



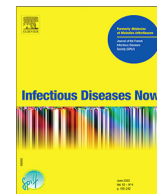
Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Available online at  
**ScienceDirect**  
[www.sciencedirect.com](http://www.sciencedirect.com)

Elsevier Masson France  
**EM|consulte**  
[www.em-consulte.com/en](http://www.em-consulte.com/en)



## Original article

# Attitudes of healthcare professionals toward the COVID-19 vaccination campaign in France

J.E. Mueller<sup>a</sup>, J. Bauer<sup>b,\*</sup>

<sup>a</sup>École des hautes études en santé publique (EHESP), Rennes, France

<sup>b</sup>Service Universitaire des Maladies Infectieuses et du Voyageurs, CH Dron, 59200 Tourcoing, France

## ARTICLE INFO

Article history:  
 Available online xxxx

Keywords:  
 Covid vaccination  
 Vaccine hesitancy  
 Health care workers  
 Flu vaccination

## Summary

During the Covid outbreak, very few health professionals took an extreme position of vaccine refusal. Some differences were observed in terms of theoretical acceptance of the 2018 influenza vaccination campaign and COVID-19 vaccination in winter 2020–2021.

The features most frequently associated with vaccine acceptance were: benefit-risk perception favoring vaccination (OR 13.5 [10.1–18.0]), absence of fear of a serious adverse effect (OR 8.7 [6.8–11.2]), employer's incentive perceived as motivating (OR 7.3 [4.1–13.2]), notion that vaccination is a collective response to the crisis (OR 5.3 [3.4–8.2]), favorable family opinion (OR 4.6 [3.6–6.0]) and fear of a severe form of COVID-19 (OR 1.8 [1.4–2.4]).

Vaccine hesitancy has been characterized as a continuum between an individual who accepts all vaccinations and others who refuse all vaccinations. Among health professionals in France, there is a selection process at the time of hiring due to the requirement of vaccination against hepatitis B. As a result, very few health professionals who take an extreme position of vaccine refusal. Attitudes toward COVID-19 vaccination were generally more extreme with more caregivers accepting vaccination in all scenarios (43.9% vs 9.9% during the influenza vaccination campaign) but also with more caregivers refusing vaccination in all scenarios (17.2% vs 9.9% during the influenza vaccination campaign).

In two preference studies presenting series of vaccination scenarios to French healthcare professionals, differences were

observed in terms of theoretical acceptance of the 2018 influenza vaccination campaign and COVID-19 vaccination in winter 2020–2021 [1,2]. Attitudes toward COVID-19 vaccination were generally more extreme, with more caregivers accepting vaccination in all scenarios (43.9% vs 9.9% during the influenza vaccination campaign) but also with more caregivers refusing vaccination in all scenarios (17.2% vs 9.9% during the influenza vaccination campaign). As is often the case, overall hypothetical acceptance was greater among doctors than among paramedical professionals. To summarize, we observed that about one third of healthcare professionals readily accept vaccination, while about half of them accept vaccination in certain scenarios, depending on the characteristics of vaccination presented.

The factors impelling healthcare professionals to accept influenza vaccination were the potential for epidemic and disease control, and the protection of patients and families [3]. In addition, higher vaccine effectiveness and longer duration of protection, along with more extensive coverage among colleagues, had a positive impact. On the other hand, messages from hospital management had no impact, while the offer of badges “I’m vaccinated” was seen as dissuasive.

As regards vaccination against COVID-19, these factors seem to have been similar, albeit with a negative impact of the uncertainty about vaccine effectiveness and duration of protection (unknown at the beginning of the campaign). The absence of indirect protection and the argument of a favorable benefit-risk balance of vaccination if a severe side effect was known had negative impacts, as well [2].

In a study on Covid-19 vaccine intentions among healthcare professionals in France at the beginning of the campaign, the

\* Corresponding author.  
 E-mail address: [bauerjules@gmail.com](mailto:bauerjules@gmail.com) (J. Bauer).

prevalence of intentions was dynamic and increased in all categories of health professionals, between December 2020 and February 2021. In a similar survey in late summer 2021, the percentage of healthcare workers declaring vaccination before summer (before announcement of obligation) was similar to that of persons with intention to accept a third dose, should it be recommended (unpublished data). This suggests that by then, vaccine acceptance had reached a plateau.

As of now, five components or psychological antecedents of vaccine hesitancy and acceptance have been cited: confidence in vaccines and the system that delivers them, complacency (e.g., not perceiving diseases as high risk), constraints (perception of structural barriers), calculation (engagement in extensive information searching and weighing of risks higher than benefits), collective responsibility (determination to protect others) and convenience (perception of practical barriers) [4]. Additional factors such as social conformity and confidence in the wider system (leading to reactance against vaccine promotion) may likewise be brought into play [5].

Among the factors associated with vaccination intention among healthcare professionals at the beginning of the vaccination campaign, we found: benefit-risk perception in favor of vaccination (OR 13.5 [10.1–18.0]), absence of fear of a serious adverse effect (OR 8.7 [6.8–11.2]), employer's incentive perceived as motivating (OR 7.3 [4.1–13.2]), notion that vaccination is a collective response to the crisis (OR 5.3 [3.4–8.2]), favorable family opinion (OR 4.6 [3.6–6.0]) and fear of a severe form of COVID-19 (OR 1.8 [1.4–2.4]). After the announcement in summer 2021 of mandatory vaccination, the factors most strongly associated with healthcare professionals' having received the Covid-19 vaccination were the notion that vaccination is a collective response to the crisis and a (very) favorable opinion on Covid-19 vaccination among family and friends. The motivating factor most strongly associated with intention for a booster dose was perceived employer incentive. (CAPP-VaCov study, unpublished

data). These data illustrate the major role of interpersonal factors in vaccine acceptance.

### Disclosure of interest

The authors declare no conflict of interest.

### Funding

The meeting in which this topic was presented was funded by the French Infectious Diseases Society (SPIILF).

### Authors' contributions

All authors contributed equally to this work.

### References

- [1] Mueller JE, Olivier C, Diaz Luevano C, Bouvet E, Abiteboul D, Pellissier G, et al. Cross-sectional study on the seasonal flu and COVID-19 vaccination intentions of healthcare professionals: Which levers for vaccine promotion? *Bull Epidemiol Hebd* 2021(Cov\_2):2–9. , [http://beh.santepubliquefrance.fr/beh/2021/Cov\\_2/2021\\_Cov\\_2\\_1.html](http://beh.santepubliquefrance.fr/beh/2021/Cov_2/2021_Cov_2_1.html).
- [2] Díaz Luévano C, Sicsic J, Pellissier G, Chyderiotis S, Arwidson P, Olivier C, et al. Quantifying healthcare and welfare sector workers' preferences around COVID-19 vaccination: a cross-sectional, single-profile discrete-choice experiment in France. *BMJ Open* 2021;11:e055148.
- [3] Godinot LD, Sicsic J, Lachatre M, Bouvet E, Abiteboul D, Rouveix E, et al. Quantifying preferences around vaccination against frequent, mild disease with risk for vulnerable persons: A discrete choice experiment among French hospital health care workers. *Vaccine* 2021;39:805–14.
- [4] Betsch C, Schmid P, Heinemeier D, Korn L, Holtmann C, Böhm R. Beyond confidence: Development of a measure assessing the 5C psychological antecedents of vaccination. *PLoS ONE* 2018;13:e0208601.
- [5] Moirangthem S, Olivier C, Gagneux-Brunon A, Pellissier G, Abiteboul D, Bonmarin I, et al. Social conformism and confidence in systems as additional psychological antecedents of vaccination: a survey to explain intention for COVID-19 vaccination among healthcare and welfare sector workers, France, December 2020 to February 2021. *Eurosurveillance* 2022;27:2100617.