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Original article

Public opinion on a mandatory COVID-19 vaccination policy in France: a cross-sectional survey

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ABSTRACT

Objectives: Reaching the last pockets of unvaccinated people is challenging, and has led to the consideration of mandatory vaccination for coronavirus disease 2019 (COVID-19). Our aim was to assess attitudes toward mandatory COVID-19 vaccination in France before the announcement of—and factors associated with opposition to—this type of policy.

Methods: Between the 10th and 23rd May 2021, we conducted a cross-sectional online survey among a representative sample of the French population aged 18 and over, and a specific sample of the French senior population aged over 65.

Results: Among 3056 respondents, 1314 (43.0%) were in favour of mandatory COVID-19 vaccination, 1281 (41.9%) were opposed to such a policy, and 461 (15.1%) were undecided. Among opponents to mandatory COVID-19 vaccination for the general population, 385 (30.05%) were in favour of mandatory COVID-19 vaccination for healthcare workers (HCWs). In multivariate analysis, the age groups 18–24 and 25–34 years were significantly more opposed than the reference group (>75 years old) with respective adjusted odds ratio (aOR) and 95% confidence interval (95%CI) 4.67 (1.73–12.61) and 3.74 (1.57–8.93). Having no intention of getting COVID-19 vaccination was strongly associated with opposition to mandatory vaccination (aOR 10.67, 95%CI 6.41–17.76). In comparison with partisans of the centre, partisans of the far left and green parties were more likely to be opposed to mandatory COVID-19 vaccine, with respective aORs (95%CI) of 1.89 (1.06–3.38) and 2.08 (1.14–3.81).

Conclusion: Attitudes toward mandatory COVID-19 vaccination are split in the French general population, and the debate might become politicized. **Amandine Gagneux-Brunon, Clin Microbiol Infect 2022;28:433**

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Introduction

Coronavirus disease 2019 (COVID-19) has been responsible for more than 225 million cases and more than 4.6 million deaths worldwide up to the 14th September 2021 [1]. Vaccines were developed at “a pandemic speed” [2]. More than 5 billion COVID-19 vaccines had been administered worldwide by the end of August 2021 [3]. After 5–6 months of COVID-19 vaccination campaigns,

many high-income countries have reached their coverage plateau (60% of the entire population) [3]. In France, all individuals over the age of 12 years have been eligible for COVID-19 vaccination since 1st June 2021. On 1st July 2021, 51% of the general French population (59.8% of the eligible population) had received a first dose of COVID-19 vaccine [4].

As has been seen in the past with childhood immunizations, vaccinating a majority of the population is easier than reaching the last pockets of unvaccinated people, the unwilling or weakly motivated [5,6]. Faced with this challenge in the past, many countries have resorted to various forms of vaccination mandates [7]. While recourse to constraint in its various forms can be effective in increasing vaccine coverage—particularly by pushing those who wait and those who refuse to act—it also presents the risk of antagonizing part of the public, causing reactance and stimulating anti-vaccine movements [8]. Because the debate around mandatory COVID-19 vaccination is emerging in many countries, it is crucial to understand the conditions under which this policy could be widely accepted. France was among the most vaccine-hesitant countries in the world before the COVID-19 epidemic [9,10], and hesitancy toward COVID-19 vaccination has remained higher than in most neighbouring countries throughout the period [11]. Studying attitudes towards vaccine mandates in such a context can help to highlight the variety of factors influencing the acceptability of coercive measures, including preferences for political parties [12], identifying target groups, and developing specific interventions to reduce reactance. Although healthcare workers (HCWs) were identified as a priority target group for COVID-19 vaccination, on 1st July only 60% of French HCWs had received a dose of COVID-19 vaccine [4]. To increase COVID-19 vaccine coverage in HCWs, COVID-19 vaccine mandates appeared as a solution. In France, the compulsory vaccination against hepatitis B led to a significant increase in vaccination coverage and reduced the differences between professional categories [13].

In a survey carried out in May 2021, participants were asked for their opinion about COVID-19 vaccine mandates for the general population and for HCWs [14]. In this context, it seems interesting to assess opinions about mandatory vaccination prior to its implementation, and to identify factors associated with opposition to COVID-19 vaccination mandates in France.

Methods

Design and sample

Between 10th and 23rd May 2021, we conducted a cross-sectional online survey among a sample of the French population aged 18 and over, with participants who were randomly selected from an existing online research panel of more than 750 000 nationally representative households of the general population (Bilendi SA®). A quota sampling method was applied to achieve a sample of 1514 respondents representative for the French adult population in terms of age, gender, occupation and population in the area of residence. In total 50 200 invitations were sent to reach this sample (response rate 3.1%). An additional sample of 1544 French residents ≥ 65 years of age selected from the same panel, representative of the general 'senior' population in terms of gender and age, was added because the survey also aimed to identify reasons for non-vaccination in the elderly. A total of 5700 additional persons over 65 years of age were invited to answer the survey to obtain this extra sample (response rate 27.1%). Prior information on the panellists was used to determine eligibility and to select a stratified random sample with oversampling of

panellists over 65 years of age. To limit coverage bias—due to the fact that not all people use the internet, and, among users, that not all of them are willing to participate in web surveys—random sampling was stratified to match French official census statistics for gender, age, occupation (eight categories), population in the area of residence (five categories) and region (12 categories). In addition, a survey weight that takes into account gender, age, region and size of residence area was calculated and assigned to each response. The study design was approved by the ethical committee of the University Hospital Institute Méditerranée Infection (#2021–001).

Data collected

In addition to background socioeconomic variables (gender, age, profession), we collected intention to vaccinate or history of COVID-19 vaccination, concerns about COVID-19, and opinion of vaccines in general. Respondents were asked to which French political party they felt the closest (among a quite comprehensive list of 17 parties), and responses were encoded into: far-left, green party, left, centre and right governmental parties, and far-right and feeling close to no party. Regarding mandatory COVID-19 vaccination, respondents were asked whether they think that vaccination against COVID should be mandatory for the entire population; the question was "Do you think that COVID-19 vaccination should be mandatory for all?". Respondents against mandatory COVID-19 vaccination were asked whether they think that COVID-19 vaccination should be mandatory for HCWs: "Do you think that COVID-19 vaccination should be mandatory for HCWs?". For both questions, the answers were yes, no or don't know.

Statistical analysis

Attitudes toward a mandatory COVID-19 vaccination for the general population were merged into a binary outcome: 'opposition to COVID-19 mandatory vaccine policy' equalled 1 if participants answered no, otherwise the value was 0. We chose this dichotomization, while we considered that undecided individuals will not be those who will strongly express their opposition. We first used bivariate analyses, and χ^2 tests in cross-tabulations, and a bivariate logistic regression to investigate factors associated with opposition to mandatory COVID-19 vaccination, using respondents' socioeconomic background, concern about COVID-19, and political preferences as covariates. In a second part, we aimed to better describe the population of individuals reluctant about COVID-19 vaccination mandates for all, but in favour of mandatory COVID-19 vaccination for HCWs. In the regression model, we used bivariate analyses and a bivariate logistic regression to investigate factors associated with the attitude toward a COVID-19 vaccine mandate for HCWs in respondents opposed to a mandatory COVID-19 vaccine policy for all. In regression models, we used a forward stepwise selection method (entry threshold $p < 0.2$) to retain statistically significant covariates only.

Results

A total of 3056 individuals answered the questionnaire (1455 men, 47.6%). Among the respondents, 1314 (43.0%) were in favour of mandatory COVID-19 vaccination, 1281 (41.9%) were opposed to such a policy, and 461 (15.1%) were undecided (Table 1).

Opinions differed between age groups; 61.4% of the respondents aged 25–34 years were opposed to COVID-19, in contrast to 18.2%

Table 1

Comparison between respondents with favourable or undecided opinions and respondents with negative opinions towards coronavirus disease 2019 (COVID-19) vaccine mandates

	Favourable or undecided opinion toward COVID-19 vaccination mandates (n = 1775)		Opposition toward COVID-19 vaccination mandates (n = 1281)		p
	n	%	n	%	
Gender:					
Male (n = 1455)	850	58.4	605	41.6	0.83
Female (n = 1601)	925	57.8	676	42.2	
Age groups:					
18–24 (n = 315)	146	46.5	169	53.51	<0.005
25–34 (n = 447)	173	38.6	274	61.37	
35–49 (n = 737)	373	50.6	364	49.36	
50–64 (n = 745)	444	59.6	301	40.37	
65–74 (n = 439)	334	75.9	105	24.02	
≥75 (n = 373)	305	81.8	68	18.17	
Socio-professional categories:					
Farmers, artisans, shopkeepers, CEOs (n = 130)	62	47.8	68	52.2	<0.005
Executives and intellectual professionals (n = 327)	173	53.1	154	46.9	
Intermediate professions (n = 423)	223	52.7	200	47.2	
Employees (n = 437)	213	48.7	224	51.3	
Blue-collar workers (n = 336)	140	41.7	196	58.3	
Retired (n = 1032)	768	74.5	264	25.5	
Unemployed (n = 371)	196	52.7	175	47.3	
Healthcare workers:					
Yes (n = 291)	151	51.9	140	48.1	0.16
No (n = 2765)	1624	58.7	1141	41.3	
Fear of getting infected:					
Not frightened (n = 899)	438	48.8	461	51.2	<0.005
Not very frightened (n = 809)	485	60.1	323	39.9	
Very frightened (n = 778)	456	58.6	322	41.4	
Extensively frightened (n = 571)	396	69.3	175	30.7	
Intention to get vaccinated:					
Yes or already vaccinated (n = 2348)	1670	71.1	678	28.9	<0.005
No (n = 708)	105	14.8	603	85.2	
Trust in pharmaceutical companies:					
Yes (n = 1317)	922	70.0	395	30.0	<0.005
No (n = 1739)	853	49.1	886	50.9	
Trust in government during the pandemic:					
Yes (n = 1428)	1037	72.6	391	27.4	<0.005
no (n = 1628)	738	45.4	890	54.6	
Favourable opinion toward vaccines in general:					
Yes (n = 2349)	1561	66.5	788	33.5	<0.005
No/undecided (n = 707)	214	30.3	493	69.7	
Partisan preference:					
Others (n = 97)	59	61.3	38	38.7	<0.005
No declared preference (n = 1027)	557	54.2	471	45.8	
Far left (n = 252)	107	42.3	145	57.7	
Left (n = 272)	174	63.8	98	36.2	
Green party (n = 217)	104	47.9	113	52.1	
Centre (n = 449)	337	75.0	112	25.0	
Right (n = 292)	209	71.5	83	28.5	
Far right (n = 450)	229	51.0	221	49.0	
Science does people (n = 2756):					
more good than harm (n = 1131)	713	64.2	418	35.8	<0.005
about as much good as harm (n = 1448)	794	54.8	654	45.2	
more harm than good (n = 177)	52	29.6	125	70.4	

CEO, chief executive officer.

All variables with a p < 0.1 in univariate analysis were integrated in the regression model. Variables associated with the attitude toward a mandatory COVID-19 vaccination policy have p < 0.05.

of individuals over the age of 75. Among the respondents who intended to get vaccinated or had already been vaccinated, 28.9% were opposed to mandatory COVID-19 vaccination.

The multivariate analysis confirmed that opinion toward a mandatory COVID-19 policy differed between age groups; younger individuals were more likely to be opposed to a mandatory COVID-19 vaccination (Table 2). COVID-19 vaccination personal refusal was an important predictor of opposition to a mandatory COVID-19

vaccination (aOR 10.67, 95%CI 6.41–17.76). Differences in attitude to a mandatory COVID-19 vaccination were observed depending on political affiliation. Low trust in the government was also associated with reluctance to accept a mandatory COVID-19 vaccine policy (aOR 1.78, 95%CI 1.29–2.45). Respondents with an unfavourable opinion or no opinion about vaccination in general were also reluctant to accept a mandatory COVID-19 vaccine policy (aOR 2.81, 95%CI 1.85–4.27).

Table 2
Factors associated with opposition to coronavirus disease 2019 (COVID-19) vaccination mandates for the general population

	OR	aOR (n = 2756)
Gender:		
Male (n = 1455)	Ref	Ref
Female (n = 1601)	1.03 (0.82–1.29)	0.99 (0.73–1.33)
Age groups:		
18–24 (n = 315)	5.18 (3.31–8.12)	4.67 (1.73–12.61)
25–34 (n = 447)	7.15 (4.84–10.58)	3.74 (1.57–8.93)
35–49 (n = 737)	4.39 (3.15–6.11)	2.82 (1.27–6.29)
50–64 (n = 745)	3.05 (2.15–4.32)	1.99 (0.99–4)
65–74 (n = 439)	1.42 (1.1–1.85)	1.36 (1.02–1.81)
≥75 (n = 373)	Ref	Ref
Socio-professional categories:		
Farmers, artisans, shopkeepers, CEOs (n = 130)	1.24 (0.65–2.37)	1.41 (0.6–3.29)
Executives and intellectual professionals (n = 327)	Ref	Ref
Intermediate professions (n = 423)	1.01 (0.63–1.62)	0.86 (0.47–1.59)
Employees (n = 437)	1.19 (0.75–1.9)	0.8 (0.43–1.47)
Blue-collar workers (n = 336)	1.58 (0.97–2.57)	0.98 (0.51–1.87)
Retired (n = 1032)	0.39 (0.26–0.59)	0.72 (0.32–1.61)
Unemployed (n = 371)	1.01 (0.57–1.8)	0.46 (0.19–1.1)
Fear of getting infected:		
Not frightened (n = 899)	2.37 (1.67–3.37)	1.82 (1.19–2.78)
Not very frightened (n = 809)	1.5 (1.04–2.16)	1.25 (0.8–1.95)
Very frightened (n = 778)	1.6 (1.11–2.30)	1.59 (1.05–2.42)
Extensively frightened (n = 571)	Ref	Ref
Intention to get vaccinated:		
Yes or already vaccinated (n = 2348)	Ref	Ref
No (n = 708)	14.14 (9.56–20.92)	10.67 (6.41–17.76)
Trust in pharmaceutical companies:		
Yes (n = 1317)	Ref	Ref
No (n = 1739)	2.43 (1.91–3.09)	1.3 (0.95–1.79)
Trust in government during the pandemic:		
Yes (n = 1428)	Ref	Ref
No (n = 1628)	3.19 (2.52–4.05)	1.78 (1.29–2.45)
Favourable opinion toward vaccines in general:		
Yes (n = 2349)	Ref	1.0 1.0
No/undecided (n = 707)	4.56 (3.41–6.10)	(2.81 1.85–4.27)
Partisan preference:		
Others (n = 97)	1.89 (0.9–3.98)	1.26 0.39–4.04
No declared preference (n = 1028)	2.54 (1.73–3.72)	0.94 0.58–1.53
Far left (n = 252)	4.1 (2.55–6.61)	1.89 1.06–3.38
Left (n = 272)	1.7 (1.02–2.84)	1.22 0.69–2.17
Green party (n = 217)	3.27 (1.93–5.54)	2.08 1.14–3.81
Centre (n = 449)	Ref	Ref
Right (n = 292)	1.2 (0.74–1.94)	0.85 0.47–1.54
Far right (n = 450)	2.89 (1.85–4.51)	1.04 0.61–1.77
Science does people (n = 2756):		
more good than harm (n = 1131)	Ref	Ref
about as much good as harm (n = 1448)	1.48 1.15–1.9	0.89 0.65–1.22
more harm than good (n = 177)	4.26 2.55–7.1	0.78 0.34–1.81

OR, odds ratio; aOR, adjusted odds ratio; Ref, reference; CEO, chief executive officer. All variables with $p < 0.2$ in univariate analysis were integrated in the regression model. Variables associated with the attitude toward a mandatory COVID-19 vaccination policy are in bold ($p < 0.05$).

Among the 1281 individuals opposed to mandatory COVID-19 vaccination, 386 (30.1%) were nevertheless in favour of a mandatory COVID-19 vaccination for HCWs. Individuals against a mandatory COVID-19 vaccine policy but accepting mandatory vaccine for HCWs represented 12.6% of the sample. Factors

associated with acceptance of a mandatory COVID-19 vaccine policy limited to HCWs are depicted in Tables 3 and 4.

Discussion

In this survey we observed that the opinion of the general population on a mandatory COVID-19 vaccination policy was split, as 43% of the respondents were in favour, 15% were undecided, and 41.9% were opposed to it. Among the opponents to such a policy, around one third was in favour of mandatory COVID-19 vaccination for HCWs.

France is known as a ‘vaccine-hesitant’ country [9], and may be a country reluctant to accept mandatory COVID-19 vaccination. The proportion of opponents to a mandatory COVID-19 vaccine in France is not far from the 51% proportion observed in a German study carried out in June and July 2020 [15]. We observed a higher proportion of opponents in France than in the USA and Greece (respectively 17.3% and 25.7%) [16,17]. In Australia, 73% of the population said they would support the government requiring the coronavirus vaccine for activities such as travel, work, and study, and only 9% were clearly opposed to a mandatory COVID-19 vaccination [18].

We observed that older age and a very high level of fear of COVID-19 were associated with support for a COVID-19 vaccination mandate for the general population. These factors were also identified in other European studies about COVID-19 vaccination mandates [15,17] and were also associated with intention to get vaccinated [19,20]. Intention to get vaccinated or vaccinated status were highly associated with support for mandatory COVID-19 vaccination, and it is not surprising to identify common determinants.

French reluctance to accept mandatory COVID-19 vaccination may in part be explained by some questions about mandatory vaccination. In December 2020, before the launch of the vaccine campaign, the President of the French Republic promised that the vaccine would not be made mandatory. On 12th July 2021, while the Delta variant spread in France, he announced mandatory COVID-19 vaccination for HCWs and other exposed professions and the ‘COVID-19 passport’ extension (complete vaccine schedule, or COVID-19 infection in the previous 6 months, or a negative severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2) test in the previous 72 h) for the general population to attend public settings (such as restaurants, movie theatres, shopping centres, etc.). Since this announcement, 13 million French people have received their first dose of vaccine, and vaccine coverage reached 85.1% of the eligible population on 8th September 2021. At the time of writing, the movement against the ‘COVID-19 passport’, that protests every week, does not seem to be growing and is not supported by the majority of the French population. We observed that vaccinated individuals or those who intend to get vaccinated could be opposed to COVID-19 vaccination mandates. In the United Kingdom, vaccine passports would make a large minority of individuals no more nor less inclined to accept a COVID-19 vaccine, and individuals with definite intentions to get vaccinated were less inclined to get vaccinated if a vaccine passport was implemented [21]. It remains unclear whether ‘COVID-19 passports’ are more acceptable than mandatory COVID-19 vaccination for the general population. Indeed, mandatory COVID-19 vaccination for the general population is a highly politicized issue in the context of the 2022 presidential election campaign. We observed that lack of trust in the government during the pandemic and partisanship of far left and green parties were associated with a greater opposition to a mandatory COVID-19 vaccination policy. The influence of political identities on attitudes to vaccines has also been observed for the intention to get vaccinated against COVID-19 in France [12]. In the USA, Democrats (in Australia major party voters) were more likely to be in favour of mandatory COVID-19 vaccination than Republicans [16,18]. In contrast, in Germany, political preferences do

Table 3

Factors associated with acceptance of a mandatory coronavirus disease 2019 (COVID-19) vaccination policy only for healthcare workers (HCWs) in the French general population in opponents to a COVID-19 mandatory vaccine policy for the general population ($n = 1281$)

	Negative or undecided opinion toward COVID-19 vaccine mandates for HCWs $n = 895$		Favourable opinion toward COVID-19 vaccine mandates for HCWs $n = 386$		p
	n	%	n	%	
Gender:					
Male ($n = 605$)	411	68.0	194	32.0	0.4
Female ($n = 676$)	484	71.6	192	28.4	
Age groups:					
18–24 ($n = 168$)	114	67.9	54	32.1	<0.005
25–34 ($n = 275$)	218	79.3	57	20.7	
35–49 ($n = 367$)	282	76.7	85	23.3	
50–64 ($n = 301$)	189	62.7	112	37.3	
65–74 ($n = 105$)	62	59.5	43	40.5	
≥75 ($n = 68$)	33	48.3	35	51.7	
Socio-professional categories:					
Farmers, artisans, Shopkeepers, CEOs ($n = 68$)	53	77.9	15	22.1	0.11
Executives and intellectual professionals ($n = 154$)	105	68.2	49	37.8	
Intermediate professions ($n = 200$)	142	71.0	58	29.0	
Employees ($n = 224$)	173	77.2	51	22.8	
Workers ($n = 196$)	145	73.9	51	26.1	
Retired ($n = 263$)	152	57.8	111	42.2	
Unemployed ($n = 175$)	125	71.4	50	28.6	
Healthcare workers:					
Yes ($n = 140$)	103	73.6	37	26.4	0.54
No ($n = 1141$)	792	69.4	349	30.6	
Fear of getting infected:					
Not frightened ($n = 461$)	344	74.6	117	25.4	0.09
A little frightened ($n = 323$)	237	73.4	86	26.6	
Very frightened ($n = 222$)	145	65.3	77	34.6	
Extremely frightened ($n = 175$)	105	60.0	70	40.0	
Intention to get vaccinated:					
Yes or already vaccinated ($n = 678$)	389	57.4	289	42.6	<0.005
No ($n = 603$)	506	83.9	97	16.1	
Trust in pharmaceutical companies:					
Yes ($n = 395$)	239	60.6	156	39.4	<0.005
No ($n = 886$)	656	74.1	230	25.9	
Trust in government during the pandemic:					
Yes ($n = 391$)	238	60.9	153	39.1	<0.005
No ($n = 890$)	658	73.9	233	26.1	
Favourable opinion toward vaccines in general:					
Yes ($n = 789$)	542	68.7	247	31.3	0.46
No/undecided ($n = 493$)	354	71.8	139	28.2	
Partisan preference:					
Others ($n = 37$)	29	78.3	8	21.7	0.08
No declared preference ($n = 471$)	369	78.3	102	21.7	
Far left ($n = 145$)	99	68.3	46	31.7	
Left ($n = 98$)	66	67.3	32	32.7	
Green party ($n = 113$)	76	67.3	37	32.78	
Centre ($n = 112$)	67	59.8	45	40.2	
Right ($n = 83$)	47	56.7	36	43.3	
Far right ($n = 221$)	143	64.7	78	35.3	
Science does people:					
more good than harm ($n = 405$)	263	64.9	142	35.1	0.04
about as much good as harm ($n = 654$)	449	68.6	205	31.38	
more harm than good ($n = 125$)	104	83.3	21	16.7	

CEO, chief executive officer.

not seem to be associated with attitudes toward mandatory COVID-19 vaccination [15]. It has previously been observed that attitudes toward vaccine mandates were even more influenced by partisan orientations than vaccination intentions [22]. In addition, since 15th October, COVID-19 tests in asymptomatic individuals to obtain 'COVID-19 passports' are no longer free in France. This appears to be a back-door way of making vaccination almost compulsory.

Mandatory COVID-19 vaccination would lead to an increase in vaccine coverage, as currently observed in French HCWs. COVID-19 vaccine coverage in HCWs was 62.4% on 12th July and reached 88.4% on 6th September. However, a COVID-19 vaccine mandate might be counterproductive, particularly if it is not acceptable for a great majority of the population [23]. Such a policy can have

detrimental consequences: reduced uptake of other vaccines, a decrease in adherence to personal protective measures, enhancement of suspicion of both vaccines in general and public health authorities, and a reduction in autonomy in the decision-making. A detrimental effect of a mandatory COVID-19 vaccination policy is quite uncertain in France. Santé Publique France has observed an increase in vaccine coverage of non-mandatory vaccines since the extension of mandatory vaccinations in infants, and a slight increase in the proportion of the French population favourable to vaccines in general [24]. After a period of reluctance, acceptability of mandatory COVID-19 vaccination will probably increase. In the past, the rate of favourable opinions toward mandatory childhood vaccines increased after the extension of the number of mandatory

Table 4

Factors associated with support for coronavirus disease 2019 (COVID-19) vaccination mandates for healthcare workers (HCWs) in opponents to a COVID-19 vaccination mandate for the general population in multivariable analysis

Factors	OR (95%CI)	aOR (95%CI)
Gender:		
Male	Ref	Ref
Female	0.85 (0.56–1.24)	1.10 (0.71–1.71)
Age:		
18–24	0.44 (0.21–0.93)	0.95 (0.23–3.97)
25–34	0.24 (0.13–0.46)	0.41 (0.11–1.5)
35–49	0.28 (0.16–0.49)	0.48 (0.14–1.72)
50–64	0.56 (0.31–1.01)	1.01 (0.31–3.3)
65–74	0.64 (0.4–1.02)	0.63 (0.37–1.08)
≥75	Ref	Ref
Socio-professional categories:		
Executives and intellectual professionals	Ref	Ref
Farmers, artisans, shopkeepers, CEOs (<i>n</i> = 68)	0.60 (0.2–1.8)	0.61 (0.18–2.11)
Intermediate professions	0.86 (0.41–1.79)	0.93 (0.41–2.08)
Employees	0.62 (0.29–1.31)	0.62 (0.26–1.43)
Workers	0.75 (0.36–1.56)	0.73 (0.3–1.79)
Retirees	1.54 (0.78–3.05)	1.15 (0.32–4.16)
Unemployed	0.84 (0.35–2.05)	1.06 (0.36–3.16)
Fear of getting infected:		
Not frightened (<i>n</i> = 461)	0.52 (0.29–0.93)	0.65 (0.35–1.23)
A little frightened (<i>n</i> = 323)	0.55 (0.3–1.03)	0.65 (0.33–1.3)
Very frightened (<i>n</i> = 222)	0.79 (0.44–1.43)	0.92 (0.47–1.8)
Extremely frightened (<i>n</i> = 175)	Ref	Ref
COVID-19 vaccination intention:		
Intention to get vaccinated or ever vaccinated	Ref	Ref
No intention	0.26 (0.16–0.40)	0.32 (0.19–0.53)
Trust in pharmaceutical companies:		
Yes	Ref	Ref
No	0.54 (0.36–0.81)	0.84 (0.5–1.41)
Trust in the government during the pandemic:		
Yes	Ref	Ref
No	0.54 (0.37–0.82)	0.74 (0.43–1.27)
Political partisan preference:		
Centre	Ref	Ref
Other	0.45 (0.11–1.88)	0.74 (0.17–3.29)
No preference	0.41 (0.21–0.82)	0.75 (0.31–1.86)
Far left	0.70 (0.31–1.56)	0.84 (0.3–2.37)
Left	0.73 (0.31–1.72)	0.96 (0.35–2.63)
Green	0.72 (0.31–1.68)	0.98 (0.32–3)
Right	1.12 (0.47–2.64)	1.45 (0.5–4.2)
Far right	0.81 (0.38–1.7)	1.78 (0.68–4.63)
Science does people:		
more good than harm	Ref	Ref
about as much good as harm	0.86 (0.56–1.3)	1.00 (0.62–1.62)
more harm than good	0.37 (0.17–0.82)	0.75 (0.3–1.87)

Ref, reference; OR, odds ratio; aOR, adjusted odds ratio; CEO, chief executive officer. Variables with $p < 0.05$ are in bold.

vaccines in 2018 [24]. Furthermore, in July 2021 in an opinion poll, 58% of the respondents were in favour of mandatory COVID-19 vaccination for all [25]. The COVID-19 passport could be considered as a form of COVID-19 vaccine mandate, and a majority of the French general population (58%) has a favourable opinion about the COVID-19 passport [26].

Our study suffers from several limitations. First, we can address the representativeness of participants in comparison with the French general population. Sample size is limited for the younger age groups; however, the observations have been weighted for age, gender, professional categories, and living areas. Older age and antecedents or intention to take up COVID-19 vaccination were great predictors of attitudes toward COVID-19 vaccination

mandates. The survey was an internet-based survey, and so individuals without access to technologies or with disabilities are probably underrepresented in our sample. In addition, undecided respondents were not asked about their attitudes to a mandatory COVID-19 vaccination for HCWs. As we observed that one third of the opponents to COVID-19 vaccination mandates in the general population were in favour of specific mandates for HCWs, we cannot estimate the true proportion of the population in favour of mandatory COVID-19 vaccination for HCWs.

In conclusion, opinions toward COVID-19 vaccination mandates were split in France in May 2021. Mandatory COVID-19 vaccination is a highly political issue in the context of the next French presidential election. Despite the implementation of the COVID-19 passport and COVID-19 vaccination mandates for HCWs and COVID-exposed professionals, France seems to have hit the glass ceiling of COVID-19 vaccination coverage. In addition, disparities are observed between regions and French overseas territories. If another wave hits France in the autumn, and if a more comprehensive outreach programme is not put in place by then, the dilemma might well be: what would be less unacceptable: mandatory vaccination, or new containment measures?

Author contributions

Conception or design of the work: PV, AGB, JKW, EBN, OL and MB. Acquisition of the data: PV and JKW. Analysis: PV, JKW and AGB. Interpretation of data for the work: PV, OL, EBN, PPW and AGB.

Transparency declaration

EBN participated on a Data Safety Monitoring Board or Advisory Board for Pfizer and Janssen, but payment was made to her institution. Other authors did not declare any conflicts of interest. This research was carried out within the COVIREIVAC platform (intended for COVID-19 vaccine clinical research) and received financial support from Institut national de la santé et de la recherche médicale (INSERM), the Ministry of Health, and The Ministry of Higher Education and Research.

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