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Public vaccination reluctance: What makes us change our minds? Results of a longitudinal cohort survey.

Authors' information:

Paweł Waszkiewicz, Faculty of Law and Administration, Department of Criminalistics, University of Warsaw, Krakowskie Przedmieście 26/28, 00-927 Warsaw, Poland

Piotr Lewulis, Faculty of Law and Administration, Department of Criminalistics, University of Warsaw, Krakowskie Przedmieście 26/28, 00-927 Warsaw, Poland

Michał Górski, Faculty of Law and Administration, Department of Criminalistics, University of Warsaw, Krakowskie Przedmieście 26/28, 00-927 Warsaw, Poland

Adam Czarnecki, ARC Rynek i Opinia, Market Research Institute, Słowackiego 12, 01-627 Warsaw, Poland

Wojciech Feleszko, Department of Pediatric Pulmonology and Allergy, Medical University of Warsaw, Żwirki i Wigury 63A, 02-091 Warsaw, Poland

Corresponding author:

Paweł Waszkiewicz, p.waszkiewicz@uw.edu.pl Krakowskie Przedmieście 26/28, 00-927 Warsaw, Poland

Public vaccination reluctance: What makes us change our minds? Results of a longitudinal cohort survey.

December 2021 marks two significant anniversaries associated with the COVID-19 global pandemic: the first case of COVID-19 was identified in December 2019 and in December 2020 several countries approved the deployment of vaccines against the virus. The development and production of vaccines at an unprecedented pace made rapid immunization possible for billions of people worldwide and vaccination remains the most effective method of fighting against the virus. Assuming an R_0 of 6 for the Delta variant, the herd immunity threshold (i.e., the proportion of people who would need to be fully vaccinated, infected, or both, to interrupt endemic transmission) would need to be greater than 85%¹. However, COVID-19 immunization rates are still unsatisfactory in most countries, with vaccination programs being relatively inefficient even in the G20's most developed countries. By November 2021, only 59% of eligible Americans^{2,3} and 68% of eligible EU citizens⁴ were vaccinated. Notably, the rates of vaccination are affected by

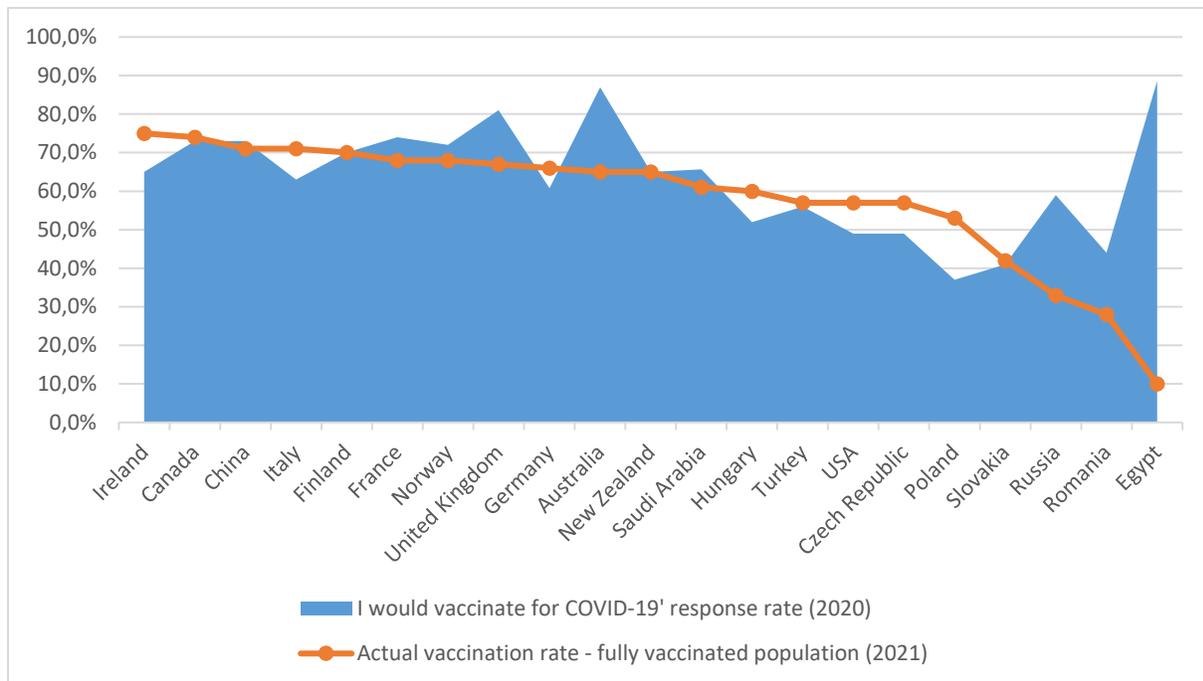
country-specific variables associated with vaccine production, planning, and distribution⁵ and each country may be subject to a separate in-depth analysis. However, there is at least one universal phenomenon responsible for low COVID-19 immunization rates: vaccination hesitancy or reluctance (which, being aware of their distinctiveness, will be hereby treated jointly as positions of those who do not express the will to be vaccinated).

In June 2020, we presented an overview of international attitudes towards COVID-19 vaccination, indicating that low vaccination acceptance is common in many nations⁶. At the time, the question of vaccination willingness was hypothetical. Almost one year after vaccine deployment, hesitancy continues to result in hundreds of millions of people worldwide deciding not to vaccinate against COVID-19.

Comparing the previously expressed willingness to vaccinate⁶ with current COVID-19 vaccination rates³, consistency is observed in some countries but is divergent in others (Table 1).

Table 1. An international overview of the willingness to vaccinate against COVID-10 (in 2020) and the actual vaccination rate in 2021.

Country	'I would vaccinate for COVID-19' response rate (2020)	Actual vaccination rate - one dose (2021)	Actual vaccination rate - fully vaccinated population (2021)
Ireland	65%	76%	75%
Canada	73%	78%	74%
China	73%	76%	71%
Italy	63%	77%	71%
Finland	70%	76%	70%
France	74%	76%	68%
Norway	72%	77%	68%
United Kingdom	81%	73%	67%
Germany	60%	69%	66%
Australia	87%	75%	65%
New Zealand	65%	76%	65%
Saudi Arabia	66%	69%	61%
Hungary	52%	62%	60%
Turkey	56%	65%	57%
USA	49%	66%	57%
Czech Republic	49%	58%	57%
Poland	37%	54%	53%
Slovakia	41%	46%	42%
Russia	59%	38%	33%
Romania	44%	29%	28%
Egypt	89%	17%	10%



Since COVID-19 vaccination is not mandatory, discrepancies between the willingness to vaccinate (expressed in 2020) and actual (2021) immunization rates indicate changes in individual attitudes towards the issue. To avoid mandatory vaccinations, it is necessary to accurately identify the reasons behind such changes and discrepancies. Evidenced-based strategies and guidelines to encourage vaccination among those that are hesitant are being designed by various public health professionals and divisions (e.g., the CDC⁷, GAVI⁸, and RAND⁹). However, due to the understandable lack of existing research specific to COVID-19 vaccination hesitancy, these policies are based on declared, empirically unverified, reasons for changing attitudes. To address this issue, we conducted a longitudinal study to determine the extent of individual declarations of intent and subsequent real-life actions.

In 2020, 38% of responders declared a positive attitude towards COVID-19 vaccination (Group A) and they usually (86%) followed through with receiving their immunization by 2021. Out of the 25% of respondents who declared vaccine reluctance in 2020 (Group B), the majority (68%) remained unwilling, and did not plan, to vaccinate against COVID-19 in 2021. Notably, the majority of individuals who were vaccine-hesitant in 2020 (Group C, comprising 36% of respondents) had received at least one dose of a COVID-19 vaccine (53%) or planned to be vaccinated (16%; Table 2). These findings demonstrate that individual decisions on vaccination may change over time, potentially leading to a rise in vaccination acceptance.

Table 2. Intention to vaccinate (2020) versus actual vaccination acceptance (2021).

Response type	In 2020 (n=438):	In 2021:
I would vaccinate	38%	(n=169)
I am vaccinated (at least one dose)		79%
I am planning to get vaccinated		12%
I do not plan to vaccinate		9%
I would not vaccinate	25%	(n=111)
I am vaccinated (at least one dose)		27%
I am planning to get vaccinated		6%
I do not plan to vaccinate		67%
I do not know/I am not sure	36%	(n=158)
I am vaccinated (at least one dose)		57%
I am planning to get vaccinated		16%
I do not plan to vaccinate		27%

Moreover, after one year, study respondents were asked to disclose the reasons behind their vaccination decisions, in an effort to understand the reasons motivating individuals' choices to vaccinate despite previous hesitation or reluctance. Among previously vaccine-reluctant individuals (Group B), the main reasons included concern about their health and safety (50%) and their desire to travel (26.6%) – which is significantly more difficult without COVID-19 vaccination certification. Vaccine-hesitant individuals (Group C) also indicated health and safety as their primary concern (69%), as well as the pursuit of herd immunity and a notion of common social safety (12.6%; Table 3).

Table 3. Reasons for individual change of attitude towards COVID-19 vaccination among those who declared COVID-19 vaccination hesitance or reluctance (in 2020), although vaccinated in 2021.

Attitude towards COVID-19 vaccination in 2020 and 2021 (n=438)	Reason for changing the attitude (as declared in 2021)	
Individuals vaccine reluctant in 2020, but vaccinated or planning to in 2021 (n=30)		
	Concerns for own health and safety	50,0%
	Wanting to travel and to end the restrictions	26,6%
	Peer pressure and persuasion	3,3%
	The pursuit of herd immunity and common safety	3,3%
	I don't know	6,7%
	Other reasons	10,0%
Individuals vaccine hesitant in 2020, but vaccinated or planning to in 2021 (n=87)		
	Concerns for own health and safety	69,0%
	Wanting to travel and to end the restrictions	10,3%
	Peer pressure and persuasion	3,4%
	The pursuit of herd immunity and common safety	12,6%
	Other reasons	4,6%

The main factors helping to increase vaccination acceptance are based on a self-centered pursuit of safety and freedom from restrictions. Contrary to government's communication practices would suggest, the study participants did not confirm the theory of celebrities' and public figures' influential power on promoting COVID-19 vaccination. Therefore, immunization promotion strategies should focus more on the personal health risks associated with COVID-19 and the social benefits of vaccination.

Vaccination hesitancy is not a new phenomenon and COVID-19 is not the last global public health threat. Thus, it is essential to understand the factors that influence people's decisions about vaccination and changes in viewpoints to prepare effective vaccination strategies for a healthy future.

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Conflicts of interest:

None declared

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Supplementary information:

(i) On 2–9 June 2020, we conducted an opinion survey in Poland through an online omnibus survey tool. Quota sampling and statistical weighting by gender, age, region, and city size were applied to make the sample representative of Poland's offline adult population (aged 18–65). The survey was completed on <https://epanel.pl/> (n=1066) in an online opt-in panel operated by the ARC Rynek i Opinia Independent Research Institute. Cadas software was used for online self-completed questionnaires (CADAS Software Sp. z o.o., Warsaw, Poland) and then multichoice question items were randomized. Weighted response frequencies were calculated using SPSS software. Statistical analysis was completed and any subgroup differences were statistically significant with a 95% confidence interval. The data file provided by the Research Institute contained no personally-identifying information.

Among other questions, the survey questions targeted the respondent's declared will to vaccinate against COVID-19 (once a vaccine is available to the public, which was hypothetical at the time). A selection of answers was provided: Yes (I am willing to vaccinate), No (I will not get vaccinated), and I do not know (I am unsure).

(ii) On 4-10 August 2021, a follow-up survey was conducted using the same tools and methodology as described above. The same group of respondents (n=1000) that were registered at the epanel.pl were invited to participate; however, only 43% (n=438) of participants from the first wave responded to the follow-up survey. The participants were assigned individual (but anonymized) codes allowing the researchers to link responses across years.

The survey participants were asked whether or not they had been vaccinated against COVID-19. Quantitative analysis provided a change-in-attitudes scale towards COVID-19 vaccination.

Among those participants who took part in the 2020 study, those who declared COVID-19 reluctance or hesitation but finally got vaccinated (n=117) were asked about the reasons for changing their attitudes. The question was open-ended (i.e., freeform text box) and the responses were subject to basic qualitative analysis to determine reasons why those previously unwilling to vaccinate decided to do so.