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Vaccine Strategy During the Covid-19 Pandemic: A Community Engaged Research Supporting a Policy Oriented Towards Nonprofit Organizations and Volunteers

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Abstract
In the face of the Covid-19 crisis, vaccination was the medical tool and nonprofit organizations have tried to reduce its social impact. Nevertheless, they are mostly constituted of elderly volunteers, who chose to suspend their commitment. In France, within community-engaged research, a proposition from practitioners was to adapt the health strategy by including volunteers in the vaccine strategy. A survey dedicated to these topics and testing the proposition in January-February 2021 obtained 1,862 responses from volunteers. It confirms that the pandemic has disrupted volunteering and that the vaccination of volunteers would allow NPOs to reduce the lack of human resources.

Keywords Vaccination · Nonprofits · Volunteer · France · Health Policy

Introduction

The rapid emergence of effective vaccines has been a hope for coping with the Covid-19 pandemic (Belle & Cantarelli, 2021). However, vaccines are useful only in cases of broad public acceptance and high vaccination coverage. In other words, public authorities faced the challenge of converting the vaccine acceptability into actual injections.

Scholars have studied the determinants explaining the willingness to be vaccinated against Covid-19 (Lazarus et al., 2021; Yin et al., 2022). However, to date, no

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survey analyzed the role of membership or volunteering in non-profit organizations (NPOs). NPOs are only mentioned as key influencers (e.g. Tsheten et al., 2022).

These organizations indeed fulfil great responsibilities in building public trust. For instance, Belle and Cantarelli (2021) have shown that social nudges are particularly useful in promoting vaccination, especially in the case of Covid-19. Social norms facilitate vaccination, and not only within an organization. NPOs, as trusted organizations, would also have an advocacy role to play.

Moreover, some NPOs do much more than playing a social advocacy role : many are also on the front line in addressing the health, social and economic crises caused by the pandemic. The NPOs' response to the crisis heavily relies on volunteers. This is why they are studied by scholars, for instance within the French Red Cross (Heyerdahl et al., 2021).

In response to the health and social crises, *Recherches & Solidarités*, a network of French experts and academics, has set up an experiment to facilitate the vaccination of NPOs' volunteers. The purpose also was to show the importance of their priority vaccination. In February 2021, in France, only healthcare professionals, employees working for the elderly or handicapped people, firefighters, people with co-morbidities and those over 75 could be vaccinated. In April 2021, the minimum age has been reduced to 55 (Ministère des Solidarités et de la Santé, 2021). The opening to all took place in May 2021. By early August 2021, 63.2% of the total population had received at least one dose of vaccine. At the beginning of 2022, when the fifth wave hit France because of the Omicron variant, 79.6% of the population had received a first dose and 77.7% had a complete vaccination schedule (three doses of vaccines or Covid-19 infections).

However, France remains among the most suspicious countries, alongside Russia and Poland. Hardly more than one citizen in two was likely to be vaccinated (Lazarus et al., 2021). In this, French authorities had to put in place strong incentives such as a health/vaccine pass, a document that attests that a person meets the criteria for a full vaccination schedule and which was required for access to leisure and food services.

Recherches & Solidarités's proposal was based on the identification of an additional problem. The lack of priority given to volunteers has indeed had an effect on the life of NPOs. By the end of April 2021, 61% of NPOs had lost contact with a majority of their volunteers and in 43% of NPOs, volunteers stopped their activity for fear of the virus (Le Mouvement Associatif et al., 2021).

The approach proposed here can be described as a community-engaged research and the objective of this article is to verify the relevance of volunteers as a special vaccination group. Three research questions are thus associated to these objectives:

Research question 1 (RQ1): To what extent has the pandemic weakened volunteering?

Research question 2 (RQ2): How can volunteer status be linked to vaccination willingness?

Research question 3 (RQ3): To what extent has the community-engaged research conducted by Recherches & Solidarités served the NPOs?

The article therefore follows an original structure. First, a review of the literature highlights the importance of the issues raised by *Recherches & Solidarités*. Then,

the details of the community-engaged research approach and the survey method are presented. Finally, the results are used to discuss the three research questions.

Background in Literature

Recherches & Solidarités wanted to bring their idea to the public authorities. However, going beyond the context of a single experiment seems appropriate. The literature review below offers some initial insights into this subject.

NPOs and Covid-19: Between Threatening Their Viability and Strengthening Their Social role

NPOs include organizations of different nature and from various sectors. Within NPOs, grassroots volunteer organizations (GVOs) occupy a major place. They are characterized by the importance of their members and volunteers. Their activity is essentially based on people who give their time and money in order to act in favor of the beneficiaries. In this, the dependence on volunteers has become a common feature (Nesbit et al., 2018). The survival of NPOs and GVOs in particular is therefore at risk when volunteers retire.

In a period of crisis, NPOs have several roles to play. First of all, their initial mission has a strong social impact. For instance, they can maintain and strengthen their links within communities (Misener et al., 2020). In times of social distancing and restrictive measures, these connections are crucial, within the organization between people but also externally with stakeholders. Even a temporary suspension of volunteering is therefore an urgent problem.

In addition, another mission of public utility is assigned to NPOs. They are trustworthy organizations, compared to a context of mistrust towards political powers and, sometimes, pharmaceutical laboratories. In this, NPOs could promote vaccination within their community by becoming soft prescribers. They would complement the recommendations of health authorities and healthcare professionals (French et al., 2020).

The Vaccine Strategy Against Covid-19: Prioritization and Population Acceptance

In the absence of an obligation, optimal vaccination coverage can only be achieved if a majority wishes to be vaccinated. Studies show that the vaccine acceptability is quite good but depends on traditional factors such as age, respondent's health and the role of caregivers (e.g. Reiter et al., 2020).

A vaccination strategy must therefore convince the population and manage the vaccines shortage. While Western countries have greatly benefited from the first produced doses, other countries are still receiving reduced quantities. The prioritization issue is therefore crucial. Health authorities had to decide on ethical paradoxes, particularly between competing values (O'Flynn, 2021) such as equal access to vaccines and the need to prioritize people.

People with co-morbidities (Ribas et al., 2021), the elderly (Jeyanathan et al., 2020) and health professionals (Chirico et al., 2020) are favored by scholars. Beyond this apparent consensus, scholars are questioning the relevance of a prioritization solely based on health concerns. The place of the youngest is discussed (Giubilini et al., 2020), because they are gathered in their schools for example. Essential workers with high added value for the society also include very different categories (e.g. food industries, public transport, security). They are at various vaccination stages according to the studies reviewed (Hassan-Smith et al., 2020; Russell & Greenwood, 2020).

The weak consideration of essential workers in favor of age criteria is criticized by scholars (Persad et al., 2020). To extend this criticism, NPO volunteers can also be seen as essential workers. However, these people are not identified in the target groups to be vaccinated, including in researches proposing a full vaccination strategy (J. Yang et al., 2021).

To show the value of this group, the present study should therefore determine if the pandemic has weakened volunteering and if being a volunteer can be related to vaccination. This was the proposal from *Recherches & Solidarités*.

A Specific Approach: A community-engaged Research Leading to a Broader Survey

Community-engaged research is a "research in any field that partners university scholarly resources with those in the public and private sectors to enrich knowledge, address and help solve critical societal issues, and contribute to the public good" (Stanton, 2008, p. 20). This research approach places the community at the heart of the knowledge production. The practitioners and professionals develop the main aspects of the research. Their points of view and expertise are the research base. The research target is therefore the community (Touboulic et al., 2020). In this, the results are provided to organizations and society and then contribute to the advancement of scientific knowledge (Cunliffe & Scaratti, 2017).

Wallerstein et al., (2017) provide a four-stage model for engaged research, used here to describe the context of this study. First, the partnership process is the pre-existing collaboration between nonprofit professionals and researchers within *Recherches & Solidarités.* It is a French NPO created in 2008. It is constituted by a network of professionals, experts and scholars, who are all specialists in solidarity and NPOs. As a partner of public authorities and NPOs federations, the organization studies the French non-profit sector.

Second, the context is the pandemic: volunteers within NPOs have been withdrawing and suspending their activities to protect themselves (Bazin & Malet, 2021). This is significant because, despite their annual budget of 113 billion euros, French NPOs are above all GVOs. They rely on their volunteers in order to exist and work: only 12% of French GVOs have employees and frequently fewer than 2 (Tchernonog & Prouteau, 2019).

Third, the intervention and research processes are based on a dual approach. The first part was an original proposal from *Recherches & Solidarités*. They wanted to show that vaccinating volunteers was logistically possible without depriving vulnerable people of doses. The idea was to adjust the French vaccination strategy (Bazin

& Malet, 2021). *Recherches & Solidarités* proposed to identify volunteers who were ready to be quickly vaccinated. They were called by the vaccination center in case of appointment cancellations or absences. This proposal did not hinder the policy oriented towards the over 75-year-olds (at the time of the proposal in January 2021) and did not ask for more doses of vaccine.

Recherches & Solidarités in January, 2021, noted that there were fewer volunteers and the vulnerable groups' needs were increasing (Sebbag et al., 2021). At the same time, the vaccination campaign only covered people over 75 and those over 50 with health problems. The proposed initiative focused on volunteers between 50 and 74 and volunteering in health, charity and social NPOs. The proposal is based on three principles (Bazin & Malet, 2021):

1) "Avoiding imperative measures to respect vaccination implementation actors and the difficulties of their mission".

2) "Not interfering with the process underway with people over 75 and operating at a constant number of doses".

3) Taking advantage of the absence of people expected to attend an appointment: "replace them with volunteers identified and proposed in advance by NPOs managers and able to move quickly".

The local experiment was carried in the town of Châteaudun (Eure-et-Loir in the centre of the country) and its surroundings with the help of the Territorial Professional Health Community (*Communauté Professionnelle Territoriale de Santé*, CPTS Sud 28) as a vaccination center for Châteaudun. Eleven NPOs were approached, including *Les Restaurants du Coeur*, the *Secours Populaire Français*, the Society of Saint-Vincent-de-Paul, the *Petits Frères des Pauvres*, the French Red Cross and the *Secours Catholique*. These NPOs have proposed lists of volunteers to be vaccinated (especially those who can be vaccinated with a medical certificate) and the vaccination center called volunteers in cases of absences.

In one month, 66 volunteers between 50 and 74 received a first injection following absences or cancellations. They represent 3% of the 2,500 people vaccinated on February 22, 2021 in Châteaudun and its surroundings. Volunteers and NPOs have expressed their relief. The first ones no longer had difficulties in getting an appointment to be vaccinated and the second ones were glad to have some volunteers back (Sebbag et al., 2021).

The second part of this community-engaged research is the study underlying the present article. In order to show the generalizability of this experiment, a scientific approach was adopted. A survey was launched by *Recherches & Solidarités* on January 14, 2021. It was disseminated through *Recherches & Solidarités*'s social networks and newsletter and some French NPOs federations and umbrella organizations in the sector also relayed the survey. As a result, a majority of large French NPOs received the questionnaire and forwarded it to their volunteers. However, it is not possible to know exactly how many NPOs were reached or how many volunteers received the survey. By February 10, 2021, 1,862 volunteers had responded.

Table 1 then presents the four questions asked and the sorting variables. Organizations from the health, social, sports and youth sectors are the most represented. They are both the most numerous in France and the targets of the survey conducted. Volunteers over the age of 50 are in the majority in the sample. They were precisely

Table 1 Presentation of the questionnaire and responses distribution

Question	Proposed modalities to respondents	Modalities name	N	
Q1- In view of the current health risks and your volunteer activity	You stay active by going into the field.	Active	922	49.92%
	You have preferred on your own to temporarily interrupt your activity in the field.	Chosen suspension	232	12.56%
	The leaders of your organization have asked you to suspend your volunteer activities.	Imposed suspension	183	9.91%
	Your organization has temporarily ceased its activities in the field.	Closure	510	27.61%
Q2- When you are offered the vaccine, what will you do?	I will get vaccinated without hesitation.	Yes	1,146	61.95%
	I am hesitating but I plan to find out how to make my choice / I prefer to wait a little to have a better visibility	I don't know	582	31.46%
	I will not be vaccinated	No	122	6.59%
Q3A- How do you envisage your volunteer activity between now and your vaccination? (question available if the first answer was chosen to Q2)	Without a vaccine, I do not wish to have a volunteer activity	Yes, suspension until vaccine injection	165	14.84%
	I will continue or return to my volunteer activity with special care and attention	No	947	85.16%
Q3B- Do you think your volunteer activity might influence your desire to be vaccinated? (question available if the second or the third answer was chosen to Q2)	Yes, above all to be more serene in my volunteer activity	Yes, for me	74	10.44%
	Yes, primarily for the protection of the members or beneficiaries of my organization.	Yes, for others	180	25.39%
	No, my volunteer activity has little influence on my position on the vaccine / I don't see the link	No link	455	64.17%
Organizational sector	Advocacy		43	2.34%
	Charity		78	4.24%
	Culture		119	6.46%
	Economy		128	6.95%
	Environment		49	2.66%
	Health		199	10.81%
	Leisure		70	3.80%
	Social		607	32.97%
	Sport		186	10.10%
	Youth		192	10.43%
	Other		170	9.23%
What are the main publics your organization addresses?	To all publics	All	880	47.85%
	To young people	Young	235	12.78%
	To adults	Adults	185	10.06%
	To the elderly	Older	133	7.23%
	To persons with disabilities or handicaps	Handicap	70	3.81%
	To people in great difficulty	In difficulty	270	14.68%
	To ill persons	Ill	66	3.59%
Gender	Female	F	1,009	54.48%
	Male	M	846	45.52%

Table 1 (continued)

Question	Proposed modalities to respondents	Modalities name	N	
Age	Under 50 years old	<50	323	17.54%
	Between 50 and 65 years old	50–65	449	24.38%
	Over 65 years old	>65	1,070	58.09%
Your volunteer commitment is approximately…	Less than one hour per week	<1 h	357	19.36%
	Between 1 and 10 h per week	1–10 h	921	49.95%
	More than 10 h per week	>10 h	566	30.69%
Does your current volunteer activity lead you to have contact with members, beneficiaries and/or the public?	No		512	27.86%
	Yes		1,326	72.14%

the target of the survey, in terms of vaccination policy. The sample obtained is in line with the work carried out by *Recherches & Solidarités* with regard to individual characteristics and is not randomized because the target is reached.

The variables are all categorical and Table 1 presents the descriptive statistics. In the context of the community-engaged research, the multivariate and scientific approach was assigned to me with the aim of publishing an academic article. I have carried out multiple logistic regressions. They are all relevant with regard to the R^2 obtained and likelihood tests. Multinomial logistic regressions were not used because the analysis by modality was the one chosen by *Recherches & Solidarités*. Finally, the outcomes of the research, the fourth step of Wallerstein et al. (2017)'s model, are the 66 vaccinated volunteers, the dissemination of good practices and the production of scientific knowledge on vaccine prioritization.

Findings

The first and the third findings helps to answer the research question RQ1 (To what extent has the pandemic weakened volunteering?) and the final three subsections are differentiated responses to the research question RQ2 (How can volunteer status be linked to vaccination willingness?).

The Impact of the Covid-19 Pandemic on Volunteering

Table 2 shows that the characteristics of volunteer involvement account for almost one-third of volunteer continuation (R^2=0.30). The health crisis particularly affected NPOs in the cultural, leisure, advocacy and sports sectors. Stopping sports activities posed a medium-term health problem and the lack of leisure and cultural activities also had an effect on the citizens and volunteers' mental health. Fragile populations also saw the NPOs around them lose their volunteers, especially the ill, the handicapped and the youngest people. Volunteers over 65 were the most likely to suspend their volunteering and they have chosen this interruption. In contrast, people who volunteer more than 10 h a week remained largely active in their NPOs. Similarly,

Table 2 Logistic regression of the variable Q1 on current volunteer activity

	Imposed suspension			Chosen suspension			Active		
	B	*p*	SE	B	*p*	SE	B	*p*	SE
Constant	-4.5955	***	(1.0430)	-2.3473	***	(0.4791)	1.1277	**	(0.3699)
Other	1.3880		(1.0564)	0.2597		(0.4993)	-0.7129	^	(0.3941)
Sport	-0.8208		(1.2456)	-1.2244	*	(0.5791)	-0.8829	*	(0.3902)
Advocacy	1.3088		(1.1912)	0.7747		(0.5940)	-1.1627	*	(0.4862)
Social	1.4496		(1.0355)	-0.1811		(0.4786)	-0.0402		(0.3704)
Leisure	1.1962		(1.1010)	-0.2935		(0.5929)	-1.0094	*	(0.4591)
Charity	1.3360		(1.0984)	0.3451		(0.5434)	-0.5613		(0.4370)
Health	1.6883		(1.0540)	0.2459		(0.5099)	-0.5274		(0.3992)
Youth	1.5346		(1.0637)	-0.2801		(0.5322)	-0.6174		(0.4053)
Culture	0.9836		(1.0786)	-0.6979		(0.5598)	-1.2132	**	(0.4214)
Economy	0.9944		(1.0797)	0.3052		(0.5121)	-0.6008		(0.4119)
Young	0.4929	^	(0.2991)	0.2592		(0.2584)	-0.0288		(0.1932)
Adults	0.1708		(0.3001)	0.0756		(0.2458)	-0.1738		(0.1952)
Older	0.4133		(0.3143)	-0.3751		(0.3372)	-0.0377		(0.2266)
In difficulty	0.2530		(0.2662)	-0.0790		(0.2430)	0.7116	***	(0.1837)
Ill	1.3137	***	(0.3789)	-0.2936		(0.4459)	-0.6273		(0.3311)
Handicap	0.7674	^	(0.4065)	0.1695		(0.3898)	-0.3224		(0.2976)
M	0.1172		(0.1720)	0.1838		(0.1525)	0.1913	^	(0.1133)
50–65	-0.3983	^	(0.2111)	-0.4343	*	(0.1922)	0.5766	***	(0.1349)
< 50	-0.7823	**	(0.2697)	-0.5586	*	(0.2230)	0.8043	***	(0.1569)
1–10 h	0.8909	***	(0.2365)	0.4509	*	(0.1893)	-0.7235	***	(0.1281)
< 1 h	1.2700	***	(0.2713)	0.8029	***	(0.2255)	-1.2991	***	(0.1728)
Contact - N	0.6254	***	(0.1751)	0.5914	***	(0.1596)	-1.7772	***	(0.1372)
-2Log(Likelihood)	116.28	***		75.86	***		455.19	***	
R^2(Nagelkerke)	0.1332			0.0792			0.3030		
N	1,766			1,766			1,766		

Notes: Standard errors in parentheses. Comparison groups for categorical variables are: environmental sector, all public, female, age > 65, commitment of more than 10 h per week, contact with the public. For each regression conducted for this variable, 1 is assigned to the modality tested, 0 is assigned to the other modalities. ^ : $p < .10$; * $p < .05$; ** $p < .01$ and *** $p < .001$.

NPOs in direct contact with people were less affected by volunteer suspensions because their mission was crucial in times of health crisis.

Willingness of Volunteers to be Vaccinated

Table 3 indicates that volunteer involvement may play a role in the individual vaccination decision. Volunteers in the health, economic, social and charitable sectors were most likely to be vaccinated. Moreover, men and people over 65 were more concerned about vaccination. However, the NPO's beneficiary public did not have a major effect. The decision of volunteers in direct contact with people is still uncertain; but volunteers who have chosen to suspend their activity are the most willing to be vaccinated. The results are therefore in line with Detoc et al. (2020).

Table 3 Logistic regression of the modalities of the variable Q2 on willingness to be vaccinated

	Yes			I don't know			No		
	B	*p*	SE	B	*p*	SE	B	*p*	SE
Constant	0.4473		(0.3769)	-0.9781	**	(0.3726)	-2.7352	***	(0.6028)
Other	0.8035	*	(0.3675)	-0.4771		(0.3580)	-0.8707		(0.5516)
Sport	0.9090	*	(0.3655)	-0.8612	*	(0.3588)	-0.0970		(0.4888)
Advocacy	0.1951		(0.4665)	0.2922		(0.4536)	-1.7390		(1.1066)
Social	1.1698	***	(0.3460)	-0.8633	*	(0.3357)	-0.7951	^	(0.4781)
Leisure	0.7695	^	(0.4204)	-0.5752		(0.4137)	-0.4001		(0.6167)
Charity	1.0808	**	(0.4175)	-0.6676		(0.4120)	-1.1274		(0.7365)
Health	1.2340	**	(0.3763)	-0.8435	*	(0.3683)	-1.2803	*	(0.5882)
Youth	0.8451	*	(0.3828)	-0.5391		(0.3743)	-0.9313		(0.5869)
Culture	0.7860	*	(0.3829)	-0.4114		(0.3719)	-0.9321		(0.5687)
Economy	1.2421	**	(0.3924)	-0.9300	*	(0.3871)	-1.0611	^	(0.6358)
Young	0.4814	*	(0.1960)	-0.2952		(0.2018)	-0.6752	^	(0.3973)
Adults	-0.0997		(0.1825)	0.2616		(0.1848)	-0.4656		(0.3789)
Older	0.1198		(0.2222)	0.1667		(0.2243)	-1.4715	*	(0.7366)
In difficulty	0.1741		(0.1763)	-0.1120		(0.1843)	-0.3254		(0.3508)
Ill	0.0113		(0.3224)	-0.3094		(0.3513)	0.5436		(0.5650)
Handicap	-0.4598		(0.2833)	0.7106	*	(0.2804)	-1.0225		(0.7418)
M	0.4054	***	(0.1098)	-0.3383	**	(0.1133)	-0.1982		(0.2123)
50–65	-0.9008	***	(0.1250)	0.7548	***	(0.1292)	0.8632	***	(0.2449)
< 50	-1.1666	***	(0.1439)	0.9236	***	(0.1461)	1.0591	***	(0.2593)
1–10 h	-0.0807		(0.1254)	0.1238		(0.1302)	0.0283		(0.2528)
< 1 h	-0.3247	*	(0.1613)	0.1690		(0.1661)	0.6416	*	(0.2885)
Contact - N	-0.2836	*	(0.1277)	0.2262	^	(0.1307)	0.1856		(0.2415)
Imposed suspension	-0.5684	*	(0.2325)	0.5375	*	(0.2403)	0.2557		(0.5085)
Closure	-0.6088	**	(0.1922)	0.5403	**	(0.1992)	0.3763		(0.3988)
Active	-0.6182	***	(0.1845)	0.5024	**	(0.1919)	0.4984		(0.3890)
-2Log(Likelihood)	205.46	***		138.30	***		74.91	***	
R^2(Nagelkerke)	0.1495			0.1062			0.1092		
N	1,766			1,766			1,766		

Notes: Standard errors in parentheses. Comparison groups for categorical variables are: Environmental sector, all public, female, age > 65, commitment of more than 10 h per week, contact with the public, chosen suspension of volunteering. For each regression conducted for this variable, 1 is assigned to the modality tested, 0 is assigned to the other modalities. ^ : $p < .10$; * $p < .05$; ** $p < .01$ and *** $p < .001$.

Vaccinate Volunteers to Encourage Their Return to the Field

Table 4 focuses on volunteers who wish to be vaccinated and who will not volunteer without an injection. They are primarily volunteers in contact with elderly people, over 65 and with a commitment of less than 10 h per week. These volunteers have above all chosen to interrupt their commitment. However, one out of three volunteers in France is over 65. These volunteers are the most active: NPOs are therefore losing their main human resource.

Table 4 Logistic regression of the variable Q3A of volunteering suspension until injection for volunteers wishing to be vaccinated

	Suspension until injection		
	B	*p*	SE
Constant	-1.6019	^	(0.8810)
Other	0.2027		(0.8981)
Sport	0.3730		(0.8938)
Advocacy	0.8660		(1.0923)
Social	0.3360		(0.8653)
Leisure	0.4404		(0.9452)
Charity	0.7851		(0.9308)
Health	0.6977		(0.9118)
Youth	0.5257		(0.9061)
Culture	0.0014		(0.9154)
Economy	0.5048		(0.9025)
Young	0.3707		(0.3367)
Adults	-0.0693		(0.3479)
Older	1.0224	**	(0.3647)
In difficulty	0.1722		(0.3910)
Ill	0.3950		(0.5551)
Handicap	-0.1575		(0.6995)
M	-0.1293		(0.2078)
50–65	-0.6028	*	(0.2880)
<50	-0.6284	^	(0.3694)
1–10 h	0.5274	*	(0.2694)
<1 h	0.9088	**	(0.3215)
Contact - N	0.6213	**	(0.2080)
Imposed suspension	-1.2658	***	(0.3192)
Closure	-0.4718	*	(0.2356)
Active	-4.1292	***	(0.5383)
-2Log(Likelihood)	260.31	***	
R^2(Nagelkerke)	0.3813		
N	1,067		

Notes: Standard errors in parentheses. Comparison groups for categorical variables are the same as the previous table. ^ : $p<.10$; * $p<.05$; ** $p<.01$ and *** $p<.001$.

Promoting Vaccination Thanks to the Relay of non-profit Organizations

Table 5 analyzes the effects of volunteering on attitude towards vaccination. 65% of the respondents said that their volunteering activity has little influence over the vaccine intention. In fact, this absence of link is primarily the attitude of volunteers who are not very present in the field (less than one hour a week). Within the category of volunteers seeing a link between vaccination and volunteering, volunteers in contact with young people, volunteers in the field for more than 10 h a week and men are likely to be vaccinated to protect themselves. Volunteers who are in contact with elderly or disabled people or who are not currently in the field may want to protect others by getting vaccinated.

Table 5 Logistic regression of the modalities of the variable Q3B on the influence of volunteerism on vaccination attitude

	Yes. for me			Yes. for others			No link		
	B	*p*	SE	B	*p*	SE	B	*p*	SE
Constant	-2.2767	**	(0.7095)	-1.1227	*	(0.5182)	0.5998		(0.4733)
Other	-0.0340		(0.7775)	0.7052		(0.5518)	-0.6348		(0.5125)
Sport	-1.2856		(0.8973)	0.0701		(0.5576)	0.3350		(0.5149)
Advocacy	-0.0906		(0.9206)	0.8162		(0.6559)	-0.7295		(0.6225)
Social	0.1027		(0.7122)	0.2621		(0.5224)	-0.2573		(0.4782)
Leisure	-0.3206		(0.9969)	-0.1122		(0.6752)	0.2158		(0.6160)
Charity	0.0609		(0.9324)	0.0411		(0.7073)	-0.1190		(0.6326)
Health	0.1988		(0.7676)	-0.0185		(0.5883)	-0.1867		(0.5292)
Youth	-1.2039		(0.8800)	0.8089		(0.5916)	-0.2306		(0.5478)
Culture	-0.5131		(0.9052)	-0.0915		(0.6041)	0.2338		(0.5547)
Economy	-0.3714		(0.8828)	-0.5199		(0.7017)	0.4892		(0.6116)
Young	1.8498	***	(0.4654)	-0.3507		(0.3760)	-0.5634	^	(0.3231)
Adults	1.0029	*	(0.4636)	0.4643		(0.3101)	-0.7802	**	(0.2925)
Older	0.4883		(0.6089)	0.9792	**	(0.3748)	-1.0535	**	(0.3697)
In difficulty	0.5260		(0.4740)	0.2401		(0.3252)	-0.4068		(0.3037)
Ill	1.1959	^	(0.6858)	0.1490		(0.6202)	-0.6555		(0.5224)
Handicap	0.6271		(0.6118)	1.0619	**	(0.4055)	-1.2317	**	(0.4101)
M	0.5801	*	(0.2911)	0.2090		(0.1992)	-0.4469	*	(0.1862)
50–65	0.2107		(0.3246)	-0.4193	^	(0.2263)	0.3033		(0.2082)
<50	0.1980		(0.3639)	-0.1301		(0.2400)	0.0581		(0.2246)
1–10 h	-0.8143	*	(0.3239)	-0.1831		(0.2264)	0.5033	*	(0.2122)
<1 h	-1.5084	**	(0.4815)	-0.5738	*	(0.2933)	1.0388	***	(0.2748)
Contact - N	-0.0397		(0.3591)	-0.4797	*	(0.2405)	0.4354	*	(0.2203)
Chosen suspension	0.2875		(0.4884)	-0.1647		(0.3767)	0.0113		(0.3334)
Imposed suspension	0.6430		(0.4666)	0.2068		(0.3482)	-0.4049		(0.3210)
Closure	-0.2758		(0.3997)	0.2599		(0.2431)	-0.1462		(0.2284)
-2Log(Likelihood)	48.43	**		47.24	**		72.10	***	
R^2(Nagelkerke)	0.1455			0.1003			0.1407		
N	664			664			664		

Notes: Standard errors in parentheses. Comparison groups for categorical variables are the same as the previous table. For each regression conducted for this variable, 1 is assigned to the modality tested, 0 is assigned to the other modalities. ^ : $p<.10$; * $p<.05$; ** $p<.01$ and *** $p<.001$.

Discussion

This section lists the research questions and their final status. The discussion then moves on to the implications for the community and then for *Recherches & Solidarités* and researchers; as they are targets for a community-engaged research.

Research Questions Statement

Table 6 proposes a synthesis of the results and contributions in particular for countries building their vaccination strategy. The answers to the research questions are

Table 6 A summary of the results and contributions

	Conducted analysis	Result	Comment	Contribution for other countries
Research question 1 (RQ1): To what extent has the pandemic weakened volunteering?	Study of the impact of the Covid-19 pandemic on volunteering	22.5% of volunteers stopped their activities due to fear of the virus (not due to administrative closure). 27.6% of NPOs were closed.	Vulnerable groups, as beneficiaries of these volunteers, have lost the support of these volunteers.	The social impact of the forced closure of NPOs must be questioned, especially when they target vulnerable groups.
Research question 2 (RQ2): How can volunteer status be linked to vaccination willingness?	Analysis of willingness to be vaccinated within volunteers	NPO volunteers were more likely to want to be vaccinated than the rest of the population. Volunteers who suspended their activity were more likely to be vaccinated.	If volunteers had been prioritized in the vaccination strategy, more people could have returned to support NPOs' beneficiaries.	The inclusion of volunteers in the list of key occupations and activities is a relevant avenue to explore, depending on the national context.
	Analysis of the return to the field of volunteers who suspended their activity	15% of volunteers refuse to get involved without a vaccine, especially those over 65.	Volunteers over 65 are the most numerous in French NPOs.	Prioritization by age could be coupled with prioritization by core occupation or activity.
	Analysis of the link between volunteering and desire to be vaccinated	35% of volunteers see a link between the two.	Volunteers who do not see a link between the two are those who are not very involved and who are not in contact with the public.	The link between vaccination and volunteering exists among those most involved and in contact with the public, of which NPOs are the most dependent.

quite clear. On the one hand, in response to RQ1 (To what extent has the pandemic weakened volunteering?), the Covid-19 crisis had a massive effect on volunteering. On the other hand, in response to RQ2 (How can volunteer status be linked to vaccination willingness?), the link between vaccination and volunteering is not obvious. However, when conducting regression analyses, the link appears: the most committed people and those in the field are particularly concerned. If the volunteers had been among the priority groups to be vaccinated, people would have been able to return to their beneficiaries more quickly (since they had stopped their activities because of the virus).

In order to answer the research question RQ3 (To what extent has the community-engaged research conducted by Recherches & Solidarités served the NPOs?), the chosen method unfortunately did not lead to changes in public vaccination policy in France in 2021. Presently, the French vaccination strategy is to target hesitant people and no longer to prioritize fragile people. We therefore have a little hindsight on the present French strategy. Nevertheless, the French experience of prioritization by age can provide lessons for other countries developing their vaccination strategy. The horizon of this community-engaged research is thus broader than expected, even

if it had not a direct effect on the French community, except for the 66 vaccinated volunteers.

Implications for the Community (Public Authorities and NPOs)

First of all, the results show a nonprofit sector in difficulty due to the suspension of the commitment of certain volunteers (Table 2). In social, health and charity NPOs, 40% of volunteers between 50 and 75 have withdrawn while needs are increasing. People who are ill or in difficulty need volunteers from NPOs in addition to the accompaniment of healthcare professionals. However, they are deprived of a part of their action. The results then show greater vaccine acceptance among volunteers in the social, health and charity sectors (Table 3). In other words, not including volunteers among essential workers can be seen as a gap opened by previous studies and health recommendations.

Volunteers in priority sectors (maybe identified by public authorities) could thus be added to essential workers. This could protect NPOs' viability, because they have few resources and often only have their volunteers to run their operations and carry out their mission with a positive social impact. In addition, beyond the health and social sectors, volunteers from the sports and cultural sectors, from community animating sectors and sectors with low dematerialization capability could also be integrated in a later phase. NPOs indeed have an important societal role to counter the negative effects of the health crisis.

Second, NPOs may have a role in promoting vaccination, even if it is limited to their communities. Within volunteers in hesitation or against vaccination, a nudge from their NPOs can make them to rethink about it, even if it only concerns 36% of them. These results illustrate recent publications on the subjective nature of the individual vaccine decision. Chou and Budenz (2020) indeed invites to "activate positive emotions" to reinforce the "prosocial motivations" of people hesitating to be vaccinated.

The positive message sent by NPOs promoting vaccination for their members can have a great impact. Through direct discourse or communication on their internal vaccination policy, NPOs become opinion makers for their community. Such action is a key to success of the vaccination strategy (French et al., 2020; Schoch-Spana et al., 2020). With 12.5 million volunteers (Bazin et al., 2022), French GVOs have a large community that could be sensitized. This is also the case for other countries.

Implications for *Recherches & Solidarités* and for Scholars

There is also a contribution for *Recherches & Solidarités*. In view of the results, their proposal can be seen as relevant. In particular, the organization was concerned about interruptions in volunteering in the social, health and charitable sectors. The proposal meets its objective: volunteers in these sectors were willing to be vaccinated. Immediate practical and professional contributions existed: (1) for the design of health initiatives with NPOs, (2) in order to justify the legitimacy and relevance of these initiatives to the public authorities, (3) to prevent wastage of vaccine doses and (4) to ensure that vaccinated volunteers were able to return to the field.

The general public and the press embraced the initiative, but the paradox between centralized health decision-making and decentralized initiatives (Yang, 2020) remained strong in France and the experimentation was not generalized. Even if this initiative has not found its place in France, the present survey has demonstrated that volunteers are a relevant public in the vaccination strategy.

If the authorities had retained the proposed criteria (of age and sector of activity), the vaccination policy would not have been upset. 20.3 million of French people are between 50 and 74. 4.85 million are volunteers, and more precisely 1.5 million in the health, charity and social sectors. According to the survey conducted, 61% of the target population are in the field, i.e. 915,000 volunteers. 71% would be willing to be vaccinated, or 650,000 people. The proposed initiative therefore covers less than 1% of the French population. In this, this proposal can be generalized internationally and the experimentation (Sebbag et al., 2021) could inspire other countries.

The results also provide information on public governance and NPOs' capacity building. On the one hand, the results highlight the limitations of centralized vaccine logistics and of a top-down approach. While one vaccination center implemented an accurate and cost-effective process, it has not been replicated. The public administration suffered from a lack of organizational learning and recognition of local initiatives. On the other hand, based on recent research on non-profit capacity (Nordin et al., 2022), some lessons can be drawn. First, the dependence of NPOs on volunteers largely explains the organizational failures. The pandemic has given rise to a new practice of remote volunteering that could help to overcome this shortcoming. Second, while financial aspects are often crucial, here, NPOs would have needed above all clarity on health measures. At the beginning of 2021, France was experiencing a new Covid-19 wave that finally led to a new lockdown. The uncertainty was very difficult to manage and the non-profit capacity also relies on trusting relationships with partners. Finally, NPOs have demonstrated their capacity for innovation and absorption of shocks as global as a pandemic. While there is a tendency to attempt to impose corporate practices on NPOs, it is undoubtedly a good idea to draw inspiration from what NPOs have done to survive.

Conclusion

This article is based on a community-engaged research conducted by a collaborative network of professionals and scholars. It sought to put NPOs and volunteers at the heart of the vaccine strategy. These people are still neglected in prioritization policies despite the inclusion of essential workers in some of the vaccination plans.

The results of the statistical analyses show that the NPO sector is suffering from the health crisis and is lacking of human resources. The potential of this sector to act against the current crisis is highlighted too.

This article therefore calls for adaptations and agility (Joyce, 2021) in the vaccination strategy, such as the initiative led by *Recherches & Solidarités*, or for a strong signal sent to volunteers in strategic sectors by including them in an earlier phase of the vaccination plan.

This article has thus responded to the scholars' demands, both in terms of analyzing the role of NPOs despite their limited resources (French et al., 2020) and in terms of surveys of specific sub-populations to understand their attitudes and beliefs towards Covid-19 (Schoch-Spana et al., 2020). It also extended the analysis and ground proposal of a non-profit actor into a possible public policy. Finally, the French vaccination policy is now open to all persons who wish to be vaccinated. In the short and medium term, the results of this article may be useful to other countries with the same problems of access to vaccine doses. In the longer term, the findings could inspire French and other countries' considerations on vaccine policies and potential prioritization.

This article has essentially theoretical limitations: its aim has been to discuss the French authorities' vaccine strategy. It is therefore not anchored on a theoretical framework to be tested with hypotheses. Furthermore, the survey was produced by *Recherches & Solidarités* with no possibility of adjusting the questions or the diffusion. These limitations could be overcome by including a theoretical framework such as the terror management theory (e.g. Pyszczynski et al., 2021) and producing a survey with a mixed methodology. In addition, this limitation may be of interest to other researchers involved in community-engaged research. It seems important to reinsert the conceptual and theoretical issues earlier in the process to avoid the pitfall encountered here.

Finally, the impact of including volunteers in the vaccination strategy is a new research direction. A survey taking into account the current context of a majority of vaccinated people versus a resistant minority might be useful. Finally, understanding why the French authorities never retained the initiative proposed by *Recherches & Solidarités* would be useful, in line with Baekkeskov (2016).

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Data Availability The data that support the findings of this study are available from *Recherches & Solidarités*.

Declarations

Informed Consent: Respondents in the data have freely chosen to answer the questionnaire online. All data is stored without any identifying information.

Ethical Approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Conflict of interest The author is a board member and a member of the expert committee of *Recherches & Solidarités*, and receives no compensation.

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