquer la date **[Afficher si CA9B=1 « de l'injection » ; Afficher si CA9B=2 « de la dernière injection »]**

1. ~~Affichage d'un calendrier avec la possibilité de répondre NSP~~
2. ~~Vous ne savez pas~~

**SI CA9B2=1****SINGLE****CA9C2**

Pourriez-vous nous indiquer la date ... ?

 *Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative*

**AFFICHER SQ2 SI CA9B3=2 OU 3 OU 4 OU 5**

**AFFICHER SQ3 SI CA9B3=3 OU 4 OU 5**

**AFFICHER SQ4 SI CA9B3=4 OU 5**

**AFFICHER SQ5 SI CA9B3= 5**

**MASQUER SQ5**

**SQ1 A SQ5: LA DATE NE DOIT PAS ETRE POSTERIEURE A LA DATE DU JOUR**

**SQ2 : LA DATE DOIT ETRE POSTERIEURE A LA SQ1**

**SQ3 : LA DATE DOIT ETRE POSTERIEURE A LA SQ2 ET SQ1**

**SQ4 : LA DATE DOIT ETRE POSTERIEURE A LA SQ3, SQ2 ET SQ1**


**SQ5 : LA DATE DOIT ETRE POSTERIEURE A LA SQ4, SQ3, SQ2 ET SQ1**

- SQ1. Afficher «de l'injection » si CA9B3=1 // Afficher « de la première injection » si CA9B3=2 ou 3 ou 4 ou 5
- SQ2. Afficher «de la dernière injection » si CA9B3=2 // Afficher « de la deuxième injection» si CA9B3=3 ou 4 ou 5
- SQ3. Afficher «de la dernière injection » si CA9B3=3 // Afficher « de la troisième injection» si CA9B3=4 ou 5
- SQ4. Afficher «de la dernière injection » si CA9B3=4 // Afficher « de la quatrième injection» si CA9B3=5
- SQ5. « de la dernière injection » si CA9B3=5

1. Affichage d'un calendrier avec la possibilité de répondre NSP
2. Vous ne savez pas

**SI CA9B=1 OU 2****SINGLE****CA9D**

**Avec quel vaccin avez-vous été vacciné contre la COVID-19?**

 *Une seule réponse possible*

**ROTATION DES REPONSES SAUF POUR L'ITEM 5 QUI RESTE EN DERNIER**

1. Pfizer
2. Moderna
3. Astrazeneca
4. Johnson and Johnson
5. Je ne sais pas

SI CA9B2=1

SINGLE

CA9D1

Avec quel vaccin avez-vous été vacciné contre la COVID-19 lors de votre ...?

 Une seule réponse possible

AFFICHER SQ2 SI CA9B3=2 OU 3 OU 4 OU 5

AFFICHER SQ3 SI CA9B3=3 OU 4 OU 5

AFFICHER SQ4 SI CA9B3=4 OU 5

AFFICHER SQ5 SI CA9B3=5

MASQUER SQ5

- SQ1. Afficher «injection » si CA9B3=1 // Afficher «première injection » si CA9B3=2 ou 3 ou 4 ou 5  
 SQ2. Afficher «dernière injection » si CA9B3=2 // Afficher « deuxième injection» si CA9B3=3 ou 4 ou 5  
 SQ3. Afficher «dernière injection » si CA9B3=3 // Afficher « troisième injection» si CA9B3=4 ou 5  
 SQ4. Afficher «dernière injection » si CA9B3=4 // Afficher « quatrième injection» si CA9B3=5  
 SQ5. « dernière injection » si CA9B3=5

ROTATION DES REPONSES SAUF POUR L'ITEM 5 ET 6 QUI RESTENT EN DERNIER

1. Pfizer
2. Moderna
3. Astrazeneca
4. Janssen
5. Je ne sais pas
6. Autre vaccin **[A PLACER AVANT LE CODE 5]**
7. Novavax

A MASQUER

SI CA9B3=1 ou 2

SINGLE

CA9D2

Une injection supplémentaire contre la COVID-19 est-elle prévue ?

1. Oui
2. Non

A TOUS

SINGLE

## CA9D3

Suivez-vous un traitement prophylactique contre le SARS-CoV-2 (anticorps monoclonaux tels que Ronapreve ou Evushield) ?

1. Oui
2. Non
3. Ne souhaite pas répondre

SI CA9D3=1

SINGLE

## CA9D4

Plus précisément, quel traitement par anticorps monoclonaux suivez-vous ?

 Une seule réponse possible

1. **RONAPREVE** (casirivimab/imdevimab) du laboratoire Roche
2. **EVUSHELD** (tixagévimab/cilgavimab) du laboratoire AstraZeneca
3. Je ne sais pas
4. Ne souhaite pas répondre

A TOUS (QCIBLE=1, CAS INDEX)

SINGLE

## CA10

[Afficher si CA1=1 « Les questions suivantes portent sur votre contamination actuelle. »]

Vous êtes-vous placé en isolement vis-à-vis des personnes extérieures à votre foyer ? (Port du masque, limitation du contact avec ses proches, pratique du télétravail, limitation des sorties à l'extérieur du domicile, etc.)

1. Non
2. Oui


SI CA10=2

SINGLE

## CA11

[Afficher si CA1=1 « Les questions suivantes portent sur votre contamination actuelle. »]

Quand vous êtes-vous placé en isolement vis-à-vis des personnes extérieures à votre foyer ?

 Une seule réponse possible

1. Dès l'apparition des premiers symptômes [Afficher si CA6\_2=1]
2. Dès la réalisation du test
3. Dès le résultat du test
4. Dès l'identification d'un contact avec un cas de Covid-19 [Afficher si CA7=2 ou 3]
5. Autre

SI CA11=4 OU 5

SINGLE

## CA11\_2

[Afficher si CA1=1 « Les questions suivantes portent sur votre contamination actuelle. »]

Plus précisément, à quelle date vous êtes-vous placé en isolement vis-à-vis des personnes extérieures à votre foyer ?

 Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

1. JJ/MM/ AAAA
2. Vous ne savez pas

**LA DATE DOIT ETRE ANTERIEURE A LA DATE DU JOUR**

**AFFICHER UN CALENDRIER**

**SI CA10=2**

**MULTIPLE**

**CA12**

**[Afficher si CA1=1 « Les questions suivantes portent sur votre contamination actuelle. »]**

Quelles mesures parmi les suivantes avez-vous mis en place ?

 Plusieurs réponses possibles

**ROTATION ALEATOIRE CODES 1 A 4**

1. Limitation des déplacements au strict nécessaire
2. Eviter les contacts avec les personnes à risque
3. Port du masque en cas de contact avec toute autre personne
4. Lavage des mains régulier
5. Aucune de ces mesures **[Exclusif]**

**A TOUS (QCIBLE=1, CAS INDEX)**

**SINGLE**

**CA13**

**[Afficher si CA1=1 « Les questions suivantes portent sur votre contamination actuelle. »]**

Avez-vous mis en place une ou des mesures d'isolement vis-à-vis des personnes de votre foyer ? (Exemple : port du masque systématique dans votre logement, pièce de vie ou de couchage séparée, etc.)

1. Oui
2. Non
3. Je vis seul(e) / Je vis seul(e) le temps de mon isolement

**SI CA13=1**

**SINGLE**

**CA14**

**[Afficher si CA1=1 « Les questions suivantes portent sur votre contamination actuelle. »]**

Quand vous êtes-vous placé en isolement vis-à-vis des personnes de votre foyer ?

 Une seule réponse possible

1. Dès l'apparition des premiers symptômes **[Afficher si CA6\_2=1]**
2. Dès la réalisation du test
3. Dès le résultat du test
4. Dès l'identification d'un contact avec un cas de Covid-19 **[Afficher si CA7=2 ou 3]**
5. Autre

**SI CA14=4 OU 5**

SINGLE

## CA14\_2

[Afficher si CA1=1 « Les questions suivantes portent sur votre contamination actuelle. »]

Plus précisément, à quelle date vous êtes-vous placé en isolement vis-à-vis des personnes de votre foyer ?

 Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

3. JJ/MM/ AAAA
4. Vous ne savez pas

**LA DATE DOIT ETRE ANTERIEURE A LA DATE DU JOUR**


**AFFICHER UN CALENDRIER**

**SI CA13 = 1**

SINGLE

## CA15

Quelles mesures d'isolement avez-vous mises en place entre vous et les personnes de votre foyer ?

 Une seule réponse possible par proposition

**MENU DEROULANT**

**ROTATION ALEATOIRE DES SQ**

**SQ1. Chambre isolée**

1. Oui
2. Non
3. Nous ne dormons pas dans la même chambre en temps normal

**SQ2. Prise des repas seul(e)**

1. Oui
2. Non
3. Nous ne prenons pas nos repas ensemble en temps normal

**SQ3. Toilettes et salle de bains séparées**

1. Oui
2. Non
3. Nous utilisons des toilettes et salle de bains séparées en temps normal.

**SQ4. Port du masque systématique**

1. Oui
2. Non

**SQ5. Nettoyage des surfaces, poignées... avec des produits désinfectants**

1. Oui
2. Non

**SQ6. Aération des locaux pendant 10 à 15 minutes au moins 2 fois par jour**

1. Oui
2. Non

**POSER SI QCIBLE=2**



## B : QUESTIONS AUPRES DES PROCHES

## A TOUS (QCIBLE=2, PROCHES)

SINGLE

## INTROB

Bonjour,

Nous vous sollicitons aujourd'hui pour participer à une étude scientifique réalisée par l'équipe de recherche de l'Institut Pasteur. Cette étude est menée en partenariat avec la Caisse Nationale d'Assurance Maladie (CNAM), Santé Publique France et l'institut Ipsos.

Votre participation est importante pour aider à mieux comprendre comment les personnes atteintes par la COVID-19 ont été infectées. Nous posons les mêmes questions à des personnes atteintes par la COVID-19 et à des personnes qui ne le sont pas.

Avant de répondre au questionnaire, nous vous invitons à lire la note d'information et à indiquer votre accord pour y participer. Vous devrez confirmer avoir pris connaissance de la note d'information et accepter de participer à l'étude pour continuer vers le questionnaire.

Afin de pouvoir répondre au questionnaire, l'utilisation de l'un des navigateurs internet suivants est indispensable : Chrome, Firefox, Edge ou Safari.

## INSERTION DE LA NOTE D'INFORMATION AVEC POSSIBILITE DE LA TELECHARGER

1. Je confirme avoir pris connaissance de la note d'information et accepte de participer à l'étude.

## A TOUS (QCIBLE=2, PROCHES)

SINGLE

## Q0B

Avez-vous déjà répondu à ce questionnaire ?

 Une seule réponse possible

1. Oui → **STOP INTERVIEW ALLER A « FINQ0 »**
2. Non

## A TOUS (QCIBLE=2, PROCHES)

SINGLE

## Q0B\_2

Faites-vous l'objet d'une mesure de protection juridique (sauvegarde de justice, curatelle, curatelle renforcée, tutelle, ...) ?

 Une seule réponse possible

1. Oui → **STOP INTERVIEW ALLER A « QFINB1 »**
2. Non

**REPRISE DE LA QDROIT ACTUALISEE  
A TOUS (QCIBLE=2, PROCHES)**

SINGLE

**QDROITB**

Voici votre numéro identifiant. Merci de le conserver précieusement.

[affichage de l'identifiant]-ComCor

Il est indispensable dans l'hypothèse où vous souhaiteriez exercer vos droits sur vos données à caractère personnel, sans celui-ci nous ne pourrions pas identifier votre questionnaire. Il devra être précisé avec l'objet de votre demande dans le cas où vous prendriez contact avec le délégué à la protection des données de l'Institut Pasteur :

par voie postale à l'adresse suivante :

Institut Pasteur Direction juridique  
28 rue du Docteur Roux  
75 724 Paris Cedex 15 France

OU par courriel adressé à [dpo@pasteur.fr](mailto:dpo@pasteur.fr)

Souhaitez-vous recevoir votre identifiant par courriel (dans les 24 heures) ? Votre adresse électronique sera supprimée dès l'envoi de votre identifiant.

1. Oui
2. Non

**A TOUS (QCIBLE=2, PROCHES)**

SINGLE

**CB1**

L'invitation pour participer à cette étude vient-elle de la personne diagnostiquée positive à votre domicile ?

 Une seule réponse possible

1. Oui et vous vivez avec cette personne
2. Oui mais vous ne vivez pas avec cette personne → **STOP INTERVIEW**
3. Non → **STOP INTERVIEW**
4. Vous ne savez pas → **STOP INTERVIEW**

**SI Q0B\_2=1 OU CB1=2 OU 3 OU 4**

TEXTE

**QFINB1**

Nous vous remercions de votre participation.

Malheureusement, vous n'êtes pas éligible pour poursuivre l'étude.

En vous renouvelant tous nos remerciements pour votre participation à cette étude.

**A TOUS (QCIBLE=2, PROCHES)**

SINGLE

**CB2**

Suite au diagnostic de cette personne, avez-vous réalisé un test de recherche de COVID-19 par prélèvement de nez ou de gorge ?

 Une seule réponse possible

1. Oui
2. Non mais je projette d'en réaliser dans les prochains jours
3. Non et je ne souhaite pas en réaliser => **ALLER STOP QFINB2**

**SI CB2 = 2**

FIN

**CB3**

Pour les besoins de l'étude, nous avons besoin que vous réalisiez le test de recherche de COVID-19 par prélèvement de nez ou de gorge.

Une fois le test réalisé et le résultat en votre possession, vous pourrez reprendre le questionnaire. Pour ce faire, il vous suffira de cliquer à nouveau sur le lien qui se trouve dans le mail d'invitation.

Les questions auxquelles vous aurez déjà répondu seront sauvegardées. Il vous suffira simplement de revenir à la question précédente à l'aide de la flèche située ci-dessous et d'actualiser votre dernière réponse.

**SI CB2 = 1**

MULTIPLE

**CB3B**

Grâce à quel type de test diagnostique avez-vous été diagnostiqué ou dépisté positif de pour le Covid COVID-19 ?

 Plusieurs réponses possibles

**ROTATION ALEATOIRE CODES 1 A 2**


1. Test PCR (résultat généralement après plusieurs heures minimum)
2. Test Antigénique (résultat généralement après 15-30 minutes)
3. Vous ne savez pas [Exclusif]

**SI CB2 = 1**

SINGLE

**CB4**

Et à quelle date avez-vous réalisé ce test par prélèvement de nez ou de gorge ?

 Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**Test de cohérence : la date indiquée doit être antérieure à la date du jour**

1. JJ /MM/ AAAA
2. Vous ne savez pas

**SI CB2 = 1**

SINGLE

**CB5**

Quel était le résultat de ce test ?

 Une seule réponse possible

1. Positif
2. Négatif
3. Vous êtes toujours en attente du résultat

SI CB5 = 3

FIN

CB6

Pour les besoins de l'étude, nous avons besoin que vous soyez en possession du résultat du test de recherche de COVID-19 par prélèvement de nez ou de gorge.

Vous pourrez ensuite reprendre le questionnaire. Pour ce faire, il vous suffira de cliquer à nouveau sur le lien qui se trouve dans le mail d'invitation.


Les questions auxquelles vous aurez déjà répondu seront sauvegardées. Il vous suffira simplement de revenir à la question précédente à l'aide de la flèche située ci-dessous et d'actualiser votre dernière réponse.

~~SI CB5=1~~

SINGLE

CB6B\_2

Avez-vous été contaminé(e) par ... ?

 Une seule réponse possible

1. Le virus d'origine (celui qui est arrivé en France en 2020)
2. Le nouveau variant dit « Anglais »
3. Le nouveau variant dit « Sud-africain/Brésilien »
6. Le nouveau variant dit « Indien »
5. Autre nouveau variant
4. Vous ne savez pas **[Toujours à présenter en dernier]**

POSER SI CB3B=1 ET CB5=1


MULTIPLE

CB6B\_3

Par quel(le) variant/mutation avez-vous été contaminé(e) ?

La spécificité de la mutation est indiquée sur la feuille de résultat. Cette information est très importante afin d'aider l'Institut Pasteur à mieux comprendre la transmission du virus.

 Plusieurs réponses possibles

 Un seul variant peut être sélectionné

**LES CODES 10, 11 ET 13 NE PAS PERMETTRE DE SELECTIONNER LES CODES 10, 11 ET 13. ILS SERVENT A ESPACER LES BLOCS D'ITEMS.**

10. SI LES RESULTATS SONT EXPRIMES SOUS FORME DE VARIANT : **(NE PAS VALIDER)**
  1. Le virus d'origine (celui qui est arrivé en France en 2020)
  2. Le variant « Anglais » / variant Alpha
  3. Le variant Beta ou Gamma
  4. Le variant « Indien » / variants Delta ou Kappa
  14. Le nouveau variant Omicron
  8. Autre variant
11. SI LES RESULTATS SONT EXPRIMES SOUS FORME DE MUTATION : **(NE PAS VALIDER)**

5. La mutation E484K
6. La mutation E484Q
7. La mutation L452R
15. Mutation(s) K417N et/ou DEL69/70 et/ou S371L-S373P et/ou Q493R
12. Aucune mutation n'a été détectée **[EXCLUSIF]**
13. CODE A BLANC **(NE PAS VALIDER)**
9. Vous ne savez pas **[EXCLUSIF]**

**SI PLUSIEURS REPONSES PARMIS LES CODES 1, 2, 3, 4 OU 8 OU 14 ALORS FAIRE APPARAÎTRE LE MESSAGE SUIVANT : « VOUS NE POUVEZ PAS SÉLECTIONNER PLUSIEURS VARIANTES ».**

**NE PAS PASSER À LA QUESTION SUIVANTE SI PLUSIEURS REPONSES PARMIS LES CODES 1, 2, 3, 4 OU 8 OU 14**

**SI AU MOINS UNE REPONSE PARMIS LES CODES 1, 2, 3, 4 OU 8 OU 14 ET UNE REPONSE PARMIS LES CODES 5, 6, 7 OU 12 OU 15 ALORS FAIRE APPARAÎTRE LE MESSAGE SUIVANT : « VOUS NE POUVEZ PAS SÉLECTIONNER UN TYPE DE VARIANT ET UN TYPE DE MUTATION ».**

**NE PAS PASSER À LA QUESTION SUIVANTE SI UNE REPONSE PARMIS 1, 2, 3, 4 OU 8 OU 14 ET UNE REPONSE PARMIS 5, 6, 7 OU 12 OU 15**

### **A TOUS (QCIBLE=2, PROCHES)**

**SINGLE**

#### **CB6A2**

**Avez-vous été vacciné contre la COVID-19 ?**

 *Une seule réponse possible*

- ~~1. Oui, partiellement (une seule injection)~~
- ~~2. Oui, avec un protocole complet (2 injections)~~
- ~~3. Non~~
- ~~4. Ne souhaite pas répondre~~

### **SI CB5= 1**

**SINGLE**

#### **CB6BIS**

**CONCERNANT VOTRE ÉPISODE DE COVID-19 : Votre état de santé a-t-il nécessité une hospitalisation ?**

1. Oui
2. Non

### **A TOUS (QCIBLE=2, PROCHES)**

**SINGLE**

#### **CB6A3**

**Avez-vous été vacciné contre la COVID-19 ?**

 *Une seule réponse possible*

1. Oui
2. Non
3. Ne souhaite pas répondre

SI CB6A3=1

SINGLE

CB6A4

Combien d'injections vaccinales contre COVID-19 avez-vous reçues ?

*Une seule réponse possible***MASQUER CODE 5**

1. Une seule injection
2. Deux injections
3. Trois injections
4. Quatre injections
5. Cinq injections

SI CB6A2=1 ou 2

SINGLE

CB6B2CAL

Pourriez-vous nous indiquer la date **[Afficher si CB6A2=1 « de l'injection » ; Afficher si CB6A2=2 « de la dernière injection »]**

1. Affichage d'un calendrier avec la possibilité de répondre NSP
2. Vous ne savez pas

SI CB6A3=1

SINGLE

CB6A5

Pourriez-vous nous indiquer la date ... ?

 Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**AFFICHER SQ2 SI CB6A4=2 OU 3 OU 4 OU 5****AFFICHER SQ3 SI CB6A4=3 OU 4 OU 5****AFFICHER SQ4 SI CB6A4=4 OU 5****AFFICHER SQ5 SI CB6A4= 5****MASQUER SQ5****SQ1 A SQ5: LA DATE NE DOIT PAS ETRE POSTERIEURE A LA DATE DU JOUR****SQ2 : LA DATE DOIT ETRE POSTERIEURE A LA SQ1****SQ3 : LA DATE DOIT ETRE POSTERIEURE A LA SQ2 ET SQ1****SQ4 : LA DATE DOIT ETRE POSTERIEURE A LA SQ3, SQ2 ET SQ1****SQ5 : LA DATE DOIT ETRE POSTERIEURE A LA SQ4, SQ3, SQ2 ET SQ1**

- SQ1. Afficher «de l'injection » si CB6A4=1 // Afficher « de la première injection » si CB6A4=2 ou 3 ou 4 ou 5
- SQ2. Afficher «de la dernière injection » si CB6A4=2 // Afficher « de la deuxième injection» si CB6A4=3 ou 4 ou 5

- SQ3. Afficher «de la dernière injection » si CB6A4=3 // Afficher « de la troisième injection» si CB6A4=4 ou 5
- SQ4. Afficher «de la dernière injection » si CB6A4=4 // Afficher « de la quatrième injection» si CB6A4=5
- SQ5. de la dernière injection si CB6A4=5


1. Affichage d'un calendrier avec la possibilité de répondre NSP
2. Vous ne savez pas

SI CB6A2=1 ou 2

SINGLE

CB6D

Avec quel vaccin avez-vous été vacciné contre la COVID-19 ?

 Une seule réponse possible**ROTATION DES REPONSES SAUF POUR L'ITEM 5 QUI RESTE EN DERNIER**

1. Pfizer
2. Moderna
3. Astrazeneca
4. Johnson and Johnson
5. Je ne sais pas

SI CB6A3=1

SINGLE

CB6D1

Avec quel vaccin avez-vous été vacciné contre la COVID-19 lors de votre ...?

 Une seule réponse possible**AFFICHER SQ2 SI CB6A4=2 OU 3 OU 4 OU 5****AFFICHER SQ3 SI CB6A4=3 OU 4 OU 5****AFFICHER SQ4 SI CB6A4=4 OU 5****AFFICHER SQ5 SI CB6A4=5****MASQUER SQ 5**

- SQ1. Afficher «injection » si CB6A4=1 // Afficher «première injection » si CB6A4=2 ou 3 ou 4 ou 5
- SQ2. Afficher «dernière injection » si CB6A4=2 // Afficher « deuxième injection» si CB6A4=3 ou 4 ou 5
- SQ3. Afficher «dernière injection » si CB6A4=3 // Afficher « troisième injection» si CB6A4=4 ou 5
- SQ4. Afficher «dernière injection » si CB6A4=4 // Afficher « quatrième injection» si CB6A4=5
- SQ5. « dernière injection » si CB6A4=5

**ROTATION DES REPONSES SAUF POUR L'ITEM 5 ET 6 QUI RESTENT EN DERNIER**

1. Pfizer
2. Moderna
3. Astrazeneca
4. Janssen
5. Je ne sais pas
6. Autre vaccin [ A PLACER AVANT LE CODE 5]



7. Novavax

**SI CB6A4=1 ou 2**

SINGLE

**CB6D2**

Une injection supplémentaire contre la COVID-19 est-elle prévue ?

1.  Oui
2.  Non

**SI CB2 = 1**

SINGLE

**CB5B**

Avez-vous présenté des symptômes évocateurs de COVID-19 (fièvre, toux, douleur de gorge, mal de tête, courbatures inhabituelles, perte de goût ou d'odorat, ...) ?

 Une seule réponse possible

1. Oui
2. Non

**A TOUS**

SINGLE

**CB5C**

Suivez-vous un traitement prophylactique contre le SARS-CoV-2 (anticorps monoclonaux tels que Ronapreve ou Evushield) ?

1. Oui
2. Non
3. Ne souhaite pas répondre

**SI CB5C=1**

SINGLE

**CB5D**

Plus précisément, quel traitement par anticorps monoclonaux suivez-vous ?

 Une seule réponse possible

1. **RONAPREVE** (casirivimab/imdevimab) du laboratoire Roche
2. **EVUSHELD** (tixagévimab/cilgavimab) du laboratoire AstraZeneca
3. Je ne sais pas
4. Ne souhaite pas répondre

**A TOUS (QCIBLE=2, PROCHES)**

SINGLE

**CB6\_A**

[Afficher si CB1=1 « Les questions suivantes portent sur votre contamination actuelle. »]

Vous êtes-vous placé en isolement ? (Port du masque, limitation du contact avec ses proches, pratique du télétravail, limitation des sorties à l'extérieur du domicile, etc.)

1. Non
2. Oui

SI CB6\_A=2

SINGLE

CB6\_B

[Afficher si CB5=1 « Les questions suivantes portent sur votre contamination actuelle. »]  
Quand vous êtes-vous placé en isolement ?

1. Dès l'apparition des premiers symptômes [Afficher si CB5B=1]
2. Dès la réalisation du test
3. Dès le résultat du test
4. Dès l'identification d'un contact avec un cas de COVID-19
5. Autre

SI CB6\_A=2

MULTIPLE

CB6\_C

[Afficher si CB5=1 « Les questions suivantes portent sur votre contamination actuelle. »]  
Quelles mesures parmi les suivantes avez-vous mis en place ?

 Plusieurs réponses possibles

ROTATION ALEATOIRE CODES 1 A 4


1. Limitation des déplacements au strict nécessaire
2. Eviter les contacts avec les personnes à risque
3. Port du masque en cas de contact avec toute autre personne
4. Lavage des mains régulier
5. Aucune de ces mesures [Exclusif]

A TOUS (QCIBLE=2, PROCHES)

SINGLE

CB7

Avez-vous, par le passé déjà été diagnostiqué positif/ve pour la maladie COVID-19 ?

 Une seule réponse possible

1. Oui
2. Non

SI CB7 = 1

MULTIPLE

CB8

Vous avez déclaré avoir déjà été diagnostiqué positif/ve pour la maladie COVID-19.

## Était-ce...

 Plusieurs réponses possibles


1. A la suite d'un test virologique sur prélèvement de nez ou de gorge ou salivaire
2. A la suite de recherches d'anticorps dans le sang (sérologie)
3. Après un avis médical sans confirmation biologique


## SI QB8 = 1

SINGLE

## CB9

Quand avez-vous réalisé le test virologique sur prélèvement de nez ou de gorge ou salivaire ?

 Si vous avez réalisé plusieurs tests, merci d'indiquer la date du test qui s'est révélé positif.

 Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**Test de cohérence : la date indiquée doit être antérieure à la date du jour**


1. MM/ AAAA
2. Vous ne savez pas

## SI QB8 = 2

SINGLE

## CB10

Quand avez-vous réalisé la recherche d'anticorps dans le sang (sérologie) ?

 Si vous avez réalisé plusieurs tests, merci d'indiquer la date du test qui s'est révélé positif.

 Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**Test de cohérence : la date indiquée doit être antérieure à la date du jour**

1. MM/ AAAA
2. Vous ne savez pas


## SI QB8 = 3

SINGLE

## CB11

Quand avez-vous eu l'avis médical (sans confirmation biologique) ?

 Si vous avez eu plusieurs épisodes, merci d'indiquer la date du premier épisode.

 Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**Test de cohérence : la date indiquée doit être antérieure à la date du jour**

1. MM/ AAAA
2. Vous ne savez pas

**POSER SI QCIBLE=3****C : QUESTIONS AUPRES DES TEMOINS DISTANTS****A TOUS (QCIBLE=3, TEMOINS DISTANTS)**

TEXTE

**INTROC**

Bonjour,

Nous vous sollicitons aujourd'hui pour participer à une étude scientifique réalisée par l'équipe de recherche de l'Institut Pasteur. Cette étude est menée en partenariat avec la Caisse Nationale d'Assurance Maladie (CNAM), Santé Publique France et l'institut Ipsos.

Votre participation est importante pour aider à mieux comprendre comment les personnes atteintes par la COVID-19 ont été infectées. Nous posons les mêmes questions à des personnes atteintes par la COVID-19 et à des personnes qui ne le sont pas.

Avant de répondre au questionnaire, nous vous invitons à lire la note d'information et à indiquer votre accord pour y participer. Vous devrez confirmer avoir pris connaissance de la note d'information et accepter de participer à l'étude pour continuer vers le questionnaire.

**INSERTION DE LA NOTE D'INFORMATION AVEC POSSIBILITE DE LA TELECHARGER**

1. Je confirme avoir pris connaissance de la note d'information et accepte de participer à l'étude.

**A MASQUER APRES LES TESTS + A DEPLACER AVANT INTROC****RECODE AUTOMATIQUE**

SINGLE

**ELIG**

1. **N'a pas été diagnostiqué positif**
2. A été diagnostiqué positif **UNIQUEMENT** à la suite d'un test virologique
3. A été diagnostiqué positif **UNIQUEMENT** à la suite de recherches d'anticorps dans le sang
4. **Après un avis médical sans confirmation biologique UNIQUEMENT**
5. A été diagnostiqué positif à la suite d'un test virologique **ET** de recherches d'anticorps dans le sang
6. A été diagnostiqué positif à la suite d'un test virologique **ET** après un avis médical sans confirmation biologique sang
7. A été diagnostiqué positif à la suite de recherches d'anticorps dans le sang **ET** après un avis médical sans confirmation biologique
8. A été diagnostiqué positif à la suite d'un test virologique **ET** de recherches d'anticorps dans le sang **ET** Après un avis médical sans confirmation biologique
9. Présente actuellement un épisode de COVID-19

**POSER LA SUITE DU QUESTIONNAIRE SI ELIG=1 A 8**  
**A TOUS (QCIBLE=3, TEMOINS DISTANTS)**

SINGLE

## Q0C\_2

Faites-vous l'objet d'une mesure de protection juridique (sauvegarde de justice, curatelle, curatelle renforcée, tutelle, ...)?

 Une seule réponse possible

1. Oui → **STOP INTERVIEW ALLER A « QFINC1 »**
2. Non

## SI Q0C\_2 = 1

TEXTE

## QFINC1

Nous vous remercions de votre participation.  
Malheureusement, vous n'êtes pas éligible pour participer à l'étude.  
En vous renouvelant tous nos remerciements pour votre participation à cette étude.



**DEMASQUER CC3 \_AFFICHAGE D'UN CALENDRIER**  
**QCIBLE=3 ET SI ELIG = 2 OU 5 OU 6 OU 8**

SINGLE

## CC3

Vous avez déclaré avoir déjà été diagnostiqué positif/ve pour la maladie COVID-19 après la réalisation d'un test virologique sur prélèvement de nez ou de gorge ou salivaire.

Quand avez-vous réalisé ce test virologique ?

-  Si vous avez réalisé plusieurs tests, merci d'indiquer la date du test qui s'est révélé positif.
-  Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**Test de cohérence : la date indiquée doit être antérieure à la date du jour\_ Affichage d'un calendrier**

1. JJ/MM/ AAAA
2. Vous ne savez pas



**DEMASQUER CC4 \_AFFICHAGE D'UN CALENDRIER**  
**QCIBLE=3 ET SI ELIG = 3 OU 5 OU 7 OU 8**

SINGLE

## CC4

Vous avez déclaré avoir déjà été diagnostiqué positif/ve pour la maladie COVID-19 après une recherche d'anticorps dans le sang-(sérologie).

Quand avez-vous réalisé cette recherche ?

-  Si vous avez réalisé plusieurs tests, merci d'indiquer la date du test qui s'est révélé positif.
-  Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**Test de cohérence : la date indiquée doit être antérieure à la date du jour\_ Affichage d'un calendrier**

1. JJ/MM/ AAAA
2. Vous ne savez pas

## SI A ETE DIAGNOSTIQUE POSITIF SUITE A UN AVIS MEDICAL



**QCIBLE=3 ET ELIG =4 OU 6 OU 7 OU 8**

SINGLE

**CC5**

Vous avez déclaré avoir déjà été diagnostiqué positif/ve pour la maladie COVID-19 après un avis médical sans confirmation biologique.

Quand avez-vous eu cet avis ?

-  Si vous avez eu plusieurs épisodes, merci d'indiquer la date du premier épisode.
-  Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**Test de cohérence : la date indiquée doit être antérieure à la date du jour \_ Affichage d'un calendrier**


1. JJ/MM/ AAAA
2. Vous ne savez pas

**A TOUS (QCIBLE=3, TEMOINS DISTANTS)**

SINGLE

**CC6A**

**Avez-vous été vacciné contre la COVID-19 ?**

 Une seule réponse possible

- ~~1. Oui, partiellement (une seule injection)~~
- ~~2. Oui, avec un protocole complet (2 injections)~~
- ~~3. Non~~
- ~~4. Ne souhaite pas répondre~~

**SI ELIG = 2 A 8**

SINGLE

**CC6BIS**

**CONCERNANT VOTRE EPISODE DE COVID-19 : Votre état de santé a-t-il nécessité une hospitalisation ?**

1. Oui
2. Non

**A TOUS (QCIBLE=3, TEMOINS DISTANTS)**

SINGLE

**CC6A2**

**Avez-vous été vacciné contre la COVID-19 ?**

 Une seule réponse possible

1. Oui
2. Non
3. Ne souhaite pas répondre

**SI CC6A2=1**

SINGLE

**CC6A3**

**Combien d'injections vaccinales contre COVID-19 avez-vous reçues ?**

*Une seule réponse possible*

**MASQUER CODE 5**

1. Une seule injection
2. Deux injections
3. Trois injections
4. Quatre injections
5. Cinq injections

**SI CC6=1 OU 2**

SINGLE

**CC6B**

Pourriez-vous nous indiquer la date [Afficher si CC6A=1 « de l'injection » ; Afficher si CC6A=2 « de la dernière injection »]

1. Affichage d'un calendrier avec la possibilité de répondre NSP
2. Vous ne savez pas

**SI CC6A2=1**

SINGLE

**CC6B2**

Pourriez-vous nous indiquer la date ... ?

 Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**AFFICHER SQ2 SI CC6A3=2 OU 3 4 OU 5**

**AFFICHER SQ3 SI CC6A3=3 OU 4 OU 5**

**AFFICHER SQ4 SI CC6A3=4 OU 5**

**AFFICHER SQ5 SI CC6A3= 5**

**MASQUER SQ5**

**SQ1 A SQ5: LA DATE NE DOIT PAS ETRE POSTERIEURE A LA DATE DU JOUR**

**SQ2 : LA DATE DOIT ETRE POSTERIEURE A LA SQ1**

**SQ3 : LA DATE DOIT ETRE POSTERIEURE A LA SQ2 ET SQ1**

**SQ4 : LA DATE DOIT ETRE POSTERIEURE A LA SQ3, SQ2 ET SQ1**

**SQ5 : LA DATE DOIT ETRE POSTERIEURE A LA SQ4, SQ3, SQ2 ET SQ1**

- SQ1. Afficher «de l'injection » si CC6A3=1 // Afficher « de la première injection » si CC6A3=2 ou 3
- SQ2. Afficher «de la dernière injection » si CC6A3=2 // Afficher « de la deuxième injection» si CC6A3=3
- SQ3. Afficher «de la dernière injection » si CC6A3=3 // Afficher « de la troisième injection» si CC6A3=4 ou 5
- SQ4. Afficher «de la dernière injection » si CC6A3=4 // Afficher « de la quatrième injection» si CC6A3=5
- SQ5. de la dernière injection si CC6A3=5


1. Affichage d'un calendrier avec la possibilité de répondre NSP
2. Vous ne savez pas

**SI CC6A=1 OU 2**

SINGLE

## CC6C

Avec quel vaccin avez-vous été vacciné contre la COVID-19?

 Une seule réponse possible

**ROTATION DES REPONSES SAUF POUR L'ITEM 5 QUI RESTE EN DERNIER**

1. ~~Pfizer~~
2. ~~Moderna~~
3. ~~Astrazeneca~~
4. ~~Johnson and Johnson~~
5. ~~Je ne sais pas~~

## SI CC6A2=1

SINGLE

## CC6D1

Avec quel vaccin avez-vous été vacciné contre la COVID-19 lors de votre ...?

 Une seule réponse possible

**AFFICHER SQ2 SI CC6A3=2 OU 3 OU 4 OU 5**

**AFFICHER SQ3 SI CC6A3=3 OU 4 OU 5**

**AFFICHER SQ4 SI CA9B3=4 OU 5**

**AFFICHER SQ5 SI CA9B3=5**

**MASQUER SQ5**

- SQ1. Afficher «injection » si CC6A3=1 // Afficher «première injection » si CC6A3=2 ou 3  
 SQ2. Afficher «dernière injection » si CC6A3=2 // Afficher « deuxième injection » si CC6A3=3  
 SQ3. Afficher «dernière injection » si CC6A3=3 // Afficher « troisième injection » si CC6A3=4 ou 5  
 SQ4. Afficher «dernière injection » si CC6A3=4 // Afficher « quatrième injection » si CC6A3=5  
 SQ5. « dernière injection » si CC6A3=5

**ROTATION DES REPONSES SAUF POUR L'ITEM 5 ET 6 QUI RESTENT EN DERNIER**

1. Pfizer
2. Moderna
3. Astrazeneca
4. Janssen
5. Je ne sais pas
6. Autre vaccin **[A PLACER DEVANT LE CODE 5]**
7. Novavax

## SI CC6A3=1 ou 2

SINGLE

## CC6D2

Une injection supplémentaire contre la COVID-19 est-elle prévue ?



1. ~~Oui~~
2. ~~Non~~

**A TOUS**

SINGLE

**CC6D3**

Suivez-vous un traitement prophylactique contre le SARS-CoV-2 (anticorps monoclonaux tels que Ronapreve ou Evushield) ?

1. Oui
2. Non
3. Ne souhaite pas répondre

**SI CC6D3=1**

SINGLE

**CC6D4**

Plus précisément, quel traitement par anticorps monoclonaux suivez-vous ?

 Une seule réponse possible

1. **RONAPREVE** (casirivimab/imdevimab) du laboratoire Roche
2. **EVUSHELD** (tixagévimab/cilgavimab) du laboratoire AstraZeneca
3. Je ne sais pas
4. Ne souhaite pas répondre

**POSER SI QCIBLE=4****D : QUESTIONS AUPRES DU PERSONNEL SOIGNANT****NOUVELLE QUESTION \_REPRISE INTROB****A TOUS (QCIBLE=4, PERSONNEL SOIGNANT)**

TEXTE

**INTROD**

Bonjour,

Nous vous sollicitons aujourd'hui pour participer à une étude scientifique réalisée par l'équipe de recherche de l'Institut Pasteur. Cette étude est menée en partenariat avec la Caisse Nationale d'Assurance Maladie (CNAM), Santé Publique France et l'institut Ipsos.

Votre participation est importante pour aider à mieux comprendre comment les personnes atteintes par la COVID-19 ont été infectées. Nous posons les mêmes questions à des personnes atteintes par la COVID-19 et à des personnes qui ne le sont pas.

Avant de répondre au questionnaire, nous vous invitons à lire la note d'information et à indiquer votre accord pour y participer. Vous devrez confirmer avoir pris connaissance de la note d'information et accepter de participer à l'étude pour continuer vers le questionnaire.

Afin de pouvoir répondre au questionnaire, l'utilisation de l'un des navigateurs internet suivants est indispensable : Chrome, Firefox, Edge ou Safari.

### INSERTION DE LA NOTE D'INFORMATION AVEC POSSIBILITE DE LA TELECHARGER (NOUVELLE NOTE D'INFORMATION)

1. Je confirme avoir pris connaissance de la note d'information et accepte de participer à l'étude.

#### NOUVELLE QUESTION \_REPRISE Q0B

A TOUS (QCIBLE=4, PERSONNEL SOIGNANT)

SINGLE

Q0D

Avez-vous déjà répondu à ce questionnaire ?

 Une seule réponse possible

1. Oui → STOP INTERVIEW ALLER A « FIN Q0 »
2. Non

#### NOUVELLE QUESTION \_REPRISE Q0B\_2

A TOUS (QCIBLE=4, PERSONNEL SOIGNANT)

SINGLE

Q0D\_2

Faites-vous l'objet d'une mesure de protection juridique (sauvegarde de justice, curatelle, curatelle renforcée, tutelle, ...) ?

 Une seule réponse possible

1. Oui → STOP INTERVIEW ALLER A « QFIND1 »
2. Non

#### NOUVELLE QUESTION \_REPRISE QFINC1

SI Q0D\_2 = 1

TEXTE

QFIND1

Nous vous remercions de votre participation.

Malheureusement, vous n'êtes pas éligible pour participer à l'étude.

En vous renouvelant tous nos remerciements pour votre participation à cette étude.

#### NOUVELLE QUESTION - REPRISE DE LA QDROITA

A TOUS (QCIBLE=4, PERSONNEL SOIGNANT)

SINGLE

QDROITD

Voici votre numéro identifiant. Merci de le conserver précieusement.

[affichage de l'identifiant]-ComCor

Il est indispensable dans l'hypothèse où vous souhaiteriez exercer vos droits sur vos données à caractère personnel, sans celui-ci nous ne pourrions pas identifier votre questionnaire. Il devra être précisé avec l'objet de votre demande dans le cas où vous prendriez contact avec le délégué à la protection des données de l'Institut Pasteur :

par voie postale à l'adresse suivante :

Institut Pasteur Direction juridique  
28 rue du Docteur Roux  
75 724 Paris Cedex 15 France

OU par courriel adressé à [dpo@pasteur.fr](mailto:dpo@pasteur.fr)

Souhaitez-vous recevoir votre identifiant par courriel (dans les 24 heures)? Votre adresse électronique sera supprimée dès l'envoi de votre identifiant.

1. Oui
2. Non

### NOUVELLE QUESTION - REPRISE DE LA QDROIT2A ACTUALISEE

SI QDROITD = 1 (OUI)

MAIL

QDROIT2D

Merci de bien vouloir indiquer votre adresse électronique afin que nous puissions vous envoyer votre identifiant par courriel :

- SQ1. Veuillez saisir votre adresse électronique  
SQ2. Veuillez de nouveau saisir votre adresse électronique

### SI ADRESSE SQ1 <> SQ2 ALORS AFFICHER

« Les adresses électroniques sont différentes. Merci de bien vouloir saisir à nouveau votre adresse électronique. »

### ENVOI MAIL AUTOMATIQUE AVEC ID

### NOUVELLE QUESTION

A TOUS (QCIBLE=4, PERSONNEL SOIGNANT)

SINGLE

CDO

Présentez-vous ACTUELLEMENT un épisode de COVID-19 ?

 Une seule réponse possible

1. Oui => **ALLEZ QFIND**
2. Non
3. Vous ne savez pas => **ALLEZ QFIND**

### NOUVELLE QUESTION

SI CDO=1 OU 3

TEXTE

QFIND

Nous vous remercions de votre participation.  
Malheureusement, vous n'êtes pas éligible pour participer à l'étude.

En vous renouvelant tous nos remerciements pour votre participation à cette étude.

**STOP INTERVIEW SI CD0=1 OU 3**

**NOUVELLE QUESTION**

**A TOUS (QCIBLE=4, PERSONNEL SOIGNANT)**

SINGLE

**CD1**

Avez-vous déjà été diagnostiqué positif/ve pour la maladie COVID-19 ?

 Une seule réponse possible

1. Oui
2. Non
3. Ne souhaite pas répondre → **STOP INTERVIEW**

**SI A ETE DIAGNOSTIQUE POSITIF CD1=1**

MULTIPLE

**CD2**

Vous avez déclaré avoir déjà été diagnostiqué positif/ve pour la maladie COVID-19.  
Était-ce...

 Plusieurs réponses possibles

1. A la suite d'un test virologique sur prélèvement de nez ou de gorge ou salivaire
2. A la suite de recherches d'anticorps dans le sang (sérologie)
3. Après un avis médical sans confirmation biologique
4. Ne souhaite pas répondre **[EXCLUSIVE] → STOP INTERVIEW**



**SI CD2=1**

SINGLE

**CD3**

Vous avez déclaré avoir déjà été diagnostiqué positif/ve pour la maladie COVID-19 après la réalisation d'un test virologique sur prélèvement de nez ou de gorge ou salivaire.

Quand avez-vous réalisé ce test virologique-?

-  Si vous avez réalisé plusieurs tests, merci d'indiquer la date du test qui s'est révélé positif.
-  Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**Test de cohérence : la date indiquée doit être antérieure à la date du jour**

1. JJ/MM/ AAAA
2. Vous ne savez pas



**SI CD2=2**

SINGLE

**CD4**

Vous avez déclaré avoir déjà été diagnostiqué positif/ve pour la maladie COVID-19 après une recherche d'anticorps dans le sang-(sérologie).

Quand avez-vous réalisé cette recherche-?

-  Si vous avez réalisé plusieurs tests, merci d'indiquer la date du test qui s'est révélé positif.
-  Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**Test de cohérence : la date indiquée doit être antérieure à la date du jour**

1. JJ/MM/ AAAA
2. Vous ne savez pas



**SI CD2=3**

SINGLE

**CD5**

**Vous avez déclaré avoir déjà été diagnostiqué positif/ve pour la maladie COVID-19 après un avis médical sans confirmation biologique.**

**Quand avez-vous eu cet avis ?**

-  Si vous avez eu plusieurs épisodes, merci d'indiquer la date du premier épisode.
-  Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**Test de cohérence : la date indiquée doit être antérieure à la date du jour \_ Affichage d'un calendrier**


1. JJ/MM/ AAAA
2. Vous ne savez pas

**A TOUS (QCIBLE=4, PERSONNEL SOIGNANT)**

SINGLE

**CD6A**

**Avez-vous été vacciné contre la COVID-19 ?**

 Une seule réponse possible

1. ~~Oui, partiellement (une seule injection)~~
2. ~~Oui, avec un protocole complet (2 injections)~~
3. ~~Non~~
4. ~~Ne souhaite pas répondre~~

**CD2=1 OU 2 OU 3**

SINGLE

**CD6BIS**

**CONCERNANT VOTRE EPISODE DE COVID-19 : Votre état de santé a-t-il nécessité une hospitalisation ?**

1. Oui
2. Non

**A TOUS (QCIBLE=4, PERSONNEL SOIGNANT)**

SINGLE

**CD6A2**

**Avez-vous été vacciné contre la COVID-19 ?**

 Une seule réponse possible

1. Oui
2. Non
3. Ne souhaite pas répondre

## SI CD6A2=1

SINGLE

## CD6A3

Combien d'injections vaccinales contre COVID-19 avez-vous reçues ?

*Une seule réponse possible*

## MASQUER CODE 5

1. Une seule injection
2. Deux injections
3. Trois injections
4. Quatre injections
5. Cinq injections

## SI CD6=1 ou 2

SINGLE

## CD6B

Pourriez-vous nous indiquer la date **[Afficher si CD6A=1 « de l'injection » ; Afficher si CD6A=2 « de la dernière injection »]**

1. ~~Affichage d'un calendrier avec la possibilité de répondre NSP~~
2. ~~Vous ne savez pas~~

## SI CD6A2=1

SINGLE

## CD6C

Pourriez-vous nous indiquer la date ... ?

 *Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative*

AFFICHER SQ2 SI CD6A3=2 OU 3 OU 4 OU 5

AFFICHER SQ3 SI CD6A3=3 OU 4 OU 5

AFFICHER SQ4 SI CD6A3=4 OU 5

AFFICHER SQ5 SI CD6A3= 5

MASQUER SQ5

SQ1 A SQ5: LA DATE NE DOIT PAS ETRE POSTERIEURE A LA DATE DU JOUR

SQ2 : LA DATE DOIT ETRE POSTERIEURE A LA SQ1

SQ3 : LA DATE DOIT ETRE POSTERIEURE A LA SQ2 ET SQ1

SQ4 : LA DATE DOIT ETRE POSTERIEURE A LA SQ3, SQ2 ET SQ1

SQ5 : LA DATE DOIT ETRE POSTERIEURE A LA SQ4, SQ3, SQ2 ET SQ1

- SQ1. Afficher « de l'injection » si **CD6A3=1** // Afficher « de la première injection » si **CD6A3=2** ou 3  
 SQ2. Afficher « de la dernière injection » si **CD6A3=2** // Afficher « de la deuxième injection » si **CD6A3=3**  
 SQ3. Afficher « de la dernière injection » si **CD6A3=3** // Afficher « de la troisième injection » si **CD6A3=4** ou 5

SQ4. Afficher «de la dernière injection » si CD6A3=4 // Afficher « de la quatrième injection» si CD6A3=5  
 SQ5. de la dernière injection si CD6A3=5

1. Affichage d'un calendrier avec la possibilité de répondre NSP
2. Vous ne savez pas

**SI CD6A2=1**

SINGLE

**CD6D1**

**Avec quel vaccin avez-vous été vacciné contre la COVID-19 lors de votre ...?**

 Une seule réponse possible

**AFFICHER SQ2 SI CD6A3=2 OU 3 OU 4 OU 5**

**AFFICHER SQ3 SI CD6A3=3 OU 4 OU 5**

**AFFICHER SQ4 SI CA9B3=4 OU 5**

**AFFICHER SQ5 SI CA9B3=5**

**MASQUER SQ5**

SQ1. Afficher «injection » si **CD6A3=1** // Afficher «première injection » si **CD6A3=2** ou 3  
 SQ2. Afficher «dernière injection » si **CD6A3=2** // Afficher « deuxième injection» si **CD6A3=3**  
 SQ3. Afficher «dernière injection » si CD6A39B3=3 // Afficher « troisième injection» si CD6A3=4 ou 5  
 SQ4. Afficher «dernière injection » si CD6A3=4 // Afficher « quatrième injection» si CD6A3=5  
 SQ5. « dernière injection » si CD6A3=5

**ROTATION DES REPONSES SAUF POUR L'ITEM 5 ET 6 QUI RESTENT EN DERNIER**

1. Pfizer
2. Moderna
3. Astrazeneca
4. Janssen
5. Je ne sais pas
6. Autre vaccin **[A PLACER AVANT LE CODE 5]**
7. Novavax

**SI CD6A3=1 ou 2**

SINGLE

**CD6D2**

**Une injection supplémentaire contre la COVID-19 est-elle prévue ?**

1. —Oui
2. —Non

**A TOUS**

SINGLE

**CD6D3**

**Suivez-vous un traitement prophylactique contre le SARS-CoV-2 (anticorps monoclonaux tels que Ronapreve ou Evushield) ?**

1. Oui
2. Non
3. Ne souhaite pas répondre

**SI CD6D3=1**

**SINGLE**

**CD6D4**

**Plus précisément, quel traitement par anticorps monoclonaux suivez-vous ?**

 *Une seule réponse possible*

1. **RONAPREVE** (casirivimab/imdevimab) du laboratoire Roche
2. **EVUSHELD** (tixagévimab/cilgavimab) du laboratoire AstraZeneca
3. Je ne sais pas
4. Ne souhaite pas répondre

## PARTIE II: QUESTIONNAIRE GENERAL

### POSER A TOUS

#### PARTIE A: DONNEES SOCIO-DEMOGRAPHIQUES

**POSER SI QCIBLE =1 OU 2 OU 4**

**POUR LA CIBLE 3 (TEMOINS DISTANTS, LA QUESTION EST POSEE EN AMONT ET SERA RECODEE AUTOMATIQUEMENT A LA QUESTION SUIVANTE)**

**NUMERIC**

**QG1**

**Quel est votre âge ?**

**MIN 18 MAX 109**

**MENU DEROULANT**

1. 18
2. 19
3. 20
4. 21
5. ...

109

**QUESTION NON VISIBLE PAR LES REpondANTS DEMASQUER POUR LES TESTS**

**SI QCIBLE =1 OU 2 ALORS RECODER SELON QG1**

**SI QCIBLE=3 NE PAS POSER ET RECODER AUTOMATIQUEMENT DONNEES IMPORTEES VARIABLE « RESPONDENTAGE »**

**NUMERIC**

**RESPONDENTAGE**



1. 18
2. 19
3. 20
4. 21
5. ...

109

**QUESTION NON VISIBLE PAR LES REpondANTS DEMASQUER POUR LES TESTS**

**A TOUS**

**NUMERIC**

**QAGE RECODE**

**SI QCIBLE =1 OU 2 OU 3 OU 4 ALORS RECODER SELON RESPONDENTAGE**

1. 18-28 ans
2. 29-38 ans
3. 39-48 ans
4. 49-58 ans
5. 59-68 ans
6. 69 ans et plus

**QUESTION NON VISIBLE PAR LES REpondANTS DEMASQUER POUR LES TESTS**

**A TOUS**

**NUMERIC**

**QAGE RECODE 2**

**SI QCIBLE =1 OU 2 OU 3 OU 4 ALORS RECODER SELON RESPONDENTAGE**

1. 18-29 ans
2. 30-54 ans
3. 55 ans et plus

**POSER SI QCIBLE =1 OU 2 OU 4**

**POUR LA CIBLE 3 (TEMOINS DISTANTS, LA QUESTION EST POSEE EN AMONT ET SERA RECODEE AUTOMATIQUEMENT)**

**SINGLE RESPONSE**

**QG2**

**Êtes-vous ?**

1. Un homme
2. Une femme

**POSER SI QCIBLE =1 OU 2 OU 4**

**POUR LA CIBLE 3 (TEMOINS DISTANTS, LA QUESTION EST POSEE EN AMONT ET SERA RECODEE AUTOMATIQUEMENT)**

## DROPDOWN

## QG3

**Veillez indiquer le département et la commune où vous résidez.**

Si vous rencontrez des difficultés à sélectionner votre commune, cela peut être lié au navigateur internet que vous utilisez ou de vos paramètres de connexion Internet, qui empêchent l'apparition de la liste des communes. Nous vous invitons à essayer un autre navigateur. Si malgré cela le problème persiste, nous vous prions de nous excuser de ce désagrément.

- Département: **utiliser la liste add (colonne « dept »)**
- Commune: **utiliser la liste add (colonne « COMMUNE » : faire afficher uniquement les communes selon le département sélectionné précédemment)**

**A TOUS**

*A MASQUER APRES LES TESTS*

## SINGLE RESPONSE

## QG4C \_ REGIONS

**SI QCIBLE= 1 OU 2 OU 4 ALORS UTILISER LA LISTE ADD (COLONNE « REG13 »)**

**SI QCIBLE = 3 ET RESPONDENT REG = 1 ALORS QG4C = 1**

**SI QCIBLE = 3 ET RESPONDENT REG = 2 ALORS QG4C = 2**

**SI QCIBLE = 3 ET RESPONDENT REG = 3 ALORS QG4C = 3**

**SI QCIBLE = 3 ET RESPONDENT REG = 4 ALORS QG4C = 4**

**SI QCIBLE = 3 ET RESPONDENT REG = 5 ALORS QG4C = 5**

**SI QCIBLE = 3 ET RESPONDENT REG = 6 ALORS QG4C = 6**

**SI QCIBLE = 3 ET RESPONDENT REG = 7 ALORS QG4C = 7**

**SI QCIBLE = 3 ET RESPONDENT REG = 8 ALORS QG4C = 8**

**SI QCIBLE = 3 ET RESPONDENT REG = 9 ALORS QG4C = 9**

**SI QCIBLE = 3 ET RESPONDENT REG = 10 ALORS QG4C = 10**

**SI QCIBLE = 3 ET RESPONDENT REG = 11 ALORS QG4C = 11**

**SI QCIBLE = 3 ET RESPONDENT REG = 12 ALORS QG4C = 12**

1. Île-de-France
2. Centre - Val de Loire
3. Bourgogne -Franche-Comté
4. Normandie
5. Hauts-de-France
6. Grand Est
7. Pays de la Loire
8. Bretagne
9. Nouvelle-Aquitaine
10. Occitanie
11. Auvergne-Rhône-Alpes
12. Provence-Alpes-Côte d'Azur + Corse

**POSER SI QCIBLE =1 OU 2 OU 4 OU 3**

~~POUR LA CIBLE 3 (TEMOINS DISTANTS, LA QUESTION EST POSEE EN AMONT ET SERA RECODEE AUTOMATIQUEMENT)~~

DEMASQUER POUR LES TESTS

SINGLE RESPONSE

**QG4 RECODE AUTOMATIQUE DE LA CATEGORIE D'AGGLOMERATION**

UTILISER LA LISTE ADD

SI (QCIBLE =1 OU 2 OU 4 ET HABITAT1=0) OU (QCIBLE =3 ET VARIABLE « Z »=1) ALORS QG4 RECODE = 1  
 SI (QCIBLE =1 OU 2 OU 4 ET HABITAT1=1) OU (QCIBLE =3 ET VARIABLE « Z »=2) ALORS QG4 RECODE = 2  
 SI (QCIBLE =1 OU 2 OU 4 ET HABITAT1=2) OU (QCIBLE =3 ET VARIABLE « Z »=3) ALORS QG4 RECODE = 3  
 SI (QCIBLE =1 OU 2 OU 4 ET HABITAT1=3) OU (QCIBLE =3 ET VARIABLE « Z »=4) ALORS QG4 RECODE = 4  
 SI (QCIBLE =1 OU 2 OU 4 ET HABITAT1=4) OU (QCIBLE =3 ET VARIABLE « Z »=5) ALORS QG4 RECODE = 5  
 SI (QCIBLE =1 OU 2 OU 4 ET HABITAT1=5) OU (QCIBLE =3 ET VARIABLE « Z »=6) ALORS QG4 RECODE = 6  
 SI (QCIBLE =1 OU 2 OU 4 ET HABITAT1=6) OU (QCIBLE =3 ET VARIABLE « Z »=7) ALORS QG4 RECODE = 7  
 SI (QCIBLE =1 OU 2 OU 4 ET HABITAT1=7) OU (QCIBLE =3 ET VARIABLE « Z »=8) ALORS QG4 RECODE = 8  
 SI (QCIBLE =1 OU 2 OU 4 ET HABITAT1=8) OU (QCIBLE =3 ET VARIABLE « Z »=9) ALORS QG4 RECODE = 9

1. Communes Rurales
2. Moins de 5 000 hab.
3. De 5 à 9 999 hab.
4. De 10 à 19 999 hab.
5. De 20 à 49 999 hab.
6. De 50 à 99 999 hab.
7. De 100 à 199 999 hab.
8. De 200 000 hab. et plus
9. Agglomération Parisienne

**A TOUS**

A MASQUER APRES LES TESTS

SINGLE RESPONSE

**QG4\_2 RECODE AUTOMATIQUE DE LA CATEGORIE D'AGGLOMERATION**

SI QG4 = 1 OU 2 ALORS QG4\_2=1

SI QG4 = 3 OU 4 ALORS QG4\_2=2

SI QG4 = 5 OU 6 ALORS QG4\_2=3

SI QG4 = 7 OU 8 ALORS QG4\_2=4

SI QG4 = 9 ALORS QG4\_2=5


1. Rurales/ Moins de 5 000 hab.
2. De 5 à 19 999 hab.
3. De 20 à 99 999 hab.
4. De 100 000 hab. et plus
5. Agglomération Parisienne

## A TOUS

DROPDOWN

## QG5

Combien de personnes habitent à votre adresse actuelle ?

 Indiquez tous les adultes, y compris vous-même, et tous les enfants vivant à cette adresse depuis au moins 2 mois

- \_1 1
- \_2 2
- \_3 3
- \_4 4
- \_5 5
- \_6 6
- \_7 7
- \_8 8
- \_9 9
- \_10 10
- \_11 11
- \_12 12+

## SI QG5&lt;&gt;1

SINGLE

## QG5B

Avez-vous des enfants ou étudiants au sein de votre domicile ?

1. Oui
2. Non

## SI QG5B=1

MULTIPLE

## QG5C

Dans quel(s) établissement(s) sont-ils scolarisés... ?

 Plusieurs réponses possibles

1. En crèche
2. Chez une assistante maternelle
3. En école maternelle
4. En école primaire
5. Au collège
6. Au lycée
7. En université
8. Non scolarisé




## POSER SI QG5 &lt;&gt; 1

SI QG5 =1 ALORS NE PAS POSER ET RECODER AUTOMATIQUEMENT R1=1 DEMASQUER POUR LES TESTS

SINGLE

R1 – IDENTIFICATION DE LA PERSONNE AYANT LES REVENUS LES PLUS ELEVES DE VOTRE FOYER

**Êtes-vous la personne ayant les revenus les plus élevés de votre foyer ?**



-  *La personne qui, dans le foyer, a le plus de revenus, qu'il s'agisse de salaires, pensions, allocations de chômage, investissement ou toute autre source de revenus.*
-  *Le recueil de données relatives aux revenus du foyer permet de répondre à l'objectif de la recherche COMCOR qui est de caractériser les facteurs socio-démographiques associés à un risque augmenté d'infection par le SARS-CoV-2.*
-  *Une seule réponse possible*

1. Oui
2. Oui, avec un autre membre du foyer
3. Non

**A TOUS**

SINGLE

**R2****Quelle est votre situation professionnelle actuelle (situation globale, sans prendre en compte les congés et arrêts de travail)?**

-  *Le recueil de données relatives à la situation professionnelle permet de répondre à l'objectif de la recherche COMCOR qui est de caractériser les facteurs socio-démographiques associés à un risque augmenté d'infection par le SARS-CoV-2.*
-  *Une seule réponse possible*

1. Salarié(e) à plein temps
2. Salarié(e) à temps partiel
3. Travaille à mon compte
4. Ne travaille pas actuellement, mais en recherche d'emploi
5. Ne travaille pas actuellement et ne recherche pas d'emploi / en incapacité de travail
6. Homme/femme au foyer
7. Retraité(e)
8. Etudiant(e)/élève

*POSER SI R2= 1 ou 2 ou 3 ou 4*

SINGLE

**R3****Quelle est votre profession ?****Si vous ne trouvez pas le nom exact de votre profession, choisissez l'option la plus proche.****SI R2=4 ALORS AFFICHER :****Si vous êtes sans emploi, sélectionnez la proposition qui correspond le mieux à votre dernier emploi.**

-  *Une seule réponse possible*

1. Agriculteurs sur petite exploitation
2. Agriculteurs sur moyenne exploitation
3. Agriculteurs sur grande exploitation
4. Artisans
5. Commerçants et assimilés
6. Chefs d'entreprise de 10 salariés ou plus

7. Professions libérales
8. Cadres de la fonction publique
9. Professeurs, professions scientifiques
10. Professions de l'information, des arts et des spectacles
11. Cadres administratifs et commerciaux d'entreprise
12. Ingénieurs et cadres techniques d'entreprise
13. Professeurs des écoles, instituteurs et assimilés
14. Professions intermédiaires de la santé et du travail social
15. Clergé, religieux
16. Professions intermédiaires administratives de la fonction publique
17. Professions intermédiaires administratives et commerciales des entreprises
18. Techniciens
19. Contremaîtres, agents de maîtrise
20. Employés civils et agents de service de la fonction publique
21. Policiers et militaires
22. Employés administratifs d'entreprise
23. Employés de commerce
24. Personnels des services directs aux particuliers
25. Ouvriers qualifiés de type industriel
26. Ouvriers qualifiés de type artisanal
27. Chauffeurs
28. Ouvriers qualifiés de la manutention, du magasinage et du transport
29. Ouvriers non qualifiés de type industriel
30. Ouvriers non qualifiés de type artisanal
31. Ouvriers agricoles

DEMASQUER POUR LES TESTS

POSER SI R2= 1 ou 2 ou 3 ou 4

R4

RECODE

SI (R2= 1 OU 2 OU 3 OU 4) ET (R3= 1 A 3) ALORS RECODER R4=1

SI (R2= 1 OU 2 OU 3 OU 4) ET (R3= 4 A 6) ALORS RECODER R4=2

SI (R2= 1 OU 2 OU 3 OU 4) ET (R3= 7 A 12) ALORS RECODER R4=3

SI (R2= 1 OU 2 OU 3 OU 4) ET (R3= 13 A 19) ALORS RECODER R4=4

SI (R2= 1 OU 2 OU 3 OU 4) ET (R3= 20 A 24) ALORS RECODER R4=5

SI (R2= 1 OU 2 OU 3 OU 4) ET (R3= 25 A 31) ALORS RECODER R4=6

SI R2=7 ALORS RECODER R4=7

SI R2=5 OU 6 OU 8 ALORS RECODER R4=8

1. Agriculteurs exploitants
2. Professions Indépendantes
3. Cadres Supérieurs
4. Professions intermédiaires
5. Employés
6. Ouvriers
7. Retraités

8. Inactifs

DEMASQUER POUR LES TESTS

A TOUS

SINGLE

R5

RECODE

SI R4=1 OU 2 OU 3 OU 4 ALORS R5=1

SI R4=5 OU 6 ALORS R5=2

SI R4=7 OU 8 ALORS R5=3



1. CSP+
2. CSP-
3. INACTIF

POSER SI R1=3

SINGLE

R6

Actuellement, quelle est la situation professionnelle de la personne ayant les revenus les plus élevés de votre foyer?

-  *Le recueil de données relatives à la situation professionnelle permet de répondre à l'objectif de la recherche COMCOR qui est de caractériser les facteurs socio-démographiques associés à un risque augmenté d'infection par le SARS-CoV-2.*
-  *Une seule réponse possible*

1. Salarié(e) à plein temps
2. Salarié(e) à temps partiel
3. Travaille à son compte
4. Ne travaille pas actuellement, mais en recherche d'emploi
5. Ne travaille pas actuellement et ne recherche pas d'emploi / en incapacité de travail
6. Homme/femme au foyer
7. Retraité(e)
8. Etudiant(e)/élève

POSER SI R6= 1 ou 2 ou 3 ou 4

SINGLE

R7

Quelle est la profession de la personne ayant les revenus les plus élevés de votre foyer?

Si vous ne trouvez pas le nom exact, choisissez l'option la plus proche.

**SI R6=4 ALORS AFFICHER :** Si la personne ayant les revenus les plus élevés de votre foyer est sans emploi, sélectionnez la proposition qui correspond le mieux à son dernier emploi.

-  *Une seule réponse possible*

1. Agriculteurs sur petite exploitation
2. Agriculteurs sur moyenne exploitation

3. Agriculteurs sur grande exploitation
4. Artisans
5. Commerçants et assimilés
6. Chefs d'entreprise de 10 salariés ou plus
7. Professions libérales
8. Cadres de la fonction publique
9. Professeurs, professions scientifiques
10. Professions de l'information, des arts et des spectacles
11. Cadres administratifs et commerciaux d'entreprise
12. Ingénieurs et cadres techniques d'entreprise
13. Professeurs des écoles, instituteurs et assimilés
14. Professions intermédiaires de la santé et du travail social
15. Clergé, religieux
16. Professions intermédiaires administratives de la fonction publique
17. Professions intermédiaires administratives et commerciales des entreprises
18. Techniciens
19. Contremaîtres, agents de maîtrise
20. Employés civils et agents de service de la fonction publique
21. Policiers et militaires
22. Employés administratifs d'entreprise
23. Employés de commerce
24. Personnels des services directs aux particuliers
25. Ouvriers qualifiés de type industriel
26. Ouvriers qualifiés de type artisanal
27. Chauffeurs
28. Ouvriers qualifiés de la manutention, du magasinage et du transport
29. Ouvriers non qualifiés de type industriel
30. Ouvriers non qualifiés de type artisanal
31. Ouvriers agricoles

### DEMASQUER POUR LES TESTS

*POSER SI R6= 1 ou 2 ou 3 ou 4*

**SINGLE**

**R8**

**RECODE**

**SI (R6= 1 OU 2 OU 3 OU 4) ET (R7= 1 A 3) ALORS RECODER R8=1**

**SI (R6= 1 OU 2 OU 3 OU 4) ET (R7= 4 A 6) ALORS RECODER R8=2**

**SI (R6= 1 OU 2 OU 3 OU 4) ET (R7= 7 A 12) ALORS RECODER R8=3**

**SI (R6= 1 OU 2 OU 3 OU 4) ET (R7= 13 A 19) ALORS RECODER R8=4**

**SI (R6= 1 OU 2 OU 3 OU 4) ET (R7= 20 A 24) ALORS RECODER R8=5**

**SI (R6= 1 OU 2 OU 3 OU 4) ET (R7= 25 A 31) ALORS RECODER R8=6**

**SI R6=7 ALORS RECODER R8=7**

**SI R6=5 OU 6 OU 8 ALORS RECODER R8=8**

1. Agriculteurs exploitants
2. Professions Indépendantes



3. Cadres Supérieurs
4. Professions intermédiaires
5. Employés
6. Ouvriers
7. Retraités
8. Inactifs

DEMASQUER POUR LES TESTS

POSER SI R1=3

SINGLE

R9

RECODE

SI R8=1 OU 2 OU 3 OU 4 ALORS R9=1

SI R8=5 OU 6 ALORS R9=2

SI R8=7 OU 8 ALORS R9=3

1. CSP+
2. CSP-
3. INACTIF

DEMASQUER POUR LES TESTS

A TOUS

SINGLE

CSP

RECODE

SI (R5=1 ET R1=1 OU 2) OU R9=1 ALORS CSP=1

SI (R5=2 ET R1= 1 OU 2) OU R9=2 ALORS CSP =2

SI (R5=3 ET R1= 1 OU 2) OU R9=3 ALORS CSP =3

1. CSP+
2. CSP-
3. INACTIF

CSP- : Employés ou Ouvriers

CSP+ : Agriculteurs exploitants / Professions Indépendantes / Cadres Supérieurs / Professions intermédiaires

INACTIF : Retraités / Inactifs

A TOUS

SINGLE

QG16

Quel est le diplôme le plus élevé que vous ayez obtenu ?

 Une seule réponse possible

1. Vous n'êtes jamais allé(e) à l'école ou vous l'avez quittée avant la fin du primaire
2. Aucun diplôme et scolarité interrompue à la fin du primaire ou avant la fin du collège


3. Aucun diplôme et scolarité jusqu'à la fin du collège ou au-delà
4. CEP (certificat d'études primaires)
5. BEPC, brevet élémentaire, brevet des collèges, DNB
6. CAP, BEP ou diplôme de niveau équivalent
7. Baccalauréat général ou technologique
8. Brevet supérieur, capacité en droit, DAEU, ESEU
9. Baccalauréat professionnel, brevet professionnel, de technicien ou d'enseignement, diplôme équivalent
10. BTS, DUT, Deug, Deust, diplôme de la santé ou du social de niveau bac+2, diplôme équivalent
11. Licence, licence pro, maîtrise, diplôme équivalent de niveau bac+3 ou bac+4
12. Master, DEA, DESS, diplôme grande école niveau bac+5, doctorat de santé
13. Doctorat de recherche (hors santé)

## A TOUS

SINGLE

## QG17

## Avez-vous la nationalité française ?

 *Le recueil de données relatives à la nationalité du participant et de ses parents, ainsi qu'au pays de naissance du participant ont pour objectifs de permettre la « caractérisation de la population étudiée en vue de comparaison avec d'autres études épidémiologiques en lien avec le SARS-CoV-2 ».*

 *Une seule réponse possible*


1. Oui, de naissance (y compris par réintégration)
2. Oui, par naturalisation, mariage, déclaration ou option à sa majorité
3. Non
4. Vous ne savez pas
5. Ne souhaite pas répondre


## A TOUS

SINGLE

## QG18

## Dans quel pays êtes-vous né(e) ?

 *Le recueil de données relatives à la nationalité du participant et de ses parents, ainsi qu'au pays de naissance du participant ont pour objectifs de permettre la « caractérisation de la population étudiée en vue de comparaison avec d'autres études épidémiologiques en lien avec le SARS-CoV-2 ».*

 *Une seule réponse possible*


1. En France
2. A l'étranger
3. Vous ne savez pas
4. Ne souhaite pas répondre


## SI QG18=2

SINGLE

## QG19

## Vous avez déclaré être né(e) à l'étranger. Et plus précisément, dans quel pays était-ce ?

 *Le recueil de données relatives à la nationalité du participant et de ses parents, ainsi qu'au pays de naissance du participant ont pour objectifs de permettre la « caractérisation de la population étudiée en vue de comparaison avec d'autres études épidémiologiques en lien avec le SARS-CoV-2 ».*


 *Une seule réponse possible*

1. **AFFICHAGE DE LA LISTE DEROULANTE DES PAYS** (même liste que pour la Q19)
2. Ne souhaite pas répondre

**A TOUS**

SINGLE

**QG20****Quelle est (ou quelle était) la nationalité de votre père ?**

 *Le recueil de données relatives à la nationalité du participant et de ses parents, ainsi qu'au pays de naissance du participant ont pour objectifs de permettre la « caractérisation de la population étudiée en vue de comparaison avec d'autres études épidémiologiques en lien avec le SARS-CoV-2 ».*


 *Une seule réponse possible*


1. Française de naissance (y compris par réintégration)
2. Française par naturalisation, mariage, déclaration ou option à sa majorité
3. Etrangère
4. Père inconnu
5. Vous ne savez pas
6. Ne souhaite pas répondre

**A TOUS**

SINGLE

**QG21****Quelle est (ou quelle était) la nationalité de votre mère ?**

 *Le recueil de données relatives à la nationalité du participant et de ses parents, ainsi qu'au pays de naissance du participant ont pour objectifs de permettre la « caractérisation de la population étudiée en vue de comparaison avec d'autres études épidémiologiques en lien avec le SARS-CoV-2 ».*

 *Une seule réponse possible*

1. Française de naissance (y compris par réintégration)
2. Française par naturalisation, mariage, déclaration ou option à sa majorité
3. Etrangère
4. Mère inconnue
5. Vous ne savez pas
6. Ne souhaite pas répondre

**A TOUS**

SINGLE

**QG8****Concernant votre habitation principale, dans quel type de logement habitez-vous ?**

 *Une seule réponse possible*

1. Une maison individuelle
2. Un appartement
3. Un foyer avec chambre individuelle
4. Un foyer avec chambre partagée
5. En EHPAD (établissements d'hébergement pour personnes âgées dépendantes)

## A TOUS

MULTIPLE

## QG90

Possédez-vous un ou plusieurs des animaux domestiques suivants dans votre foyer ?

 Plusieurs réponses possibles

ROTATION ALEATOIRE CODES 1 A 4

CODE 6 EXCLUSIVE

1. Chien
2. Chat
3. Oiseau
4. Poisson
5. Autre animal domestique
6. Il n'y a aucun animal domestique dans mon foyer [Exclusive]

## POSER A TOUS

## PARTIE B: ETAT DE SANTE

## A TOUS

INTRO

## QINTRO


Les questions suivantes portent sur votre état de santé.

## A TOUS

SINGLE

## QG90B

Diriez-vous que d'une façon générale, vous faites attention à votre santé ?

 Une seule réponse possible

1. Oui, beaucoup
2. Plutôt assez
3. Peu
4. Pas du tout

## A TOUS

NUMERIC

## QG9

Quelle est votre taille ?

 Veuillez saisir votre taille en centimètres Veuillez fournir une réponse, même si elle est approximative - Exemple : si 1m80 coder 180

MIN 70 MAX 250

\\_ \\_ \\_ \\_ \\_ centimètres

## A TOUS

NUMERIC

## QG10

Quel est votre poids ?

 Veuillez saisir votre poids en kilogrammes

MIN 20 MAX 250

\\_ \\_ \\_ \\_ \\_ kilogrammes

## A TOUS

MULTIPLE

## QG11

Souffrez-vous d'une des maladies suivantes ?

 Plusieurs réponses possibles

ROTATION ALEATOIRE – CODE 5 ET 6 EXCLUSIFS

1. Diabète
2. Hypertension artérielle
3. Angine de poitrine / infarctus du myocarde
4. Maladie respiratoire chronique (bronchite chronique, asthme, ...)
5. Aucune de ces maladies
6. Ne souhaite pas répondre

SI QG2 =2 OU SEXE=2

SINGLE

## QG11B

Êtes-vous enceinte ?

 Une seule réponse possible

1. Oui
2. Non
3. Vous ne savez pas
4. Ne souhaite pas répondre

SI QG11B = 1

SINGLE

## QG11C

A quel stade de votre grossesse êtes-vous ?

 Une seule réponse possible

1. Premier trimestre
2. Deuxième trimestre
3. Troisième trimestre

A MASQUER

A TOUS

SINGLE

## QG12

Actuellement, prenez-vous un traitement immunosuppresseur (qui diminue vos défenses contre les infections) ?

 Une seule réponse possible

1. ~~Oui~~
2. ~~Non~~
3. ~~Ne souhaite pas répondre~~

**A TOUS****SINGLE****QG12B****Avez-vous une maladie ou suivez-vous un traitement qui diminue vos défenses immunitaires (immunodépression) ?** *Une seule réponse possible*

1. Oui
2. Non
3. Ne souhaite pas répondre

**SI QG12B=1****MULTIPLE****QG12C****Plus précisément, qu'est-ce qui provoque cette immunodépression ?** *Plusieurs réponses possibles*

1. Je souffre d'un cancer du sang (par exemple lymphome, leucémie, myélodysplasie, myélome, etc.)
2. Je souffre d'un autre type de cancer (par exemple cancer du poumon, du sein, du colon, etc.)
3. J'ai subi une transplantation d'organe (poumon, cœur, rein, foie, etc.)
4. J'ai subi une greffe de cellules souches
5. Je souffre d'une insuffisance rénale nécessitant une dialyse
6. Je souffre d'un lupus systémique ou vascularite nécessitant un traitement immunodépresseur
7. Je suis un traitement par corticoïde (prednisolone par exemple) (au moins 10mg/j) depuis au moins deux semaines
8. Je suis un traitement immunosuppresseur
9. Autre cause
10. Ne souhaite pas répondre

**SI QG12C=1 OU 2****SINGLE****QG12D****Suivez-vous une chimiothérapie ?** *Une seule réponse possible*

1. Oui
2. Non
3. Ne souhaite pas répondre

**NOUVELLE QUESTION****A TOUS****SINGLE****QG12E****Quel est votre groupe sanguin ?**

 Une seule réponse possible

1. A
2. B
3. AB
4. O
5. Ne sait pas
6. Ne souhaite pas répondre

**NOUVELLE QUESTION****A TOUS****SINGLE****QG12EBIS****Veillez préciser votre Rhésus :**

 Une seule réponse possible


1. Positif
2. Négatif
3. Ne sait pas
4. Ne souhaite pas répondre

**A TOUS****SINGLE****QG13****Actuellement fumez-vous des cigarettes (en paquet, roulées ou tubées) ?**

 Une seule réponse possible

1. Oui
2. Non

**SI QG13 = 1****SINGLE****QG14****En moyenne, au cours de ces 30 derniers jours, combien de cigarettes avez-vous fumé par jour ?**

 Une seule réponse possible

1. Moins de 10
2. Entre 10 et 20
3. Plus de 20

**A TOUS****MULTIPLE****QG15****Parmi la liste suivante de substituts nicotiniques, lesquels avez-vous consommé ou utilisé au cours des 30 derniers jours ?**

 Plusieurs réponses possibles

**ROTATION ALEATOIRE – CODE 6 EXCLUSIVE**

1. Patch
2. Gommes
3. Comprimés
4. Spray, inhalateur
5. Cigarette électronique
6. Aucun, je ne consomme pas de substitut nicotinique

**SI QG13 = 1 OU QG15=5**

**SINGLE**

**QG15B**

**Toujours au cours des 30 derniers jours, vous est-il arrivé de fumer/vapoter en groupe ?**

1. Oui
2. Non



## PARTIE III : QUESTIONNAIRE SPHERE EXTRA-DOMICILIAIRE

## SI QCIBLE=1 (CAS INDEX)

INTRO

## QINTRO3A

Les questions suivantes portent sur les gestes barrières [Si CA7=1 alors afficher « au cours des 7 jours avant le début des symptômes. » // SI CA7<> 1 alors afficher « au cours des 7 jours avant la réalisation du test. »]

## SI QCIBLE=2 (PROCHES)

INTRO

## QINTRO3B

Les questions suivantes portent sur les gestes barrières au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile.

## SI QCIBLE=3 OU 4 (TEMOINS DISTANTS OU PERSONNEL SOIGNANT)

INTRO

## QINTRO3C

Les questions suivantes portent sur les gestes barrières au cours des 7 derniers jours.

## RAPPEL DE L'INTRODUCTION POUR LES QUESTIONS Q1 A Q14

## POSER A TOUS

## PARTIE A: GESTES BARRIERES

## 1-PORT DU MASQUE

## A TOUS

SINGLE

## Q1

A l'extérieur de votre domicile, dans les situations où le masque est recommandé/obligatoire, diriez-vous que vous le [si QCIBLE = 3 ou 4 alors afficher : portez... // si QCIBLE = 1 ou 2 alors afficher : portiez...]

 Une seule réponse possible

1. Jamais
2. Rarement
3. Régulièrement mais moins de la moitié du temps
4. Régulièrement et plus de la moitié du temps
5. Tout le temps
6. Je n'ai pas fréquenté de lieu où le masque est recommandé/obligatoire

## A TOUS

SINGLE

## Q1BIS

Et dans le cercle familial et amical diriez-vous que vous [si QCIBLE = 3 ou 4 alors afficher : portez le masque... // si QCIBLE = 1 ou 2 alors afficher : portiez le masque...]

 Une seule réponse possible

1. Jamais
2. Rarement
3. Régulièrement mais moins de la moitié du temps
4. Régulièrement et plus de la moitié du temps
5. Tout le temps
6. Je n'ai pas rencontré de personne de mon cercle familial ou amical


## A MASQUER

~~FILTRER SI Q1 <-> 1 ET Q1BIS <-> 1~~

SINGLE

## Q2

~~[si QCIBLE = 3 alors afficher : Portez-vous // si QCIBLE = 1 ou 2 alors afficher : Portiez-vous] un masque chirurgical ou un masque « grand public » (masque en tissu, norme Afnor) ?~~

~~ Une seule réponse possible~~

- ~~1. Exclusivement un masque chirurgical~~
- ~~2. Plus souvent un masque chirurgical~~
- ~~3. Un masque chirurgical ou grand public de façon équivalente~~
- ~~4. Plus souvent un masque grand public~~
- ~~5. Exclusivement un masque grand public~~

## A MASQUER

~~SI Q2 = 1 A 4~~

SINGLE

## Q3

~~Diriez-vous que vous [si QCIBLE = 3 alors afficher : changez // si QCIBLE = 1 ou 2 alors afficher : changez] votre masque chirurgical après l'avoir porté...~~

~~ Une seule réponse possible~~

- ~~1. 4 heures~~
- ~~2. Un jour~~
- ~~3. Plus d'un jour mais moins d'une semaine~~
- ~~4. Une semaine ou plus~~

## A MASQUER

~~SI Q2 = 2 A 5~~

SINGLE

## Q4

Diriez-vous que vous [~~si QCIBLE = 3 alors afficher : lavez // si QCIBLE = 1 ou 2 alors afficher : laviez~~] votre masque « grand public » (masque en tissu, norme Afnor) après l'avoir porté...

~~📖 Une seule réponse possible~~

- ~~1. 4 heures~~
- ~~2. Un jour~~
- ~~3. Plus d'un jour mais moins d'une semaine~~
- ~~4. Une semaine ou plus~~

## POSER A TOUS

### PARTIE A : GESTES BARRIERES

#### 2- LAVAGE DES MAINS

#### A TOUS

SINGLE

#### Q5

A quelle fréquence vous [~~si QCIBLE = 3 ou 4 alors afficher : lavez-vous // si QCIBLE = 1 ou 2 alors afficher : laviez~~] les mains ?

~~📖 Une seule réponse possible~~

1. Jamais
2. 1 à 4 fois par jour
3. 5 à 10 fois par jour
4. Plus de 10 fois par jour

#### A MASQUER

#### SI Q5 = 2 A 4

SINGLE

#### Q6

Et diriez-vous que vous vous [~~si QCIBLE = 3 alors afficher : lavez // si QCIBLE = 1 ou 2 alors afficher : laviez~~] les mains...

~~📖 Une seule réponse possible~~

- ~~1. Exclusivement à l'eau et au savon~~
- ~~2. Le plus souvent à l'eau et au savon mais il vous arrive d'utiliser un gel hydro-alcoolique~~
- ~~3. Aussi bien à l'eau et au savon qu'avec un gel hydro-alcoolique~~
- ~~4. Le plus souvent avec un gel hydro-alcoolique, mais il vous arrive d'utiliser de l'eau et du savon~~
- ~~5. Exclusivement avec un gel hydro-alcoolique~~

#### SI Q5 = 2 A 4

SINGLE

#### Q6B

Lorsque vous [~~si QCIBLE = 3 ou 4 alors afficher : êtes // si QCIBLE = 1 ou 2 alors afficher : étiez~~] à l'extérieur de chez vous, [~~si QCIBLE = 3 ou 4 alors afficher : utilisez-vous // si QCIBLE = 1 ou 2 alors afficher : utilisiez-vous~~] du gel hydroalcoolique ?

~~📖 Une seule réponse possible~~

1. Je ne suis pas sortie de chez moi
2. Jamais
3. Parfois
4. Systématiquement

### POSER A TOUS

#### PARTIE A : GESTES BARRIERES

#### 3 - AERATION

#### A TOUS

SINGLE

#### Q6C

Lorsque vous [si QCIBLE = 3 ou 4 alors afficher : êtes // si QCIBLE = 1 ou 2 alors afficher : étiez] dans un lieu clos (à votre domicile, au travail, etc.) en présence de personnes extérieures à votre foyer, est-ce que vous [si QCIBLE = 3 ou 4 alors afficher : aérez // si QCIBLE = 1 ou 2 alors afficher : aérez] la pièce au moins 5 minutes toutes les heures ?

 Une seule réponse possible

1. Oui
2. Non
3. Vous ne savez pas
4. Je ne me suis pas retrouvé(e) dans un lieu clos avec des personnes extérieures à mon foyer

### POSER A TOUS

#### PARTIE A: GESTES BARRIERES

#### 4 - DISTANCIATION PHYSIQUE

#### A TOUS

SINGLE

#### Q7

Dans quelle mesure diriez-vous que vous [si QCIBLE = 3 ou 4 alors afficher : maintenez // si QCIBLE = 1 ou 2 alors afficher : maintenez] une distance d'au moins un mètre [Affichage des sous-questions]

 Une seule réponse possible

#### ROTATION

#### MASQUER SQ1

SQ1. Au travail ? **AFFICHER UNIQUEMENT SI R2=1 ou 2 ou 3**

SQ2. Avec des amis ou des membres de votre famille qui ne font pas partie de votre foyer ?

#### EN LIGNE

1. Toujours
3. Souvent
4. Rarement
5. Jamais

## POSER A TOUS

## PARTIE A: GESTES BARRIERES

## 5 – EMBRASSADES

## A TOUS

SINGLE

## Q8

**Afficher si QCIBLE = 3 ou 4 :** Dans quelle mesure vous arrive-t-il de saluer les personnes que vous rencontrez en leur serrant la main ou en les embrassant ?

**Afficher si QCIBLE = 1 ou 2 :** Dans quelle mesure vous arrivait-il de saluer les personnes que vous rencontriez en leur serrant la main ou en les embrassant ?

 Une seule réponse possible

1. Toujours
2. Souvent
3. Rarement
4. Jamais
5. Je n'ai rencontré personne

## POSER A TOUS

## PARTIE A: GESTES BARRIERES

## 6 – TOUS ANTI COVID

## A TOUS

SINGLE

## Q8B

Avez-vous utilisé l'application Tous anti Covid au cours des deux dernières semaines ?

 Une seule réponse possible

1. Oui
2. Non

**SI Q8B=1 ET QCIBLE=2 OU 3 OU 4 (PROCHES OU TEMOINS DISTANTS OU PERSONNEL SOIGNANT)**

SINGLE

## Q8C

Avez-vous été notifié d'un contact avec une personne contaminée par l'application Tous anti Covid?

 Une seule réponse possible

1. Oui
2. Non

## POSER A TOUS

## PARTIE A: GESTES BARRIERES

## 7 – CONTACTS A RISQUE

## A TOUS

SINGLE

## Q8D

Avec combien de personnes extérieures à votre foyer [**si QCIBLE = 3 ou 4 alors afficher : avez-vous // si QCIBLE = 1 ou 2 alors afficher : aviez-vous**] interagi (contact physique, discussion ou proximité avec distance inférieure à un mètre pendant plusieurs minutes, avec ou sans masque) **DANS UN MILIEU CLOS ?**

 Une seule réponse possible

1. Aucune personne
2. Moins de 3 personnes
3. Entre 4 et 10 personnes
4. Plus de 10 personnes

## A TOUS

SINGLE

## Q8E

Avec combien de personnes extérieures à votre foyer [**si QCIBLE = 3 ou 4 alors afficher : avez-vous // si QCIBLE = 1 ou 2 alors afficher : aviez-vous**] interagi (contact physique, discussion ou proximité avec distance inférieure à un mètre pendant plusieurs minutes, avec ou sans masque) **EN EXTERIEUR ?**

 Une seule réponse possible

1. Aucune personne
2. Moins de 3 personnes
3. Entre 4 et 10 personnes
4. Plus de 10 personnes

## A TOUS

SINGLE

## Q8F

Lorsque vous étiez à proximité de personnes extérieures à votre foyer, dans quelle mesure avez-vous porté des lunettes (de vue ou de soleil) ?

 Une seule réponse possible

1. Toujours
2. Plus de la moitié du temps
3. Moins de la moitié du temps
4. Jamais
5. Je ne me suis pas retrouvé(e) à proximité de personnes extérieures à mon foyer

**POSER UNIQUEMENT A LA CIBLE C (TEMOINS DISTANTS)****PARTIE A: GESTES BARRIERES****8 – AUTOTEST****POSER SI CIBLE C****SINGLE****Q8BIS\_1****Au cours des 7 derniers jours, avez-vous réalisé au moins un autotestautotest ?** *Une seule réponse possible*

1. Oui
2. Non

**Q8BIS\_1=1****QUESTION OUVERTE****Q8BIS\_2****Plus précisément, combien d'autotest avez-vous réalisé au cours de ces 7 derniers jours ?****MIN 1/MAX 7****SI REPONSE =0 OU >7 ALORS AFFICHER : VEUILLEZ SAISIR UNE REPONSE ENTRE 1 ET 7**

|\_|

**Q8BIS\_1=1****MULTIPLE****Q8BIS\_2B****Pourquoi avez-vous réalisé ce ou ces autotests ?** *Plusieurs réponses possibles***ROTATION ALEATOIRE DES CODE 1 A 9**

1. Car j'avais des symptômes
2. Car j'étais personne contact
3. Car je voulais participer à un événement
4. Car je voulais rencontrer des proches à risque
5. Car c'était demandé dans le cadre de mon travail
6. J'en fais régulièrement de façon systématique
7. Car le délai était trop long pour un test en pharmacie ou laboratoire
8. Car j'avais peur d'être contaminé(e) en pharmacie ou en laboratoire
9. Car j'avais peur de contaminer des personnes en allant en pharmacie ou en laboratoire
10. Pour une autre raison

**POSER SI Q8BIS\_2=1**

SINGLE

**Q8BIS\_3A****Cet autotest était-il positif ?** *Une seule réponse possible*

1. Oui
2. Non

**POSER SI Q8BIS\_2>1**

SINGLE

**Q8BIS\_3B****Parmi ces autotests, combien étaient-ils positifs ?****MIN 0 – MAX 7****TEST DE COHERENCE : SI Q8BIS\_3B > Q8BIS\_2 ALORS AFFICHER**

« Le nombre d'autotests positifs ne peut pas être supérieur au nombre total d'autotests réalisés au total »

**Q8BIS\_3A=1 OU Q8BIS\_3A>0**

MULTIPLE

**Q8BIS\_4****A la suite, du ou de vos autotests positifs, avez-vous réalisé un (ou plusieurs) test(s) de confirmation en pharmacie, en laboratoire ou auprès d'un professionnel de santé ?** *Plusieurs réponses possibles*

1. Oui, un ou plusieurs test(s) PCR
2. Oui, un ou plusieurs test(s) antigénique
3. Non, je n'ai pas réalisé de test de confirmation **[exclusif]**

**Q8BIS\_3A=2 OU Q8BIS\_3A=0**

MULTIPLE

**Q8BIS\_5****A la suite, du ou de vos autotests négatifs, avez-vous réalisé un (ou plusieurs) test(s) de confirmation en pharmacie, en laboratoire ou auprès d'un professionnel de santé ?** *Plusieurs réponses possibles*

1. Oui, un ou plusieurs test(s) PCR
2. Oui, un ou plusieurs test(s) antigénique
3. Non, je n'ai pas réalisé de test de confirmation **[exclusif]**



## POSER A TOUS

## PARTIE B: HABITUDES ET COMPORTEMENTS

## 1 – TRAVAIL

## SI QCIBLE=1 (CAS INDEX)

INTRO

## QINTRO3A\_2

Les questions suivantes portent sur vos habitudes et comportements [Si CA7=1 alors afficher « au cours des 7 jours avant le début des symptômes. » // SI CA7<> 1 alors afficher « au cours des 7 jours avant la réalisation du test. »]

## SI QCIBLE=2 (PROCHES)

INTRO

## QINTRO3B\_2

Les questions suivantes portent sur vos habitudes et comportements au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile.

## SI QCIBLE=3 OU 4 (TEMOINS DISTANTS OU PERSONNEL SOIGNANT)

INTRO

## QINTRO3C\_2

Les questions suivantes portent sur vos habitudes et comportements au cours des 7 derniers jours.

## RAPPEL DE L'INTRODUCTION POUR LES QUESTIONS Q9 A Q14

## A TOUS

SINGLE

## Q9\_2

Avez-vous pratiqué une activité professionnelle ?

 Une seule réponse possible

1. Oui (y compris partiellement)
2. Non, je suis actuellement sans activité professionnelle
3. Non, j'étais en congé pendant toute la période (vacances, maladie, congés maternité ou parental, etc.)

## POSER SI Q9\_2=1

## SI Q9\_2=2 RECODER AUTOMATIQUEMENT Q9=4

SINGLE

## Q9

Avez-vous pratiqué votre travail à distance (télétravail) ?

 Une seule réponse possible

1. Oui, entièrement
2. Oui, partiellement
3. Non
4. Je suis actuellement sans activité professionnelle

**SI Q9 = 2 OU 3**

SINGLE

**Q11****Combien de jours vous êtes-vous rendu(e) sur votre lieu de travail?** *Une seule réponse possible*

1. 1 à 2 jours
2. 3 à 4 jours
3. 5 jours ou plus

**SI Q9 = 2 OU 3**


SINGLE

**Q11\_1****Avez-vous mangé sur votre lieu de travail en présence d'autres personnes (restaurant d'entreprise, cantine, cafétéria, etc.) ?** *Une seule réponse possible*

1. Oui
2. Non

**SI Q9 = 2 OU 3**

SINGLE

**Q11\_2****Est-ce que vous maintenez une distance d'un mètre entre vous et les autres personnes sur votre lieu de travail ?** *Une seule réponse possible*

1. Oui, toujours
2. Oui, uniquement lorsque nous ne portons pas le masque (déjeuner, café, pause cigarette, etc.)
3. Non

**SI Q9 = 2 OU 3**

SINGLE

**Q11\_3****Sur votre lieu de travail (en dehors des pauses café ou du déjeuner) en présence d'autres personnes (collègues dans un bureau, réunions, clients, etc.), [si QCIBLE = 3 ou 4 alors afficher : portez-vous // si QCIBLE = 1 ou 2 alors afficher : portez-vous] un masque ?** *Une seule réponse possible*

1. Oui, tout le temps
2. Oui, de temps en temps
3. Non, jamais
4. Je n'ai pas travaillé en présence d'autres personnes

**SI Q9 = 1 OU 2 OU 3**

SINGLE

**Q12****Effectuez-vous un travail de bureau ?** Une seule réponse possible

1. Oui
2. Non

**SI Q12 = 1**

SINGLE

**Q13****Et travaillez-vous dans un open space ?** Une seule réponse possible

1. Oui
2. Non

**SI Q12 = 1**

SINGLE

**Q13B****Partagez-vous un bureau avec d'autres personnes ?** Une seule réponse possible

1. Oui
2. Non

**SI Q9 = 1 OU 2 OU 3**

MULTIPLE

**Q14****Et travaillez-vous...** Plusieurs réponses possibles**ROTATION ALEATOIRE SAUF CODE 8 – A PRESENTER TOUJOURS EN DERNIER**

1. En tant que professionnel(le)s de santé ou dans le domaine de la santé
2. Dans l'hôtellerie, restauration
3. Dans un commerce avec contact avec les clients
4. En tant qu'enseignant
5. En tant que personnel de guichet
6. En tant que chauffeur de bus, taxi ou VTC
7. En tant qu'aide à la personne hors professionnel(le)s de santé
- 8. Dans un autre domaine, précisez dans le cadre ci-dessous INSERER UN TEXT BOX**
9. Chauffeur-livreur ou livraison à domicile (repas, colis, etc.)

**SI Q14 = 4**

MULTIPLE

**Q14B\_1****Dans quel type d'établissement enseignez-vous ?** Plusieurs réponses possibles

1. Ecole maternelle
2. Ecole primaire
3. Au collège
4. En lycée
5. Post-bac ou universitaire
6. Formation continue, public professionnel adulte
7. Ecole artistique, conservatoire, etc.
8. Autre type d'établissement

SI Q14 = 4

MULTIPLE

#### Q14B\_2

Avez-vous été en contact avec une personne connue positive à la Covid-19 [ Si QCIBLE=1 et Si CA7=1 alors afficher « au cours des 7 jours avant le début des symptômes » // Si QCIBLE=1 et CA7<> 1 alors afficher « au cours des 7 jours avant la réalisation du test » // Si QCIBLE=2 alors « au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile » // Si QCIBLE=3 ou 4 alors « au cours des 7 derniers jours » ], quel qu'en soit le lieu ?

 Plusieurs réponses possibles


1. Elève COVID positif
2. Collègue COVID positif
3. Personne de la sphère privée COVID positif
4. Une autre personne
5. Non **[Exclusif]**

SI Q14 = 6

SINGLE

#### Q14C\_1

Plus précisément, êtes-vous ?

 Une seule réponse possible

1. Chauffeur de taxi
2. VTC
3. Chauffeur de bus
4. Autre

SI Q14 = 6

SINGLE

#### Q14C\_2

En présence de passagers dans votre véhicule, [si QCIBLE = 3 ou 4 alors afficher : portez-vous // si QCIBLE = 1 ou 2 alors afficher : portez-vous] le masque ?

 Une seule réponse possible

1. Oui, toujours
2. Oui, de temps en temps
3. Non
4. Je n'ai pas eu de passagers dans mon véhicule au cours des 7 derniers jours **[AFFICHER SI QCIBLE = 3 ou 4]**

5. Je n'ai pas eu de passagers dans mon véhicule au cours des 7 jours avant le début des symptômes  
[AFFICHER SI QCIBLE=1 et Si CA7=1]
6. Je n'ai pas eu de passagers dans mon véhicule au cours des 7 jours avant la réalisation du test [AFFICHER SI QCIBLE=1 et CA7<> 1]
7. Je n'ai pas eu de passagers dans mon véhicule au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile » [AFFICHER SI QCIBLE=2]

SI (Q14C\_1=1 OU 2) ET (Q14C\_2 = 1 OU 2 OU 3)

SINGLE

#### Q14C\_3

Dans votre véhicule, [si QCIBLE = 3 ou 4 alors afficher : disposez-vous // si QCIBLE = 1 ou 2 alors afficher : disposez-vous] d'une séparation entre vous et vos clients (vitre de protection, bâche, etc.) ?

 Une seule réponse possible

1. Oui
2. Non

SI (Q14C\_1=1 OU 2) ET (Q14C\_2 = 1 OU 2 OU 3)

SINGLE

#### Q14C\_4

[si QCIBLE = 3 ou 4 alors afficher : Aérez-vous // si QCIBLE = 1 ou 2 alors afficher : Aérez-vous] régulièrement (au moins une fois par heure) votre véhicule en ouvrant les fenêtres ?

 Une seule réponse possible

1. Oui
2. Non
3. Les vitres du véhicule ne peuvent pas s'ouvrir

SI Q14 = 1

SINGLE

#### Q14\_1

Dans quel type de structure travaillez-vous majoritairement ?

 Une seule réponse possible

#### ROTATION ALEATOIRE SAUF CODE 10 – A PRESENTER TOUJOURS EN DERNIER

1. Centre hospitalier/Centre de lutte contre le cancer
2. Clinique / hôpital privé
3. Soins de suite réadaptation
4. Etablissement d'hébergement ou équivalent (EHPAD, Hôpital local, polyhandicap, SLD, etc.)
5. Cabinet libéral ou Centre de santé
6. Laboratoire de biologie médicale libéral
7. Pharmacie d'officine
8. Centre d'hémodialyse privé ou associatif
9. Hospitalisation à domicile (HAD), Soins à domicile (SAD)
10. Autre

**SI Q14\_1 = 1, 2, 3 OU 4**

SINGLE

**Q14\_2****Quelle est la taille de cette structure de santé ?** Une seule réponse possible

1. Moins de 50 lits ou places
2. Entre 50 et 100 lits ou places
3. Entre 101 et 300 lits ou places
4. Entre 301 et 600 lits ou places
5. Plus de 600 lits ou places

**SI Q14\_1 = 1 OU 2**

SINGLE

**Q14\_3****Quel est votre secteur principal d'activité ?** Une seule réponse possible**ROTATION ALEATOIRE**

1. Médecine
2. Chirurgie
3. Obstétrique
4. Réanimation/USC
5. Bloc opératoire
6. Médico-technique
7. Administratif

**SI Q14\_1 = 5**


SINGLE

**Q14\_4****Au sein de votre structure, travaillez-vous ?** Une seule réponse possible

1. Seul
2. Avec d'autres professionnels de santé/social

**SI Q14 = 1**

SINGLE

**Q14\_5****Quel est votre catégorie professionnelle ?***Si vous ne trouvez pas le nom exact de votre profession, choisissez l'option la plus proche.* Une seule réponse possible

1. Agent administratif
2. Aide-soignant(e)
3. Ambulancier
4. Agent de service hospitalier
5. Assistant dentaire

6. Assistant social
7. Audioprothésiste
8. Biologiste médecin ou pharmacien
9. Brancardier
10. Cadre de soins
11. Chirurgien-dentiste
12. Diététicien(ne)
13. Élève IFSI/aide-soignant
14. Ergothérapeute
15. Étudiant(e) en médecine/pharmacie/maïeutique
16. Infirmier(e)
17. Interne
18. Kinésithérapeute
19. Manipulateur radio
20. Médecin généraliste
21. Médecin spécialiste
22. Opticien-lunetier
23. Orthophoniste
24. Orthoprothésiste
25. Orthoptiste
26. Pédicure-podologue
27. Pharmacien
28. Préparateur en pharmacie
29. Prothésistes et orthésistes
30. Psychologue
31. Psychomotricien(ne)
32. Sage-femme
33. Technicien de laboratoire
34. Autre (sans précision)
35. Auxiliaire de vie => **A FAIRE AFFICHER APRES LE CODE 7 : Audioprothésiste**

**SI Q14=1**

SINGLE

**Q14\_6****Dans votre activité professionnelle, êtes-vous directement au contact de patients/clients ?** *Une seule réponse possible***ROTATION ALEATOIRE SAUF CODE 4 – A PRESENTER TOUJOURS EN DERNIER**

1. Oui, principalement adultes mais non personnes âgées
2. Oui, principalement enfants
3. Oui, principalement des personnes âgées
4. Non

**SI Q14\_6=4 ET Q14\_1=10 alors aller Q15****SI Q14\_6=1 OU 2 OU 3**

SINGLE

**Q14\_7**

Dans votre activité professionnelle, avez-vous effectué des visites de patients à domicile [ Si QCIBLE=1 et Si CA7=1 alors afficher « au cours des 7 jours avant le début des symptômes ? » // Si QCIBLE=1 et CA7<> 1 alors afficher « au cours des 7 jours avant la réalisation du test ? » // Si QCIBLE=2 alors « au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile ? » // Si QCIBLE=3 ou 4 alors « au cours des 7 derniers jours ? ] »

 Une seule réponse possible

1. Oui
2. Non

SI Q14=1

SINGLE

Q14\_8

Sur quelles plages horaires travaillez-vous habituellement (hors gardes) ?

 Une seule réponse possible

1. Journée (matin ou après-midi)
2. Nuit
3. Alternance jour/nuit

SI Q14\_6=1 OU 2 OU 3

SINGLE

Q14\_9

Travaillez-vous habituellement auprès de patients COVID-19 positifs ?

 Une seule réponse possible

1. Oui, dans une unité COVID
2. Oui, fréquemment
3. Oui, parfois
4. Non, jamais

SI Q14=1

MULTIPLE

Q14\_10

Avez-vous été en contact avec une personne connue infectée par le SARS-CoV-2 [ Si QCIBLE=1 et Si CA7=1 alors afficher « au cours des 7 jours avant le début des symptômes » // Si QCIBLE=1 et CA7<> 1 alors afficher « au cours des 7 jours avant la réalisation du test » // Si QCIBLE=2 alors « au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile » // Si QCIBLE=3 ou 4 alors « au cours des 7 derniers jours » ], quel qu'en soit le lieu ?

 Plusieurs réponses possibles

1. Patient COVID positif
2. Collègue COVID positif
3. Personne de la sphère privée COVID positif
4. Une autre personne
5. Non **[Exclusif]**



## SI Q14=1

SINGLE

## Q14\_11

Une situation de cluster/cas groupé (au moins 3 cas de COVID-19) a-t-elle été identifiée dans votre entourage professionnel [ Si QCIBLE=1 et Si CA7=1 alors afficher « au cours des 7 jours avant le début des symptômes » // Si QCIBLE=1 et CA7<> 1 alors afficher « au cours des 7 jours avant la réalisation du test » // Si QCIBLE=2 alors « au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile » // Si QCIBLE=3 ou 4 alors « au cours des 7 derniers jours » ]?

 Une seule réponse possible

1. Oui, cluster de personnels soignants COVID-19
2. Oui, cluster de patients COVID-19
3. Oui, les deux
4. Non

## SI Q14\_6=1 OU 2 OU 3

SINGLE

## Q14\_12A

Généralement, lors de vos activités de soins en contact direct avec des patients [ Si QCIBLE=1 et Si CA7=1 alors afficher « au cours des 7 jours avant le début des symptômes » // Si QCIBLE=1 et CA7<> 1 alors afficher « au cours des 7 jours avant la réalisation du test » // Si QCIBLE=2 alors « au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile » // Si QCIBLE=3 ou 4 alors « au cours des 7 derniers jours » ], quel type de masque portiez-vous systématiquement ?

 Une seule réponse possible

## ROTATION ALÉATOIRE


1. Masque chirurgical
2. Masque en tissu
3. Masque de type FFP2 (type « bec de canard » ou autre)

SI Q14\_6=1 OU 2 OU 3

SINGLE

## Q14\_12B

Toujours en général, lors de vos activités de soins en contact direct avec des patients [ Si QCIBLE=1 et Si CA7=1 alors afficher « au cours des 7 jours avant le début des symptômes » // Si QCIBLE=1 et CA7<> 1 alors afficher « au cours des 7 jours avant la réalisation du test » // Si QCIBLE=2 alors « au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile » // Si QCIBLE=3 ou 4 alors « au cours des 7 derniers jours » ], portez-vous systématiquement les équipements de protection individuelle suivants ?

 Une seule réponse possible par ligne

## PRESENTER EN TABLEAU – UNE SEULE REPONSE POSSIBLE PAR LIGNE

1. Oui
2. Non

## ROTATION ALEATOIRE

- |      |                                  |
|------|----------------------------------|
| SQ1. | Lunette de protection ou visière |
| SQ2. | Gants à usage unique             |
| SQ3. | Surblouse                        |
| SQ4. | Tablier                          |

SI Q14\_6=1 OU 2 OU 3 ET Q14\_9=1 OU 2 OU 3

SINGLE

## Q14\_13A

Et plus précisément, lors de vos activités de soins en contact direct AVEC DES PATIENTS SUSPECTS OU AVERES COVID-19 POSITIFS [Si QCIBLE=1 et Si CA7=1 alors afficher « au cours des 7 jours avant le début des symptômes » // Si QCIBLE=1 et CA7<> 1 alors afficher « au cours des 7 jours avant la réalisation du test » // Si QCIBLE=2 alors « au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile » // Si QCIBLE=3 ou 4 alors « au cours des 7 derniers jours » ], quel type de masque portez-vous systématiquement ?

 Une seule réponse possible

## ROTATION ALÉATOIRE

1. Masque chirurgical
2. Masque en tissu
3. Masque de type FFP2 (type « bec de canard » ou autre)

SI Q14\_6=1 OU 2 OU 3 ET Q14\_9=1 OU 2 OU 3

SINGLE

## Q14\_13B

Et toujours lors de vos activités de soins en contact direct AVEC DES PATIENTS SUSPECTS OU AVERES COVID-19 POSITIFS [Si QCIBLE=1 et Si CA7=1 alors afficher « au cours des 7 jours avant le début des symptômes » // Si QCIBLE=1 et CA7<> 1 alors afficher « au cours des 7 jours avant la réalisation du test » // Si QCIBLE=2 alors « au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile » // Si QCIBLE=3 ou 4 alors « au cours des 7 derniers jours » ], portez-vous systématiquement les équipements de protection individuelle suivants?

 Une seule réponse possible par ligne

## PRESENTER EN TABLEAU – UNE SEULE REPONSE POSSIBLE PAR LIGNE

1. Oui
2. Non

**ROTATION ALEATOIRE**

- SQ1. Lunette de protection ou visière
- SQ2. Gants à usage unique
- SQ3. Surblouse
- SQ4. Tablier

**SI Q14=1****SINGLE****Q14\_14**

Lors de vos interactions avec vos collègues (pauses, discussions, transmissions, etc.) [ Si QCIBLE=1 et Si CA7=1 alors afficher « au cours des 7 jours avant le début des symptômes » // Si QCIBLE=1 et CA7<> 1 alors afficher « au cours des 7 jours avant la réalisation du test » // Si QCIBLE=2 alors « au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile » // Si QCIBLE=3 alors « au cours des 7 derniers jours » ], à quelle fréquence portiez-vous le masque chirurgical ?

 Une seule réponse possible

1. Toujours
2. Souvent
3. Rarement
4. Jamais

**A TOUS ET SI G5=1 ALORS NE PAS POSER Q14\_15 MAIS RECODER AUTOMATIQUEMENT Q14\_15=4  
A TOUS ET SI ET G5<> 1 ALORS POSER Q14\_15 ET NE PRESENTER QUE LES CODES 1 A 3.**

**SINGLE****Q14\_15**

Partagez-vous votre domicile avec un professionnel de santé ?

 Une seule réponse possible

1. Oui
2. Non
3. Ne souhaite pas répondre
4. Vit seul (e ) **A MASQUER (RECODER AUTOMATIQUEMENT SI QG5=1)**

## POSER A TOUS

## PARTIE B: HABITUDES ET COMPORTEMENTS

## 2 – TRANSPORT

## SI QCIBLE=1 (CAS INDEX)

INTRO

## QINTRO5A

Les questions suivantes concernent vos déplacements [Si CA7=1 alors afficher « au cours des 7 jours avant le début des symptômes. » // SI CA7<> 1 alors afficher « au cours des 7 jours avant la réalisation du test. »]

## SI QCIBLE=2 (PROCHES)

INTRO

## QINTRO5B

Les questions suivantes concernent vos déplacements au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile.

## SI QCIBLE=3 OU 4 (TEMOINS DISTANTS OU PERSONNEL SOIGNANT)

INTRO

## QINTRO5C

Les questions suivantes concernent vos déplacements au cours des 7 derniers jours.

## REPRENDRE LES INTRODUCTIONS POUR LES QUESTIONS Q15 A Q19B

## A TOUS

SINGLE

## Q15

Avez-vous utilisé des transports en commun (trains grands lignes, trains régionaux, bus réguliers ou longue distance, métro, tramway, RER) ?

 Une seule réponse possible

1. Oui, tous les jours
2. Oui, quelques fois **A MASQUER**
3. Non, jamais


## A MASQUER

## SI Q15=2

SINGLE

## Q16

Diriez-vous que vous avez utilisé les transports en commun ?

 Une seule réponse possible

1. Un à deux jours
2. Trois à quatre jours
3. Cinq jours ou plus

## SI Q15 = 1 OU 2

MULTIPLE

## Q17

Et avez-vous utilisé... ?

 Plusieurs réponses possibles

## ROTATION ALEATOIRE

1. Le bus
2. Le métro
3. Le tramway
4. Le RER => **Afficher uniquement si QG4 RECODE=9**
5. Le train régional / TER
6. Le train Grandes Lignes (TGV)

## SI Q17=1

SINGLE

## Q17A\_1

Et avez-vous utilisé le bus ?

 Une seule réponse possible

1. Un à deux jours
2. Trois à quatre jours
3. Cinq jours ou plus

## SI Q17=2

SINGLE

## Q17A\_1BIS

Et avez-vous utilisé le métro ?

 Une seule réponse possible

1. Un à deux jours
2. Trois à quatre jours
3. Cinq jours ou plus

## SI Q17=2

SINGLE

## Q17A\_2

En moyenne, combien de temps ont duré vos trajets en métro ?

 Une seule réponse possible

1. Moins de 15 minutes
2. Entre 15 et 30 minutes
3. Supérieur à 30 minutes

## SI Q17=2

SINGLE

## Q17A\_3

Et avez-vous utilisé le métro pendant les heures de pointe (à titre indicatif : 7h30 – 9h30 et 16h30 – 19h30 en semaine) ?

 Une seule réponse possible

1. Oui
2. Non

SI Q17=2

SINGLE

Q17A\_4

Et avez-vous utilisé le métro pendant les heures creuses ?

 Une seule réponse possible

1. Oui
2. Non

SI Q17=2

SINGLE

Q17A\_5

Lorsque vous avez emprunté le métro, était-ce principalement seul ou accompagné de vos proches ?

 Une seule réponse possible

1. Plutôt seul
2. Plutôt avec des proches
3. Les deux de façon équivalente

A TOUS

MULTIPLE

Q17B

Et avez-vous partagé un véhicule personnel avec des personnes ne faisant pas partie de votre foyer ?

 Une seule réponse possible

1. Oui
2. Non

SI Q17B=1

SINGLE

Q17B\_1

Plus précisément, avez-vous effectué un trajet en véhicule personnel avec des personnes de votre entourage (hors membres de votre foyer), par exemple avec des collègues de travail ou des amis ?

 Une seule réponse possible

1. Oui
2. Non

SI Q17B=1

SINGLE

Q17B\_2

Plus précisément, avez-vous effectué un trajet en covoiturage issu d'une plateforme spécialisée (BlaBlaCar, Karos, Klaxit, etc.) avec des personnes ne faisant pas partie de votre entourage ?

 Une seule réponse possible


1. Oui
2. Non

**SI Q17B\_2 = 1**

SINGLE

**Q17B\_3**

Plus précisément, combien de temps a duré le PLUS LONG trajet en covoiturage issu de plateforme spécialisée (BlaBlaCar, Karos, Klaxit, etc.) avec des personnes ne faisant pas partie de votre entourage ?

 Une seule réponse possible

1. Moins d'une heure
2. Plus d'une heure

**A TOUS**

SINGLE

**Q17C**

Et avez-vous effectué un trajet en VTC ou en Taxi ?

 Une seule réponse possible

1. Oui
2. Non

## POSER A TOUS

### PARTIE B: HABITUDES ET COMPORTEMENTS

#### 3 – VOYAGES

**A TOUS**

SINGLE

**Q18**

Vous êtes-vous déplacé **[Affichage des sous-questions]**

 Une seule réponse possible

- SQ1. Hors de votre région ?  
SQ2. A l'étranger ?

1. Oui
2. Non

**SI Q18\_SQ2 = 1**

MULTIPLE

**Q19**

Et plus précisément, dans quel(s) pays(s) vous êtes-vous déplacé ?

 Plusieurs réponses possibles

**FORCER LA REPONSE POUR LA SQ1 UNIQUEMENT**

**SQ2 : NE PAS FAIRE AFFICHER DANS LA LISTE LE/LES PAYS CITES EN SQ1**

**SQ3 : NE PAS FAIRE AFFICHER DANS LA LISTE LE/LES PAYS CITES EN SQ1 ET SQ2**

**SQ4 : NE PAS FAIRE AFFICHER DANS LA LISTE LE/LES PAYS CITES EN SQ1 ET SQ2 ET SQ3**

**SQ5 : NE PAS FAIRE AFFICHER DANS LA LISTE LE/LES PAYS CITES EN SQ1 ET SQ2 ET SQ3 ET SQ4**

SQ1. Pays 1 : **liste déroulante**

SQ2. Pays 2 : **liste déroulante**

SQ3. Pays 3 : **liste déroulante**

SQ4. Pays 4 : **liste déroulante**

SQ5. Pays 5 : **liste déroulante**

**SI Q18 SQ1 =1 OU Q18 SQ2=1**

**MULTIPLE**

**Q19B**

**Parmi la liste suivante, quel(s) moyen(s) de transport avez-vous utilisé pour voyager ?**

 *Plusieurs réponses possibles*

**ROTATION ALEATOIRE SAUF CODE 6-EXCLUSIF**

1. Car/Bus
2. Covoiturage
3. Train grandes lignes et TGV
4. Avion
5. Bateau (ferry ou croisière)
6. Par un autre moyen (voiture individuelle...) **[Exclusif]**
7. Trains régionaux, TER et Trans d'Equilibre du Territoire (TET)

**SI Q18 SQ1 =1 OU Q18 SQ2=1**

**MULTIPLE**

**Q19C**

**Avez-vous voyagé pour motif...**

 *Plusieurs réponses possibles*

1. Professionnel
2. Privé

**SI Q19B =3 OU 7**

**SINGLE**

**Q19 C\_1**

**Concernant votre dernier trajet en train : Précisez la date**

**Test de cohérence : la date indiquée doit être antérieure à la date du jour**

1. MM/ AAAA
2. Vous ne savez pas



**SI Q19B =3 OU 7****MULTIPLE****Q19C\_2****En train, avez-vous voyagé ...** *Plusieurs réponses possibles*

1. Seul
2. En groupe

**SI Q19B=3 OU 7****MULTIPLE****Q19D****Avez-vous mangé dans la gare ?** *Plusieurs réponses possibles*

1. Non, je n'ai pas mangé au sein de la gare **[Excusif]**
2. Oui, un repas dans un restaurant
3. Oui, un repas à emporter
4. Oui, un en-cas ou un goûter

**SI Q19B=3 OU 7****MULTIPLE****Q19E****Avez-vous mangé à bord du train ?** *Plusieurs réponses possibles*

1. Non, je n'ai pas mangé à bord **[Exclusif]**
2. Oui, un repas ou un en-cas dans le wagon bar
3. Oui, un repas à ma place
4. Oui, un en-cas ou un goûter à ma place

**SI Q19B=3 OU 7****SINGLE****Q19E1****Combien de temps le trajet en train (le plus long, si plusieurs trajets) a-t-il duré ?** *Une seule réponse possible*

1. Moins d'une heure
2. Entre une et moins de deux heures
3. Entre deux et moins de quatre heures
4. Quatre heures ou plus

**SI Q19B=3 OU 7****MULTIPLE****Q19E2****Pendant votre trajet ou vos trajets en train, quel type de masque avez-vous utilisé majoritairement ?** *Plusieurs réponses possibles*

1. FFP2 ou « bec-de-canard »
2. Masque chirurgical
3. Masque en tissu

SI Q19B=4

SINGLE

Q19E3

Concernant votre dernier trajet en avion : Précisez la date

**Test de cohérence : la date indiquée doit être antérieure à la date du jour**

1. MM/ AAAA
2. Vous ne savez pas

SI Q19B=4 ET CA7=4

SINGLE

Q19F

Avez-vous réalisé votre test positif au COVID-19 pour répondre aux demandes des autorités relatives à votre voyage en avion ?

1. Oui
2. Non

SI Q19B=4

MULTIPLE

Q19G

Avez-vous mangé dans l'aéroport ?

 Plusieurs réponses possibles

1. Non, je n'ai pas mangé au sein de l'aéroport **[Exclusif]**
2. Oui, un repas dans un restaurant
3. Oui, un repas à emporter
4. Oui, un en-cas ou un goûter

SI Q19B=4

MULTIPLE

Q19H

Pour monter à bord de l'avion, avez-vous embarqué... ?

*(Si vous avez embarqué dans plusieurs avions avec différents moyens, notez chacun des moyens utilisés)*

 Plusieurs réponses possibles

1. Par bus
2. Par passerelle
3. Par un autre moyen

## SI Q19B=4

MULTIPLE

## Q19I

Avez-vous mangé à bord de l'avion ?

 Plusieurs réponses possibles

1. Non, je n'ai pas mangé à bord **[Exclusif]**
2. Oui, un plateau repas
3. Oui, un repas emporté
4. Oui, un en-cas ou un goûter

## SI Q19B=4

SINGLE

## Q19J

Combien de temps le vol (le plus long, si plusieurs vols) a-t-il duré ?

 Une seule réponse possible

5. Moins de deux heures
6. Entre deux et moins de quatre heures
7. Entre quatre et moins de six heures
8. Six heures ou plus

## SI Q19B=4

MULTIPLE

## Q19K

Dans quel(s) type(s) d'avion avez-vous voyagé ?

 Plusieurs réponses possibles

1. Monocouloir (2 rangées de 2 ou 3 sièges)
2. Bi-couloir (3 rangées de 3 – 4 – 3 sièges)
3. Vous ne savez pas **[Exclusif]**

## A TOUS

SINGLE

## Q19L

Toujours [ **Si QCIBLE=1 et Si CA7=1 alors afficher « au cours des 7 jours avant le début des symptômes » // Si QCIBLE=1 et CA7<> 1 alors afficher « au cours des 7 jours avant la réalisation du test » // Si QCIBLE=2 alors « au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile » // Si QCIBLE=3 ou 4 alors « au cours des 7 derniers jours » ], avez-vous dormi en dehors de votre domicile ?**

 Une seule réponse possible

1. Non
2. Oui, une nuit
3. Oui, 2 à 5 nuits
4. Oui, 6 nuits ou plus

**SI Q19L=2, 3 OU 4****MULTIPLE****Q19M****Et plus précisément, avez-vous dormi...** *Plusieurs réponses possibles*

1. Chez des amis ou de la famille et vous étiez seul(e)
2. Chez des amis ou de la famille avec d'autres personnes
3. Dans un hôtel ou un Bed&Breakfast
4. Dans une location ou un AirBnB avec des membres de votre foyer uniquement
5. Dans une location ou un AirBnB avec d'autres personnes
6. Sur votre lieu de travail
7. Dans un camping
8. Ailleurs

**A TOUS****SINGLE****Q19N**

Toujours [ **Si QCIBLE=1 et Si CA7=1 alors afficher « au cours des 7 jours avant le début des symptômes » // Si QCIBLE=1 et CA7<> 1 alors afficher « au cours des 7 jours avant la réalisation du test » // Si QCIBLE=2 alors « au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile » // Si QCIBLE=3 ou 4 alors « au cours des 7 derniers jours » ], avez-vous fréquenté une station de sport d'hiver (ski, raquettes, luge, autre) ?**

 *Une seule réponse possible*

1. Oui
2. Non

**POSER SI Q19N=1****MULTIPLE****Q19O****Et plus précisément, quelles sont, parmi cette liste, toutes les activités que vous avez pratiqué ?** *Plusieurs réponses possibles***ROTATION ALEATOIRE DES CODES 1 A 4**




1. Le ski alpin / snowboard
2. Le ski de fond
3. Le ski de randonnée
4. Les raquettes
5. Autre
6. Aucun sport d'hiver **[Exclusif]**

POSER SI (Q19N=1 ET CA6\_2=1) OU (Q19N=1 ET CB5B=1)

NUMERIQUE

Q1901

Combien de jours après votre premier jour dans la station vos symptômes ont-ils débuté ?

-  Le jour 1 correspond au jour d'arrivée
-  Si vous ne connaissez pas le nombre de jours, merci d'indiquer un nombre approximatif
-  Si plus de 15 jours, veuillez indiquer 15

MIN : 1 / MAX : 15

POSER SI (Q19N=1 ET CA6\_2=1) OU (Q19N=1 ET CB5B=1)

SINGLE

Q1902

Etiez-vous dans la station quand vos symptômes ont débuté ?




1. Oui
2. Non
3. Vous ne savez pas

POSER SI Q1902=2

NUMERIQUE

Q1903

Combien de jours après avoir quitté la station vos symptômes ont-ils débuté ?

-  Le jour 1 correspond au premier jours hors de la station
-  Si vous ne connaissez pas le nombre de jours, merci d'indiquer un nombre approximatif
-  Si plus de 7 jours, veuillez indiquer 7

MIN : 1 / MAX : 7

POSER SI 19N=1

MULTIPLE

Q1904

Comment vous êtes-vous rendu dans la station de sports d'hiver ?

-  Plusieurs réponses possibles

ROTATION ALEATOIRE DES CODES 2 A 4

1. J'habite sur place **[Exclusif]**
2. En voiture
3. En train
4. En bus
5. Par un autre moyen

**POSER SI 1904=2 OU 3 OU 4 OU 5**

MULTIPLE

**Q1905****Où logiez-vous dans la station de sports d'hiver ?** *Plusieurs réponses possibles*

1. Chalet individuel
2. Chalet en résidence
3. Appartement hors résidence de vacances
4. Appartement dans une résidence de vacances
5. Autre type de logement individuel
6. Autre type de logement dans une résidence de vacances

**POSER SI 1905=2 OU 4 OU 6**

SINGLE

**Q1906****Partagez-vous des repas (petits-déjeuners par exemple) avec d'autres personnes de l'immeuble ou de la résidence ?**

1. Oui
2. Non

**POSER SI 1904=2 OU 3 OU 4 OU 5**

NUMERIQUE

**Q1907****Combien de personnes partageaient ce logement, vous y compris ?** *Si plus de 25 personnes, veuillez indiquer 25***MIN : 1 / MAX : 25****POSER SI Q19N=1**

SINGLE

**Q1908****Avez-vous mangé dans des restaurants en station ou sur les pistes ?**

1. Oui
2. Non

**POSER SI 1908=1**

MULTIPLE

**Q1909****Etait-ce...**

1. En intérieur
2. En extérieur

**POSER SI Q19N=1****SINGLE****Q19O10****Avez-vous été dans des bars en station ou sur les pistes ?**

1. Oui
2. Non

**POSER SI 19O10=1****MULTIPLE****Q19O11****Etait-ce...**

1. En intérieur
2. En extérieur

**POSER SI Q19N=1****SINGLE****Q19O12****Avez-vous utilisé des remontées mécaniques fermées (type télécabines ou téléphérique) ?**

1. Oui
2. Non

**POSER SI Q19N=1****SINGLE****Q19O13****Avez-vous utilisé des remontées mécaniques ouvertes (type télésièges) ?**

1. Oui
2. Non

**POSER SI Q19N=1****SINGLE****Q19O14****Vous êtes-vous retrouvé dans des files d'attente dans lesquelles vos voisins ne portaient pas ou portaient mal le masque (sous le nez ou sous le menton) ?**

1. Oui, tout le temps
2. Oui, souvent
3. Oui, rarement
4. Non, jamais
5. Je ne me suis pas retrouvé(e) dans des files d'attente

**POSER SI Q19N=1****SINGLE****Q19O15**

## Avez-vous loué du matériel de sport d'hiver ?

1. Oui
2. Non

## POSER A TOUS

## PARTIE B: HABITUDES ET COMPORTEMENTS


## 6 – FREQUENTATION DE STRUCTURE DE SOINS

## A TOUS

SINGLE

## Q100

Avez-vous fréquenté une structure de soins (cabinet médical, pharmacie, hôpital, imagerie médicale, cabinet paramédical, etc.) pour une consultation, un séjour ou une visite [ Si QCIBLE=1 et Si CA7=1 alors afficher « au cours des 7 jours avant le début des symptômes ? » // Si QCIBLE=1 et CA7<> 1 alors afficher « au cours des 7 jours avant la réalisation du test ? » // Si QCIBLE=2 alors « au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile ? » // Si QCIBLE=3 ou 4 alors « au cours des 7 derniers jours ? ]

 Une seule réponse possible

1. Oui
2. Non

## SI Q100=1

MULTIPLE

## Q101

Plus précisément, avez-vous fréquenté (pour une consultation, un séjour ou une visite) [ Si QCIBLE=1 et Si CA7=1 alors afficher « au cours des 7 jours avant le début des symptômes ? » // Si QCIBLE=1 et CA7<> 1 alors afficher « au cours des 7 jours avant la réalisation du test ? » // Si QCIBLE=2 alors « au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile ? » // Si QCIBLE=3 ou 4 alors « au cours des 7 derniers jours ? ]

 Plusieurs réponses possibles

## ROTATION ALÉATOIRE

1. Cabinet médical
2. Cabinet dentaire
3. Laboratoire d'analyses médicales
4. Consultation ponctuelle ou visite dans un hôpital ou clinique
5. Séjour (au moins 24h) dans un hôpital ou clinique
6. Cabinet paramédical (infirmière, kinésithérapeute, ostéopathe, etc.) et sage-femme
7. Psychologue
8. Centre d'imagerie médicale
9. Pharmacie
10. EHPAD ou maison de retraite
11. Foyer d'accueil médicalisé



## SI Q101=3

SINGLE

## Q102

**Si QCIBLE=1 et Si CA7=1 alors afficher** « Toujours au cours des 7 jours avant le début des symptômes, vous êtes-vous rendu dans un laboratoire d'analyses médicales... »

**Si QCIBLE=1 et CA7<> 1 alors afficher** « Toujours au cours des 7 jours avant la réalisation du test, vous êtes-vous rendu dans un laboratoire d'analyses médicales... »

**Si QCIBLE=2 alors** « Toujours au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile, vous êtes-vous rendu dans un laboratoire d'analyses médicales... »

**Si QCIBLE=3 ou 4 alors** «Toujours au cours des 7 derniers jours, vous êtes-vous rendu dans un laboratoire d'analyses médicales... »

**[Affichage des sous-questions]**

 Une seule réponse possible

SQ1. dans le cadre d'un test ou d'un dépistage Covid-19 ?

SQ2. dans le cadre d'une autre analyse médicale ?

1. Oui
2. Non

## POSER A TOUS

## PARTIE B: HABITUDES ET COMPORTEMENTS

## 5 – LIVRAISON

## A TOUS

SINGLE

## Q99\_1

Avez-vous été chercher une ou des commandes à emporter (repas, articles, courses, etc.) [ **Si QCIBLE=1 et Si CA7=1 alors afficher** « au cours des 7 jours avant le début des symptômes ? » // **Si QCIBLE=1 et CA7<> 1 alors afficher** « au cours des 7 jours avant la réalisation du test ? » // **Si QCIBLE=2 alors** « au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile ? » // **Si QCIBLE=3 ou 4 alors** « au cours des 7 derniers jours ? » ]

 Une seule réponse possible

1. Oui
2. Non

## A TOUS

SINGLE

## Q99\_2

Vous êtes-vous fait livrer à domicile (repas, articles, courses, etc.) [ **Si QCIBLE=1 et Si CA7=1 alors afficher** « au cours des 7 jours avant le début des symptômes ? » // **Si QCIBLE=1 et CA7<> 1 alors afficher** « au cours des 7 jours avant la réalisation du test ? » // **Si QCIBLE=2 alors** « au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile ? » // **Si QCIBLE=3 ou 4 alors** « au cours des 7 derniers jours ? » ]

 Une seule réponse possible

1. Oui
2. Non

## POSER A TOUS

### PARTIE B: HABITUDES ET COMPORTEMENTS

#### 4 – REUNIONS & RASSEMBLEMENTS

#### SI QCIBLE=1 (CAS INDEX)

INTRO

##### QINTRO6A

Les questions suivantes concernent les réunions et rassemblements [Si CA7=1 alors afficher « au cours des 7 jours avant le début des symptômes. » // SI CA7<> 1 alors afficher « au cours des 7 jours avant la réalisation du test. »]

#### SI QCIBLE=2 (PROCHES)

INTRO

##### QINTRO6B

Les questions suivantes concernent les réunions et rassemblements au cours des 7 jours avant le(s) premier(s) cas de contamination à votre domicile.

#### SI QCIBLE=3 OU 4 (TEMOINS DISTANTS OU PERSONNEL SOIGNANT)

INTRO

##### QINTRO6C

Les questions suivantes concernent les réunions et rassemblements au cours des 7 derniers jours.


### REPRENDRE LES INTRODUCTIONS ET LES REPETER DES Q20 A Q29F

#### A TOUS

SINGLE

##### Q20

Parmi la liste suivante de réunions et rassemblements, quels sont tous ceux auxquels vous avez participé ?

 Une seule réponse possible par proposition

#### EN COLONNE- ROTATION ALEATOIRE

- SQ1. Réunion professionnelle physique (et non à distance)
- SQ2. Cours en milieu scolaire ou universitaire (en présentiel)
- SQ3. Rassemblements culturels (cinéma, théâtre, musée, concert, chorale, etc.)
- SQ4. Rassemblements religieux
- SQ5. Réunion dans un cadre privé (cercle familial ou amical à domicile, dans des lieux privés ou privatisés)
- SQ6. Evènements sportifs (matches, tournois, galas, compétitions, etc.)

#### EN LIGNE

1. Oui

2. Non

SI Q20 – SQ1 = 1

SINGLE

### Q21A

**Vous avez déclaré avoir participé à des réunions professionnelles physiques (et non à distance).**

**Combien de fois avez-vous participé à des réunions professionnelles ?**

 Une seule réponse possible

1. Une à deux fois
2. Trois à quatre fois
3. Cinq fois ou plus

SI Q20 – SQ1 = 1

SINGLE

### Q21B

**Combien de temps a duré la réunion professionnelle physique (et non à distance) la plus longue ?**

 Une seule réponse possible

1. Moins de 30 minutes
2. Entre 30 minutes et 2 heures
3. Plus de 2 heures

SI Q20 – SQ1 = 1

SINGLE

### Q21C

**Combien de personnes se trouvaient à la réunion professionnelle physique (et non à distance) qui a rassemblé le plus de personnes ?**

 Une seule réponse possible

1. Moins de 5 personnes
2. Entre 5 et 20 personnes
3. Entre 21 et 50 personnes
4. Plus de 50 personnes

SI Q20 – SQ2 = 1

SINGLE

### Q22A

**Vous avez déclaré avoir assisté à des cours en milieu scolaire ou universitaire (en présentiel).**

**Combien de fois avez-vous assisté à des cours en milieu scolaire ou universitaire ?**

 Une seule réponse possible

1. Une à deux fois
2. Trois à quatre fois
3. Cinq fois ou plus

SI Q20 – SQ2 = 1

MULTIPLE

## Q22B

Ces cours en milieu scolaire ou universitaire se déroulaient-ils...

 Plusieurs réponses possibles

1. En salle
2. En amphithéâtre
3. Ailleurs

SI Q20 – SQ2 = 1

SINGLE

## Q22C

Combien de personnes se trouvaient au cours en milieu scolaire ou universitaire qui a rassemblé le plus de personnes ?

 Une seule réponse possible


1. Moins de 5 personnes
2. Entre 5 et 20 personnes
3. Entre 21 et 50 personnes
4. Plus de 50 personnes

## A MASQUER

SI Q20 – SQ3 = 1

SINGLE

## Q23A

~~Vous avez déclaré avoir participé à des rassemblements culturels.~~~~Les spectateurs, au cours de cet/ces évènement(s) culturel(s), étaient-ils majoritairement assis ou debout ?~~~~ Une seule réponse possible~~

- ~~1. Majoritairement debout
  2. Majoritairement assis~~

SI Q20 – SQ3 = 1

SINGLE

## Q23

Vous avez déclaré avoir participé à des rassemblements culturels (cinéma, théâtre, musée, concert, chorale ...).

Combien de fois avez-vous participé à des rassemblements culturels ?

 Une seule réponse possible

1. Une à deux fois
2. Trois à quatre fois
3. Cinq fois ou plus

SI Q20 – SQ3 = 1

MULTIPLE

## Q23B

Vous avez déclaré avoir participé à des rassemblements culturels. Plus précisément, vous êtes-vous rendu :

 Plusieurs réponses possibles

ROTATION ALEATOIRE \_ SAUF CODE 5 TOUJOURS EN DERNIER

1. Au théâtre
2. Au cinéma
3. Dans un musée / monument
4. Dans un concert en salle
5. Ailleurs
6. Spectacle ou concert à ciel ouvert / festival

**NOUVELLE QUESTION**

SI Q23B\_4 = 1

SINGLE

**Q23C1**

Vous avez déclaré avoir participé à un/des concerts en salle.  
A combien de concert(s) en salle avez-vous assisté ?

1. Un concert
2. Deux ou trois concerts
3. Plus de trois concerts

**NOUVELLE QUESTION**

SI Q23B\_4 = 1

SINGLE

**Q23C2**

Avez-vous participé à ce / ces concert(s) en salle en étant ?

 Une seule réponse possible

1. Assis
2. Debout (fosse)
3. Les deux

**NOUVELLE QUESTION**

SI Q23C2 = 1 OU 3

MULTIPLE

**Q23C2B**

Au cours de ce ou ces concerts assis

 Plusieurs réponses possibles

1. La salle contenait une petite jauge (centaines de personnes ou moins)
2. La salle contenait une grande jauge (milliers de personnes)
3. Vous ne savez pas **[Exclusif]**

**NOUVELLE QUESTION**

SI Q23C2 = 1 OU 3

MULTIPLE

**Q23C3B**

Au cours de ce ou ces concerts debout :

 Plusieurs réponses possibles

1. La salle contenait une petite jauge (centaines de personnes ou moins)
2. La salle contenait une grande jauge (milliers de personnes)
3. Vous ne savez pas **[Exclusif]**

**NOUVELLE QUESTION**

SI Q23B\_4 = 1

SINGLE

## Q23C4

Au cours de ce ou ces concerts, vous est-il arrivé de boire ou de manger ?

1. Oui
2. Non

**NOUVELLE QUESTION**

SI Q23B\_4 = 1

SINGLE

## Q23C5

Au cours de ce ou ces concerts, les spectateurs près de vous chantaient ou criaient-ils sans masque ?

1. Oui
2. Non

**NOUVELLE QUESTION**

SI Q23B\_4 = 1

MULTIPLE

## Q23C6

A l'occasion de ce ou ces concerts, combien de temps avez-vous passé sur place ?

 Plusieurs réponses possibles

1. Moins de 3h
2. 3h ou plus

**NOUVELLE QUESTION**

SI Q23B\_4 = 1

MULTIPLE

## Q23C7

Selon vous, la ou les salles de concert vous sembla(en) t-elle(s) :

 Plusieurs réponses possibles

1. Plutôt bien ventilée (porte ouverte, ventilation ressentie)
2. Plutôt mal ventilée (chaleur, sensation de manque d'air)
3. Je n'ai pas d'avis [Exclusif]

**NOUVELLE QUESTION**

SI Q23B\_4 = 1

SINGLE

## Q23C8

Selon vous, lors de l'attente la plus longue, combien de temps en cumulé avez-vous passé en file d'attente en INTERIEUR (billetterie, vestiaire, toilette, bar )

 Une seule réponse possible

1. Moins de 20 minutes
2. 20 minutes et moins d'une heure
3. Plus d'une heure et moins de 2 heures
4. Plus de 2 heures

**NOUVELLE QUESTION**

SI Q23B\_6 = 1

SINGLE

**Q23D1**

A combien de spectacle(s), concert(s) à ciel ouvert ou festival(s) avez-vous assisté ?

1. Un
2. Deux ou trois
3. Plus de trois

**NOUVELLE QUESTION**

SI Q23B\_6 = 1

SINGLE

**Q23D2**

Avez-vous participé à ce/ces concert(s) à ciel ouvert ou festival(s) en étant assis ?

1. Assis
2. Debout (fosse)
3. Les deux

**NOUVELLE QUESTION**

SI Q23D2 = 1 OU 3

MULTIPLE

**Q23D2B**

Au cours de ce ou ces concert(s) à ciel ouvert ou festival(s) en étant assis

 Plusieurs réponses possibles

1. Le lieu contenait une petite jauge (centaines de personnes ou moins)
2. Le lieu contenait une grande jauge (milliers de personnes)
3. Vous ne savez pas **[Exclusif]**

**NOUVELLE QUESTION**

SI Q23D2 = 2 OU 3

MULTIPLE

**Q23D3B**

Au cours de ce ou ces concert(s) à ciel ouvert ou festival(s) en étant debout (fosse)

 Plusieurs réponses possibles

1. Le lieu contenait une petite jauge (centaines de personnes ou moins)
2. Le lieu contenait une grande jauge (milliers de personnes)
3. Vous ne savez pas **[Exclusif]**

**NOUVELLE QUESTION**

SI Q23B\_6 = 1

SINGLE

**Q23D4**

Au cours de ce ou ces concerts à ciel ouvert ou festivals, avez-vous bu ou mangé ?

1. Oui

2. Non

**NOUVELLE QUESTION**

SI Q23B\_6 = 1

SINGLE

**Q23D5**

Au cours de ce ou ces concerts à ciel ouvert ou festivals, les spectateurs près de vous chantaient ou criaient-ils sans leur masque ?

1. Oui
2. Non

**NOUVELLE QUESTION**

SI Q23B\_6 = 1

MULTIPLE

**Q23D6**

A l'occasion de ce ou ces concerts à ciel ouvert ou festivals, combien de temps avez-vous passé sur place ?

 Plusieurs réponses possibles

1. Moins de 3 heures
2. Entre 3 et 12 heures
3. Plus de 12 heures sans dormir sur place
4. Plus de 12 heures en ayant dormi sur place

**NOUVELLE QUESTION**

SI Q23B\_6 = 1

SINGLE

**Q23D7**

Selon vous, lors de l'attente la plus longue, combien de temps en cumulé avez-vous passé en file d'attente (billetterie, vestiaire, toilette, bar) ?

 Une seule réponse possible

1. Moins de 20 minutes
2. 20 minutes et moins d'une heure
3. Plus d'une heure et moins de 2 heures
4. Plus de 2 heures

SI Q20 – SQ4 = 1

SINGLE

**Q24**

Vous avez déclaré avoir participé à des rassemblements religieux.  
Combien de fois avez-vous participé à des rassemblements religieux ?

 Une seule réponse possible

1. Une à deux fois
2. Trois à quatre fois
3. Cinq fois ou plus

SI Q20 – SQ5 = 1

SINGLE

**Q25A**



**Vous avez déclaré avoir participé à des réunions dans un cadre privé (cercle familial ou amical à domicile, dans des lieux privés ou privatisés).**

**Combien de fois avez-vous participé à des réunions privées ?**

 *Une seule réponse possible*

1. Une à deux fois
2. Trois à quatre fois
3. Cinq fois ou plus

**SI Q20 – SQ5 = 1**

**MULTIPLE**

**Q25A\_2**

**Vous avez déclaré avoir participé à des réunions dans un cadre privé (cercle familial ou amical à domicile, dans des lieux privés ou privatisés).**

**Était-ce à l'occasion ... ?**

 *Plusieurs réponses possibles*

**ROTATION ALEATOIRE SAUF CODE 6**

1. D'une cérémonie (type mariage, enterrement, baptême, etc.)
2. D'un repas sans occasion particulière
3. D'un café ou apéritif sans occasion particulière
4. D'un anniversaire, pot, sortie
5. D'une fête familiale ou amicale
6. Lors d'un autre évènement

**SI Q20 – SQ5 = 1**

**SINGLE**

**Q25B**

**Combien de temps a duré la réunion dans un cadre privé (cercle familial ou amical à domicile, dans des lieux privés ou privatisés) la plus longue ?**

 *Une seule réponse possible*

1. Moins de 30 minutes
2. Entre 30 minutes et 2 heures
3. Plus de 2 heures

**SI Q20 – SQ5 = 1**

**SINGLE**

**Q25C**

**Combien de personnes se trouvaient à la réunion dans un cadre privé (cercle familial ou amical à domicile, dans des lieux privés ou privatisés) qui a rassemblé le plus de personnes ?**

 *Une seule réponse possible*

1. Moins de 5 personnes
2. Entre 5 et 20 personnes
3. Entre 21 et 50 personnes
4. Plus de 50 personnes

## SI Q20 – SQ5 = 1

SINGLE

## Q25D

Ces réunions dans un cadre privé (cercle familial ou amical à domicile, dans des lieux privés ou privatisés) se déroulaient-elles...

 Une seule réponse possible

1. Exclusivement en espace extérieur
2. Plus souvent en espace extérieur qu'en intérieur
3. Plus souvent en espace intérieur qu'en extérieur
4. En espace extérieur et en intérieur de façon équivalente
5. Exclusivement en espace intérieur

## SI Q20 – SQ6 = 1

MULTIPLE

## Q25E

Vous avez déclaré avoir participé à des événements sportifs (matches, tournois, galas, compétitions, etc.). Etait-ce...

 Plusieurs réponses possibles


1. En intérieur
2. En extérieur

## A TOUS

SINGLE

## Q26

Avez-vous fréquenté

 Une seule réponse possible par proposition

**EN COLONNE-ROTATION ALEATOIRE****NE PAS AFFICHER SQ1**

- SQ1. des restaurants ou bars ? **NE PAS AFFICHER**
- SQ2. des discothèques, des raves, soirées en appartement privé, etc. ? **NE PAS AFFICHER**
- SQ3. des commerces (boutiques, centre commercial, marché, etc.) ?
- SQ4. des restaurants ?
- SQ5. des bars ?
- SQ6. un salon de coiffure / barbier ?
- SQ7. un institut de beauté (esthéticienne, manucure, etc.) ?
- SQ8. des discothèques, bars dansants et boîtes de nuit ?
- SQ9. des soirées en appartement privé etc. ?
- SQ10. des raves ?
- SQ11. des salons, congrès, foires d'exposition, conférences ?
- SQ12. des parcs à thème, parcs d'attraction ou parcs zoologiques ?

**EN LIGNE**

1. Oui
2. Non

## A TOUS

SINGLE

## Q26\_2


Avez-vous participé à une réunion politique en intérieur **ne nécessitant pas de pass sanitaire?** Une seule réponse possible

1. Oui
2. Non

~~SI Q26–SQ1 = 1~~

SINGLE

## Q27A

~~Combien de fois avez-vous fréquenté des restaurants ou des bars ?~~~~ Une seule réponse possible~~


- ~~1. Une à deux fois~~
- ~~2. Trois à quatre fois~~
- ~~3. Cinq fois ou plus~~

## A MASQUER

~~SI Q26–SQ1 = 1~~

SINGLE

## Q27B

~~Vous avez déclaré avoir fréquenté des restaurants ou bars.  
Était-ce ... ?~~~~ Une seule réponse possible~~

- ~~1. Exclusivement en espace extérieur~~
- ~~2. Plus souvent en espace extérieur qu'en intérieur~~
- ~~3. Plus souvent en espace intérieur qu'en extérieur~~
- ~~4. En espace extérieur et en intérieur de façon équivalente~~
- ~~5. Exclusivement en espace intérieur~~

## SI Q26–SQ4 = 1

SINGLE

## Q27A2

Combien de fois avez-vous fréquenté des restaurants ?

 Une seule réponse possible

1. Une à deux fois
2. Trois à quatre fois
3. Cinq fois ou plus

## SI Q26–SQ4 = 1

SINGLE

## Q27B2

**Vous avez déclaré avoir fréquenté des restaurants.**

**Était-ce ... ?**

 *Une seule réponse possible*

1. Exclusivement en espace extérieur
2. Plus souvent en espace extérieur qu'en intérieur
3. Plus souvent en espace intérieur qu'en extérieur
4. En espace extérieur et en intérieur de façon équivalente
5. Exclusivement en espace intérieur

*SI Q26–SQ5 = 1*

SINGLE

## Q27A3

**Combien de fois avez-vous fréquenté des bars ?**

 *Une seule réponse possible*

1. Une à deux fois
2. Trois à quatre fois
3. Cinq fois ou plus

*SI Q26–SQ5 = 1*

SINGLE

## Q27B3

**Vous avez déclaré avoir fréquenté des bars.**

**Était-ce ... ?**

 *Une seule réponse possible*

1. Exclusivement en espace extérieur
2. Plus souvent en espace extérieur qu'en intérieur
3. Plus souvent en espace intérieur qu'en extérieur
4. En espace extérieur et en intérieur de façon équivalente
5. Exclusivement en espace intérieur

*SI Q26 SQ8=1*

SINGLE

## Q27D

**Combien de fois avez-vous fréquenté des discothèques, bars dansants et boîtes de nuit?**

 *Une seule réponse possible*

1. Une à deux fois Une fois
2. Trois à quatre fois Deux à trois fois
3. Cinq fois ou plus Plus de trois fois

**NOUVELLE QUESTION**

SI Q27D = 2 OU 3

TEXTE

## Q27DBIS

Vous avez déclaré être allé(s) plus d'une fois en discothèque, les questions suivantes portent sur la soirée au cours de laquelle vous êtes resté le plus longtemps.



**NOUVELLE QUESTION**

Q26 SQ8 = 1

SINGLE

## Q27D1

Avec combien de personnes êtes-vous allé(e) en DISCOTHEQUE / CLUB ?

-  **Si Q27D = 2 ou 3** <Vous avez déclaré être allé(e) plus d'une fois en discothèque, les questions suivantes portent sur la soirée au cours de laquelle vous êtes resté(e) le plus longtemps>
-  Une seule réponse possible

1. Seul(e)
2. Moins de 3 personnes
3. Entre 4 et 10 personnes
4. Plus de 10 personnes


**NOUVELLE QUESTION**

Q26 SQ8 = 1

SINGLE

## Q27D2

A l'entrée de la discothèque, y a-t-il eu un contrôle du pass vaccinal ?

-  **Si Q27D = 2 ou 3** <Vous avez déclaré être allé(e) plus d'une fois en discothèque, les questions suivantes portent sur la soirée au cours de laquelle vous êtes resté(e) le plus longtemps>
1. Oui
  2. Non



**NOUVELLE QUESTION**

Q26 SQ8 = 1

SINGLE

## Q27D3

Avec combien de personnes, avez-vous interagi (contact physique, discussion, baisers ou distance inférieure à un mètre pendant plusieurs minutes, avec ou sans masque) EN INTERIEUR ?

-  **Si Q27D = 2 ou 3** <Vous avez déclaré être allé(e) plus d'une fois en discothèque, les questions suivantes portent sur la soirée au cours de laquelle vous êtes resté(e) le plus longtemps>
-  Une seule réponse possible

1. Aucune personne
2. 3 personnes ou moins
3. Entre 4 et 10 personnes
4. Plus de 10 personnes



**NOUVELLE QUESTION**

Q26 SQ8 = 1

SINGLE

## Q27D4

Combien de temps avez-vous passé dans la discothèque ?

-  **SI Q27D = 2 ou 3** <Vous avez déclaré être allé(e) plus d'une fois en discothèque, les questions suivantes portent sur la soirée au cours de laquelle vous êtes resté(e) le plus longtemps>
-  Une seule réponse possible

1. Moins de 2 heures
2. Entre 2 et 4 heures
3. Entre 4 et 6 heures
4. Plus de 6 heures


**NOUVELLE QUESTION**

SI Q26 SQ8 = 1

SINGLE

## Q27D5

Au cours de la soirée, avez-vous chanté ou crié sur la musique ?

-  **SI Q27D = 2 ou 3** <Vous avez déclaré être allé(e) plus d'une fois en discothèque, les questions suivantes portent sur la soirée au cours de laquelle vous êtes resté(e) le plus longtemps>

1. Oui
2. Non

**NOUVELLE QUESTION**

SI Q26 SQ8 = 1

SINGLE

## Q27D6

Au cours de la soirée en DISCOTHEQUE/ CLUB avez-vous consommé...

SQ1. De l'alcool ou des produits psychoactifs (MDMA, cocaïne, extasy, GHB, 3 MMC, Kétamine ...) :  
SQ3 : Du tabac :

1. Oui
2. Non
3. Ne souhaite pas répondre

**SQ EN LIGNE ET ITEM EN COLONNE****NOUVELLE QUESTION**

SI Q27D6 SQ3 = 1

SINGLE

## Q27D6B

Le fumeur était-il en INTERIEUR ou EXTERIEUR ?

1. En intérieur
2. En extérieur

**NOUVELLE QUESTION**

SI Q26 SQ8 = 1

SINGLE

Q27D7

Selon vous, la discothèque/ boîte de nuit vous semblait-elle :

1. Plutôt bien ventilée (porte ouverte, ventilation ressentie)
2. Plutôt mal ventilée (chaleur, sensation de manque d'air)
3. Je n'ai pas d'avis

**NOUVELLE QUESTION**

SI Q26 SQ8 = 1

SINGLE

Q27D8

Selon vous, la salle était remplie :

1. En jauge pleine (vous touchiez les gens en dansant, vous vous sentiez un peu serré(e))
2. En jauge moyenne (vous aviez de l'espace pour danser)
3. En jauge vide (vous aviez l'impression d'une salle vide)

**NOUVELLE QUESTION**

SI Q26 SQ8 = 1

SINGLE

Q27D9

Selon vous, combien de temps en cumulé avez-vous passé en file d'attente en INTERIEUR (billetterie, vestiaire, toilette, bar)

1. Moins de 20 minutes
2. 20 minutes et moins d'une heure
3. Plus d'une heure et moins de 2 heures
4. Plus de 2 heures

SI Q26 SQ8=1

SINGLE

Q27E

Vous avez déclaré avoir fréquenté des discothèques, bars dansants et boîtes de nuit.

Était-ce ... ?

 Une seule réponse possible

1. Exclusivement en espace extérieur
2. Plus souvent en espace extérieur qu'en intérieur
3. Plus souvent en espace intérieur qu'en extérieur
4. En espace extérieur et en intérieur de façon équivalente
5. Exclusivement en espace intérieur

SI Q26-SQ9=1

SINGLE

Q27G

Combien de fois avez-vous fréquenté des soirées en appartement privé etc. ?

 Une seule réponse possible

1. Une à deux fois
2. Trois à quatre fois
3. Cinq fois ou plus

**SI Q26–SQ9=1**

SINGLE

**Q27H**

**Vous avez déclaré avoir fréquenté des soirées en appartement privé etc.  
Était-ce ... ?**

 *Une seule réponse possible*

1. Exclusivement en espace extérieur
2. Plus souvent en espace extérieur qu'en intérieur
3. Plus souvent en espace intérieur qu'en extérieur
4. En espace extérieur et en intérieur de façon équivalente
5. Exclusivement en espace intérieur

**SI Q26–SQ10=1**

SINGLE

**Q27I**

**Combien de fois avez-vous fréquenté des raves ?**

 *Une seule réponse possible*


1. Une à deux fois
2. Trois à quatre fois
3. Cinq fois ou plus

**SI Q26–SQ10=1**

SINGLE

**Q27J**

**Vous avez déclaré avoir fréquenté des raves.  
Était-ce ... ?**

 *Une seule réponse possible*

1. Exclusivement en espace extérieur
2. Plus souvent en espace extérieur qu'en intérieur
3. Plus souvent en espace intérieur qu'en extérieur
4. En espace extérieur et en intérieur de façon équivalente
5. Exclusivement en espace intérieur

**SI Q26–SQ3 = 1**

SINGLE

**Q27C**

**Combien de fois avez-vous fréquenté des commerces (boutiques, centre commercial, marché, etc.) ?**

 *Une seule réponse possible*



1. Une à deux fois
2. Trois à quatre fois
3. Cinq fois ou plus

SI Q26 – SQ3 = 1

MULTIPLE

Q27F

**Vous avez déclaré avoir fréquenté des commerces, plus précisément, vous êtes-vous rendu**

 *Plusieurs réponses possibles*

**ROTATION ALEATOIRE SAUF CODE 5**


1. Dans un supermarché/hypermarché (grande enseigne type Auchan, Leclerc, etc.)
2. Dans une galerie marchande / centre commercial avec boutiques
3. Dans un commerce de proximité (boutique de vêtement, boulangerie, alimentation générale, etc.)
4. Sur un marché ouvert / couvert
5. Dans un autre commerce

A TOUS

SINGLE

Q28

**Avez-vous pratiqué une activité sportive en dehors de chez vous ?**

 *Une seule réponse possible par proposition*

**EN COLONNE - ROTATION ALEATOIRE SAUF SQ6**

- SQ1. Dans une salle de sport (salle de musculation, salle de danse, etc.)
- SQ2. En dehors d'une salle de sport \_ **NE PAS AFFICHER**
- SQ3. Dans un gymnase
- SQ4. Dans un dojo
- SQ5. En extérieur
- SQ6. Ailleurs

**EN LIGNE**

1. Oui
2. Non

SI Q28 – SQ1 A SQ6 = 1

SINGLE

Q28A

**Avez-vous utilisé du matériel en commun avec d'autres personnes (ballon, machine de musculation, tapis de gym, etc.) ?**

 *Une seule réponse possible*

1. Oui
2. Non

SI Q28 – SQ1 A SQ6 = 1

SINGLE

Q28B

Au cours de cette activité sportive, étiez-vous en présence d'autres personnes ne faisant pas partie de votre foyer ?

 Une seule réponse possible

1. Oui, mais sans contact physique
2. Oui, avec un contact physique
3. Non

SI Q28 SQ1 A SQ6 = 1

SINGLE

Q29A

Combien de fois avez-vous pratiqué une activité sportive en dehors de chez vous?

 Une seule réponse possible

1. Une à deux fois
2. Trois à quatre fois
3. Cinq fois ou plus


A MASQUER

POSER SI Q28\_SQ2=1

SINGLE

Q29B

~~Les activités sportives pratiquées en dehors d'une salle de sport, se déroulaient-elles...~~

~~ Une seule réponse possible~~

- ~~1. Exclusivement en espace extérieur~~
- ~~2. Plus souvent en espace extérieur qu'en intérieur~~
- ~~3. Plus souvent en espace intérieur qu'en extérieur~~
- ~~4. En espace extérieur et en intérieur de façon équivalente~~
- ~~5. Exclusivement en espace intérieur~~

A TOUS

SINGLE

Q29C

Avez-vous fréquenté une piscine publique (natation, aqua bike, aquagym, bébé-nageur, etc.)?

 Une seule réponse possible

1. Oui
2. Non

SI Q29C=1

SINGLE

Q29D

Combien de fois avez-vous fréquenté une piscine publique ?

 Une seule réponse possible

1. Une à deux fois
2. Trois à quatre fois
3. Cinq fois ou plus

**A TOUS**

SINGLE

**Q29E**

Vous êtes-vous occupé ou avez-vous rencontré des enfants/étudiants en dehors de ceux domiciliés chez vous ?

1. Oui
2. Non

**SI Q29E=1**

MULTIPLE

**Q29F**

Vous avez déclaré vous être occupé ou avoir rencontré des enfants/étudiants en dehors de ceux domiciliés chez vous.

Dans quel(s) établissement(s) sont-ils scolarisés... ?

 Plusieurs réponses possibles

1. En crèche
2. Chez une assistante maternelle
3. En école maternelle
4. En école primaire
5. Au collège
6. Au lycée
7. En université
8. Non scolarisé

**A MASQUER****A TOUS**

SINGLE

**Q29G**

Avez-vous fréquenté un lieu ou participé à évènement festif ou culturel exigeant un Pass sanitaire ?

1. Oui
2. Non

**A MASQUER****SI Q29G=1**

MULTIPLE

**Q29H**

Et plus précisément, quels sont les lieux ou évènements festifs ou culturels fréquentés exigeant un Pass sanitaire ?

 Plusieurs réponses possibles

**ROTATION ALEATOIRE SAUF CODE 16**

1. Chapiteaux, salles de théâtre / spectacles, salles culturelles, cinémas
2. Salles de conférence
3. Salons et foires d'exposition
4. Stades / établissements sportifs
5. Casinos/salles de jeux

6. Zoos
7. Parcs à thème/parc d'attraction
8. Spectacles ou concerts à ciel ouvert / festivals
9. Musées et monuments
10. Cafés, restaurants, bars
11. Salles de sports
12. Centres commerciaux
13. Avion
14. Train (TGV, intercités ou trains de nuit), car (pour les longs trajets)
15. Discothèque/bar dansant/boite de nuit
16. Autre

**A MASQUER**

**POSER SI ((Q29G=1 ET ((Q23B=1 OU 2 OU 4) ET Q29H<>1) OU ((Q29C=1 OU Q28SQ3 OU 4=1) ET Q29H<>4) OU (Q23B=6 ET Q29H<>8) OU (Q23B=3 ET Q29H<>9) OU (Q26SQ4 OU SQ5=1) ET Q29H<>10) OU (Q28SQ1=1 ET Q29H<>11) OU (Q27F=2 ET Q29H<>12) OU (Q19B=4 ET Q29H<>13) OU (Q19B=1 OU 3) ET Q29H<>14) OU (Q26SQ8=1 ET Q29H<>15)))**

GRID

**Q29I**

**Vous avez précédemment déclaré avoir fréquenté les lieux ou participé aux évènements suivants :**

**Si Q23B=1 alors afficher : Théâtre**

**Si Q23B=2 alors afficher : Cinéma**

**Si Q23B=3 alors afficher : Musée**

**Si Q23B=4 alors afficher : Concert en salle**

**Si Q23B=6 alors afficher : Spectacle ou concert à ciel ouvert / festival**

**Si Q26SQ8=1 alors afficher : Discothèque/bar dansant /boite de nuit**

**Si Q26SQ4=1 alors afficher : Restaurant**

**Si Q26SQ5=1 alors afficher : Bar**

**Si Q28SQ1=1 alors afficher : Salle de sport (salle de musculation, salle de danse, etc.)**

**Si Q28SQ3=1 alors afficher : Gymnase**

**Si Q28SQ4=1 alors afficher : Dojo**

**Si Q29C=1 alors afficher : Piscine publique**

**Si Q27F=2 alors afficher : Galerie marchande / centre commercial avec boutiques**

**Si Q19B=1 alors afficher : Car/bus**

**Si Q19B=3 alors afficher : Train grandes lignes et TGV**

**Si Q19B=4 alors afficher : Avion**

**Pourriez-vous nous confirmer que ces lieux ou évènements n'exigeaient pas le Pass sanitaire ?**

Une seule réponse possible par lieu/évènement

**PRESENTER SOUS FORME DE TABLEAU****EN COLONNE:**

1. Exigeait le Pass sanitaire
2. N'exigeait PAS le Pass sanitaire

**EN LIGNE : ROTATION**

**SQ1. \_\_\_\_\_ Chapiteaux, salles de théâtre / spectacles, salles culturelles, cinémas (Afficher si ((Q23B=1 ou 2 ou 4) ET Q29H<>1))**

- SQ2. — Code à blanc (Salles de conférence)
- SQ3. — Code à blanc (Salons et foires d'exposition)
- SQ4. — Stades / établissements sportifs (Afficher si ((Q29C=1 ou Q28SQ3 ou 4=1) ET Q29H<>4))
- SQ5. — Code à blanc (Casinos/salles de jeux)
- SQ6. — Code à blanc (Zoos)
- SQ7. — Code à blanc (Parcs à thème/parc d'attraction)
- SQ8. — Spectacles ou concerts à ciel ouvert / festivals (Afficher si ((Q23B=6 ET Q29H<>8))
- SQ9. — Musées et monuments (Afficher si (Q23B=3 ET Q29H<>9))
- SQ10. — Cafés, restaurants, bars (Afficher si ((Q26SQ4 ou SQ5=1) ET Q29H<>10))
- SQ11. — Salles de sports (Afficher si (Q28 SQ1 =1 ET Q29H<>11))
- SQ12. — Centres commerciaux (Afficher si (Q27F=2 ET Q29H<>12))
- SQ13. — Avion (Afficher si (Q19B=4 ET Q29H<>13))
- SQ14. — Train (TGV, intercités ou trains de nuit), car (pour les longs trajets) (Afficher si ((Q19B=1 ou 3) ET Q29H<>14))
- SQ15. — Discothèque/bar dansant/boite de nuit (Afficher si (Q26SQ8=1 ET Q29H<>15))

### SI QCIBLE=1 OU 2 (CAS INDEX OU PROCHES)

#### PARTIE IV: QUESTIONNAIRES SPECIFIQUES

### SI QCIBLE=1 OU 2 (CAS INDEX OU PROCHES)

#### PARTIE A : CLASSIFICATION

### SI QCIBLE=1 CAS INDEX

#### POUR LES TESTS UNIQUEMENT : SI QCIBLE=1 OU 2

SINGLE

#### Q30

Savez-vous qui vous a transmis le virus ?

- L'identité de cette personne ne vous sera pas demandée
- Une seule réponse possible

#### PRESENTER LE CODE 3 AVANT LE CODE 2

1. Oui, avec certitude
2. Non => A2 « Cas extra-domiciliaire avec cas source inconnu »
3. Oui, mais j'ai des doutes

### SI Q30= 1 OU Q30=3

SI (Q30=1 ET QG5=1) OU (Q30=3 ET QG5=1) ALORS NE PAS POSER Q32 ET RECODER AUTOMATIQUEMENT Q32=2

DEMASQUER POUR LES TESTS

SINGLE

#### Q32

La personne qui vous a transmis le virus vit-elle sous le même toit que vous ?

- Une seule réponse possible

1. Oui => A3 « Cas intra-domiciliaire »

2. Non =>A1 « Cas extra-domiciliaire avec cas source connu »

SI Q30= 1 OU 3

SNGLE

Q31

La personne qui vous transmis le virus a-t-elle été testée positive au COVID-19 par prélèvement de nez ou de gorge ?

 Une seule réponse possible

1. Oui
2. Non
3. Vous ne savez pas

SI Q30= 2

SINGLE

Q31B

Suspectez-vous une ou plusieurs situations (ou évènements) ayant eu lieu [Si CA7=1 alors afficher « au cours des 7 jours avant le début des symptômes. » // SI CA7<> 1 alors afficher « au cours des 7 jours avant la réalisation du test. »]

 Une seule réponse possible

**PRESENTER LE CODE 3 AVANT LE CODE 2**

1. Oui, un seul évènement ou situation
2. Non
3. Oui, plusieurs évènements ou situations

SI Q31B= 1

SINGLE

Q31C

Quel type de situation ou d'évènement suspectez-vous être à l'origine de votre contamination ?

 Une seule réponse possible

**ROTATION ALEATOIRE- SAUF CODE 8 TOUJOURS EN DERNIER**

**NE PAS AFFICHER CODE 6**

**MASQUER CODES 1 ET 2**

1. Une réunion **[MASQUER]**
2. Un repas **[MASQUER]**
3. Un verre ou un café dans un bar
4. Une soirée festive (bar, discothèque, soirée dansante, etc.)
5. Une cérémonie (mariage, remise de diplômes, baptême, etc.)
6. Un spectacle (théâtre, compétition sportive, gala, concert, etc.) **NE PAS AFFICHER**
7. Un déplacement en transport en commun
8. Autre évènement
9. Un spectacle assis (théâtre, cinéma, etc.)
10. Un spectacle debout (gala, etc.)
11. Fréquentation d'une structure de soin (en tant que professionnel ou en tant que patient)
12. Au travail, à votre poste ou en réunion
13. Au travail, lors d'une pause café ou du déjeuner
14. Un repas dans un bar ou restaurant
15. Un repas ou une réunion avec mes proches au domicile
16. Une sortie dans une salle de sport ou un équipement sportif (piscine, salle d'escalade, gymnase, etc.)
17. Une sortie dans un espace bien-être (esthéticienne, massage, coiffeur, etc.)
18. Marchés de Noël **[MASQUER]**
19. Une sortie pour faire des courses (supermarchés, magasins, etc.)
20. Un évènement sportif dans un stade
21. Un évènement sportif dans un lieu clos

SI Q31B= 3

MULTIPLE

Q31CTER

Parmi ces situations ou évènements, quel est celui que suspectez être à l'origine de votre contamination...

 3 réponses maximum possibles**UNE SEULE REPONSE POSSIBLE PAR SOUS-QUESTION****SOUS-QUESTION :**

1. En premier ?
2. En deuxième ?
3. En troisième ?

**ROTATION ALEATOIRE DES ITEMS SAUF****CODE 8 ET 22 TOUJOURS EN DERNIER****SQ2 : NE PAS AFFICHER L'ITEM SELECTIONNE EN SQ1 (SAUF CODE 8)****SI SQ2=22 NE PAS POSER SQ3****SQ3 : NE PAS AFFICHER LES ITEMS SELECTIONNES EN SQ1 ET SQ2 (SAUF CODE 8)**

1. CODE A BLANC
2. CODE A BLANC
3. Un verre ou un café dans un bar
4. Une soirée festive (bar, discothèque, soirée dansante, etc.)
5. Une cérémonie (mariage, remise de diplômes, baptême, etc.)
6. CODE A BLANC
7. Un déplacement en transport en commun
8. Autre évènement
9. Un spectacle assis (théâtre, cinéma, etc.)
10. Un spectacle debout (gala, etc.)
11. Fréquentation d'une structure de soin (en tant que professionnel ou en tant que patient)
12. Au travail, à votre poste ou en réunion
13. Au travail, lors d'une pause café ou du déjeuner
14. Un repas dans un bar ou restaurant
15. Un repas ou une réunion avec mes proches au domicile
16. Une sortie dans une salle de sport ou un équipement sportif (piscine, salle d'escalade, gymnase, etc.)
17. Une sortie dans un espace bien-être (esthéticienne, massage, coiffeur, etc.)
18. Marchés de Noël **[MASQUER]**
19. Une sortie pour faire des courses (supermarchés, magasins, etc.)
20. Un évènement sportif dans un stade
21. Un évènement sportif dans un lieu clos
22. Pas d'autre situation ou évènement **[AFFICHER SI SQ 2 OU 3]**



**SI Q31C=11**

SINGLE

**Q31C\_2**

Avez-vous fréquenté une structure de soin en tant que...

 Une seule réponse possible**ROTATION ALEATOIRE**


1. Professionnel ?
2. Patient ?

**SI Q31B= 1**

SINGLE

**Q31D**

Dans quel contexte a eu lieu cette situation ou évènement ?

 Une seule réponse possible**ROTATION ALEATOIRE- SAUF CODE 7**

1. Professionnel
2. Familial
3. Culturel
4. Religieux
5. Amical
6. Sportif
7. Dans un autre contexte

**SI Q31B= 1**

SINGLE

**Q31E**

Quels sont les éléments qui vous font suspecter cette situation ou évènement en particulier ?

 Plusieurs réponses possibles**ROTATION ALEATOIRE- SAUF CODE 4**

1. Grand nombre de personnes
2. Absence de port du masque
3. Absence de distanciation physique
4. Autre élément

**SI Q31B= 1**

SINGLE

**Q31G**

Pourriez-vous nous indiquer la date de cette situation ou évènement suspect ?

1. JJ/MM/ AAAA
2. Vous ne savez pas

LA DATE NE DOIT PAS ETRE ANTERIEURE A LA DATE DU JOUR

SI Q31B= 1

OE

Q31F

Pour nous aider d'avantage, merci de nous décrire succinctement (en quelques mots) la situation ou l'évènement en particulier.

 Inscrivez vos réponses dans la zone de texte ci-dessous

INSERER TEXT BOX

A TOUS (SI QCIBLE=1 OU 2, CAS INDEX OU PROCHES)

DEMASQUER POUR LES TESTS

SINGLE

QBRAS

Si Q32=2 alors QBRAS=1

Si Q30=2

Si Q32=1 alors QBRAS =3

Si CB5=1 et Q32<>1 alors QBRAS =4

Si CB5=1 et Q32=1 alors QBRAS =5

Si CB5=2 et Q32<>1 alors QBRAS=6

Si CB5=2 et Q32=1 alors QBRAS=7

1. A1 « Cas extra-domiciliaire avec cas source connu »
2. A2 « Cas extra-domiciliaire avec cas source inconnu »
3. A3 « Cas intra-domiciliaire »
4. B1 « Cas proche de cas extra-domiciliaire »
5. B2 « Cas proche de cas intra-domiciliaire »
6. B3 « Témoin proche de cas extra-domiciliaire »
7. B4 « Témoin proche de cas intra-domiciliaire »

**POSER SI QBRAS=3 OU 4 OU 5 OU 6 OU 7 (BRAS A3 OU B1 A B4)**  
**PARTIE B : QUESTIONNAIRE CONTAMINATION INTRA-DOMICILIAIRE**

**A TOUS (QBRAS=3 OU 4 OU 5 OU 6 OU 7 (BRAS A3 OU B1 A B4))**

**SI ((QBRAS=3 OU 4 OU 5 OU 6 OU 7) ET QG5=1) ALORS NE PAS POSER Q33 RECODER AUTOMATIQUEMENT Q32=«0 »**

DEMASQUER POUR LES TESTS

NUMERIC

**Q33**

**SI (QBRAS =3 ET CA7=1) OU (QBRAS =4 ET CB5=1) OU (QBRAS =5 ET CB5=1) ALORS AFFICHER :**

Au cours des **7** jours avant le début des symptômes, combien de personnes vivant avec vous ont eu un diagnostic de COVID-19 confirmé par prélèvement de nez ou de gorge ?

**SI (QBRAS =3 ET CA7<>1) OU (QBRAS =4 ET CB5=2) OU (QBRAS =5 ET CB5=2) ALORS AFFICHER :**

Au cours des **7** jours avant la réalisation du test, combien de personnes vivant avec vous ont eu un diagnostic de COVID-19 confirmé par prélèvement de nez ou de gorge ?

**SI QBRAS =6 OU 7 ALORS AFFICHER :**

Au cours des **7** derniers jours, combien de personnes vivant avec vous ont eu un diagnostic de COVID-19 confirmé par prélèvement de nez ou de gorge ?

 Veuillez indiquer la réponse dans la case suivante

**QUANTITE MIN 0 – QUANTITE MAX 11**

**SI QG5=2 ALORS AFFICHER EN Q33 CODE 1 ET 2 (« 0 » ET « 1 »)**

**SI QG5=3 ALORS AFFICHER EN Q33 CODE 1 A 3 (« 0 » A « 2 »)**

**SI QG5=4 ALORS AFFICHER EN Q33 CODE 1 A 4 (« 0 » A « 3 »)**

**SI QG5=5 ALORS AFFICHER EN Q33 CODE 1 A 5 (« 0 » A « 4 »)**

**SI QG5=6 ALORS AFFICHER EN Q33 CODE 1 A 6 (« 0 » A « 5 »)**

...

**SI QG5=12 ALORS AFFICHER EN Q33 CODE 1 A 12 (« 0 » A « 11 »)**

## POSER SI QBRAS=3

## PARTIE B : QUESTIONNAIRE CONTAMINATION INTRA-DOMICILIAIRE

## BRAS A3 : CAS INTRA-DOMICILIAIRE

## A TOUS (SI QBRAS=3, A3-CAS INTRA-DOMICILIAIRE)

TEXTE

## QINTRO7

Les questions suivantes concernent la personne à l'origine de votre contamination.

**RAPPELER CETTE INTRODUCTION DANS CHAQUE QUESTION (ENCADRE) DE LA Q34 A Q46**

## A TOUS (SI QBRAS=3, A3-CAS INTRA-DOMICILIAIRE)

SINGLE

## Q34

Cette personne a-t-elle présenté des symptômes évocateurs de COVID-19 (fièvre, toux, douleur de gorge, mal de tête, courbatures inhabituelles, perte de goût ou d'odorat, ...)?

 Une seule réponse possible

1. Oui
2. Non

## SI Q34 = 1

SINGLE

## Q35

Quand a-t-elle présenté ses premiers symptômes ?

 Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**Test de cohérence : la date indiquée doit être antérieure à la date du jour**


1. JJ/MM/ AAAA
2. Vous ne savez pas

## A TOUS (SI QBRAS=3, A3-CAS INTRA-DOMICILIAIRE)

SINGLE

## Q36

Et à quelle date a-t-elle eu un diagnostic de COVID-19 par prélèvement de nez ou de gorge ?

 Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**Test de cohérence : la date indiquée doit être antérieure à la date du jour**

1. JJ/MM/ AAAA
2. Vous ne savez pas
3. Cette personne n'a pas réalisé de test

**A TOUS (SI QBRAS=3, A3-CAS INTRA-DOMICILIAIRE)**

SINGLE

Q37

Est-ce...

 Une seule réponse possible



1. Un homme
2. Une femme

**A TOUS (SI QBRAS=3, A3-CAS INTRA-DOMICILIAIRE)**

NUMERIC

Q38

Quel est son âge ?


-  Si vous ne connaissez pas l'âge exact, merci de saisir un âge approximatif
-  Si moins d'un an, merci de saisir 1

**QUANTITE MIN 01 – MAX 99****A TOUS (SI QBRAS=3, A3-CAS INTRA-DOMICILIAIRE)**

SINGLE

Q39

Cette personne est-elle votre... ?

 Une seule réponse possible

1. Sœur/Frère
2. Conjoint(e)
3. Mère/Père
4. Fille/Fils
5. Ami(e)
6. Colocataire
7. Autre

**A TOUS (SI QBRAS=3, A3-CAS INTRA-DOMICILIAIRE)**

SINGLE

Q40

Vit-elle habituellement chez vous ou était-elle de passage ?

 Une seule réponse possible

1. Elle vit habituellement chez vous
1. Elle était de passage

**A TOUS (SI QBRAS=3, A3-CAS INTRA-DOMICILIAIRE)**

SINGLE

Q41

Avez-vous mis en place des mesures d'isolement entre vous et cette personne (par exemple : port du masque, désinfection des poignées, couchage isolé, etc.)?

 Une seule réponse possible

1. Oui

2. Non

**SI Q41 = 1**

SINGLE

**Q42**

**Vous avez déclaré avoir mis en place des mesures d'isolement entre vous et cette personne.**

**Était-ce :**

 *Une seule réponse possible*

1. Dès qu'elle a présenté des symptômes **Afficher si Q34=1**
2. Dès qu'elle a eu le résultat de son test
3. A un autre moment

**SI Q42 = 3**

SINGLE

**Q43**

**Quand avez-vous mis en place ces mesures d'isolement entre vous et cette personne ?**

 *Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative*

**Test de cohérence : la date indiquée doit être antérieure à la date du jour**


1. JJ/MM/AAAA
2. Vous ne savez pas

**SI Q41 = 1**

SINGLE

**Q44**

**Quelles mesures d'isolement ont été mises en place ?**

 *Une seule réponse possible par proposition*

**MENU DEROULANT**

**ROTATION ALEATOIRE DES SQ**

**SQ7. Chambre isolée**

4. Oui
5. Non
6. Nous ne dormons pas dans la même chambre en temps normal

**SQ8. Prise des repas seul(e)**

4. Oui
5. Non
6. Nous ne prenons pas nos repas ensemble en temps normal

**SQ9. Toilettes et salle de bains séparées**

4. Oui
5. Non
6. Nous utilisons des toilettes et salle de bains séparées en temps normal.

**SQ10. Port du masque systématique**

3. Oui
4. Non

SQ11. Nettoyage des surfaces, poignées... avec des produits désinfectants

3. Oui
4. Non

SQ12. Aération des locaux pendant 10 à 15 minutes au moins 2 fois par jour

3. Oui
4. Non

SI Q41 = 2 ET Q34 = 1

SINGLE

Q45

Jusqu'à quand cette personne a-t-elle eu des symptômes de COVID-19 ?

 Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**Test de cohérence : la date indiquée doit être antérieure à la date du jour**

1. JJ/ MM/ AAAA
2. Vous ne savez pas

A TOUS (SI QBRAS=3, A3-CAS INTRA-DOMICILIAIRE)


OE

Q46

Pour nous aider d'avantage, merci de nous décrire succinctement (en quelques mots) les circonstances de cette contamination.

 Inscrivez vos réponses dans la zone de texte ci-dessous

**INSERER TEXT BOX**



POSER SI QBRAS=4 A 7

PARTIE B : QUESTIONNAIRE CONTAMINATION INTRA-DOMICILIAIRE

BRAS B1, B2, B3, B4 : CAS PROCHES & TEMOINS PROCHES

A TOUS (SI QBRAS=4 A 7, BRAS B1, B2, B3 ET B4)

TEXTE

QINTRO8

Les questions suivantes concernent la personne qui vous a invité(e) à participer à cette étude.

**RAPPELER CETTE INTRODUCTION DANS CHAQUE QUESTION (ENCADRE) DE LA Q50 A Q55**

A TOUS (SI QBRAS=4 A 7, BRAS B1, B2, B3 ET B4)

SINGLE

Q50

Cette personne est-elle votre... ?

 Une seule réponse possible

1. Sœur/Frère
2. Conjoint(e)

3. Mère/Père
4. Fille/Fils
5. Ami(e)
6. Colocataire
7. Autre

**A TOUS**

SINGLE

**Q51**

Avez-vous mis en place des mesures d'isolement entre vous et cette personne (par exemple : port du masque, désinfection des poignées, couchage isolé, etc.)?

 Une seule réponse possible

1. Oui
2. Non

**SI Q51 = 1**

SINGLE

**Q52**

Vous avez déclaré avoir mis en place des mesures d'isolement entre vous et cette personne.

Était-ce :

 Une seule réponse possible


1. Dès qu'elle a présenté des symptômes (**Afficher si CA7=1**)
2. Dès qu'elle a eu le résultat de son test
3. A un autre moment

**SI Q52 = 3**

SINGLE

**Q53**

Quand avez-vous mis en place ces mesures d'isolement entre vous et la personne qui vous a invité(e) à participer à cette étude ?

 Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**Test de cohérence : la date indiquée doit être antérieure à la date du jour**


1. JJ/ MM/ AAAA
2. Vous ne savez pas

**SI Q51 = 1**

SINGLE

**Q54**

Quelles mesures d'isolement ont été mises en place ?

 Une seule réponse possible par proposition

**MENU DEROUlant ROTATION ALEATOIRE DES SQ**



**SQ1. Chambre isolée**

1. Oui
2. Non
3. Nous ne dormons pas dans la même chambre en temps normal

**SQ2. Prise des repas seul(e)**

1. Oui
2. Non
3. Nous ne prenons pas nos repas ensemble en temps normal

**SQ3. Toilettes et salle de bains séparées**

1. Oui
2. Non
3. Nous utilisons des toilettes et salle de bains séparées en temps normal.

**SQ4. Port du masque systématique**

1. Oui
2. Non

**SQ5. Nettoyage des surfaces, poignées... avec des produits désinfectants**

1. Oui
2. Non

**SQ6. Aération des locaux pendant 10 à 15 minutes au moins 2 fois par jour**

1. Oui
2. Non

**SI Q51 = 2 ET CA7 = 1**

**SINGLE**

**Q55**

**Jusqu'à quand cette personne a-t-elle eu des symptômes de COVID-19 ?**

 *Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative*

**Test de cohérence : la date indiquée doit être antérieure à la date du jour**

1. JJ/ MM/ AAAA
2. Vous ne savez pas

**POSER SI QBRAS=5 OU 7**

**PARTIE B : QUESTIONNAIRE CONTAMINATION INTRA-DOMICILIAIRE**

**BRAS B2 ET B4 : CAS PROCHE DE CAS INTRA-DOMICILIAIRE ET TEMOIN PROCHE DE CAS INTRA-DOMICILIAIRE**

**A TOUS (SI QBRAS=5 OU 7, BRAS B2 OU B4)**

**TEXTE**

**INTRO8BIS**

Les questions suivantes concernent la première personne à avoir eu des symptômes ou un diagnostic de COVID-19 à votre domicile.

**RAPPELER CETTE INTRODUCTION DANS CHAQUE QUESTION (ENCADRE) DE LA Q56 A Q68**

**A TOUS (SI QBRAS=5 OU 7, BRAS B2 OU B4)**

**SINGLE**

**Q56**

Concernant la première personne à avoir eu des symptômes ou un diagnostic de COVID-19 à votre domicile, s'agit-il de la personne qui vous a invité à participer à cette enquête ?

 Une seule réponse possible

1. Oui => **ALLER QTEL**
2. Non

**SI Q56=2**

**SINGLE**

**Q57**

Cette personne a-t-elle présenté des symptômes évocateurs de COVID-19 (fièvre, toux, douleur de gorge, mal de tête, courbatures inhabituelles, perte de goût ou d'odorat, ...) ?

 Une seule réponse possible

1. Oui
2. Non

**SI Q57 = 1**

**SINGLE**

**Q58**

Quand a-t-elle présenté ses premiers symptômes ?

 Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**Test de cohérence : la date indiquée doit être antérieure à la date du jour**

1. JJ/ MM/ AAAA
2. Vous ne savez pas

**SI Q56=2**

**SINGLE**

**Q59**

Et à quelle date a-t-elle eu un diagnostic de COVID-19 par prélèvement de nez ou de gorge ?

 Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**Test de cohérence : la date indiquée doit être antérieure à la date du jour**

1. MM/ AAAA
2. Vous ne savez pas

**SI Q56=2**

**SINGLE**

**Q60**

La première personne à avoir eu des symptômes ou un diagnostic de COVID-19 à votre domicile est-elle...

 Une seule réponse possible



1. Un homme
2. Une femme

SI Q56=2

NUMERIC

Q61

Quel est son âge ?

-  Si vous ne connaissez pas l'âge exact, merci de saisir un âge approximatif
-  Si moins d'un an, merci de saisir 1

QUANTITE MIN 01 – MAX 99

A TOUS (SI QBRAS=5 OU 7, BRAS B2 OU B4)

SINGLE

Q62

Cette personne est-elle votre... ?

 Une seule réponse possible

1. Sœur/Frère
2. Conjoint(e)
3. Mère/Père
4. Fille/Fils
5. Ami(e)
6. Colocataire
7. Autre

A TOUS (SI QBRAS=5 OU 7, BRAS B2 OU B4)

SINGLE

Q63

Vit-elle habituellement chez vous ou était-elle de passage ?

 Une seule réponse possible

1. Elle vit habituellement chez vous
2. Elle était de passage

A TOUS (SI QBRAS=5 OU 7, BRAS B2 OU B4)

SINGLE

Q64

Avez-vous mis en place des mesures d'isolement entre vous et la première personne à avoir eu des symptômes ou un diagnostic de COVID-19 à votre domicile (par exemple : port du masque, désinfection des poignées, couchage isolé, etc.) ?

 Une seule réponse possible

1. Oui
2. Non

SI Q64 = 1

SINGLE

Q65

Vous avez déclaré avoir mis en place des mesures d'isolement entre vous et cette personne.

Était-ce :

 Une seule réponse possible


1. Dès qu'elle a présenté des symptômes (**Afficher si Q57=1**)
2. Dès qu'elle a eu le résultat de son test
3. A un autre moment

SI Q65 = 3

SINGLE

Q66

Quand avez-vous mis en place ces mesures d'isolement entre vous et cette personne ?

 Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**Test de cohérence : la date indiquée doit être antérieure à la date du jour**


1. JJ/ MM/ AAAA
2. Vous ne savez pas

SI Q64 = 1

SINGLE

Q67

Quelles mesures d'isolement ont été mises en place ?

 Une seule réponse possible par proposition

**MENU DEROUlant ROTATION ALEATOIRE DES SQ**

**SQ1. Chambre isolée**

1. Oui
2. Non
3. Nous ne dormons pas dans la même chambre en temps normal

**SQ2. Prise des repas seul(e)**

1. Oui
2. Non
3. Nous ne prenons pas nos repas ensemble en temps normal

**SQ3. Toilettes et salle de bains séparées**

1. Oui
2. Non
3. Nous utilisons des toilettes et salle de bains séparées en temps normal.

**SQ4. Port du masque systématique**

1. Oui
2. Non

**SQ5. Nettoyage des surfaces, poignées... avec des produits désinfectants**

1. Oui

2. Non

SQ6. Aération des locaux pendant 10 à 15 minutes au moins 2 fois par jour


1. Oui
2. Non

SI Q64 = 2 ET Q57 = 1

SINGLE

Q68

Jusqu'à quand cette personne a-t-elle eu des symptômes de COVID-19 ?

 Si vous ne connaissez pas la date exacte, merci d'indiquer une date approximative

**Test de cohérence : la date indiquée doit être antérieure à la date du jour**

1. JJ/ MM/ AAAA
2. Vous ne savez pas

POSER SI QBRAS=1

PARTIE C : QUESTIONNAIRE CONTAMINATION EXTRA-DOMICILIAIRE

BRAS A1 : CAS EXTRA-DOMICILIAIRE AVEC CAS SOURCE CONNU

A TOUS (QBRAS=1, A1)

TEXTE

QINTRO9

Les questions suivantes concernent la personne à l'origine de votre contamination.

**RAPPELER CETTE INTRODUCTION DANS CHAQUE QUESTION (ENCADRE) DE LA Q69 A Q78**

A TOUS (QBRAS=1, A1)

SINGLE

Q69

Est-ce...

 Une seule réponse possible


1. Un homme
2. Une femme


A TOUS (QBRAS=1, A1)

NUMERIC

Q70

Quel est son âge ?

 Si vous ne connaissez pas l'âge exact, merci de saisir un âge approximatif

 Si moins d'un an, merci de saisir 1

**QUANTITE MIN 01 – MAX 99**

A TOUS (QBRAS=1, A1)

SINGLE

## Q71

Avait-elle des symptômes de COVID-19 quand elle était en contact avec vous (fièvre, toux, douleur de gorge, mal de tête, courbatures inhabituelles, perte de goût ou d'odorat, ...)?

 Une seule réponse possible

1. Oui
2. Non

## A TOUS (QBRAS=1, A1)

SINGLE

## Q72

Était-ce un contact unique ou répété sur plusieurs jours ?

 Une seule réponse possible

1. Unique
2. Répété sur plusieurs jours

## A TOUS (QBRAS=1, A1)

NUMERIC

## Q73

**SI CA7=1 alors afficher** « Combien de jours se sont passés entre votre dernier contact avec cette personne et l'apparition de vos symptômes ? »

**SI CA7<>1 alors afficher** « Combien de jours se sont écoulés entre votre dernier contact avec cette personne et la date de réalisation de votre test ? »

 Si plus de 99 jours, merci de saisir 99

**INSERER TEXT BOX – QUANTITE MIN 1 – QUANTITE MAX 99**

## SI Q72=2

TEXTE

## Q73B

Vous avez déclaré avoir eu des contacts répétés sur plusieurs jours avec la personne à l'origine de votre contamination.

Les questions suivantes concernent LE DERNIER contact que vous avez eu avec la personne à l'origine de votre contamination.

## A TOUS (QBRAS=1, A1)

SINGLE

## Q74

**SI Q72=1 alors afficher** : Etes-vous resté(e) à moins d'un mètre de cette personne pendant ...

**SI Q72=2 alors afficher** : Lors du dernier contact, êtes-vous resté(e) à moins d'un mètre de cette personne pendant ...

 Une seule réponse possible

1. Moins de quelques secondes

2. Moins de 5 minutes
3. Entre 5 et 15 minutes
4. Plus de 15 minutes
5. Vous ne vous en souvenez plus

**A TOUS (QBRAS=1, A1)**

SINGLE

**Q75****Portait-elle un masque pendant toute la durée de ce contact ?** Une seule réponse possible

1. Oui
2. Non

**A TOUS (QBRAS=1, A1)**

SINGLE

**Q76****Portiez-vous un masque pendant toute la durée de ce contact ?** Une seule réponse possible

1. Oui
2. Non

**A TOUS (QBRAS=1, A1)**


SINGLE

**Q77****SI Q72=1 alors afficher : Etiez-vous en ...****SI Q72=2 alors afficher : Lors du dernier contact, étiez-vous en ...** Une seule réponse possible

1. Intérieur (sans fenêtre ou fenêtre fermée)
- ~~2.~~ Intérieur avec fenêtre(s) ouverte(s)
- ~~3.~~ Extérieur

**A TOUS (QBRAS=1, A1)**

SINGLE

**Q78****Etiez-vous...** Une seule réponse possible

1. Dans votre région
2. En France mais en dehors de votre région
3. A l'étranger

**A TOUS (QBRAS=1, A1)**

SINGLE

**Q79****La personne à l'origine de votre contamination est-elle de votre milieu...**

 Une seule réponse possible

### ROTATION ALEATOIRE SAUF CODE 7-: TOUJOURS LE PRESENTER EN DERNIER

1. Familial
2. Professionnel (collègues, clients...)
3. Scolaire ou universitaire
3. Amical
4. Sportif
5. Culturel
6. Lieux de culte
7. D'un autre milieu
8. De soins (consultations médicale, hospitalisation, etc.) en tant que patient

### A TOUS (QBRAS=1, A1)

**MULTIPLE**

#### Q80

Parmi la liste suivante de lieux, quels sont tous ceux qui caractérisent le mieux le lieu de votre rencontre avec la personne infectée ?

 Plusieurs réponses possibles

### ROTATION ALEATOIRE SAUF CODE 10–TOUJOURS PRESENTER LE CODE 10 EN DERNIER

#### NE PAS AFFICHER CODE 8

1. Milieu professionnel
2. Milieu scolaire / universitaire
3. Cercle familial ou amical
4. Activité sportive
5. Activité de culte
6. Dans un lieu commercial où vous vous êtes rendu(e) comme client
7. Rassemblement sportif (stade de football, rugby, ...)
8. Spectacle (concert, théâtre, cinéma, ...) **NE PAS AFFICHER**
9. Moyen de transport
10. Dans un autre lieu
11. Spectacle assis (théâtre, cinéma, ...)
12. Spectacle debout (concert, etc.)
13. Lieu de soins (médical, paramédical, hospitalier, etc.) en tant que patient

### SI Q80 = 1

**MULTIPLE**

#### Q81

Vous avez déclaré avoir rencontré la personne à l'origine de votre contamination dans le milieu professionnel. Et plus précisément, était-ce...



 Plusieurs réponses possibles

### ROTATION ALEATOIRE SAUF CODE 15

1. Bureau partagé avec 2 à 5 personnes
2. Bureau partagé avec plus de 5 personnes (y compris en open space)
3. Hangar
4. Atelier
5. Garage
6. Abattoir
7. Cafétéria du personnel
8. Véhicule
9. Magasin
10. Marché
11. Logement : ouvrier, foyer
12. Site de construction
13. Lieu de restauration : bar, café, restaurant
14. Lieux de soins : hôpital, clinique, laboratoire, cabinet médical, ...
15. Ailleurs

SI Q80 = 1

MULTIPLE

### Q82

**Vous avez déclaré avoir rencontré la personne à l'origine de votre contamination dans le milieu professionnel. Et plus précisément, lors de quelle(s) activité(s) professionnelle(s) l'avez-vous rencontrée ?**

 Plusieurs réponses possibles

### ROTATION ALEATOIRE SAUF CODE 9

1. Travail à un bureau
2. Guichet
3. Service à des clients
4. Soins
5. Laboratoire d'analyse
6. Réunion de travail
7. Séminaire
8. Conférence, congrès, salon
9. Autre activité

SI Q81 = 14

SINGLE

### Q82\_B

**Vous avez déclaré avoir rencontré la personne à l'origine de votre contamination dans un lieu de soins : hôpital, clinique, laboratoire, cabinet médical, ... Et plus précisément, était-ce... ?**

 Une seule réponse possible

### ROTATION ALÉATOIRE 1 ET 2

1. Un patient
2. Un collègue de travail

## 3. Une autre personne

SI Q82=8

SINGLE

Q83

Vous avez déclaré avoir rencontré la personne à l'origine de votre contamination lors d'une conférence, congrès, salon.

Combien de personnes étaient présentes :

 Une seule réponse possible

1. Moins de 100 personnes
2. Entre 100 et 1000 personnes
3. Entre 1001 et 5000 personnes
4. Plus de 5000 personnes

SI Q80 = 2

MULTIPLE

Q84

Vous avez déclaré avoir rencontré la personne à l'origine de votre contamination dans le milieu scolaire / universitaire. Était-ce...

 Plusieurs réponses possibles

**ROTATION ALEATOIRE SAUF CODE 4**

1. Dans une salle de classe
2. Dans une salle de réunion
3. Dans un amphithéâtre
4. Ailleurs

SI Q80 = 3

SINGLE

Q85

Vous avez déclaré avoir rencontré la personne à l'origine de votre contamination dans votre cercle familial ou amical.

Plus précisément, était-ce...

 Une seule réponse possible

1. Dans votre cercle familial
2. Dans votre cercle amical.

SI Q80 = 3

SINGLE

Q86

Était-ce lors...

 Une seule réponse possible

**ROTATION ALEATOIRE SAUF CODE 4- TOUJOURS EN DERNIER**

1. D'un mariage, enterrement, baptême
2. D'un repas sans occasion particulière
3. D'un anniversaire, fête, pot, sortie

4. Lors d'un autre évènement
5. A Noël **[MASQUER]**
6. Lors du réveillon du nouvel an **[MASQUER]**

SI Q80 = 3

SINGLE

Q86B

Avez-vous rencontré la personne à l'origine de votre contamination dans un lieu de loisir (bar, restaurant, parc, musée...)?

 Une seule réponse possible

1. Oui
2. Non

SI Q86B = 2

SINGLE

Q86C

Avez-vous rencontré la personne à l'origine de votre contamination ...?

 Une seule réponse possible


1. A **votre** domicile
2. A **son** domicile
3. Ailleurs, précisez dans le cadre ci-dessous **INSERER UN TEXT BOX \_ POSSIBILITER DE PASSER A LA QUESTION SUIVANTE SI LA CASE N'EST PAS RENSEIGNEE**

SI Q86B = 1

SINGLE

Q87

Et plus précisément, dans quel lieu de loisir avez-vous rencontré la personne à l'origine de votre contamination ?

 Une seule réponse possible

**ROTATION ALEATOIRE SAUF CODE 7**

1. Bar, café
2. Restaurant
3. Discothèque
4. Musée
5. Parc d'attractions, parc à thème, zoo
6. Parc, jardin
7. Ailleurs

SI Q80 = 3

**SI Q87=5 OU 6 ALORS NE PAS POSER Q87B ET RECODER AUTOMATIQUEMENT Q87B=3 – A DEMASQUER POUR LES TESTS**

SINGLE

Q87B

Était-ce dans un espace...?

 Une seule réponse possible

1. Intérieur (sans fenêtre ou fenêtre fermée)
2. Intérieur avec fenêtre(s) ouverte(s)
3. Extérieur

**SI Q80 = 3**

SINGLE

**Q88****Combien de personnes étaient présentes lors de cet événement ?** Une seule réponse possible

1. Moins de 5 personnes
2. Entre 5 et 20 personnes
3. Entre 21 et 50 personnes
4. Plus de 50 personnes

**SI Q80 = 4**

SINGLE

**Q89****Vous avez déclaré avoir rencontré la personne à l'origine de votre contamination lors d'une activité sportive. Était-ce lors d'une activité...** Une seule réponse possible

1. Individuelle dans un espace ouvert (jardin, forêt, plage, montagne...)
2. Individuelle dans un espace clos avec d'autres personnes
3. Collective

**SI Q80 = 6**

SINGLE

**Q90****Vous avez déclaré avoir rencontré la personne à l'origine de votre contamination dans un lieu commercial où vous vous êtes rendu(e) comme client(e). Était-ce** Une seule réponse possible**ROTATION ALEATOIRE SAUF CODE 4**

1. Dans un magasin
2. Dans un centre commercial
3. Sur un marché
4. Dans un autre lieu commercial

**SI Q80 = 7**

SINGLE

**Q91****Vous avez déclaré avoir rencontré la personne à l'origine de votre contamination lors d'un rassemblement sportif (stade de football, rugby, ...). Combien de personnes étaient présentes ?** Une seule réponse possible

1. Moins de 100 personnes
2. Entre 100 et 1000 personnes

3. Entre 1001 et 5000 personnes
4. Plus de 5000 personnes

**A MASQUER****SI Q80 = 8****SINGLE****Q92**

~~Vous avez déclaré avoir rencontré la personne à l'origine de votre contamination lors d'un spectacle (concert, théâtre, cinéma, ...). Combien de personnes étaient présentes ?~~

~~ Une seule réponse possible~~

- ~~1. Moins de 100 personnes~~
- ~~2. Entre 100 et 1000 personnes~~
- ~~3. Entre 1001 et 5000 personnes~~
- ~~4. Plus de 5000 personnes~~

**SI Q80 = 11****SINGLE****Q92A**

Vous avez déclaré avoir rencontré la personne à l'origine de votre contamination lors d'un spectacle assis (théâtre, cinéma, ...). Combien de personnes étaient présentes ?

 Une seule réponse possible

1. Moins de 100 personnes
2. Entre 100 et 1000 personnes
3. Entre 1001 et 5000 personnes
4. Plus de 5000 personnes

**SI Q80 = 12****SINGLE****Q92B**

Vous avez déclaré avoir rencontré la personne à l'origine de votre contamination lors d'un spectacle debout (concert, etc). Combien de personnes étaient présentes ?

 Une seule réponse possible

1. Moins de 100 personnes
2. Entre 100 et 1000 personnes
3. Entre 1001 et 5000 personnes
4. Plus de 5000 personnes

**SI Q80 = 9****SINGLE****Q93**

Vous avez déclaré avoir rencontré la personne à l'origine de votre contamination dans un moyen de transport. Et plus précisément était-ce...

 Une seule réponse possible

**ROTATION ALEATOIRE SAUF CODE 8**

1. Métro
2. Tramway
3. Bus
4. Train
5. Avion
6. RER (**Afficher uniquement QG4 RECODE=9**)
7. Bateau de croisière
8. Dans un autre moyen de transport

SI Q80 = 13

SINGLE

Q95

Vous avez déclaré avoir rencontré la personne à l'origine de votre contamination dans un lieu de soin.  
Et plus précisément était-ce...

 Une seule réponse possible

1. Un autre patient
2. Un professionnel de santé
3. Une autre personne

A TOUS

OE

Q94

Pour nous aider d'avantage, merci de nous décrire succinctement (en quelques mots) les circonstances de cette contamination.

 Inscrivez vos réponses dans la zone de texte ci-dessous

**INSERER TEXT BOX**

A TOUS (QCIBLE=1 OU 2 OU 3 OU 4)

**MODULE FIN DE QUESTIONNAIRE**

A TOUS (QCIBLE=1 OU 2 OU 3 OU 4)

TEXTE

QTEL

Plus que quelques questions pour valider votre participation. Les informations apportées seront utiles dans la compréhension de l'épidémie de COVID-19.

Nous vous proposons à présent, si vous le souhaitez, de renseigner votre numéro de téléphone. Vous pourriez être appelé(e) dans les prochaines semaines par un enquêteur attaché à l'Institut Pasteur qui vous posera des questions pour compléter les informations obtenues et s'assurer de leur qualité.

Ce questionnaire téléphonique ne concernera qu'un petit nombre de participants tirés au sort, il est donc possible que vous ne soyez pas appelé(e).

Acceptez-vous d'être contacté par téléphone pour **cette** partie de l'étude ?

1. Oui
2. Non

**POSER SI QTEL=1**

TELEPHONE

**QTEL2**

Pourriez-vous indiquer le numéro de téléphone sur lequel nous pourrions éventuellement vous joindre si vous avez été tiré au sort pour participer à **cette** partie de l'enquête.

- SQ1.** TELEPHONE PORTABLE (ou fixe si vous n'avez pas de portable) : **autoriser N° en 01 à 09**
- SQ2.** VEUILLEZ SAISIR DE NOUVEAU VOTRE NUMERO DE TELEPHONE PORTABLE (ou fixe si vous n'avez pas de portable) : **autoriser N° en 01 à 09**

**SI SQ1 <> SQ2 ALORS AFFICHER**

« Les numéros sont différents. Merci de bien vouloir saisir à nouveau votre numéro de téléphone. »

**POSER SI QTEL=2=VIDE**

TEXTE

**QFIN1**

Nous avons bien noté que vous ne souhaitez pas être contacté(e) pour **cette** partie de l'enquête. Votre participation très précieuse se limitera ainsi à la première partie de l'étude.

**POSER SI QCIBLE=1 ET QG5<>1 (CAS INDEX)**

SINGLE

**QMAIL1**

Nous vous proposons d'inviter un de vos proches à participer à l'étude. Nous souhaitons interroger une personne avec laquelle vous vivez, qui n'est actuellement pas touchée par la COVID-19, ou alors en attente de résultat d'un éventuel prélèvement.

Vous pouvez indiquer son adresse email ci-dessous. Nous lui enverrons un email sous 24 à 48 heures pour lui proposer de participer à l'étude. Les questions posées seront proches de celles auxquelles vous avez répondu. Cette étape est facultative, votre refus n'aura pas d'impact sur votre participation.

Nous vous proposons de privilégier par ordre de préférence :

- Au mieux votre conjoint ou conjointe
- Sinon un frère, une sœur, un ami ou une amie, un colocataire (âgé d'au moins 18 ans)
- Enfin un parent ou un enfant (âgé d'au moins 18 ans).

Acceptez-vous de nous communiquer l'adresse électronique d'une personne majeure vivant à votre domicile ?

1. Oui
2. Non

**POSER SI QMAIL1=1**

MAIL

**QMAIL2**

Pourriez-vous indiquer l'adresse électronique de cette personne afin que nous lui envoyions une invitation à répondre au questionnaire.

- SQ1. Veuillez saisir l'adresse électronique
- SQ2. Veuillez de nouveau saisir l'adresse électronique

**SI ADRESSE SQ1 <> SQ2 ALORS AFFICHER**

« Les adresses électroniques sont différentes. Merci de bien vouloir saisir à nouveau l'adresse électronique d'une personne majeure vivant à votre domicile. »

**SI QCIBLE=1****RECODE AUTOMATIQUE – A DEMASQUER LORS DES TESTS**

**SI ((QAGGLO2=5 OU QAGGLO = 9) ET (CA9SQ1CAL <> VIDE ET (LASTCOMPLETE -CA9SQ1CAL<=4))  
ET**

**CONDITION 1 : ((CA3\_1 OU CA3\_2 = 1) ET (CA9B3=2 ET CA9C2SQ2NSPCAL\_1<>1 ET CA9D1SQ2 <>5))**

**OU CONDITION 2 : ((CA9B3 = 3 ET CA9C2SQ3NSPCAL\_1 <>1 ET CA9D1SQ3 <> 5))**

**OU CONDITION 3 : (CA9B2 = 2 ET CA1 = 2)**

**ET**

**(QG11B =2 OU QSEXE = 1)**

**ALORS QCIBCOR5=1 SINON QCIBCOR5=2**

SINGLE

**QCIBCOR5**

1. ELIGIBLE Corser-5
2. NON-ELIGIBLE Corser-5

**POSER SI QCIBCOR5=1**

TEXTE

**CORS1**

**Le questionnaire principal est maintenant terminé.**  
Un grand merci pour votre participation à l'étude ComCor !

Nous souhaitons à présent vous proposer de participer à l'étude CORSER-5 menée par l'Institut Pasteur. D'après vos réponses au questionnaire que vous venez de compléter, il est possible que vous soyez éligible pour y participer.

CORSER-5 a pour objectif d'étudier la réponse immunitaire des personnes dès les tous premiers jours de l'infection par le SARS-CoV-2. Cette réponse sera comparée à celle des personnes qui ne sont pas en cours d'infection.

Nous espérons ainsi pouvoir identifier un taux d'anticorps pouvant indiquer la nécessité d'un rappel vaccinal contre le COVID-19.

Vous êtes totalement libre de participer ou non à cette étude. Il s'agit d'une étude distincte de l'étude ComCor. Votre décision concernant cette étude n'aura pas d'impact sur votre participation à l'étude ComCor.

L'étude CORSER-5 comprend trois visites. La première aura lieu à votre domicile (afin d'éviter de vous faire vous déplacer en cours d'infection), les deux suivantes auront lieu un mois et six mois plus tard à l'Institut Pasteur à Paris (15e).

Si cette étude vous intéresse, vous pouvez obtenir davantage d'informations sur le site de l'Institut Pasteur à l'adresse ci-dessous. Vous y trouverez notamment une note d'information détaillée et pourrez nous laisser vos coordonnées pour être contacté(e) si vous souhaitez participer.



<https://research.pasteur.fr/fr/news/corser-5-etude-de-la-reponse-immunitaire-chez-des-personnes-en-cours-dinfection-par-le-sars-cov-2/>

**SI QCIBLE= 2 OU 3 OU QCIBCOR5=2**

SINGLE

QCOGN

**Le questionnaire principal est maintenant terminé.**  
**Nous vous remercions pour votre participation.**

Vous pouvez retrouver la note d'information détaillée sur l'étude « ComCor » et la protection de vos données personnelles à tout moment à l'adresse suivante :

<https://www.pasteur.fr/fr/sars-cov-2-covid-19-institut-pasteur/projets-recherche/etude-facteurs-sociodemographiques-comportementaux-pratiques-associes-risque-infection-sars-cov-2>

A présent, **nous vous proposons de répondre à un deuxième questionnaire.** Vous pouvez y répondre dès maintenant ou au moment de votre choix dans les quatre prochaines semaines. Ce questionnaire permettra d'étudier les attitudes de la population dans le contexte de l'épidémie COVID-19 afin d'adapter la communication sur les comportements à risque et leur prévention.

Ce questionnaire dure environ 25 minutes et comporte trois parties :

- La première partie porte sur **vos attitudes vis-à-vis du risque** (10 min) ;
- La deuxième partie porte sur **vos traits de personnalité** (10 min) ;
- La troisième partie porte sur **vos attitudes vis-à-vis de la vaccination anti-Covid-19** (5 min).

A la fin du questionnaire, si vous le souhaitez, votre profil de personnalité et de gestion du risque vous sera présenté.

**Acceptez-vous de répondre à ce deuxième questionnaire ?**

1. Oui
2. Non

**SI QCOGN=2 OU CIBLE=4**

TEXTE

QFIN2

**Le questionnaire est maintenant terminé.**  
**Nous vous remercions pour votre participation.**

**Afficher si CIBLE=4 :**

**Vous pouvez retrouver la note d'information détaillée sur l'étude « ComCor » et la protection de vos données personnelles à tout moment à l'adresse suivante :**

<https://www.pasteur.fr/fr/sars-cov-2-covid-19-institut-pasteur/projets-recherche/etude-facteurs-sociodemographiques-comportementaux-pratiques-associes-risque-infection-sars-cov-2>

**SI Q0A OU Q0B OU Q0C OU Q0D=1**

TEXTE

FINQ0

**Vous avez déjà répondu à cette étude. Vous ne pouvez plus y participer à nouveau.  
En vous renouvelant nos remerciements.**