

## COVID-19 Vaccine Hesitancy Behavior among Algerian Adults at the Onset of the Fourth Wave of Corona Virus Pandemic

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### Abstract

**Objective:** Refusal and hesitancy are obvious manifestations of negative attitudes toward COVID-19 vaccines. The majority of Algerians are reluctant to uptake COVID-19 vaccine. The goal of this study is to identify factors that influence attitudes toward the COVID-19 vaccine, in order to create behavior change communication campaigns, and a well-designed national strategy to achieve herd immunity.

**Methods:** To collect data a semi-structured questionnaire was administered to a convenient sample of 1015 adults (50.24 % females and 49.76 % males). Their mean age was  $35.9 \pm 12.3$  years. Of whom, 64.53 % were urban residents and 35.47 % were rural residents. Their education level ranged from primary education (7.40 %), high school (27.57 %), and Bachelor's degree (49.75 %) to postgraduate (15.28 %). As for their employment status, respondents were distributed between three main categories, namely, health care professionals (27.09 %), employed outside health care sector (40.39 %) and unemployed (32.51 %).

**Findings:** The findings showed that only a third of participants have positive attitudes toward vaccines, while the majority of participants (63.55%) have negative attitudes toward the Covid-19 vaccine. Positive attitudes toward COVID-19 vaccination are primarily influenced by underlying personal beliefs about the vaccine's advantages. The participants' "naive explanation of the COVID-19 pandemic", reliance on traditional medicine (indigenous medicine), natural immunity, and "Mistrust towards health authorities" are the primary causes of their negative attitudes toward the COVID-19 vaccination.

**Conclusion:** To remove roadblocks to a national pandemic-eradication strategy, sheer evidence is available to develop behavior change communication campaigns.

**Key words:** COVID-19 vaccination, Communication campaigns, Naive explanation of COVID-19 pandemic, Mistrust towards health authorities.

### Introduction

The coronavirus pandemic is an infectious disease caused by the recently discovered SARS-CoV-2 virus. After emerging in Wuhan, China in late 2019, this outbreak quickly spread across the world, largely

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disrupting the basic activities on which human beings depend, including agriculture and food systems [1].

The best way to prevent adverse consequences of coronaviruses is to take the appropriate vaccinations. Vaccines save millions of lives every year. The development of safe and effective vaccines against COVID-19 was a huge step forward towards ending the pandemic.

COVID-19 vaccines provide strong protection against severe illness and death. The World Health Organization has reported that the risk of dying from COVID-19 among unvaccinated people is at least ten times higher than among vaccinated individuals. There is also evidence to suggest that receiving the vaccine can help prevent transmission of the virus from one individual to others.

Attitudes towards the COVID-19 vaccine among the general population worldwide is a rapidly changing process [2-4]. For reasons like, trust in the perceived safety of vaccines, free access to vaccines, misinformation regarding the vaccine, fear of having side-effects, fear of faulty/fake vaccine, government conspiracies etc. [3,5-7]. Such an attitude is not new or inherent to a specific population; it is a common phenomenon in many countries [3,4,8,9]. The causes behind vaccine hesitancy/refusal are various and somehow unclear [3]. Socio-demographic and psychological factors, are at the forefront in the argument. Public mistrust towards healthcare professionals and health authorities [3,6,10-12]. Misinformation, mistrust in science and in vaccination / conspiracy theory [13,14]. Worries about unforeseen side effects of the vaccine and preference of natural immunity are among the prominent factors behind vaccine hesitancy / refusal attitudes [15-17].

Misinformation is another big hurdle in front of vaccination campaigns, particularly campaigns of COVID-19 vaccination, as the information spreads rapidly via digital and physical information systems making it difficult to distinguish between which is true and which is false. The World Health Organization Director-General described the phenomena as "infodemic" [18].

As of December 21, 2021, statistics of Covid-19 vaccination by showed that 5.61 million (12.8%) of the Algerian population were fully vaccinated (received two doses), and 7.06 million (16.1%) received their first dose [19,20]. With a total population of 44.6 million and a target, 70% of the population for vaccination (31.2 million). Which means that the majority of the population are reluctant to be vaccinated against COVID-19. At the same time, 42.7% of the world populations are vaccinated.

Given that, the country started the vaccination campaign with the first 30 doses on January 30, 2021, with a free access to vaccines and availability in healthcare centers all over the country, since March 2021. At the onset of the fourth wave of corona virus pandemic, these figures show that the vaccination campaign has not convinced large numbers of the population, and did not reach its target goal of 70% of the population taking at least their second jab, due to a vaccine hesitating or refusal behavior among large segments of the population. The question that arises is what

causes are behind vaccine hesitancy in the Algerian context? An understanding of public attitudes towards COVID-19 vaccines and associated factors in the light of the COVID-19 pandemic is urgently needed to tailor appropriate public health messages and actions, and consequently to direct policy making and intervention measures in order to boost the rate of vaccination and increase the willingness of the people to receive the vaccine. To achieve these goals, the present study aims at determining causes and predictors of positive and negative attitudes towards abstaining from or taking vaccine.

## Methods

### Participants

A convenient sample of 1015 including 510 (50.24 %) females and 505 (49.76 %) males participated in this study. Most of the respondents (69%) were willing to participate in the research. As for the rest, they are located near the researchers' areas geographically (17%) and work colleagues (14%). Their mean age was  $35.9 \pm 12.3$  years. Of whom, 64.53 % (510) were urban residents and 35.47 % (360) were rural residents. Their education level ranged from primary education (7.40 %), high school (27.57 %), and Bachelor's degree (49.75 %) to postgraduate (15.28 %). As for their employment status, respondents were distributed between three main categories, namely, health care professionals (27.09 %), employed outside health care sector (40.39 %) and unemployed (32.51 %). Participants' informed consent was obtained, after they all were told that the data collected would only be used for scientific purposes.

### Instruments

A semi-structured questionnaire was used to collect data; it was administrated in person, and composed of two sections, demographic characteristics of the participants, and predicting causes of attitudes towards COVID-19 vaccine items. The first section consisted of five items questioning the participants' age, sex, education level, place of residence, and employment status. While the second section consisted initially, of one question surveying participants' hesitating or refusal behavior towards COVID-19 vaccine: "have you undertaken a COVID-19 vaccine?" If "yes", "why?", and if "not", "why?" Researchers themselves handed out the questionnaires to the male participants. Out of respect for Algerian customs and traditions, two female students from the University of Oran were hired to deliver the questionnaires to the women.

With regard to the psychometric characteristics of the questionnaire, the validity of the scale was confirmed by using the validity of the content, as the questionnaire was presented to three arbitrators (work colleagues) who indicated the content of the tool measures the dimensions and concepts of the questionnaire. The reliability was confirmed using Cronbach's alpha equation. It was found that the reliability coefficient was (0.87).

### Data analysis

Data analysis went through two steps. First, respondents were grouped into two categories. Those who have

undertaken a COVID-19 vaccine, named “the positive attitudes category”, and those who did not take the vaccine, named “the negative attitudes category” (Table 1). Second, responses of each category were grouped into categories of causes, that is, the factors behind the participant’s decision to undertake or not the COVID-19 vaccine. The outcome resulted in the following factors influencing positive attitudes (drivers to take covid-19 vaccine):

- To protect family & those round me
- As a preventive measure
- To boost my immunity
- Convinced of covid-19 and vaccine benefits
- Administrative raisons (vaccine pass / be free to travel..).

While the factors behind the participants’ decisions to abstain from taking Covid-19 (i.e. factors influencing negative attitudes of participants towards Covid-19 vaccine) were grouped into the following five categories:

- Relay on natural immunity / traditional medicine
- To avoid negative effects on immunity system
- Mistrust in science and in vaccination / conspiracy theory
- Mistrust towards healthcare professional’s/health authorities
- For health reasons (flu, Covid-19 patient, pregnancy)

The frequency and percentage in each response category was calculated, as shown in table 2 and 3.

Attitudes	n (Number)	(Percentage)%
Positive Attitudes	370	36.45
Negative Attitudes	645	63.55
Total	1015	100%

**Table 1:** Attitudes of participants towards Covid-19 vaccine (N = 1015).

Factors influencing positive attitudes (drivers to take covid-19 vaccine)	n (Number)	(Percentage)%
To protect family & those round me	170	45.95
As a preventive measure	115	31.08
To boost my immunity	45	12.16
Convinced of covid-19 and vaccine benefits	25	6.76
Administrative raisons (vaccine pass / be free to travel..)	15	4.05
Total	370	99.99%

**Table 2:** Factors influencing positive attitudes of participants towards Covid-19 vaccine (n = 370).

Factors influencing attitude (drivers to take or not covid-19 vaccine)	n (Number)	(Percentage)%
Relay on natural immunity / traditional medicine	220	34.11
To avoid negative effects on immunity system	200	31.01
Mistrust in science and in vaccination / conspiracy theory	96	14.88
Mistrust towards healthcare professionals/health authorities	74	11.47
For health reasons (flu, Covid-19 patient, pregnancy)	55	8.53

**Table 3:** Factors influencing negative attitudes of participants towards Covid-19 vaccine (n = 645).

## Results

Results in table 1, reveal that the majority of participants (63.55) exhibit negative attitudes towards Covid-19 vaccine, and just above a third of participants have positive attitudes towards vaccine.

Results in table 2, show that the main drivers to positive attitude towards covid-19 vaccine is the protection of family and others around the person (45.95 %) and as preventive measure for personal protection against health consequences of covid-19 (31.08 %). Boosting the participant’s immunity and conviction of vaccine benefits, with 12.16 % and 6.76 % of respondents respectively, giving a total of 18.92 % of participants, who are well acquainted with vaccine benefits, and had their vaccine jabs with personal conviction, while only 4.05 % of the participants were obliged to take the vaccine for administrative raisons (vaccine pass / be free to travel..).

Results in table 3 show five factor categories influencing negative attitudes of participants towards Covid-19 vaccine. Primarily, more than a third (34.11 %) of the respondents, who did not take the vaccine relay on their natural immunity and/or use traditional medicine. Secondly, the main raison behind refusing to take vaccine among 31.01 % of negative attitudes respondents was their convictions that, Covid-19 vaccine have or could have negative effects on their immunity system. Thirdly, 14.88 %, of them, mistrust/ do not believe in science and in vaccination and they would rather tend to believe in conspiracy theory. Mistrust towards healthcare professional’s/ health authorities was the fourth determinant cause of not taking covid-19 vaccine among 11.47 % of the negative attitudes respondents. While the health reasons like flu, covid-19 patient, pregnancy (which coincided with our investigation) was the main cause for not taking covid-19 vaccine among 8.53 % of those who did not have their vaccine.

## Discussion

Results of the present study (table 1), revealed that the majority of participants (63.55 %) exhibit negative attitudes towards Covid-19 vaccine, and just above the third of participants have positive attitudes towards vaccine. Similar studies on attitudes and beliefs have showed similar trend of negative attitudes towards COVID-19 vaccine among the general populations, including health care professionals [16,21]. Studies on the issue of positive/ negative attitudes towards Covid-19 vaccine showed contradictory results, depending on the demographic characteristics of the population. Health care professionals are more likely to be in favor of covid-19 vaccine uptake, particularly doctors [22-24]. Higher level of education has been reported to be associated with positive attitudes to covid-19 vaccine [25-27]. Older age groups have a significant association with a positive attitude against COVID-19 vaccination [23,28,29]. While other segments of the population, like, younger individuals, women, rural residents and those belonging to low income laborer classes are more on the negative attitudes side [16].

Factors influencing positive attitudes towards COVID-19

vaccination are mainly inherent to personal convictions on the benefits of the vaccine, like the individual protection, the protection of the family and those around the person against health consequences of covid-19 (results in table 2). This was confirmed by similar studies [24,30,31]. Mandatory measures from the government to get the vaccine (vaccine pass / freedom of travel), seems to be among the factors leading to positive attitudes towards COVID-19 vaccination in the present study and in a number of studies [23,32-34].

In contrast, the main factors driving in favor of negative attitudes towards COVID-19 vaccination, in the present study (more than 65 %); can be classified under “the naive explanation of COVID-19 pandemic” category, which rely on traditional medicine and natural immunity. This type of attitudes is present in many studies, under similar terms, like: unawareness, possible adverse effects of the vaccine, high mistrust in vaccines and preference for natural immunity, and among some socio-demographic groups, particularly younger individuals, women, and people who were less educated, had lower income, and living in a rural area [3,6,16,35,36].

The second category of respondents (26.35 %) can be classified under one heading called the “Mistrust towards official authorities” which includes health authorities, healthcare professionals and official modern science practices. Different forms of mistrust in vaccine during Covid-19 pandemic are reported in many studies, worries about the effectiveness of Covid-19 vaccine [37,38]. Concerns about the vaccine development process, vaccine distrust, peers’ groups with negative vaccine intentions were behind negative attitudes [21]. Mistrust in research and in vaccines, which requires fostering a climate of respectful mutual trust between science and society, as has been expressed by Palamenghi et al. (2020) [11].

Results of the present study questions the relation between official scientific institutions and the society. To earn public trust, government and scientific institutions should reexamine their own practices with respect to earning and maintaining public trust, as has been rightly advocated by Goldenberg, rather than explaining vaccine hesitancy as a matter of ignorance and misunderstanding of science by the public [39]. Experiences worldwide witness some successful vaccination campaigns, which have building trust with the community, and Trust in government communication to adopt protective behavior during the coronavirus disease 2019 (COVID-19) pandemic [40,41].

## Conclusion

In spite of the availability of COVID-19 vaccine, and the health authorities’ campaigns to vaccinate as many people as possible, the present study on a convenient sample of the Algerian population revealed that nearly two-thirds of the respondents were hesitant or refusing to be vaccinated.

Hence, sheer evidence is available to develop behavior change communication campaigns to target causes behind hesitancy and refusal to take the COVID-19 vaccine, such as simplistic explanations of the COVID-19 pandemic, mistrust towards established institutions, and a lack of trust in

reliable sources of information about the COVID-19 vaccine.

## Limitations of the Study

Some limitations exist in our research. First, due to COVID-19 pandemic measures like travel and personal contact restrictions, we were unable to cover a larger geographic area. Second, the results show that, behavior change communication campaigns are urgently needed, but the sample size was too small to support the development of a comprehensive national strategy. Third, additional variables could have been added to the list of variables influencing hesitation and refusal to receive the COVID-19 vaccine if the study had been conducted under different circumstances.

In order to develop effective, fact-based public health communication campaigns that will aid in achieving the national and international goals set by the World Health Organization, it is strongly advised to conduct a national survey on vaccine hesitancy and refusal (covering all vaccines).

## Conflicts of Interest

The authors declare no competing interests.

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