Master of Public Health

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Social determinants and factors associated with use of SARS-CoV-2 self-tests during first months of self-test availability:
findings from a population-based cohort study in France

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List of acronyms

CATI - computer-assisted telephone interviewing
CAWI - computer-assisted web interviewing
CNIL - Commission nationale de l'informatique et des libertés
ECDC - European Centre for Disease Prevention and Control
EU - European Union
FIDELI - Fichiers démographiques sur les logements et les individus
HIV - human immunodeficiency virus
PROGRESS - place of residence, race/ethnicity/culture/language, occupation, gender/sex, religion, education, socioeconomic status, and social capital
SES - socioeconomic status
STI - sexually transmitted infection
WHO - World Health Organization
WTP - willingness to pay

Abstract

Background. Self-tests for SARS-CoV-2 quickly became available after the onset of the pandemic. They were especially recommended for high-risk and hard-to-reach populations. This study examines social determinants and factors associated with use of self-tests during first months of availability in France.

Methods. The EpiCov study is a national, population-based cohort study conducted in France during the Covid-19 pandemic. Primary outcome variable was *use of self-test at last SARS-CoV-2 test,* among those who reported testing between May-July 2021. Univariate and multivariable binomial weighted logistic regressions were conducted, stratified by age group (16-24, 25-59, 60+ years).

Results. Overall, 11% of the population who tested for SARS-CoV-2 between May-July 2021 reported using a self-test as last test. Use of self-tests was highest among 16-24 year-olds, individuals with higher education, and in lowest population density areas. Use was lowest among 60+ year-olds, unemployed and retired people, and first-generation immigrants. When stratifying by age, demographic factors were highly predictive of use of self-tests among 25-59 year-olds, but not among younger and older age groups. 16-24 year-olds with high perceived Covid-19 risk vs low perceived risk were more likely to use self-tests (aOR 1.99 [95%CI 1.10-3.59]). Among 25-59 year-olds, in-person workers were more likely to use self-tests than remote workers (1.90 [1.20-3.02]). Among 60+ year-olds, employed individuals were more likely to use self-tests than retired individuals (3.77 [2.19-6.51]).

Conclusions. With higher utilization in lowest population density areas and among more exposed individuals, convenience may be a primary driver of use of self-tests. Inequities in use were observed, with lower use among people with low education, older age, and immigrants. However, cost of self-tests does not appear to be a major barrier to use.

Keywords: self-testing, Covid-19, social determinants

Introduction

Widespread availability of testing and rapid, reliable diagnosis are essential components of infectious disease control.[1–5] Effective testing strategies can help reduce the spread of disease by identifying asymptomatic and latent infections, by speeding up access to treatment, by reducing international travel of infectious individuals, and by implementing successful isolation measures.[1–3] At a population level, testing can help assess the characteristics of a disease, improve surveillance, alleviate constraints on health system capacity by identifying cases at an earlier stage of infection, and in general reduce the human and economic impact of infectious diseases.[2,4,5]

Testing strategies are effective if accurate tests are both widely accessible to and highly utilized by populations at risk.[4] However, providing widespread testing in healthcare settings can be challenging, both at a structural and an individual level. Point-of-care testing requires sufficient supplies and staff available to conduct testing among and beyond symptomatic cases.[6] Limited resources can lead to delays in testing, which may lead to a delay in treatment or increased opportunities for transmission.[6,7] In addition, traditional testing strategies may miss individuals with lower healthcare engagement due to lack of accessibility of healthcare services, lack of adequate information on the process of testing, poor communication with patients (including due to language barriers), and limited availability of appointments.[6,7] Such structural barriers can contribute to a disproportionate burden of infections among minority populations, who tend to be further removed from the healthcare system.[8] Finally, individual-level factors such as privacy concerns, stigma associated with specific infectious diseases, and weak social safety nets can also contribute to reduced testing.[9]

In response to these barriers, alternative methods of testing have gained in popularity, including the use of self-testing and self-sampling for diagnosing infectious disease.[5,9–11] Self-testing is the process during which an individual collects their own sample, conducts the test, and interprets the results privately. Self-sampling involves individuals collecting their specimens and sending them to a laboratory for testing. The results are then communicated back to the individual by the laboratory.[12] As opposed to self-sampling, self-testing allows patients to bypass the healthcare system by testing and obtaining results in the comfort of their own homes.[9,13] Both approaches have been promoted by the World Health Organization (WHO) as part of its guidelines on self-care interventions for health and well-being,[11,14,15] which recommend that self-testing be offered as an additional approach to traditional testing services when available, in order to expand access to health services.[11,14,15]

Self-tests exist for various conditions, such as high cholesterol[16] or high blood glucose

levels,[16,17] as well as for HIV.[12,18] They can be available in pharmacies, stores, or online.[7,13,19] Self-testing and self-sampling increased during the Covid-19 pandemic, both for detecting SARS-CoV-2 and for diagnosing other diseases, due to high resource constraints within healthcare settings and limited human mobility.[9,20,21] While RT-PCR testing remains the gold standard for detecting SARS-CoV-2, the implementation of antigen-based SARS-CoV-2 self-testing was expected to help reduce the burden on healthcare workers and overwhelmed laboratories, avoid bringing potential cases in close proximity to each other, reduce population movement, and decrease SARS-CoV-2 exposure risk for both patients and healthcare providers.[5]

Self-tests, including for SARS-CoV-2, can provide comparable levels of reliability and accuracy to point-of-care tests conducted by healthcare providers.[22–26] Studies on HIV testing have demonstrated increased testing uptake when patients were presented with the option of using self-tests, due to the convenience, privacy, reduced stigma, and ease of use of self-testing.[18,27] In the context of Covid-19, early studies demonstrated high social acceptability of SARS-CoV-2 self-tests,[26,28–32] especially in populations already sensitized to the use of HIV self-testing.[33] Self-tests have been especially recommended to use among high-risk and hard-to-reach populations, who may face higher barriers to care and difficulty accessing traditional point-of-care testing.[15,34,35]

However, there is growing concern that self-tests may not be as successful in reaching vulnerable populations as expected.[36] For example, studies on self-testing and self-sampling for sexually transmitted infections (STI) have shown higher uptake among White populations with higher socioeconomic status (SES), women, urban residents, people with higher education, and heterosexual people, who typically have higher levels of engagement with the healthcare system, especially when the testing process involves the use of digital technologies.[19,37] These studies warn that self-testing programs could "unintentionally perpetuate existing inequities if their uptake is patterned on existing social gradients," which could happen if they are used disproportionately by people with enough resources to access existing health services.[7 (p151)] Instead, for an intervention to be considered equitable, it should result in a "give back effect," wherein the more vulnerable groups should benefit from the intervention at a higher rate because they are more in need of the services in the first place.[38]

Recent studies on SARS-CoV-2 self-tests emphasize that people with higher education,[10,28,31,39–41] people who lived in rural areas,[28,30] and people who were employed full-time[39,40] or part-time[28] were more likely to use self-tests or be willing to use one in the future. One study in the United States found that non-English speaking, underserved communities with

low health literacy faced the most challenges in accessing and using self-tests.[42] This evidence points to the need for assessing whether self-tests successfully reached those at higher risk of infection, at higher risk of exposure, or who were further removed from the healthcare system, in an equitable way.

In France, during the Covid-19 pandemic, vulnerable groups included young and intermediate aged adults,[43–47] non-EU immigrants and descendants of immigrants, [44,46–48], people with low income and/or low education,[46] women,[49] and racialized minorities.[45–50] These groups were more likely to have been infected with SARS-CoV-2,[43,45] more likely to be exposed to the virus (often due to increased use of public transportation and more crowded living situations),[48,49] and more likely to be reluctant towards vaccination.[46,47,50] For these reasons, encouraging and facilitating widespread testing among these groups was essential to limiting the spread of the virus.

This thesis aims to assess the factors associated with use of self-tests among those who tested for SARS-CoV-2 in France, focusing especially on social determinants of health and socio-demographic characteristics. Through the analysis of data from the nationally representative, population-based EpiCov cohort, we sought to determine which socio-demographic groups participated most in the use of self-tests versus other existing tests and in which contexts, to better understand the extent to which self-tests succeeded in reaching the French population in an equitable way.

This work was conducted as part of a research internship at the French Institute for Health and Medical Research (INSERM), from February to June 2024. Previously collected EpiCov data was made available for analysis. My contribution focused on refining the research question and scope, reviewing the relevant literature, determining the data analysis plan, cleaning the survey data, conducting the statistical analysis, interpreting the results, and drafting the thesis, with input from professional and academic advisors.

Methods

Study context

The EpiCov study began in France in May 2020, around 2 months after the WHO declared the Covid-19 outbreak a global pandemic.[51] Throughout the first year and a half of the pandemic, the French population was placed in lockdown three times, once from March to May 2020, then from October to December 2020, and a third time from April to May 2021. Mandatory social distancing measures and limits on traveling were put in place during that period.

During the first year of the pandemic (until April 2021), only molecular tests (RT-PCR) and antigen tests conducted by pharmacists or healthcare professionals were available in France to detect the presence of SARS-CoV-2 (Appendix 1).[52] These tests were systematically covered by French national health insurance. RT-PCR tests were primarily conducted in a laboratory setting, and rapid antigen tests were available in pharmacies. Regulatory approval for antigen self-tests using nasal swabs, designed for home use by the general public, was granted in March 2021,[53] with pharmacies authorized to distribute them from April 12, 2021.[54] While they were intended for personal use in non-clinical settings, their purchase and distribution was strictly limited to pharmacies to ensure proper guidance and usage. Self-tests were not covered by health insurance, with pricing subject to regulation and potential variation, especially in overseas departments. In June 2021, the fixed price of these tests was capped at 5.2 euros by the government. Self-tests could not be sold online, even on the websites of pharmacies.[54]

Study design and ethics

As described previously,[43,45,48,55] the EpiCov study is a national, population-based cohort study that took place in France during the Covid-19 pandemic. Individuals aged ≥15 years, living in mainland France or in three of the five French overseas territories, were randomly selected from the 2018 FIDELI administrative database on housing and individuals.[56] The FIDELI database provides administrative and contact information for 96.4% of the population living in France.

Sampling

Sampling was stratified by administrative area (département) and by poverty level (binary indicator of people below and above the threshold of 60% of the median national per capita household income). Less densely populated areas and people with lower incomes were oversampled using a differential sampling fraction, to counter expected lower response rates among these populations. Individuals living in nursing homes and prisons were excluded from the study.

Data collection

Data collection took place over four waves, in May 2020, October-December 2020, June-July 2021, and September-December 2022. A total of 371,000 selected individuals were contacted by post, email, and text messages to enroll in the first wave. Respondents were given the choice between completing a web-based survey (CAWI) or responding to computer-assisted-telephone interviews (CATI). All individuals enrolled in the first wave were invited to participate in the second wave. Individuals who responded to the first and second

waves were invited to the third wave. Finally, the fourth wave included individuals who participated in all three waves, as well as individuals who were in the initial sampling frame but did not enroll initially or complete follow-up. This sub-study focuses on outcomes reported in the third wave, but includes exposure data from the first three waves.

Ethics

The study was approved in April 2020 by the French data protection authority (CNIL, ref: MLD/MFI/AR205138) and ethics committee (Comité de Protection des Personnes Sud Méditerranée III 2020-A01191-38). In addition, it was also approved by the “Comité du Label de la Statistique Publique.” All participants or their legally authorized representatives provided informed consent to participate in the study, and the study was performed in accordance with the relevant guidelines and regulations.

Data analysis

Non-response adjustment weights

To adjust for non-response in the survey, final calibrated weights were determined using inverse probability weighting (i.e., dividing the inverse of the inclusion probability by the estimated response probability). This estimation was conducted using logit models, which were adjusted for auxiliary variables that might influence both the response mechanism and the study's main variables. These auxiliary variables, provided by the FIDELI sampling frame, encompassed a range of socio-demographic factors, income distribution, quality of contact information, and contextual aspects such as population density and the demographic composition of the area, all derived from georeferenced data. Following this, groups with similar response probabilities were identified within each department to further refine non-response adjustments, using the percentage of respondents within these homogeneity groups to calculate initial weights.

In the second phase of calibration, the initial weights were fine-tuned using population census data and projections across multiple demographic and geographic variables, including age, sex, department, education level, and region. This adjustment aimed to reduce variance and bias in variables related to these margins. The sampling strategy and survey weights were incorporated when calculating prevalence rates, confidence intervals for statistical analyses, and both unadjusted and adjusted odds ratios in logistic regression models.

Outcome variables

The outcomes of interest for this study were collected during the third wave of data collection (June-July 2021). The first outcome was the binary variable *Any SARS-CoV-2 test*

since December 2020. Participants were asked: “Since last December, have you been tested for coronavirus by a nasal swab?” and answered either yes or no. If they attempted to continue the questionnaire without providing a response, the option for “refuse to answer” appeared at that point. Participants who refused to answer this question (n=9; 0.01% of sample) were excluded from the analysis.

The second outcome was the *Type of last test.* Participants who responded yes to the previous question were asked “Where was your last test carried out?” and were given the choice of laboratory, pharmacy, self-test, or other. This variable was analyzed both as a categorical outcome (location of test used during last test) and a binary outcome (last test was or was not a self-test). Analysis of last test is a common indicator used in epidemiological studies in order to minimize recall bias.[57–61]

Respondents were also asked the month during which their last test took place. Because self-tests only became available mid-April 2021, we limited the analysis of both outcome variables to those whose last test was conducted in May, June, or July 2021. Participants (n=317) with missing data for *month of last test* were excluded from the analyses, as the timing of their test could not be ascertained.

Types of tests

Though the survey options for the second outcome were phrased as locations (laboratory, pharmacy, and self-test), these locations correspond to different types of tests used during the pandemic (RT-PCR, professionally-conducted antigen, and self-test, respectively). Antigen tests conducted by a trained professional and self-tests were both primarily available for purchase in pharmacies, while RT-PCR tests required going to a laboratory. Other locations (e.g., doctors’ offices, hospitals, workplaces, airports, and mobile testing centers) may have offered either RT-PCR or antigen tests, delivered by a healthcare professional.

For our regression analysis, we chose to only compare the use of self-test to the act of getting tested in a pharmacy, therefore excluding individuals who last tested at a lab or other location. The primary reasons for this choice were that both types of tests required traveling to a pharmacy, relied on the same rapid antigen testing technology, and were primarily used for prevention purposes, while tests conducted in laboratory settings required more effort (i.e., to access the laboratory) and were more often used for diagnosis or confirmation.

Comparing use of self-tests to pharmacy tests allows us to isolate the factors that make self-tests unique, including cost, person conducting the test, anonymity of results, and convenience. Specifically, self-tests were not reimbursed by health insurance, did not require relying on a professional for interpretation of results, did not lead to an automatic registration of

test results, did not require waiting in line or scheduling an appointment, could be purchased in bulk, and could be purchased for others (Appendix 2).

Exposure variables and covariates

To explore the social determinants associated with testing and use of self-tests, socio-economic variables were selected based on existing EpiCov literature on vulnerable groups in France during the Covid-19 pandemic, as well as the PROGRESS-Plus framework for equity in research.[62,63] The PROGRESS acronym refers to place of residence, race/ethnicity/culture/language, occupation, gender/sex, religion, education, socioeconomic status, and social capital. The "Plus" component refers to additional factors that may lead to discrimination, such as age.[64] Therefore, we selected age group, gender, education level, income level, employment status, immigration status, and household structure (i.e., presence of children or other adults in the household) as primary exposure variables, as well as the population density of participants' municipality of residence. Religion was not included as it was not asked about in the survey. Occupation was considered but not kept in the final analysis due to a high number of missing values and inconsistency between different waves of data collection, and because employment status and income level were considered more informative.

Gender, employment status, and age were obtained from the third wave of data collection, to ensure that the most up-to-date data were being used. Education level and immigration status were only collected at baseline. Household structure was collected during the second wave, assuming it remained relatively similar for most households between November 2020 and June 2021. Finally, income level and population density were obtained from the 2018 FIDELI sampling frame.

Additional exposure variables included frequency and type of social outings in the past week, vaccination status, type of work in past week (remote, hybrid, or in-person), presence of Covid-19 symptoms at any point since May 2021, any positive case within the household since December 2020, and knowledge of someone who suffered from a severe form of Covid-19. The presence of Covid-19 symptoms was constructed as a binary variable, using the possible symptomatic case definition from the European Centre for Disease Prevention and Control (ECDC), which involves the presence of at least one of five symptoms (fever, cough, difficulty breathing, sudden loss of taste or smell, and chest pain).[65] Data on these exposures were collected at the same time as data on the outcome (i.e., third wave of data collection), so temporality between exposure and testing behavior cannot be ascertained. Additionally, we included variables from baseline (general health status) and from the second wave of data collection (perceived Covid-19 risk).

Stratification

Based on anticipated differences in risk perceptions and behaviors by age, we chose to stratify our analyses by age group to account for potential effect modification. After observing trends in the general population, we analyzed potential drivers of self-test use separately in 16-24 year-olds, 25-59 year-olds, and 60+ year-olds. Various age groupings were explored, but this grouping was selected to separate young adults (a primarily student population) and the elderly (a primarily retired group) from the broader working-age population, who displayed mostly homogenous testing patterns. Age categories were created based on age during the third wave of data collection.

Statistical analysis

Statistical analyses were conducted using R version 4.2.3 and RStudio. Weighted frequency tables were developed using the *survey* package.[66] Bivariate comparisons were conducted using a weighted chi^2 test with Rao and Scott's second order correction to identify demographic, behavioral, and other exposure factors associated with testing and the type of last test in the general population.[67]

Then, stratified binomial weighted logistic regressions were fit using the *survey* package, with *Last test was self-test (vs pharmacy test)* as the binary outcome variable. Separate models were run for each age group, and only included individuals who had tested either at a pharmacy or using a self-test since May 2021. Individuals reporting a positive test result since May 2021, who represented only a small proportion of people who tested, were also excluded from the models, because positive self-tests and antigen tests were supposed to be confirmed in a laboratory through an RT-PCR test, which would lead to the misclassification of individuals whose last test would have been outside of the laboratory had they tested negative. To account for potential differences between positive and negative individuals, we adjusted for presence of Covid-19 symptoms and exposure to a positive case in the household.

Variables for each age-specific model were pre-selected through initial bivariate analyses. Variables were excluded if the confidence intervals for use of self-test within categories overlapped, if the sample size was not sufficient (i.e., if there were less than 5 observations in a given category after restricting to use of self test in each age group), and if there was no plausible relationship with the outcome within the specific age group. Univariate regression models were fit for each of these pre-selected variables, and only those with p-value <0.2 in univariate models were kept in the multivariable model.

Results

Of the 371,000 individuals aged 15+ years initially selected from the FIDELI database, 134,391 (36%) participants enrolled in the study at baseline. Of those, 107,759 responded in wave 2 (80%), and 85,074 remained in wave 3 (79%), as described in Figure 1. Individuals with missing outcome data were excluded from the analyses (N=326).

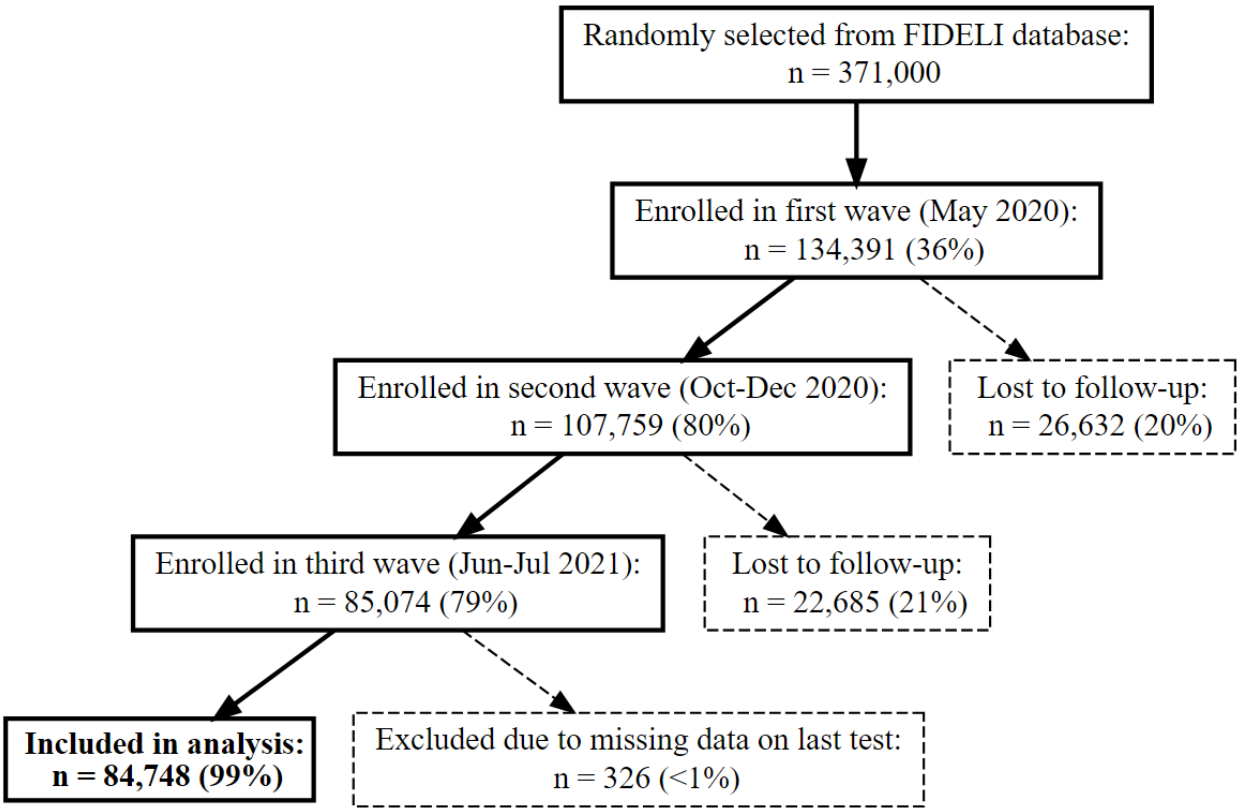

Figure 1: Evolution of study sample during the first three waves of data collection. Analysis is conducted on respondents to the third wave.

Between May and June-July 2021, 19% (95%CI 19%-20%) of the population reported receiving at least one SARS-CoV-2 test. Among those individuals, 49% (48%-50%) last tested in a laboratory, 22% (21%-23%) last tested in a pharmacy, 11% (10%-11%) last used a self-test, and 18% (17%-19%) last tested in another location. During that period, 7.3% (7.1%-7.6%) of all respondents had symptoms that fit the criteria for possible symptomatic case. Only 3.2% (2.8%-3.6%) of those who reported having tested received a positive test result (Table 1).

Table 1: Frequency of study outcomes between May and June-July 2021

Characteristic	Participants, % (n)*	95% CI
Overall	N = 84,748	
Presence of Covid-19 symptoms		
No	93 (78,091)	92–93
Yes	7.3 (6,550)	7.1–7.6
Any Covid-19 test		
No	81 (67,295)	81–82
Yes	19 (17,453)	19–20
Type of last test among those who tested		
Laboratory (RT-PCR test)	49 (8,506)	48–50
Pharmacy (antigen test)	22 (3,768)	21–23
Self-test	11 (2,257)	10–11
Other	18 (2,922)	17–19
Positive test result among those who tested		
No	97 (16,869)	96–97
Yes	3.2 (448)	2.8–3.6

Note: Missing values for missing Covid-19 symptoms (n=107) and positive test result (n=136) were omitted from the table.

* % weighted (n unweighted)

Social determinants of testing behaviors in the general population.

Results from bivariate analyses comparing testing behaviors by demographic factors are reported in Table 2a. In France, younger age groups reported testing most often, with 28% (27%-29%) of 16-24 year-olds testing at least once between May and July 2021, compared with only 12% (12%-13%) of 60+ year-olds. Individuals with graduate-level education (29% [28%-30%]) and higher income (22% [22%-23%]) were also most likely to test in general. Students (31% [29%-32%]) and employed individuals (22% [22%-23%]) tested more than their retired (12% [12%-13%]) and unemployed (19% [18%-21%]) counterparts. In addition, immigrants from the EU (23% [20%-25%]) and second-generation immigrants from outside the EU (25% [23%-27%]) tested significantly more than non-immigrants (19% [18%-19%]). Finally, individuals living with children (23% [22%-24%]) tested more than those living alone (17% [16%-18%]) or with other adults (18% [17%-18%]). No significant differences in testing behavior by gender were observed. People living in highly populated areas tested significantly more (23%

[22%-23%]) than people living in areas with low and lowest population density (17% [16%-18%] and 15% [14%-16%] , respectively).

Table 2a: Testing behaviors between May and June-July 2021, by demographic factors

Characteristic	N	No test % (n)*	95% CI	At least one test % (n)*	95% CI	p-value**
Overall	84,748	81 (67,295)	81–82	19 (17,453)	19–20	
Age group						< 0.001
16-24 yrs	9,062	72 (6,343)	71–73	28 (2,719)	27–29	
25-39 yrs	15,662	75 (11,468)	74–76	25 (4,194)	24–26	
40-59 yrs	32,508	81 (25,831)	80–81	19 (6,677)	19–20	
60+ yrs	27,516	88 (23,653)	87–88	12 (3,863)	12–13	
Gender						0.5
Male	37,445	81 (29,999)	80–81	19 (7,446)	19–20	
Female	47,283	81 (37,280)	80–81	19 (10,003)	19–20	
Education						< 0.001
Less than high school degree	25,383	83 (20,594)	82–83	17 (4,789)	17–18	
High school degree	28,717	82 (23,389)	81–82	18 (5,328)	18–19	
Undergraduate degree	18,134	78 (14,239)	78–79	22 (3,895)	21–22	
Graduate degree	12,356	71 (8,945)	70–72	29 (3,411)	28–30	
Income level						< 0.001
Deciles 1 and 2	11,010	81 (8,854)	80–82	19 (2,156)	18–20	
Deciles 3 and 4	10,384	83 (8,465)	82–84	17 (1,919)	16–18	
Deciles 5 and 6	14,642	82 (11,802)	81–83	18 (2,840)	17–19	
Deciles 7 and 8	20,432	81 (16,328)	80–81	19 (4,104)	19–20	
Deciles 9 and 10	26,047	78 (20,166)	77–78	22 (5,881)	22–23	
Employment status						< 0.001
Employed	44,348	78 (34,182)	77–78	22 (10,166)	22–23	
Student, apprentice, or intern	7,100	69 (4,837)	68–71	31 (2,263)	29–32	
Unemployed	3,645	81 (2,889)	79–82	19 (756)	18–21	
Retired	22,993	88 (19,931)	87–88	12 (3,062)	12–13	
Other	6,656	83 (5,452)	82–85	17 (1,204)	15–18	
Immigration status						< 0.001
Non-immigrant	71,304	81 (56,989)	81–82	19 (14,315)	18–19	
Second-generation immigrant (EU)	4,158	80 (3,281)	79–82	20 (877)	18–21	
First-generation immigrant (EU)	1,981	77 (1,474)	75–80	23 (507)	20–25	
Second-generation immigrant (non-EU)	2,953	75 (2,182)	73–77	25 (771)	23–27	
First-generation immigrant (non-EU)	3,096	79 (2,359)	77–81	21 (737)	19–23	

Table 2a (continued): Testing behaviors between May and June-July 2021, by demographic factors

Characteristic	N	No test % (n)*	95% CI	At least one test % (n)*	95% CI	p-value**
Household structure						< 0.001
Living alone	14,157	83 (11,373)	82–84	17 (2,784)	16–18	
Living with other people, no children	42,835	82 (34,736)	82–83	18 (8,099)	17–18	
Living with children	27,710	77 (21,148)	76–78	23 (6,562)	22–24	
Population density of the municipality						< 0.001
High	28,829	77 (21,925)	77–78	23 (6,904)	22–23	
Medium	25,871	82 (20,814)	81–82	18 (5,057)	18–19	
Low	26,437	83 (21,561)	82–84	17 (4,876)	16–18	
Lowest	3,611	85 (2,995)	84–86	15 (616)	14–16	
Region						< 0.001
Ile de France	13,679	75 (10,060)	74–76	25 (3,619)	24–26	
Auvergne Rhone Alpes	10,414	82 (8,496)	81–83	18 (1,918)	17–19	
Bourgogne Franche Comte	3,989	84 (3,302)	83–86	16 (687)	14–17	
Bretagne	4,343	83 (3,495)	81–84	17 (848)	16–19	
Centre Val de Loire	3,295	85 (2,738)	83–86	15 (557)	14–17	
Corse	447	75 (328)	69–80	25 (119)	20–31	
DROM	2,330	80 (1,831)	78–82	20 (499)	18–22	
Grand Est	8,070	79 (6,320)	78–81	21 (1,750)	19–22	
Hauts de France	7,812	83 (6,331)	81–84	17 (1,481)	16–19	
Normandie	3,679	83 (3,004)	82–85	17 (675)	15–18	
Nouvelle Aquitaine	7,699	83 (6,304)	82–84	17 (1,395)	16–18	
Occitanie	8,183	81 (6,555)	80–82	19 (1,628)	18–20	
PACA	5,855	79 (4,560)	77–80	21 (1,295)	20–23	
Pays de la Loire	4,953	82 (3,971)	81–84	18 (982)	16–19	

Note: Missing values for gender (n=20), education (n=158), income level (n=2,233), employment status (n=6), immigrant status (n=1,256), and household structure (n=46) were omitted from the table. All percentages are row percentages.

* % weighted (n unweighted)

** Chi-squared test with Rao & Scott's second order correction

Similar demographic differences were noted in the frequency of use of different types of tests as last test, though self-tests remained the least used test across all demographic groups (Table 2b). Younger individuals were more likely to use self-tests and to test in pharmacies compared to older individuals, with 14% (13%-16%) of 16-24 year-olds using self-tests compared with only 3.9% (3.3%-4.8%) of 60+ year-olds. These older individuals instead primarily sought out RT-PCR tests conducted in laboratories (58% [55%-60%]).

Table 2b: Type of test used at last test between May and June-July 2021, among those who tested, by demographic factors

Characteristic	N tested	Last tested in laboratory % (n)*	95% CI	Last tested in pharmacy % (n)*	95% CI	Last tested by self-test % (n)*	95% CI	Last tested in other location % (n)*	95% CI	p-value**
Overall	17,453	49 (8,506)	48–50	22 (3,768)	21–23	11 (2,257)	10–11	18 (2,922)	17–19	
Age group										< 0.001
16-24 yrs	2,719	43 (1,147)	41–46	27 (729)	25–29	14 (425)	13–16	16 (418)	14–18	
25-39 yrs	4,194	46 (1,841)	44–48	26 (1,096)	25–28	12 (610)	11–14	15 (647)	14–17	
40-59 yrs	6,677	49 (3,177)	47–51	21 (1,370)	20–22	12 (1,022)	11–13	18 (1,108)	17–20	
60+ yrs	3,863	58 (2,341)	55–60	15 (573)	13–17	3.9 (200)	3.3–4.8	23 (749)	21–25	
Gender										< 0.001
Male	7,446	51 (3,790)	49–52	23 (1,617)	22–24	9.5 (815)	8.7–10	17 (1,224)	16–18	
Female	10,003	48 (4,714)	46–49	22 (2,151)	20–23	12 (1,441)	11–12	19 (1,697)	18–20	
Education										< 0.001
Less than high school degree	4,789	49 (2,270)	47–51	20 (972)	19–22	10 (629)	9.1–11	20 (918)	19–22	
High school degree	5,328	49 (2,675)	47–51	22 (1,113)	21–24	8.0 (491)	7.2–8.9	21 (1,049)	19–22	
Undergraduate degree	3,895	49 (1,911)	47–51	21 (787)	20–23	14 (613)	12–15	16 (584)	14–17	
Graduate degree	3,411	48 (1,634)	46–50	27 (890)	25–29	14 (520)	13–15	10 (367)	9.3–12	
Income level										< 0.001
Deciles 1 and 2	2,156	51 (1,050)	48–54	22 (474)	19–24	8.5 (234)	7.2–10	19 (398)	17–21	
Deciles 3 and 4	1,919	47 (899)	44–50	23 (407)	20–26	9.7 (234)	8.2–11	20 (379)	18–23	
Deciles 5 and 6	2,840	49 (1,350)	46–51	20 (553)	18–21	12 (412)	11–14	20 (525)	18–22	
Deciles 7 and 8	4,104	47 (1,914)	45–49	22 (868)	21–24	12 (629)	11–14	18 (693)	16–19	
Deciles 9 and 10	5,881	51 (3,029)	50–53	23 (1,319)	22–24	11 (695)	10–12	15 (838)	14–16	
Employment status										< 0.001
Employed	10,166	47 (4,689)	46–48	23 (2,262)	22–24	13 (1,614)	12–14	17 (1,601)	16–18	
Student, apprentice, or intern	2,263	42 (934)	39–44	29 (637)	26–31	15 (366)	13–17	14 (326)	13–16	
Unemployed	756	49 (360)	44–54	26 (196)	22–30	7.5 (65)	5.5–10	18 (135)	14–21	
Retired	3,062	59 (1,900)	56–62	14 (442)	13–16	2.9 (116)	2.2–3.7	24 (604)	21–26	
Other	1,204	52 (621)	48–56	19 (231)	16–22	7.0 (96)	5.1–9.5	22 (256)	19–26	
Immigration status										< 0.001
Non-immigrant	14,315	47 (6,782)	46–48	22 (3,045)	21–23	12 (2,029)	11–13	19 (2,459)	18–20	
Second-generation immigrant (EU)	877	49 (459)	44–53	22 (185)	18–26	9.3 (86)	7.3–12	20 (147)	17–24	
First-generation immigrant (EU)	507	63 (321)	57–69	18 (92)	14–24	3.9 (28)	2.5–6.1	15 (66)	11–20	
Second-generation immigrant (non-EU)	771	49 (386)	44–54	30 (215)	25–35	6.8 (66)	5.1–9	14 (104)	11–18	
First-generation immigrant (non-EU)	737	59 (440)	54–64	23 (167)	19–27	4.2 (33)	2.7–6.4	13 (97)	10–17	

Table 2b (continued): Type of test used at last test between May and June-July 2021, among those who tested, by demographic factors

Characteristic	N tested	Last tested in laboratory % (n)*	95% CI	Last tested in pharmacy % (n)*	95% CI	Last tested by self-test % (n)*	95% CI	Last tested in other location % (n)*	95% CI	p-value**
Household structure										< 0.001
Living alone	2,784	49 (1,357)	47–52	23 (646)	21–25	9.1 (307)	7.9–11	19 (474)	17–21	
Living with other people, no children	8,099	52 (4,261)	50–53	21 (1,630)	20–22	9.0 (817)	8.2–9.8	19 (1,391)	17–20	
Living with children	6,562	46 (2,883)	44–48	24 (1,490)	22–25	13 (1,133)	13–14	17 (1,056)	16–19	
Population density of the municipality										< 0.001
High	6,904	50 (3,380)	48–51	27 (1,886)	26–29	8.7 (735)	8.0–9.6	14 (903)	13–16	
Medium	5,057	52 (2,598)	50–54	19 (956)	17–20	11 (635)	9.5–12	19 (868)	17–20	
Low	4,876	46 (2,255)	44–48	18 (833)	17–20	13 (778)	12–14	23 (1,010)	21–25	
Lowest	616	43 (273)	38–48	16 (93)	13–20	17 (109)	14–21	24 (141)	19–29	
Region										< 0.001
Ile de France	3,619	47 (1,630)	44–49	33 (1,235)	31–35	7.8 (324)	6.7–9	13 (430)	11–14	
Auvergne Rhone Alpes	1,918	52 (992)	49–55	20 (370)	18–23	11 (272)	9.6–13	16 (284)	14–19	
Bourgogne Franche Comte	687	49 (338)	44–53	17 (116)	14–21	14 (107)	11–18	20 (126)	17–25	
Bretagne	848	47 (396)	43–51	15 (125)	12–18	17 (155)	14–20	21 (172)	18–25	
Centre Val de Loire	557	43 (234)	38–49	21 (107)	17–26	18 (114)	15–22	18 (102)	14–22	
Corse	119	60 (87)	46–72	9.4 (10)	4.4–19	0.6 (2)	0.15–2.5	30 (20)	18–46	
DROM	499	53 (284)	47–59	13 (59)	9.1–17	7.4 (37)	4.8–11	27 (119)	22–33	
Grand Est	1,750	53 (941)	50–56	18 (306)	15–20	13 (246)	11–15	17 (257)	14–19	
Hauts de France	1,481	48 (727)	45–52	19 (286)	17–22	10 (196)	8.2–13	22 (272)	19–26	
Normandie	675	40 (274)	34–45	29 (162)	23–35	11 (93)	8.1–14	21 (146)	17–25	
Nouvelle Aquitaine	1,395	52 (712)	49–56	16 (221)	13–18	12 (205)	10–14	20 (257)	17–23	
Occitanie	1,628	48 (751)	45–52	19 (313)	17–22	9.8 (205)	8.3–11	22 (359)	20–25	
PACA	1,295	56 (685)	52–59	21 (288)	18–24	6.2 (114)	5–7.8	17 (208)	15–20	
Pays de la Loire	982	44 (455)	40–48	18 (170)	15–21	17 (187)	14–20	21 (170)	17–26	

Note: Missing values for gender (n=4), education (n=30), income level (n=553), employment status (n=2), immigrant status (n=246), and household structure (n=8) were omitted from the table. All percentages are row percentages.

* % weighted (n unweighted)

** Chi-squared test with Rao & Scott's second order correction

Overall, women were more likely to use self-tests (12% [11%-12%]) than men (9.5% [8.7%-10%]), as were people with undergraduate (14% [12%-15%]) or graduate education (14% [13%-15%]) compared to people with a high school degree (8.0% [7.2%-8.9%]) or less (10% [9.1%-11%]). Conversely, lower income, unemployment, and retirement were associated with lower use of self-tests (8.5% [7.2%-10%], 7.5% [5.5%-10%], and 2.9% [2.2%-3.7%], respectively), while students had the highest rates of all employment situations (15% [13%-17%]). Immigrants, especially first-generation immigrants from both inside and outside the EU, had very low rates of self-testing (3.9% [2.5%-6.1%] and 4.2% [2.7%-6.4%], respectively), and were primarily tested in laboratories instead (63% [57%-69%] and 59% [54%-64%], respectively). Finally, people living with children used self-tests more (13% [13%-14%]) than those living alone or with other adults (9.1% [7.9%-11%] and 9.0% [8.2%-9.8%]). People living in highly populated areas used self-tests the least (8.7% [8%-9.6%]), while those living in areas with lowest population density used self-tests the most (17% [14%-21%]).

Results from bivariate analysis of testing behaviors by exposure and behavioral factors in the general population are reported in Appendix 3 (Tables A3.1 and A3.2). These exposure and behavioral factors are included in age-specific analyses below, in addition to demographic variables.

Factors associated with use of self-tests versus pharmacy tests, by age group.

16-24 year-olds

Logistic regression results comparing use of self-tests to pharmacy testing among 16-24 year-olds who tested at least once are presented in Table 3a. Within this younger age group, which was the group that used self-tests the most, younger age was still associated with higher use of self-tests. Compared to 16-18 year-olds, the odds of using self-tests for 19-21 year-olds and 22-24 year-olds were 0.45 (95% CI 0.31-0.67) and 0.39 (0.25-0.61), respectively. Other demographic factors were not significantly associated with use of self-tests, after adjusting for potential confounders.

Among non-demographic factors, the primary factors associated with self-test use among 16-24 year-olds were population density and perceived Covid-19 risk. Low population density was significantly associated with an increased use of self-tests among 16-24 year-olds, with those living in lowest density areas being 3.29 (1.19-9.31) times more likely to use self-tests compared with people who lived in high density areas.

Finally, individuals with low perceived risk of Covid-19 in the previous wave of data collection (i.e., who were aware of the possibility of being infected but not particularly worried)

had the lowest use of self-testing. Compared to this reference group, young people with high risk perceptions of Covid-19 (i.e., who were worried about getting sick) were twice as likely to use self-tests (aOR 1.99, 1.10-3.59), and individuals with no perceived Covid-19 risk (i.e., who believed they were unlikely to get infected) were 2.51 times more likely to use self-tests (1.15-5.46).

Table 3a: Logistic regression analysis of factors associated with use of self-test versus testing in pharmacy between May and June-July 2021, among 16-24 year olds

	Regression sub-sample*			Univariate		Multivariable	
Characteristic	**N**	**Last test was pharmacy % (n)**	**Last test was self-test % (n)**	**OR (95% CI)**	**p-value****	**OR (95% CI)**	**p-value****
Overall	1,126	64% (707)	36% (419)				
Gender					0.6		
Male	466	65% (300)	35% (166)	Ref			
Female	660	63% (407)	37% (253)	1.09 (0.81, 1.47)			
Age group					**<0.001**		**<0.001**
16-18	447	52% (227)	48% (220)	Ref		Ref	
19-21	396	69% (269)	31% (127)	0.48 (0.34, 0.67)		0.45 (0.31, 0.67)	
22-24	283	75% (211)	25% (72)	0.35 (0.24, 0.52)		0.39 (0.25, 0.61)	
Employment status					>0.9		
Employed	151	66% (99)	34% (52)	Ref			
Student, apprentice, or intern	924	64% (576)	36% (348)	1.07 (0.69, 1.64)			
Other	51	63% (32)	37% (19)	1.11 (0.49, 2.53)			
Immigration status					0.12		0.4
Non-immigrant	964	61% (592)	39% (372)	Ref		Ref	
Second-generation immigrant (EU)	39	64% (25)	36% (14)	0.91 (0.41, 2.00)		1.19 (0.52, 2.75)	
First-generation immigrant (EU)	12	68% (8)	32% (4)	0.76 (0.20, 2.91)		1.48 (0.27, 8.24)	
Second-generation immigrant (non-EU)	82	73% (57)	27% (25)	0.59 (0.34, 1.05)		0.90 (0.46, 1.77)	
First-generation immigrant (non-EU)	14	88% (11)	12% (3)	0.22 (0.05, 0.94)		0.23 (0.05, 1.12)	
Income level					0.8		
Deciles 1 and 2	189	63% (113)	37% (76)	0.89 (0.54, 1.46)			
Deciles 3 and 4	163	63% (99)	37% (64)	0.89 (0.54, 1.49)			
Deciles 5 and 6	201	61% (123)	39% (78)	Ref			
Deciles 7 and 8	244	66% (153)	34% (91)	0.81 (0.52, 1.25)			
Deciles 9 and 10	305	66% (202)	34% (103)	0.78 (0.52, 1.19)			
Household structure					**0.048**		0.7
Living alone	180	71% (125)	29% (55)	Ref		Ref	
Living with other people, no children	556	66% (362)	34% (194)	1.22 (0.79, 1.88)		0.88 (0.54, 1.43)	
Living with children	388	59% (218)	41% (170)	1.68 (1.06, 2.65)		1.01 (0.59, 1.74)	
Population density of the municipality					**<0.001**		**0.013**
High	410	75% (296)	25% (114)	Ref		Ref	
Medium	320	62% (197)	38% (123)	1.78 (1.21, 2.61)		1.44 (0.96, 2.17)	
Low	364	55% (200)	45% (164)	2.43 (1.70, 3.47)		1.81 (1.20, 2.74)	
Lowest	32	40% (14)	60% (18)	4.40 (1.82, 10.6)		3.29 (1.19, 9.13)	

Table 3a (continued): Logistic regression analysis of factors associated with use of self-test versus testing in pharmacy between May and June-July 2021, among 16-24 year olds

		Regression sub-sample*		Univariate		Multivariable	
Characteristic	**N**	**Last test was pharmacy** % (n)	**Last test was self-test** % (n)	**OR (95% CI)**	**p-value****	**OR (95% CI)**	**p-value****
Presence of Covid-19 symptoms since May 2021					0.052		0.1
No	951	63% (589)	37% (362)	Ref		Ref	
Yes	174	72% (117)	28% (57)	0.67 (0.45, 1.00)		0.70 (0.45, 1.08)	
Used public transportation in the last week					**0.001**		0.07
No	493	58% (279)	42% (214)	Ref		Ref	
Yes	631	69% (426)	31% (205)	0.61 (0.45, 0.82)		0.73 (0.51, 1.03)	
Visited cultural locations in the last week (cinema, museum, theatre, etc)					0.14		0.7
No	814	63% (506)	37% (308)	Ref		Ref	
Yes	310	68% (199)	32% (111)	0.78 (0.57, 1.08)		0.93 (0.66, 1.32)	
Visited cafe or restaurant in the last week					**0.014**		0.6
No	314	57% (173)	43% (141)	Ref		Ref	
Yes	810	67% (532)	33% (278)	0.66 (0.48, 0.92)		0.90 (0.61, 1.32)	
Attended a party or social gathering (>6 people) in the last week					0.7		
No	598	65% (372)	35% (226)	Ref			
Yes	526	63% (333)	37% (193)	1.07 (0.79, 1.44)			
Visited family in the last week					0.8		
No	554	64% (349)	36% (205)	Ref			
Yes	570	65% (356)	35% (214)	0.97 (0.72, 1.30)			
Went on vacation in recent weeks					**<0.001**		**0.016**
No	750	60% (442)	40% (308)	Ref		Ref	
Yes	375	73% (264)	27% (111)	0.56 (0.41, 0.77)		0.66 (0.47, 0.92)	
Perceived Covid-19 risk at previous data collection wave					0.054		**0.037**
No risk (unlikely to get it)	50	56% (28)	44% (22)	1.9 (0.88, 4.13)		2.51 (1.15, 5.46)	
Low risk (might get it, not worried)	231	71% (154)	29% (77)	Ref		Ref	
Medium risk (fear of spreading to others)	660	64% (420)	36% (240)	1.36 (0.91, 2.03)		1.31 (0.88, 1.94)	
High risk (fear of getting ill)	121	54% (65)	46% (56)	2.07 (1.20, 3.59)		1.99 (1.10, 3.59)	
OR = Odds Ratio, CI = Confidence Interval							

Model metrics: AIC = 1,282; BIC = 1,368; Deviance = 1,229; Residual df = 1,024

Note: Individuals with missing data in any of the covariates (n=82) were excluded from the model. Nb observations included in model = 1,044. Variables were selected based on statistical significance in univariate analysis (p<0.2) and practical relevance for each age group. Univariate results for variables that were neither statistically significant nor relevant for this age group are omitted from this table. Their lack of association with the outcome was confirmed in sensitivity analyses.

* Regression model restricted to people whose last test was either at a pharmacy or using a self-test, and who had a negative test result. Overall frequency of use of self-test in each category, among all those who tested, is presented in Table A4.1.

** Wald test

25-59 year-olds

In 25-59 year-olds, demographic characteristics were largely associated with the use of self-tests (Table 3b). Middle-aged adults (35-44 year-olds) were most likely to use self-tests compared to 25-34 year-olds (aOR 1.46, 1.13-1.90). Individuals with graduate and undergraduate-level education were 2.18 (1.66-2.84) and 1.94 (1.52-2.48) times more likely to

use self-tests than those with a high school degree, who used self-tests the least. On the other hand, first-generation and second-generation immigrants from outside the EU were significantly less likely to use self-tests than their non-immigrant counterparts, with aORs of 0.40 (0.22-0.72) and 0.38 (0.23-0.63) respectively. Again, individuals living in lowest density areas were 1.91 (1.09-3.34) times more likely to use self-tests than those living in high density areas.

Beyond demographic characteristics, the contextual factor that was most strongly associated with use of self-tests in this age group was the type of work conducted during the pandemic. Individuals who worked in-person were 1.90 (1.20-3.02) times more likely to use self-tests than those who worked remotely.

Finally, social life and travel during that period were also strong predictors of use of self-tests. People who went to parties or social gatherings were 1.25 (1.03-1.52) times more likely to use self-tests, whereas those who used public transportation in the last week or who had recently traveled were less likely to use self-tests, with respective aORs of 0.70 (0.56-0.88) and 0.63 (0.51-0.79).

Table 3b: Logistic regression analysis of factors associated with use of self-test versus testing in pharmacy between May and June-July 2021, among 25-59 year olds

	Regression sub-sample*			Univariate		Multivariable	
Characteristic	**N**	**Last test was pharmacy % (n)**	**Last test was self-test % (n)**	**OR (95% CI)**	**p-value****	**OR (95% CI)**	**p-value****
Overall	4,034	66% (2,407)	34% (1,627)				
Gender					**<0.001**		0.2
Male	1,562	70% (1,007)	30% (555)	Ref		Ref	
Female	2,471	62% (1,400)	38% (1,071)	1.43 (1.20, 1.72)		1.15 (0.95, 1.39)	
Age group					**0.008**		**0.009**
25-34	1,006	70% (686)	30% (320)	Ref		Ref	
35-44	1,368	62% (765)	38% (603)	1.43 (1.14, 1.80)		1.46 (1.13, 1.90)	
45-59	1,660	65% (956)	35% (704)	1.29 (1.03, 1.61)		1.41 (1.10, 1.82)	
Education					**<0.001**		**<0.001**
Less than high school degree	641	65% (360)	35% (281)	1.36 (1.00, 1.83)		1.60 (1.16, 2.20)	
High school degree	1,043	72% (691)	28% (352)	Ref		Ref	
Undergraduate degree	1,113	58% (585)	42% (528)	1.83 (1.47, 2.26)		1.94 (1.52, 2.48)	
Graduate degree	1,233	66% (768)	34% (465)	1.33 (1.08, 1.65)		2.18 (1.66, 2.84)	
Income level					**<0.001**		0.14
Deciles 1 and 2	438	73% (297)	27% (141)	0.51 (0.37, 0.72)		0.71 (0.48, 1.04)	
Deciles 3 and 4	411	70% (257)	30% (154)	0.59 (0.41, 0.85)		0.76 (0.52, 1.10)	
Deciles 5 and 6	648	58% (333)	42% (315)	Ref		Ref	
Deciles 7 and 8	1,032	60% (549)	40% (483)	0.93 (0.72, 1.20)		0.88 (0.67, 1.16)	
Deciles 9 and 10	1,346	67% (854)	33% (492)	0.69 (0.54, 0.87)		0.74 (0.57, 0.97)	
Employment status					**<0.001**		0.4
Employed	3,492	64% (2010)	36% (1,482)	Ref		Ref	
Unemployed	210	81% (161)	19% (49)	0.41 (0.27, 0.61)		0.62 (0.35, 1.07)	
Student, apprentice, or intern	59	76% (47)	24% (12)	0.55 (0.24, 1.27)		0.82 (0.30, 2.24)	
Other	273	72% (189)	28% (84)	0.69 (0.45, 1.06)		0.90 (0.58, 1.40)	

Table 3b (continued): Logistic regression analysis of factors associated with use of self-test versus testing in pharmacy between May and June-July 2021, among 25-59 year olds

	Regression sub-sample*			Univariate		Multivariable	
Characteristic	**N**	**Last test was pharmacy % (n)**	**Last test was self-test % (n)**	**OR (95% CI)**	**p-value****	**OR (95% CI)**	**p-value****
Immigration status					**<0.001**		**<0.001**
Non-immigrant	3,393	62% (1,924)	38% (1,469)	Ref		Ref	
Second-generation immigrant (EU)	183	69% (119)	31% (64)	0.74 (0.48, 1.13)		0.71 (0.45, 1.12)	
First-generation immigrant (EU)	83	84% (64)	16% (19)	0.31 (0.16, 0.61)		0.45 (0.19, 1.03)	
Second-generation immigrant (non-EU)	174	85% (137)	15% (37)	0.29 (0.18, 0.46)		0.38 (0.23, 0.63)	
First-generation immigrant (non-EU)	149	80% (122)	20% (27)	0.40 (0.23, 0.68)		0.40 (0.22, 0.72)	
Household structure					**0.032**		>0.9
Living alone	591	68% (384)	32% (207)	Ref		Ref	
Living with other people, no children	1,288	68% (823)	32% (465)	1.00 (0.76, 1.33)		1.01 (0.73, 1.40)	
Living with children	2,155	63% (1,200)	37% (955)	1.27 (0.98, 1.65)		1.05 (0.78, 1.42)	
Population density of the municipality					**<0.001**		**0.003**
High	1,855	74% (1,300)	26% (555)	Ref		Ref	
Medium	1,009	59% (552)	41% (457)	1.94 (1.57, 2.41)		1.48 (1.15, 1.89)	
Low	1,047	58% (504)	42% (543)	2.05 (1.63, 2.56)		1.40 (1.10, 1.77)	
Lowest	123	48% (51)	52% (72)	3.04 (1.90, 4.89)		1.91 (1.09, 3.34)	
Positive household member since December 2020					0.15		0.089
No	3,609	65% (2,137)	35% (1,472)	Ref		Ref	
Yes	423	70% (268)	30% (155)	0.81 (0.61, 1.08)		0.77 (0.57, 1.04)	
Knows someone who had serious form of Covid-19					0.2		
No, nobody	3,664	65% (2,164)	35% (1,500)	Ref			
Yes, family or friend	342	70% (224)	30% (118)	0.82 (0.56, 1.20)			
Yes, themself	27	78% (18)	22% (9)	0.52 (0.21, 1.29)			
Presence of Covid-19 symptoms since May 2021					0.2		
No	3,424	66% (2,057)	34% (1,367)	Ref			
Yes	605	63% (347)	37% (258)	1.18 (0.91, 1.52)			
Vaccinated against SARS-CoV-2					0.075		0.6
No	1,054	69% (658)	31% (396)	Ref		Ref	
Yes	2,977	65% (1,748)	35% (1,229)	1.21 (0.98, 1.48)		1.07 (0.85, 1.34)	
Work location					**<0.001**		**<0.001**
Remote work	210	77% (154)	23% (56)	Ref		Ref	
Hybrid work	927	72% (637)	28% (290)	1.31 (0.87, 1.97)		1.02 (0.64, 1.63)	
In-person work	2,094	58% (1,065)	42% (1,029)	2.36 (1.60, 3.48)		1.90 (1.20, 3.02)	
Not currently working	799	74% (547)	26% (252)	1.14 (0.73, 1.76)		1.35 (0.80, 2.27)	
Frequency of outings in the past week					0.2		
Five outings or less	696	70% (443)	30% (253)	Ref			
Six to ten outings	1,211	66% (715)	34% (496)	1.21 (0.92, 1.60)			
More than ten outings	2,124	64% (1,247)	36% (877)	1.29 (1.00, 1.68)			
Used public transportation in the last week					**<0.001**		**0.002**
No	2,864	61% (1,538)	39% (1,326)	Ref		Ref	
Yes	1,167	78% (867)	22% (300)	0.45 (0.37, 0.55)		0.70 (0.56, 0.88)	
Visited cultural locations in the last week (cinema, museum, theatre, etc)					0.2		
No	3,238	65% (1,898)	35% (1,340)	Ref			
Yes	793	69% (507)	31% (286)	0.85 (0.67, 1.07)			

Table 3b (continued): Logistic regression analysis of factors associated with use of self-test versus testing in pharmacy between May and June-July 2021, among 25-59 year olds

		Regression sub-sample*		Univariate		Multivariable	
Characteristic	**N**	**Last test was pharmacy % (n)**	**Last test was self-test % (n)**	**OR (95% CI)**	**p-value****	**OR (95% CI)**	**p-value****
Visited cafe or restaurant in the last week					**0.017**		0.11
No	1,439	63% (771)	37% (668)	Ref		Ref	
Yes	2,592	68% (1,634)	32% (958)	0.80 (0.66, 0.96)		0.85 (0.70, 1.04)	
Attended a party or social gathering (>6 people) in the last week					**0.038**		**0.028**
No	2,893	67% (1,745)	33% (1,148)	Ref		Ref	
Yes	1,138	63% (660)	37% (478)	1.21 (1.01, 1.44)		1.25 (1.03, 1.52)	
Visited family in the last week					0.2		
No	1,877	67% (1,140)	33% (737)	Ref			
Yes	2,154	64% (1,265)	36% (889)	1.13 (0.95, 1.34)			
Went on vacation in recent weeks					**<0.001**		**<0.001**
No	3,079	63% (1,735)	37% (1,344)	Ref		Ref	
Yes	950	75% (668)	25% (282)	0.57 (0.47, 0.69)		0.63 (0.51, 0.79)	
Perceived Covid-19 risk at previous data collection wave					0.14		0.2
No risk (unlikely to get it)	108	69% (80)	31% (28)	0.99 (0.47, 2.09)		1.17 (0.52, 2.64)	
Low risk (might get it, not worried)	810	69% (512)	31% (298)	Ref		Ref	
Medium risk (fear of spreading to others)	2,002	63% (1,163)	37% (839)	1.28 (1.03, 1.58)		1.27 (1.01, 1.58)	
High risk (fear of getting ill)	787	64% (436)	36% (351)	1.24 (0.97, 1.59)		1.27 (0.98, 1.65)	
General health status at inclusion					0.3		
Good/very good	3,525	66% (2,113)	34% (1,412)	Ref			
Fine	434	61% (246)	39% (188)	1.23 (0.93, 1.63)			
Poor/very poor	71	71% (44)	29% (27)	0.81 (0.43, 1.51)			
OR = Odds Ratio, CI = Confidence Interval							

Model metrics: AIC = 4,003; BIC = 4,174; Deviance = 3,888; Residual df = 3,470

Note: Individuals with missing data in any of the covariates (n=529) were excluded from the model. Nb observations included in model = 3,505. Variables were selected based on statistical significance in univariate analysis (p<0.2) and practical relevance for each age group. Univariate results for variables that were neither statistically significant nor relevant for this age group are omitted from this table. Their lack of association with the outcome was confirmed in sensitivity analyses.

* Regression model restricted to people whose last test was either at a pharmacy or using a self-test, and who had a negative test result. Overall frequency of use of self-test in each category, among all those who tested, is presented in Table A4.2.

** Wald test

60+ year-olds

Finally, factors associated with use of self-tests in the 60+ age group were primarily related to behavioral and structural factors (Table 3c). Demographic factors such as age, gender, and education were not significantly associated with self-testing. First-generation immigrants from outside the EU had 0.08 (0.02-0.36) times the odds of using self-tests compared with non-immigrants.

Population density also appeared again as highly predictive, with individuals living in lowest density areas 4 times more likely to use self-tests than those living in high density areas (aOR 3.93, 1.59-9.76).

In terms of non-demographic factors, employment status was highly predictive of use of self-tests, even after adjusting for age, with employed individuals being 3.77 (2.19-6.51) times more likely to use self-tests than retired individuals. Older people who had visited family in the last week were more likely to use self-tests than those who had not (aOR 1.68 [1.68-2.66]). Finally, as with middle-aged adults, older adults were less likely to use self-tests when they reported using public transportation in the last week (aOR 0.28, 0.14-0.57).

Table 3c: Logistic regression analysis of factors associated with use of self-test versus testing in pharmacy between May and June-July 2021, among 60+ year olds

	Regression sub-sample*			Univariate		Multivariable	
Characteristic	**N**	**Last test was pharmacy % (n)**	**Last test was self-test % (n)**	**OR (95% CI)**	**p-value****	**OR (95% CI)**	**p-value****
Overall	757	79% (558)	21% (199)				
Gender					>0.9		
Male	351	79% (262)	21% (89)	Ref			
Female	406	79% (296)	21% (110)	0.98 (0.62, 1.54)			
Age group					**0.012**		0.5
60-69	562	75% (400)	25% (162)	Ref		Ref	
70-79	166	83% (133)	17% (33)	0.61 (0.33, 1.13)		0.85 (0.47, 1.56)	
80+	29	93% (25)	6.1% (4)	0.20 (0.06, 0.66)		0.50 (0.13, 1.87)	
Education					**0.014**		0.3
Less than high school degree	231	82% (177)	18% (54)	1.02 (0.56, 1.85)		0.87 (0.48,1.60)	
High school degree	236	82% (186)	18% (50)	Ref		Ref	
Undergraduate degree	167	74% (114)	26% (53)	1.57 (0.89, 2.78)		1.30 (0.71, 2.36)	
Graduate degree	121	65% (80)	35% (41)	2.52 (1.31, 4.83)		1.75 (0.85, 3.57)	
Income level					0.13		0.6
Deciles 1 and 2	62	87% (47)	13% (15)	0.52 (0.17, 1.58)		1.30 (0.45, 3.73)	
Deciles 3 and 4	58	83% (43)	17% (15)	0.72 (0.25, 2.11)		1.50 (0.50, 4.51)	
Deciles 5 and 6	96	78% (77)	22% (19)	Ref		Ref	
Deciles 7 and 8	194	81% (144)	19% (50)	0.86 (0.39, 1.92)		1.25 (0.58, 2.69)	
Deciles 9 and 10	332	73% (236)	27% (96)	1.32 (0.61, 2.82)		1.71 (0.84, 3.50)	
Employment status					**<0.001**		**<0.001**
Retired	532	84% (420)	16% (112)	Ref		Ref	
Employed	171	61% (96)	39% (75)	3.23 (1.92, 5.43)		3.77 (2.19, 6.51)	
Other	54	80% (42)	20% (12)	1.25 (0.49, 3.19)		1.92 (0.72, 5.17)	
Immigration status					**0.001**		**0.018**
Non-immigrant	629	77% (452)	23% (177)	Ref		Ref	
Second-generation immigrant (EU)	45	77% (37)	23% (8)	1.02 (0.35, 3.03)		1.12 (0.41, 3.07)	
First-generation immigrant (EU)	25	84% (20)	16% (5)	0.66 (0.22, 2.01)		0.49 (0.15, 1.60)	
Second-generation immigrant (non-EU)	15	85% (12)	15% (3)	0.59 (0.13, 2.62)		0.72 (0.13, 3.93)	
First-generation immigrant (non-EU)	33	98% (30)	1.9% (3)	0.06 (0.02, 0.23)		0.08 (0.02, 0.36)	
Population density of the municipality					**<0.001**		**0.002**
High	318	85% (255)	15% (63)	Ref		Ref	
Medium	225	80% (174)	20% (51)	1.45 (0.83, 2.54)		0.91 (0.50, 1.66)	
Low	171	69% (105)	31% (66)	2.59 (1.50, 4.48)		1.80 (0.98, 3.30)	
Lowest	43	54% (24)	46% (19)	4.94 (1.76, 13.8)		3.93 (1.59, 9.76)	

Table 3c (continued): Logistic regression analysis of factors associated with use of self-test versus testing in pharmacy between May and June-July 2021, among 60+ year olds

	Regression sub-sample*			Univariate		Multivariable	
Characteristic	**N = 757**	**Last test was pharmacy % (n)**	**Last test was self-test % (n)**	**OR (95% CI)**	**p-value****	**OR (95% CI)**	**p-value****
Presence of Covid-19 symptoms since May 2021					0.5		
No	677	79% (498)	21% (179)	Ref			
Yes	79	83% (60)	17% (19)	0.79 (0.41, 1.50)			
Positive household member since December 2020					0.8		
No	709	79% (518)	21% (191)	Ref			
Yes	46	81% (38)	19% (8)	0.90 (0.37, 2.15)			
Knows someone who had serious form of Covid-19					0.2		
No, nobody	670	78% (489)	22% (181)	Ref			
Yes, family or friend	77	83% (61)	17% (16)	0.76 (0.31, 1.91)			
Yes, themself	9	96% (8)	3.8% (1)	0.14 (0.02, 1.22)			
Vaccinated against SARS-CoV-2					0.9		
No	102	80% (70)	20% (32)	Ref			
Yes	654	79% (488)	21% (166)	1.06 (0.57, 1.97)			
Frequency of outings in the past week					0.12		0.3
Five outings or less	192	85% (154)	15% (38)	Ref		Ref	
Six to ten outings	196	77% (147)	23% (49)	1.72 (0.87, 3.37)		1.05 (0.55, 2.01)	
More than ten outings	368	76% (256)	24% (112)	1.75 (1.01, 3.02)		1.45 (0.81, 2.58)	
Used public transportation in the last week					**<0.001**		**<0.001**
No	585	75% (410)	25% (175)	Ref		Ref	
Yes	171	91% (147)	8.8% (24)	0.29 (0.17, 0.52)		0.28 (0.14, 0.57)	
Visited cultural locations in the last week (cinema, museum, theatre, etc)					0.6		
No	617	79% (456)	21% (161)	Ref			
Yes	139	77% (101)	23% (38)	1.15 (0.66, 1.99)			
Visited cafe or restaurant in the last week					0.6		
No	388	80% (273)	20% (115)	Ref			
Yes	368	78% (284)	22% (84)	1.12 (0.71, 1.77)			
Attended a party or social gathering (>6 people) in the last week					0.3		
No	646	80% (478)	20% (168)	Ref			
Yes	110	73% (79)	27% (31)	1.50 (0.72, 3.16)			
Visited family in the last week					**0.033**		0.026
No	363	83% (273)	17% (90)	Ref		Ref	
Yes	393	75% (284)	25% (109)	1.63 (1.04, 2.57)		1.68 (1.06, 2.66)	
Went on vacation in recent weeks					0.5		
No	510	78% (365)	22% (145)	Ref			
Yes	241	81% (188)	19% (53)	0.86 (0.55, 1.34)			
General health status at inclusion					**0.016**		0.094
Good/very good	586	77% (429)	23% (157)	Ref		Ref	
Fine	143	80% (108)	20% (35)	0.83 (0.48, 1.43)		1.19 (0.71, 2.00)	
Poor/very poor	25	95% (20)	4.9% (5)	0.17 (0.05, 0.58)		0.32 (0.10, 1.01)	

OR = Odds Ratio, CI = Confidence Interval

Model metrics: AIC = 642; BIC = 749; Deviance = 585; Residual df = 701

Note: Individuals with missing data in any of the covariates (n=31) were excluded from the model. Nb observations included in model = 726. Variables were selected based on statistical significance in univariate analysis (p<0.2) and practical relevance for each age group. Univariate results for variables that were neither statistically significant nor relevant for this age group are omitted from this table. Their lack of association with the outcome was confirmed in sensitivity analyses.

* Regression model restricted to people whose last test was either at a pharmacy or using a self-test, and who had a negative test result. Overall frequency of use of self-test in each category, among all those who tested, is presented in Table A4.3.

** Wald test

Discussion

Overview of main findings

Our analysis of social determinants of testing behaviors highlights low levels of self-test use among older adults, non-EU immigrants, unemployed or retired people, and individuals with high school-level education. These groups also tested less for SARS-CoV-2 overall, except for immigrants who had an otherwise high frequency of testing. In contrast, self-test use was high among young and highly educated individuals, who also tested more frequently overall. Women were more likely to use self-tests than men, though no difference was noted in their general testing behaviors. Previous studies on the use of self-tests for SARS-CoV-2, including one in France, have similarly observed higher rates of self-testing among women, younger individuals, people with higher education, and French-born (non-immigrant) populations.[10,28,39–41] These findings suggest that self-test use was limited among individuals who had already low levels of testing for SARS-CoV-2 overall, and instead mostly appealed to populations already habituated to SARS-CoV-2 testing.

People in the lowest density population areas, however, were consistently more likely to use self-tests, despite lower testing frequency overall, even when adjusting for potential confounding and stratifying results by age group. This finding is consistent with studies that have assessed willingness to use self-tests in various geographic contexts, finding that rural respondents were often more likely or willing to use self-tests than urban respondents.[30,68] On this point, self-tests seem to have successfully reached populations that were further away from the healthcare system and less likely to test in general.

Within each age group, the determinants of use of self-tests differ significantly. Among 16-24 year-olds, perceptual factors were more important than demographic factors in explaining use of self-tests. No significant differences by socioeconomic status, immigration status, gender, or occupation were observed. Instead, perceived risk of contracting Covid-19 was, along with population density, the most relevant driver of testing behavior.

Among 25-59 year-olds, significant differences were observed by demographic and socio-economic factors. Professional and social exposures, such as type of employment, travel, and attendance of social gatherings, were important drivers of testing behavior. Finally, among 60+ year-olds, professional and social exposures were also main drivers of use of self-tests, including employment status, visiting family, and use of public transportation. Demographic factors had low explanatory significance in this age group.

Self-testing versus pharmacy testing

To interpret these results, we examine them in light of the main differences between self-tests and tests conducted at a pharmacy, namely: cost, person conducting the test, convenience, and anonymity of results.

Cost of self-tests

Though cost concerns are a plausible hypothesis for explaining disparities between groups that used self-tests versus those who tested in pharmacies, they do not appear to be a driving factor for using self-tests in the French context in this study. Indeed, income level was not a significant predictor of use of self-test in any age group, after adjusting for confounding by other factors.

Existing research on willingness to pay (WTP) for HIV self-tests, all conducted in lower income countries, has shown that demand for these tests was heavily dependent on cost.[69–74] However, little research has been conducted on WTP for self-tests in higher income countries, or specifically for Covid-19 tests. A handful of studies conducted between August 2021 and November 2022 in low or middle income countries have suggested that WTP for SARS-CoV-2 self-tests may have been significantly higher than for HIV self-tests,[30,32,33,75,76] and one study in Germany found an average WTP for Covid-19 self-tests of 6.6 euros overall and 5.4 euros among lower income individuals, which is still higher than the maximum price of self-tests provided by pharmacies in June 2021 (i.e., 5.2 euros).[77] To better understand the importance of cost in determining uptake of self-testing, more research should be conducted on WTP for self-tests in higher income countries, both during and not during a health emergency.

Person conducting the test

Getting tested by a trained professional may be either a benefit or drawback of testing at a pharmacy, depending on the individual. For many, engaging with a professional may ensure that the test is being conducted correctly, and that they will know how to interpret the results and guide them towards next steps. Level of education was a significant predictor of use of self-test among 25-59 year-olds, who make up the majority of the population, which suggests that individuals with higher education may be more confident in their own ability to conduct self-tests correctly, understand instructions, and interpret the results on their own, without the help of a healthcare professional. The significance of immigration status in both middle-aged and older-aged adults may also be due to a lower self-confidence in one's ability to conduct the test properly, as well as potential language barriers in understanding self-test written instructions,

leading to a preference for in-person testing. Several studies on the acceptability of self-tests have highlighted participant-reported concerns about using the right testing technique and decreased test reliability when not conducted properly, especially in low literacy settings.[42,78–80] This perception may have been especially salient at the time during which our data was being collected, given that self-tests had only been available for a few months.

Older individuals may also prefer in-person testing for similar reasons, or because they have high confidence in and long-standing engagement with their regular healthcare providers. They may also have more opportunities for testing, with more frequent contact with the healthcare system. On the other hand, younger adults may actually appreciate the autonomy of self-tests and not having to engage with a healthcare professional for testing, and may feel more comfortable using self-tests. Evidence from HIV testing has shown that younger individuals were especially receptive to the option of self-testing, as they felt empowered by the ability to choose when and where to get tested as well as to control the disclosure of their results.[73] This demographic was drawn to the use of novel testing technologies, valuing the independence and control over decision-making that self-tests provided during a period marked by growing autonomy from their parents and lower trust in health providers.[73] The convenience, privacy, and user-friendly nature of self-testing were particularly appreciated by young individuals, who could test without judgment or external opinions.[73,80]

Convenience

As described above, convenience appears to be a primary enabler of self-testing, across contexts and demographics. The ability to buy in bulk and test frequently using self-tests was likely a simple way to ensure peace of mind, especially for people who were nervous about getting Covid-19 or who were more exposed in their daily life. For example, we found that young people who were highly worried about getting sick used self-tests more, potentially because conducting self-tests regularly was a convenient way to get results quickly without having to go through the healthcare system each time. Similarly, people who were employed, who worked in-person, or who frequently attended social gatherings, may have liked the option to test frequently, without having to go through the healthcare system.

Finally, self-tests may have been especially useful for people who lived at a further distance from pharmacies and health services, such as in low population density and remote areas, potentially due to the possibility of buying tests in bulk. Existing studies reinforce this hypothesis, showing that rural individuals were more likely to self-test than urban respondents,

to avoid traveling long distances to access healthcare services, waiting in line, and the financial cost of travel.[30,68]

Anonymity and disclosure of results

Finally, people who tested frequently may have wanted to avoid the potential stigma that can come with frequent testing for Covid-19, especially if they were to test positive. Indeed, stigma and fear, including the fear of being seen testing by others, of being judged or blamed by healthcare professionals, of receiving a positive test result, of having to disclose positive results to contacts, and of being treated poorly in case of a positive result, were regularly cited as barriers to testing in existing research on Covid-19 testing. [33,81–86] Frequent Covid-19 testing was sometimes perceived as associated with poor adherence to public health recommendations, such as use of masks or social distancing.[86] By using self-tests, individuals maintained control over their testing frequency and results disclosure, without fear of potential stigma or judgment.

Nevertheless, there were downsides of this anonymity for public policy and surveillance. People who tested positive using a self-test were not always counted in national case counts, especially if they did not receive laboratory confirmation. There was no way to enforce isolation, contact tracing, and other protective measures among those who only tested positive using self-tests.[33] Finally, self-test results were not recognized as valid proof in cases where negative test results were required, such as for travel abroad. This likely explains why adults who had recently traveled in our population were less likely to have used self-tests as their last test.

Strengths and limitations

The primary strength of this study is its sampling strategy, which ensures that the sample size is large and representative of the French population through appropriate weighting. The national administrative database from which the sampling frame is taken allows for adjustment for non-response and for determining the characteristics of non-respondents, which are used to create the survey weights. The sample size also allows for subgroup analysis, including stratification by age group. Another strength of this study is the comparison of use of different types of tests among those who tested. This allows us to isolate the factors explaining use of self-test versus other tests, and removes any confounding effect of testing versus not testing overall (i.e., factors that increase testing behaviors overall versus factors that actually motivate use of self-test).

A primary limitation of the study is that its findings may only apply in the context of a

disease outbreak or other health emergency, and may not be generalizable to non-crisis contexts. Other limitations relate to the way some questions were asked to participants in the survey. The *type of test used* was only asked in wave 3, which does not allow us to follow the evolution of testing behaviors throughout the whole study period. Our results are limited to the initial phases of introduction of self-tests, around June 2021. Additionally, the survey question for *type of test* focuses only on the last test conducted. While there is evidence that the last test may be a good proxy for testing behaviors during the short three month period observed,[58–61] it may be less representative for people who tested often, or who tested positive through an antigen or self-test and sought to confirm it through an RT-PCR test in a laboratory. Responses to this question may have been subject to recall bias, wherein respondents may have forgotten specific details about their last test if conducted less recently. Finally, a significant number of respondents selected “other” when responding to test location and, since the survey did not collect further information, this has been difficult to interpret.

Future research on the subject could take the form of qualitative research to further investigate the hypothesized mechanisms described above. While a significant amount of qualitative research has been conducted around the use of self-tests for HIV, the context of non-sexually transmitted infectious diseases, during a global pandemic, is different enough that it warrants its own in-depth research. Qualitative enquiries may be especially useful among younger and older age groups, for whom demographic factors do not seem to play an important role in determining use of self-tests.

Recommendations

As access to testing continues to be a significant barrier, we recommend that self-tests be more widely available and distributed beyond pharmacies, such as online or in supermarkets. This expansion would particularly benefit individuals who reside far from pharmacies or healthcare settings, reducing the barriers to testing caused by distance and limited access. Additionally, offering self-tests in more accessible locations can help decrease the fear of stigma associated with frequent testing, as people will be able to purchase and use tests anonymously, without the scrutiny of healthcare professionals.

Increased accessibility, however, should also be accompanied by increased considerations of testing equity. Previous research has noted that infectious disease testing programs often overlook equity in their design.[36,87] This conclusion is supported by the

sociodemographic differences we observe in our findings regarding use of self-tests. To increase equity in self-testing programs, existing recommendations suggest designing consumer-friendly instructions for self-testing kits, which could include pictorial, audio, and video guides for those with low literacy or vision issues.[37] Instructions should be simple and require reading skills below the seventh-grade level, and should be widely translated in languages that are relevant for each country.[42]

Given our findings on reduced self-test use among older individuals, immigrants, and individuals with lower education, there appears to be a need to empower and reassure potential users of their capability of conducting a test by themselves. Several studies conducted in both higher- and lower-resource settings have found that SARS-CoV-2 self-tests yielded comparable accuracy to tests conducted by professionals,[25,26,88] including one study that observed accurate self-testing procedures in both rural and urban Malawi.[89] In line with recommendations from the WHO,[14,15] self-tests should be presented as valid alternatives to traditional testing, within the healthcare system, with an emphasis on the simplicity and convenience of conducting the tests and interpreting results, even without the help of a healthcare professional.

Finally, to ensure that self-tests maintain accuracy even when performed by untrained individuals at home, these self-care instruments should undergo rigorous evaluation in diverse groups, including underserved communities, to validate test performance. Involving community members from underserved areas in the design and evaluation of self-tests, along with postmarket studies, can ensure effective translation, equitable access, and maintained trust in these tools.[42]

Conclusion

Our research on the use of self-tests in France in the midst of the Covid-19 pandemic shows that self-tests were not systematically used by the most at-risk populations (namely, non-EU immigrants and descendants of immigrants,[48] and people with low income and/or low education).[50] Overall, self-test use was low among immigrants and people with low education, as well as people of older age. Self-test use was also low among low income individuals, but the effect of income became non-significant when adjusting for confounders, which suggests that other factors (such as education) may be more relevant. Self-tests appear to have been successful in reaching people living in rural areas, who were perhaps less exposed to the virus, but may have had more difficulties accessing testing and care in general. Young adults and in-person workers, who were likely more exposed to the virus overall, also had high rates of

using self-tests, suggesting the importance of convenience and anonymity in driving use of self-tests.

Better equity could potentially be achieved through empowering communities with lower literacy and health self-efficacy to use self-testing devices. Emphasizing the accuracy, simplicity, and convenience of conducting self-tests and interpreting results, even without the help of a healthcare professional, could help increase access to testing among groups that face higher barriers to access the healthcare system. Finally, further research into the perceptual mechanisms that enable or restrain people from using self-tests could be useful for preparing for widespread testing during future pandemics.

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Appendices

APPENDIX 1: Timeline of availability of self-tests and introduction of the French health pass

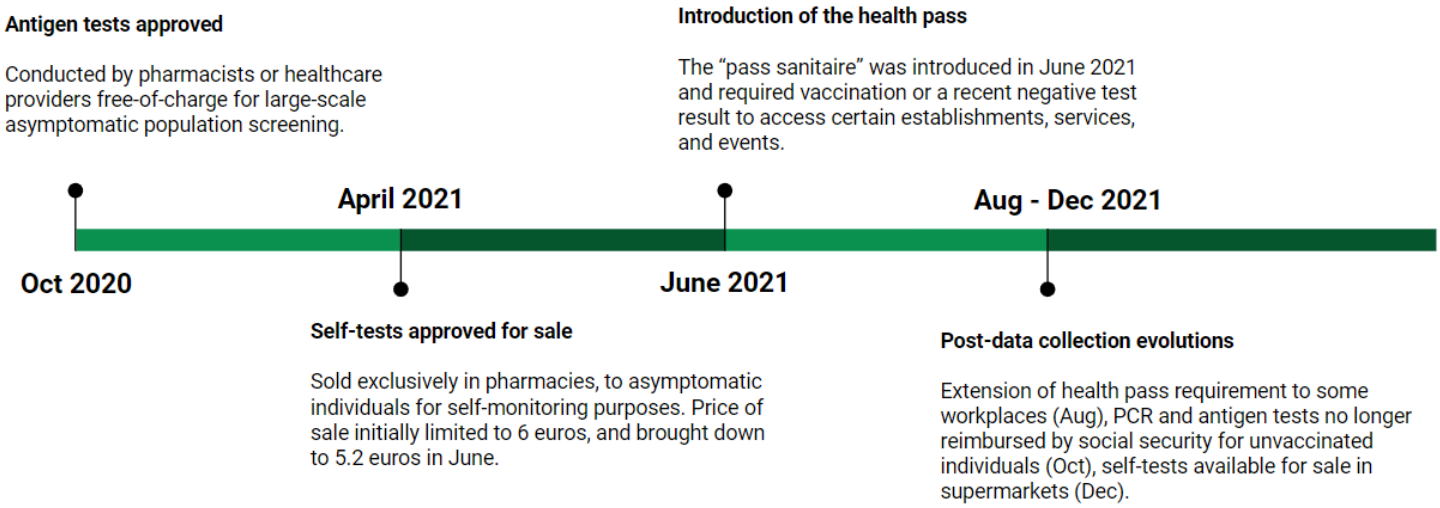

Figure A1: Timeline of availability of self-tests and introduction of the French health pass

The study began in May 2020, around 2 months after the World Health Organization (WHO) declared the Covid-19 outbreak a global pandemic. Throughout the first year and a half of the pandemic, the French population was placed in lockdown three times, once from March to May 2020, then from October to December 2020, and a third time from April to May 2021. Mandatory social distancing measures and limits on traveling were put in place during that period.

Testing availability in France

During the first year of the pandemic (until April 2021), only molecular tests (RT-PCR) and antigen tests were available in France to detect the presence of SARS-CoV-2.[1] These tests were systematically covered by French national health insurance. RT-PCR tests were considered the gold standard to confirm positive results from rapid antigen tests, and also became crucial for shortening isolation periods for positive cases. RT-PCR tests were primarily conducted in a laboratory setting.

Antigen tests complemented molecular tests by providing early infection diagnosis capabilities similar to RT-PCR tests. On September 24, 2020, antigen tests were initially approved for diagnosis of symptomatic individual, and then on October 8, 2020 their use was expanded to large-scale asymptomatic population screening (Figure 1).[1] Nasal swab tests, less invasive than nasopharyngeal swabs, gained approval on March 15, 2021, for their improved acceptability, especially for repeated sampling.[2] Antigen tests were primarily conducted in pharmacy settings.

With the introduction of the health pass (“pass sanitaire”) in June 2021, rapid antigen tests were used for individual screening to access certain facilities, events, or for travel, and to reduce isolation durations for infected individuals. These tests offered the advantage of delivering quick results (15 to 30 minutes), facilitating immediate actions for positive cases. Positive results required confirmation via RT-PCR testing, whereas negative results provided temporary health pass proof for 24 hours.[1]

Regulatory approval for antigen self-tests using nasal swabs, designed for home use by the general public, was granted by the HAS in March 2021,[2] with pharmacies authorized to distribute them from April 12, 2021.[3] While they were intended for personal use in non-clinical settings, their purchase and distribution was strictly limited to pharmacies to ensure proper guidance and usage. These tests were intended for asymptomatic individuals for self-monitoring purposes, such as before family gatherings or outings, and were not covered by health insurance, with pricing subject to regulation and potential variation, especially in overseas departments. In June 2021, the fixed price of these tests was capped at 5.2 euros by the government. Self-tests could not be sold online, even on the websites of pharmacies.[3]

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APPENDIX 2: Key differences and similarities between antigen tests conducted in pharmacies and self-tests.

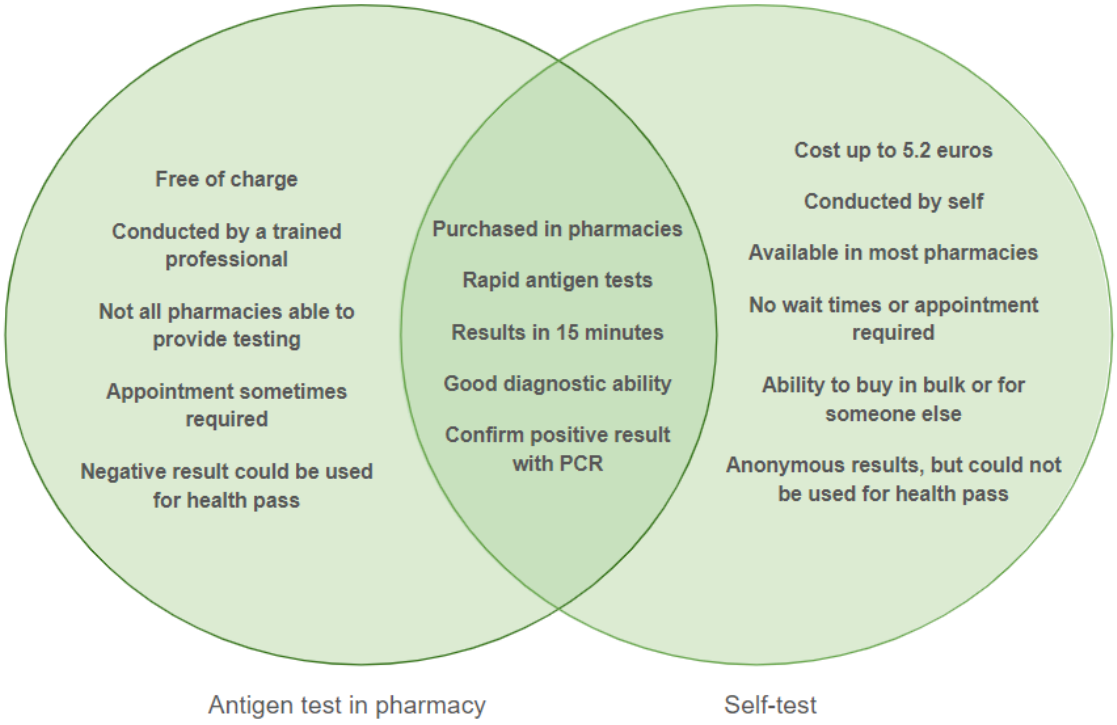

Figure A2: Key differences and similarities between antigen tests conducted in pharmacies and self-tests.

Pharmacy tests and self-tests were similar in many regards: they were both antigen tests, with high diagnostic ability and rapid results. They both required traveling to a pharmacy, either for conducting the test or for purchasing the self-tests. For both tests, a PCR confirmation was recommended in the case of a positive test result. However, four main differences between the two tests can help frame our interpretation of the results: (1) the cost of the tests differed between self-tests, which cost around 5 euros per unit at the time of the study, and pharmacy tests, which were provided free-of-charge by French social security until October 2021; (2) the person conducting the test was either a trained professional, in the case of pharmacy tests, or oneself, in the case of self-tests; (3) self-tests were more convenient, as they could be purchased in bulk as a preventive measure, or by another person, and they did not require an appointment or long waiting times; and (4) the disclosure of test results, which was automatic in the case of pharmacy tests and could be used as an official confirmation of positive or negative status, versus self-test results, which were anonymous and gave the patient more control over result disclosure.

APPENDIX 3: Testing behaviors and types of tests used between May and June-July 2021, by exposure and behavioral factors

Table A3.1: Testing behaviors between May and June-July 2021, by exposure and behavioral factors

Characteristic	N	No test % (n)*	95% CI	At least one test % (n)*	95% CI	p-value**
Overall	84,748	81 (67,295)	81–82	19 (17,453)	19–20	
Positive household member since December 2020						< 0.001
No	75,681	81 (60,501)	81–81	19 (15,180)	19–19	
Yes	9,005	77 (6,742)	76–78	23 (2,263)	22–24	
Knows someone who had serious form of Covid-19						< 0.001
No, nobody	76,972	81 (61,308)	81–81	19 (15,664)	19–19	
Yes, family or friend	6,915	78 (5,345)	76–79	22 (1,570)	21–24	
Yes, themself	839	73 (625)	68–77	27 (214)	23–32	
Presence of Covid-19 symptoms since May 2021						< 0.001
No	78,091	82 (63,126)	82–82	18 (14,965)	18–18	
Yes	6,550	62 (4,081)	60–64	38 (2,469)	36–40	
Work location						< 0.001
Remote work	2,813	75 (2,126)	73–77	25 (687)	23–27	
Hybrid work	9,879	75 (7,419)	74–76	25 (2,460)	24–26	
In-person work	31,949	79 (25,092)	79–80	21 (6,857)	20–21	
Not currently working	39,927	83 (32,509)	82–83	17 (7,418)	17–18	
Vaccinated against SARS-CoV-2						< 0.001
No	20,606	79 (16,039)	79–80	21 (4,567)	20–21	
Yes	64,080	81 (51,207)	81–82	19 (12,873)	18–19	
Frequency of outings in the past week						< 0.001
Never	675	83 (536)	78–86	17 (139)	14–22	
One to five outings	21,660	83 (17,595)	82–83	17 (4,065)	17–18	
Six to ten outings	23,821	80 (18,910)	80–81	20 (4,911)	19–20	
More than ten outings	38,482	79 (30,171)	79–80	21 (8,311)	20–21	
Used public transportation in the last week						< 0.001
No	68,302	83 (55,618)	82–83	17 (12,684)	17–18	
Yes	16,336	73 (11,594)	72–74	27 (4,742)	26–28	
Visited cultural locations in the last week (museum, theatre, etc)						< 0.001
No	73,432	82 (59,004)	81–82	18 (14,428)	18–19	
Yes	11,206	73 (8,208)	72–74	27 (2,998)	26–28	
Visited cafe or restaurant in the last week						< 0.001
No	42,396	84 (35,177)	84–85	16 (7,219)	15–16	
Yes	42,242	76 (32,035)	76–77	24 (10,207)	23–24	
Attended a party or social gathering (>6 people) in the last week						< 0.001
No	68,639	82 (55,820)	82–83	18 (13,019)	17–18	
Yes	15,799	72 (11,392)	71–73	28 (4,407)	27–29	
Visited family in the last week						0.006
No	40,751	81 (32,409)	81–82	19 (8,342)	18–19	
Yes	43,887	80 (34,803)	80–81	20 (9,084)	19–20	

Characteristic	N	No test % (n)*	95% CI	At least one test % (n)*	95% CI	p-value**
Went on vacation in recent weeks						< 0.001
No	66,800	83 (54,494)	82–83	17 (12,306)	17–18	
Yes	17,762	70 (12,656)	70–71	30 (5,106)	29–30	
Perceived Covid-19 risk at previous data collection wave						< 0.001
No risk (unlikely to get it)	2,822	83 (2,291)	81–85	17 (531)	15–19	
Low risk (might get it, not worried)	16,875	79 (13,248)	78–80	21 (3,627)	20–22	
Medium risk (fear of spreading to others)	34,610	79 (26,832)	78–79	21 (7,778)	21–22	
High risk (fear of getting ill)	19,830	82 (16,131)	81–83	18 (3,699)	17–19	
General health status at inclusion						< 0.001
Good/very good	68,312	80 (53,782)	79–80	20 (14,530)	20–21	
Fine	13,869	84 (11,448)	83–85	16 (2,421)	13–16	
Poor/very poor	2,478	81 (2,001)	79–84	19 (477)	8.9–12	

Note: Missing values for positive household member (n=62), serious form of Covid-19 (n=22), presence of Covid-19 symptoms (n=107), work location (n=180), vaccination status (n=62), frequency and type of outings (n=110), recent vacation (n=186), perceived Covid-19 risk (n=10,611), and general health status (n=89) were omitted from the table. Perceived Covid-19 risk was only asked to a random sub-sample of respondents in wave 2. All percentages are row percentages.

* % weighted (n unweighted).

** Chi-squared test with Rao & Scott's second order correction

Table A3.2: Type of test used as last test between May and June-July 2021, by exposure and behavioral factors

Characteristic	N tested	Last tested in laboratory % (n)*	95% CI	Last tested in pharmacy % (n)*	95% CI	Last tested by self-test % (n)*	95% CI	Last tested in other location % (n)*	95% CI	p-value**
Overall	17,453	49 (8,506)	48–50	22 (3,768)	21–23	11 (2,257)	10–11	18 (2,922)	17–19	
Positive household member since December 2020										< 0.001
No	15,180	48 (7,309)	47–49	22 (3,303)	21–23	11 (2,021)	10–12	18 (2547)	18–19	
Yes	2,263	54 (1,193)	51–57	21 (460)	19–23	8.9 (236)	7.7–10	16 (374)	14–18	
Knows someone who had serious form of Covid-19										0.11
No, nobody	15,664	49 (7,609)	48–50	22 (3,361)	21–23	11 (2,062)	10–11	18 (2632)	17–19	
Yes, family or friend	1,570	48 (771)	45–52	24 (367)	21–27	10 (181)	8.3–13	18 (251)	15–21	
Yes, themself	214	59 (124)	50–68	18 (39)	12–26	3.9 (13)	1.9–7.8	18 (38)	12–26	
Presence of Covid-19 symptoms since May 2021										0.01
No	14,965	50 (7,382)	49–51	22 (3,174)	21–23	10 (1,912)	9.9–11	18 (2497)	17–19	
Yes	2,469	46 (1,116)	43–48	25 (590)	23–28	12 (342)	10–13	18 (421)	16–20	
Work location										< 0.001
Remote work	687	47 (340)	43–52	29 (187)	25–33	8.5 (59)	6.2–11	15 (101)	12–19	
Hybrid work	2,460	47 (1,145)	44–49	31 (742)	29–33	12 (318)	10–13	10 (255)	9–12	
In-person work	6,857	46 (3,055)	44–47	22 (1,407)	21–24	14 (1,213)	13–15	18 (1182)	16–19	
Not currently working	7,418	52 (3,944)	51–54	20 (1,427)	18–21	7.5 (666)	6.8–8.3	21 (1381)	19–22	
Vaccinated against SARS-CoV-2										0.086
No	4,567	47 (2,119)	45–49	24 (1,045)	22–25	11 (609)	9.7–12	18 (794)	17–20	
Yes	12,873	50 (6,380)	49–51	22 (2,721)	21–23	11 (1,645)	9.9–11	18 (2127)	17–19	
Frequency of outings in the past week										< 0.001
Never	139	58 (78)	46–69	6.1 (14)	3.3–11	1.5 (4)	0.55–4	35 (43)	24–47	
One to five outings	4,065	52 (2,076)	50–54	20 (808)	19–22	8.7 (422)	7.7–9.9	19 (759)	17–21	
Six to ten outings	4,911	46 (2,309)	45–48	24 (1,118)	22–26	12 (691)	11–13	18 (793)	16–20	
More than ten outings	8,311	49 (4,032)	47–50	23 (1,823)	21–24	11 (1,139)	11–12	17 (1317)	16–18	
Used public transportation in the last week										< 0.001
No	12,684	50 (6,318)	49–51	19 (2,300)	18–20	11 (1,723)	10–12	20 (2342)	19–21	
Yes	4,742	47 (2,177)	45–49	31 (1,463)	29–32	9.6 (533)	8.7–11	13 (569)	11–14	
Visited cultural locations in the last week (museum, theatre, etc)										< 0.001
No	14,428	50 (7,163)	49–51	21 (2,942)	20–22	10 (1,820)	9.8–11	19 (2503)	18–20	
Yes	2,998	45 (1,332)	43–48	28 (8,21)	26–31	12 (436)	11–14	14 (409)	12–16	

Characteristic	N tested	Last tested in laboratory % (n)*	95% CI	Last tested in pharmacy % (n)*	95% CI	Last tested by self-test % (n)*	95% CI	Last tested in other location % (n)*	95% CI	p-value**
Visited cultural locations in the last week (museum, theatre, etc)										< 0.001
No	14,428	50 (7,163)	49–51	21 (2,942)	20–22	10 (1,820)	9.8–11	19 (2503)	18–20	
Yes	2,998	45 (1,332)	43–48	28 (8,21)	26–31	12 (436)	11–14	14 (409)	12–16	
Visited cafe or restaurant in the last week										< 0.001
No	7,219	51 (3,600)	49–53	18 (1,268)	17–20	9.4 (927)	8.6–10	21 (1424)	20–23	
Yes	10,207	47 (1,968)	46–49	26 (2,495)	25–27	12 (1,329)	11–13	15 (1488)	14–16	
Attended a party or social gathering (>6 people) in the last week										< 0.001
No	13,019	50 (6,527)	49–51	21 (2,674)	20–22	9.5 (1,549)	8.9–10	19 (2269)	18–20	
Yes	4,407	46 (1,968)	44–47	25 (1,089)	24–27	14 (707)	13–16	15 (643)	14–16	
Visited family in the last week										0.001
No	8,342	49 (4,071)	48–51	22 (1,813)	21–23	9.7 (1,041)	9–10	19 (1417)	18–21	
Yes	9,084	49 (4,424)	48–50	23 (1,950)	21–24	12 (1,215)	11–12	17 (1495)	16–18	
Went on vacation in recent weeks										< 0.001
No	12,306	47 (5,721)	46–48	22 (2,613)	21–23	12 (1,805)	11–13	19 (2167)	18–20	
Yes	5,106	55 (2,764)	53–56	23 (1,143)	22–25	7.5 (450)	6.8–8.4	15 (749)	14–16	
Perceived Covid-19 risk at previous data collection wave										< 0.001
No risk (unlikely to get it)	531	49 (258)	43–55	22 (130)	17–27	11 (58)	7.3–16	19 (85)	14–25	
Low risk (might get it, not worried)	3,627	51 (1,830)	49–53	24 (820)	22–26	9.5 (419)	8.5–11	16 (558)	14–17	
Medium risk (fear of spreading to others)	7,778	45 (3,511)	44–46	24 (1,804)	23–25	13 (1,149)	12–14	18 (1314)	17–20	
High risk (fear of getting ill)	3,699	53 (1,958)	51–56	18 (658)	17–20	9.5 (466)	8.5–11	19 (617)	17–21	
General health status at inclusion										< 0.001
Good/very good	14,530	48 (6,960)	47–49	24 (3,288)	23–25	11 (1,978)	11–12	17 (2304)	16–17	
Fine	2,421	52 (1,278)	49–55	17 (404)	15–19	8 (243)	6.7–9.5	24 (496)	21–26	
Poor/very poor	477	55 (259)	48–62	16 (71)	11–22	4.2 (34)	2.8–6.3	25 (113)	19–31	

Note: Missing values for positive household member (n=10), serious form of Covid-19 (n=5), presence of Covid-19 symptoms (n=19), work location (n=31), vaccination status (n=13), frequency and type of outings (n=27), recent vacation (n=41), perceived Covid-19 risk (n=1,818), and general health status (n=25) were omitted from the table. Perceived Covid-19 risk was only asked to a random sub-sample of respondents in wave 2. All percentages are row percentages.

* % weighted (n unweighted).

** Chi-squared test with Rao & Scott's second order correction

APPENDIX 4: Frequency of use of self-test as last test among all those who tested, by age group.

Table A4.1: Use of self-test as last test by demographic and exposure characteristics, among all those who tested, in the 16-24 year-old age group

16-24 year-olds			
Characteristic	**N = 2,719**	**Last test was self-test % (n)**	**95% CI**
Gender			
Male	1,093	14 (169)	12–17
Female	1,625	14 (256)	12–16
Age group			
16-18	935	21 (223)	19–25
19-21	1,022	12 (129)	9.9–15
22-24	762	8.8 (73)	6.8–11
Employment status			
Employed	436	11 (53)	7.9–14
Student, apprentice, or intern	2,116	15 (353)	14–17
Other	167	12 (19)	7.3–20
Immigration status			
Non-immigrant	2,320	15 (378)	14–17
Second-generation immigrant (EU)	98	15 (14)	8.3–25
First-generation immigrant (EU)	25	11 (4)	3.8–29
Second-generation immigrant (non-EU)	194	11 (25)	7.1–17
First-generation immigrant (non-EU)	45	4.1 (3)	1.2–14
Income level			
Deciles 1 and 2	529	13 (76)	10–17
Deciles 3 and 4	406	14 (64)	10–18
Deciles 5 and 6	496	16 (78)	12–20
Deciles 7 and 8	553	16 (95)	13–19
Deciles 9 and 10	683	15 (105)	12–18
Household structure			
Living alone	447	12 (57)	9.3–16
Living with other people, no children	1,356	13 (196)	11–16
Living with children	910	16 (172)	14–19
Population density of the municipality			
High	918	11 (115)	8.8–13
Medium	836	13 (126)	11–17
Low	879	18 (166)	16–22
Lowest	86	23 (18)	14–36
Presence of Covid-19 symptoms since May 2021			
No	2,275	15 (364)	13–17
Yes	440	11 (61)	8.5–15
Missing	4		
Used public transportation in the last week			
No	1,336	15 (218)	13–18
Yes	1,381	13 (207)	12–16

Visited cultural locations in the last week (museum, theatre, etc)			
No	1,973	15 (314)	13–17
Yes	744	13 (111)	11–16
Visited cafe or restaurant in the last week			
No	811	15 (144)	12–18
Yes	1,906	14 (281)	12–16
Attended a party or social gathering (>6 people) in the last week			
No	1,543	13 (228)	11–15
Yes	1,174	17 (197)	14–19
Visited family in the last week			
No	1,311	14 (210)	12–17
Yes	1,406	14 (215)	12–17
Went on vacation in recent weeks			
No	1,754	16 (310)	14–18
Yes	962	11 (115)	8.8–13
Perceived Covid-19 risk at previous data collection wave			
No risk (unlikely to get it)	131	15 (22)	9.7–23
Low risk (might get it, not worried)	305	16 (56)	12–22
Medium risk (fear of spreading to others)	1,528	15 (246)	13–17
High risk (fear of getting ill)	560	12 (77)	9.4–16
Region			
Ile de France	523	9.4 (54)	6.9–13
Auvergne Rhone Alpes	290	15 (45)	11–20
Bourgogne Franche Comte	124	19 (25)	12–28
Bretagne	155	28 (42)	20–36
Centre Val de Loire	97	24 (24)	16–35
Corse	12	0 (0)	0.00–0.00
DROM	66	7.5 (4)	2.0–24
Grand Est	277	16 (46)	11–21
Hauts de France	237	15 (45)	11–20
Normandie	130	14 (14)	7.2–26
Nouvelle Aquitaine	224	16 (37)	11–23
Occitanie	242	9.4 (29)	6.2–14
PACA	175	8.2 (15)	4.6–14
Pays de la Loire	167	26 (45)	20–34

Table A4.2: Use of self-test as last test by demographic and exposure characteristics, among all those who tested, in the 25-59 year-old age group

25-59 year-olds			
Characteristic	**N = 10,871**	**Last test was self-test % (n)**	**95% CI**
Gender			
Male	4,412	10 (556)	9.2–11
Female	6,457	13 (1,075)	12–14
Age group			
25-34	2,602	11 (323)	9.6–13
35-44	3,334	14 (604)	13–16
45-59	4,935	11 (705)	9.8–12
Education			
Less than high school degree	1,953	11 (282)	8.8–13
High school degree	3,207	8.9 (352)	7.9–10
Undergraduate degree	2,885	15 (531)	14–17
Graduate degree	2,812	15 (466)	13–16
Income level			
Deciles 1 and 2	1,319	8.2 (143)	6.7–10
Deciles 3 and 4	1,207	10 (154)	8.3–13
Deciles 5 and 6	1,846	14 (315)	12–16
Deciles 7 and 8	2,652	15 (484)	14–17
Deciles 9 and 10	3,414	13 (494)	12–14
Employment status			
Employed	9,128	13 (1,486)	12–14
Unemployed	603	6.0 (49)	4.3–8.3
Student, apprentice, or intern	147	11 (13)	6.1–20
Other	991	7.4 (84)	5.2–10
Immigration status			
Non-immigrant	8,846	14 (1,473)	13–15
Second-generation immigrant (EU)	539	10 (64)	7.9–14
First-generation immigrant (EU)	306	4.3 (19)	2.4–7.5
Second-generation immigrant (non-EU)	489	5.4 (38)	3.7–7.7
First-generation immigrant (non-EU)	536	5.3 (27)	3.3–8.3
Household structure			
Living alone	1,523	12 (207)	9.7–14
Living with other people, no children	3,809	10 (467)	9.2–12
Living with children	5,537	13 (958)	12–14
Population density of the municipality			
High	4,627	9.7 (557)	8.7–11
Medium	3,026	13 (458)	11–14
Low	2,863	15 (545)	13–16
Lowest	355	18 (72)	14–23

Positive household member since December 2020			
No	9,362	13 (1,474)	12–13
Yes	1,503	8.4 (158)	6.9–10
Knows someone who had serious form of Covid-19			
No, nobody	9,770	12 (1,504)	12–13
Yes, family or friend	980	10 (118)	7.7–14
Yes, themself	119	4.8 (10)	2.4–9.4
Presence of Covid-19 symptoms since May 2021			
No	9,231	12 (1,368)	11–12
Yes	1,63	14 (262)	12–16
Vaccinated against SARS-CoV-2			
No	3,061	10 (397)	8.7–12
Yes	7,799	13 (1,233)	12–14
Work location			
Remote work	5,466	15 (1,031)	14–16
Hybrid work	2,179	12 (293)	11–14
In-person work	571	9.1 (56)	6.7–12
Not currently working	2,642	7.3 (252)	6.1–8.7
Frequency of outings in the past week			
Five outings or less	2,265	8.9 (255)	7.5–10
Six to ten outings	3,091	13 (497)	12–14
More than ten outings	5,502	13 (879)	12–14
Used public transportation in the last week			
No	8,124	13 (1,329)	12–14
Yes	2,734	8.9 (302)	7.8–10
Visited cultural locations in the last week (museum, theatre, etc)			
No	9,133	12 (1,344)	11–12
Yes	1,725	14 (287)	12–16
Visited cafe or restaurant in the last week			
No	4,286	11 (668)	10–13
Yes	6,572	12 (963)	12–13
Attended a party or social gathering (>6 people) in the last week			
No	8,077	11 (1,152)	10–12
Yes	2,781	14 (479)	13–16
Visited family in the last week			
No	5,037	11 (740)	10–12
Yes	5,821	13 (891)	12–14
Went on vacation in recent weeks			
No	8,035	13 (1,349)	12–14
Yes	2,809	8.1 (282)	7.0–9.2

Perceived Covid-19 risk at previous data collection wave			
No risk (unlikely to get it)	274	11 (28)	5.8–20
Low risk (might get it, not worried)	2,281	10 (299)	9.1–12
Medium risk (fear of spreading to others)	5,069	14 (842)	13–15
High risk (fear of getting ill)	2,235	12 (352)	10–13
General health status at inclusion			
Good/very good	9,222	12 (1,417)	12–13
Fine	1,369	11 (188)	8.8–13
Poor/very poor	269	6.7 (27)	4.2–10
Region			
Ile de France	2,436	8.5 (242)	7.1–10
Auvergne Rhone Alpes	1,215	13 (202)	11–15
Bourgogne Franche Comte	399	14 (70)	11–18
Bretagne	517	19 (107)	15–23
Centre Val de Loire	333	19 (76)	14–24
Corse	61	1.1 (2)	0.26–4.5
DROM	325	9.2 (29)	5.7–15
Grand Est	1,096	14 (182)	12–17
Hauts de France	944	12 (139)	8.8–15
Normandie	402	12 (72)	8.8–15
Nouvelle Aquitaine	797	14 (142)	11–17
Occitanie	992	12 (158)	10–15
PACA	727	6.9 (79)	5.3–8.9
Pays de la Loire	627	19 (132)	16–23

Table A4.3: Use of self-test as last test by demographic and exposure characteristics, among all those who tested, in the 60+ year-old age group

60+ year-olds			
Characteristic	**N = 3,863**	**Last test was self-test % (n)**	**95% CI**
Gender			
Male	1,941	4.0 (90)	3.0–5.2
Female	1,921	3.9 (110)	3.0–5.1
Age group			
60-69	2,454	5.6 (162)	4.6–6.8
70-79	1,174	2.5 (33)	1.5–4.2
80+	235	1.1 (5)	0.41–3.2
Education			
Less than high school degree	1,3	3.1 (55)	2.1–4.3
High school degree	1,277	3.6 (50)	2.5–5.1
Undergraduate degree	758	5.5 (53)	4.1–7.3
Graduate degree	518	8.2 (41)	5.4–12
Income level			
Deciles 1 and 2	308	2.3 (15)	1.1–4.5
Deciles 3 and 4	306	3.5 (16)	1.8–6.7
Deciles 5 and 6	498	3.7 (19)	1.9–7.0
Deciles 7 and 8	899	4.0 (50)	2.9–5.4
Deciles 9 and 10	1,784	4.6 (96)	3.7–5.8
Employment status			
Retired	2,980	2.8 (113)	2.2–3.6
Employed	602	11 (75)	8.6–15
Other	281	4.2 (12)	1.9–8.9
Immigration status			
Non-immigrant	3,149	4.3 (178)	3.6–5.2
Second-generation immigrant (EU)	240	4.4 (8)	1.7–11
First-generation immigrant (EU)	176	2.0 (5)	0.78–5.2
Second-generation immigrant (non-EU)	88	2.3 (3)	0.66–7.7
First-generation immigrant (non-EU)	156	0.4 (3)	0.13–1.4
Household structure			
Living alone	814	3.5 (43)	2.3–5.2
Living with other people, no children	2,934	4.3 (154)	3.5–5.3
Living with children	115	1.1 (3)	0.30–3.6
Population density of the municipality			
High	1,359	3.5 (63)	2.5–4.8
Medium	1,195	3.3 (51)	2.3–4.7
Low	1,134	4.2 (67)	3.1–5.7
Lowest	175	12 (19)	5.9–24
Presence of Covid-19 symptoms since May 2021			
No	3,459	4.1 (180)	3.3–5.0
Yes	399	2.8 (19)	1.6–4.6

Positive household member since December 2020			
No	3,597	4.0 (192)	3.3–4.9
Yes	264	3.2 (8)	1.5–6.7
Knows someone who had serious form of Covid-19			
No, nobody	3,475	4.0 (182)	3.3–4.8
Yes, family or friend	318	4.3 (16)	1.9–9.4
Yes, themself	67	0.3 (1)	0.04–2.0
Vaccinated against SARS-CoV-2			
No	398	5.3 (32)	3.5–7.9
Yes	3,464	3.8 (167)	3.1–4.6
Frequency of outings in the past week			
Five outings or less	1,123	2.3 (38)	1.5–3.5
Six to ten outings	990	4.5 (49)	3.1–6.7
More than ten outings	1,738	5.1 (113)	4.0–6.5
Used public transportation in the last week			
No	3,224	4.2 (176)	3.4–5.1
Yes	627	2.6 (24)	1.7–4.0
Visited cultural locations in the last week (museum, theatre, etc)			
No	3,322	3.8 (162)	3.1–4.7
Yes	529	5.5 (38)	3.6–8.4
Visited cafe or restaurant in the last week			
No	2,122	3.4 (115)	2.7–4.3
Yes	1,729	5.0 (85)	3.7–6.7
Attended a party or social gathering (>6 people) in the last week			
No	3,399	3.6 (169)	3.0–4.4
Yes	452	7.1 (31)	4.3–12
Visited family in the last week			
No	1,994	3.1 (91)	2.3–4.1
Yes	1,857	5.2 (109)	4.0–6.6
Went on vacation in recent weeks			
No	2,517	4.3 (146)	3.4–5.3
Yes	1,335	3.2 (53)	2.4–4.3
General health status at inclusion			
Good/very good	2,75	4.7 (157)	3.8–5.8
Fine	910	3.3 (36)	2.2–4.9
Poor/very poor	190	0.7 (5)	0.28–1.7

Region			
Ile de France	660	3.5 (28)	2.2–5.5
Auvergne Rhone Alpes	413	3.3 (25)	2.1–5.1
Bourgogne Franche Comte	164	9.6 (12)	3.9–22
Bretagne	176	1.9 (6)	0.81–4.2
Centre Val de Loire	127	11 (14)	5.4–20
Corse	46	0 (0)	0.00–0.00
DROM	108	2.7 (4)	0.87–8.1
Grand Est	377	4.0 (18)	2.4–6.6
Hauts de France	300	1.9 (12)	0.97–3.5
Normandie	143	3.6 (7)	1.6–7.8
Nouvelle Aquitaine	374	5.0 (26)	2.8–8.8
Occitanie	394	3.5 (18)	2.1–5.7
PACA	393	3.7 (20)	2.1–6.5
Pays de la Loire	188	3.9 (10)	1.8–8.5

Abstract in French

Déterminants sociaux et facteurs associés à l'utilisation d'autotests SARS-CoV-2 au cours des premiers mois de disponibilité : résultats d'une étude de cohorte nationale en France

Contexte. Des autotests de dépistage du SARS-CoV-2 ont été rapidement mis à disposition après le début de la pandémie. Ils ont été particulièrement recommandés pour les populations à risque élevé et difficiles à atteindre. Cette étude examine les déterminants sociaux et les facteurs associés à l'utilisation des autotests au cours des premiers mois de disponibilité en France.

Méthodes. L'étude EpiCov est une étude de cohorte nationale, basée sur la population, menée en France pendant la pandémie de Covid-19. La principale variable analysée était l'utilisation d'un autotest lors du dernier test de dépistage du SARS-CoV-2, parmi les personnes ayant déclaré avoir effectué un test entre mai et juillet 2021. Des régressions logistiques pondérées binomiales univariées et multivariables ont été réalisées, stratifiées par groupe d'âge (16-24 ans, 25-59 ans, 60 ans et plus).

Résultats. Dans l'ensemble, 11 % de la population ayant effectué un test de dépistage du SARS-CoV-2 entre mai et juillet 2021 a déclaré avoir utilisé un autotest comme dernier test. L'utilisation des autotests était plus élevée chez les 16-24 ans, les personnes ayant un niveau d'éducation supérieur et dans les zones à plus faible densité de population. L'utilisation était la plus faible chez les 60 ans et plus, les chômeurs et les retraités, et les immigrés de première génération. Lors de la stratification par âge, les facteurs démographiques étaient fortement prédictifs de l'utilisation des autotests chez les 25-59 ans, mais pas dans les groupes d'âge plus jeunes ou plus âgés. Les jeunes de 16 à 24 ans ayant une perception élevée du risque de Covid-19 étaient plus susceptibles d'utiliser des autotests (aOR 1,99, 95%CI 1,10-3,59). Chez les 25-59 ans, les travailleurs en personne étaient plus susceptibles d'utiliser les autotests que les travailleurs à distance (1,91 [1,20-3,05]). Chez les 60 ans et plus, les personnes ayant un emploi étaient plus susceptibles d'utiliser des autotests que les retraités (3,97 [2,30-6,85]).

Conclusions. Avec une utilisation plus importante dans les zones à faible densité de population et parmi les personnes les plus exposées, la praticité peut être un facteur déterminant de l'utilisation des autotests. Des inégalités ont été observées dans l'utilisation des autotests, avec une utilisation plus faible chez les personnes ayant un faible niveau d'éducation, plus âgées et immigrées. Toutefois, le coût des autotests ne semble pas être un obstacle majeur à leur utilisation.