



## Determinants of the Willingness to Receive and Pay for COVID-19 Vaccines Prior to the Commencement of Vaccination in Indonesia

Yusuf Alam Romadhon<sup>1</sup>, Nining Lestari<sup>2</sup>, Nida Faradisa Firdausi<sup>3</sup>, Yuni Prastyo Kurniati<sup>4</sup>

1, 2, 3) Department of Public Health, Faculty of Medicine, Universitas Muhammadiyah Surakarta

4) Department of Pathology Anatomy, Faculty of Medicine, Universitas Muhammadiyah Surakarta

### Article Info

#### Article history:

Received 20 January 2022

Revised 23 June 2022

Accepted 23 June 2022

Available online 01 August 2022

#### Keywords:

Determinant factors; willingness to be vaccinated; willingness to pay; COVID-19 vaccine

#### Correspondence:

[yar245@ums.ac.id](mailto:yar245@ums.ac.id)

#### How to cite this article:

Yusuf Alam Romadhon, Nining Lestari, Nida Faradisa Firdausi, Yuni Prastyo Kurniati. Determinants of the Willingness to Receive and Pay for COVID-19 Vaccines Prior to the Commencement of Vaccination in Indonesia. MAGNA MEDIKA Berk Ilm Kedokt dan Kesehat. 2022; 9(2): 155-174

### Abstract

**Background:** The occurrence of various deceptive news on COVID-19 vaccines adversely impact the public mindset. Prior to the mass vaccination of the Indonesian government, perception of the willingness to be vaccinated and its determinant were not widely explored.

**Objectives:** Evaluating the determinants of willingness to receive and pay for COVID-19 vaccines prior to the commencement of widespread vaccination in Indonesia.

**Method:** A cross-sectional design analysis using bivariate and multivariate methods and qualitative research approach

**Results:** The determinants of willingness to be vaccinated were obtained, including the occupation of health workers and civil servants, perception of COVID-19 as dangerous, perception of the vaccines as effective, and perception of vaccine as safe. In terms of the determinants of willingness to pay, the following results were recorded, including respondents' age of 40 years, the income of IDR.2,500,000, experience from the interaction with COVID-19 patients, perception of the virus as dangerous, perception of health protocol discipline, and perception on the vaccine as effective.

**Conclusion:** The determinants of willingness to receive the COVID-19 vaccine included the occupation of health workers and civil servants, perception of the disease as dangerous, and perception of the vaccine as effective and safe. Meanwhile, the factors of willingness to pay included the age range of 40 years, high income, interaction with COVID-19 patients, perception of health protocol discipline, and the vaccines' effectiveness.

2022 MAGNA MEDIKA: Berkala Ilmiah Kedokteran dan Kesehatan with CC BY NC SA license

## INTRODUCTION

The *severe acute respiratory syndrome coronavirus 2*, also known as SAR-Cov2, is the virus responsible for the COVID-19 outbreak. This pandemic is described as a global public health emergency, with a widespread impact on virtually every aspect of human life, including the economy. World governments, laboratories, and institutions worked intensely to produce an active vaccine.<sup>1,2</sup> As a result, certain conditions appeared mandatory, such as the need for widespread vaccination using an effective and safe COVID-19 vaccine.<sup>3</sup> Under the circumstance of combating this pandemic, it takes between 55-82% of the population to be effectively immune, either using vaccination or herd immunity.<sup>4</sup> The pace of vaccine development has surpassed all records, although specific public figures doubt the effectiveness and safety.<sup>5</sup> There is a trend in various parts of the world causing a gradual decline in public willingness for vaccination. Based on an American poll from April-December 2020, approximately half the population refused to receive the vaccination.<sup>6,7</sup> A cross-sectional study was conducted in France in March-July 2020, where approximately 76.9% of the volunteers indicated willingness for vaccination.<sup>8</sup> Conversely, the vaccine rejection rate in Italy increased from 20-50%, while the willingness to pay decreased from 86.2-69.7% during and after the lockdown.<sup>9</sup> Several repeated cross-sectional studies in Hong Kong also observed a similar declining pattern, from 44.2% in the first wave to 34.8% in the third.<sup>10</sup> This refusal significantly reduces widespread coverage and prevents the success of herd immunity.<sup>9</sup>

Indonesia was possibly among the countries with the lowest enforcement of health protocol before vaccination. On social media, the hashtags with the highest rating (#IndonesiaTerserah and #Whatever Indonesia) were pioneered by Dr. Tirta due to personal disappointment with the prevalent conditions.<sup>11</sup> Alongside the announcement of the COVID-19 vaccination, several hoax news gained wider circulation, particularly in the areas of safety, effectiveness, and halalness.<sup>12</sup> These misleading information significantly influenced the government's target of vaccinating more than 70% of the population.<sup>13,14</sup> The existence of a budget constraint, where part of the cost is borne by the community, posed another primary concern. Therefore, it is necessary to understand the determinants of willingness to receive and pay for the vaccine. Furthermore, an online survey in September 2020 by the Ministry of Health in collaboration with ITAGI, UNICEF, and WHO, showed that around 74% of Indonesians were aware of the government's plan to initiate a COVID-19 vaccination program, with receipts in the range of 60%, although 65% of the respondents were not willing to pay.<sup>15</sup> Studies on factors contributing to acceptance and willingness to pay are critically needed to formulate contextually-specific health education and policies in achieving herd immunity targets from vaccination coverage.<sup>16</sup>

Consequently, the Indonesia Ministry of Health issued Ministerial Decree No. 9860 by the end of December 2020, confirming the provision of seven vaccines for official use. These medications were produced by Biofarma, AstraZeneca, Sinopharm, Moderna, Pfizer and BioNTech, and Sinovac Ltd.<sup>17</sup> Also, between December 2020 and January 2021, the media

reported on the prices with the issuance of distribution permits by BPOM (National Agency of Drug and Food Control). For instance, Detik Health revealed that the vaccines' prices ranged from IDR 200,000-IDR 800,000 per dose on 26 January 2021, at 2:35 p.m. Another media (Kontan.co.id) reported that 75 million people paid for the COVID-19 vaccination. However, studies on the vaccines and the price discourse by the mass media, as well as the willingness to pay, appeared minimal. Therefore, the purpose of this study is to evaluate the factors associated with the willingness for COVID-19 vaccination and initial payment, as well as the media discourse on the indirect purchase of the vaccines by certain persons.

## METHODS

This cross-sectional design analyzed the demographic factors, including internal family, perceptions about the COVID-19, as well as the willingness to receive and pay for the vaccine. The target population was adults aged 18 years and above with the ability to read and understand the Indonesian language. In addition, during this pandemic, the country suffered diverse implications due to the limitations on face-to-face meetings, leading to online data collection. This study was conducted in Indonesia between January-February 2021, and the sample size was calculated using 60% of the vaccination acceptance data, comprising surveys from the Indonesian Ministry of Health, in collaboration with WHO, UNICEF, and ITAGI. Furthermore, Openepi version 3.01 was employed with 80% power and a two-sided 95% confidence level to obtain a minimum sample size of 653.

Participants were invited based on the snowballing approach using social media, such as WhatsApp, Facebook, Twitter, and other online platforms. The questionnaires were distributed through Google forms containing questions on age, gender, address, residence category, education level, marital status, occupation, employment, income, religion, primary breadwinner [options: father, mother, other], the primary caregiver [option: father, mother, other], main family decision-maker [option: father, mother, other], history of COVID-19 infection [options: ever, never], experience from the interaction with COVID-19 patients [options: ever, never], perception of COVID-19 as dangerous [Likert scale 0-10], perception of the implementation of health protocols [Likert scale 0-10], perception of effectiveness [option: sure effective, doubtful, unsure] and safety [option: sure safe, doubtful, not sure], willingness to be vaccinated [options: willing, doubtful, not willing] as well as the willingness to pay for COVID-19 vaccines. Furthermore, in the question of willingness to pay, three choices were provided. The first comprised the attributes of the COVID-19 vaccine as 78% effective, very very safe, available at regular clinics, and price options of IDR 300,000 IDR. 500,000 and IDR 800,000. Meanwhile, the second option represented the COVID-19 vaccine with 94% effectiveness, very safe, available in big hospitals, price options of IDR 300,000, IDR 500,000, and IDR 800,000, and the third choice was referred to as not intended to pay. This study had been reviewed by the research ethics committee of the Faculty of Medicine, University of Muhammadiyah Surakarta, and was declared morally fit based on the ethical clearance letter numbered No. 3349/B.2/KEPK-FKUMS/II/2021.

Bivariate and multivariate analyses were performed on the categorical scale data, using chi-square and logistic regression tests, respectively. The significance of the crude odds ratio was calculated bivariate and adjusted with multivariate analysis, at = 0.05 for each. Subsequently, the statistical assessments were conducted with the support of SPSS for Windows software.

Google form was then used to perform the qualitative assessment, where the respondents related the reasons for not being vaccinated or unwilling to pay for the process. The completed fields were examined by content analysis, reduced to categories, and subsequently concluded.

## RESULTS

A total of 1,010 volunteers completed the google forms, and the majority were under 30 years of age [46 %], slightly female-dominated, and mostly living in Java and other cities. These participants also demonstrated over 12 years of education, non-health and non-government

employees [state civil servants/ASN (*Aparat Sipil Negara*)], Muslims, had an income of IDR 2.5 million or less, the primary decision-makers in the family other than only a father, perceived COVID-19 as dangerous, and absolutely disciplined in the implementation of health protocols. Furthermore, a high number of the respondents were married, the main breadwinner in non-paternal families only, and the primary caregiver other than only a mother, as well as showed a willingness to receive the vaccine [51%] (Table 1). In terms of the willingness to pay for the vaccines, the respondents preferred relative effectiveness to safety (Figure 1). Currently, 30% of the participants do not intend to pay for the COVID-19 vaccines. In the price category for each vaccine attribute, confident respondents showed a willingness to pay for each attribute with three price categories, with the maximum frequency occurring in the minimum cost [IDR 300,000]. Figure 2 shows the relatively minimal priority in vaccine effectiveness in terms of the willingness to pay compared to the safety. Even at the same price option [IDR 500,000], respondents prefer the effectiveness aspect.

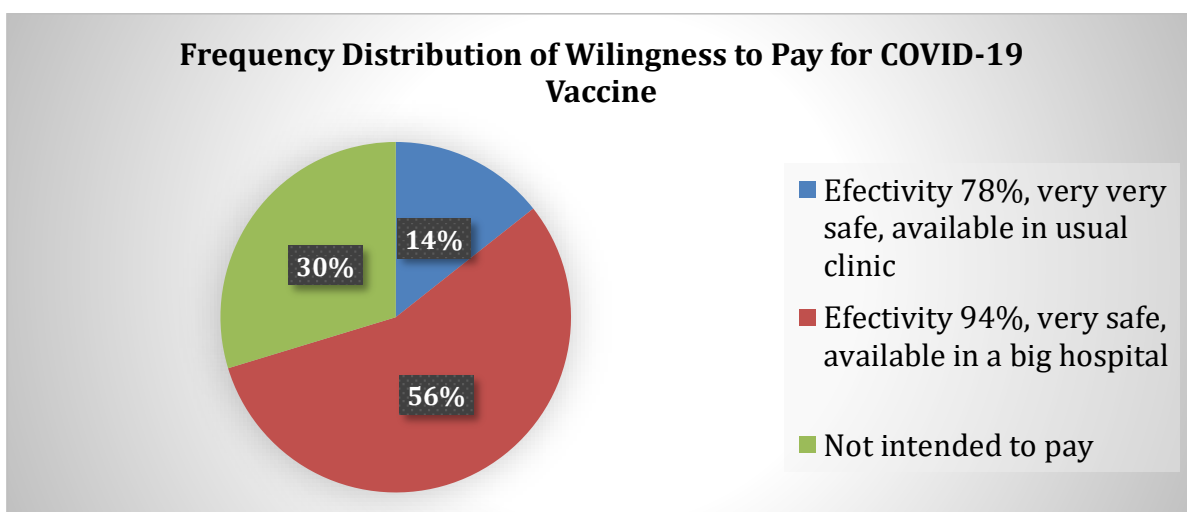
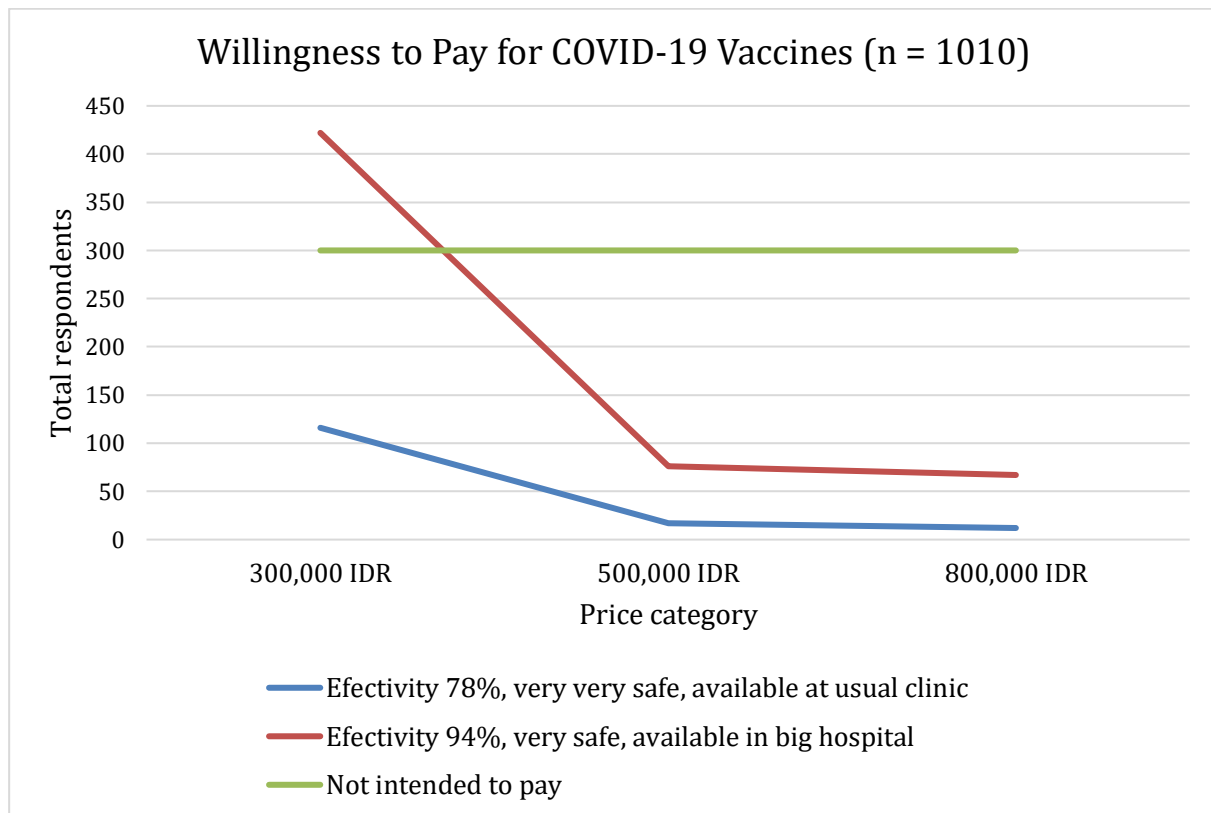


Figure 1. Frequency Distribution of Willingness to Pay per COVID-19 Vaccine based on Attribute



perceptions on the COVID-19 vaccine safety	Sure effective	424	42
	Doubtful/not sure	594	59
Willingness to be vaccinated	Sure safe	416	41
	Willing	520	51
	Not willing/doubtful	130/360	49
		[tot=490]	



**Figure 2.** Frequency Distribution of Willingness to Pay for COVID-19 vaccine based on Attributes and Price Categories.

Among respondents who had doubts about their willingness to be vaccinated, 390 respondents [Table 1], when faced with a choice of vaccine type, emphasized the relative importance of vaccine safety over effectiveness [78% effectiveness, very, very safe, available in ordinary clinics] or vaccines that relatively emphasize effectiveness over safety [effectiveness 94%, very safe, available in the hospital], 65% of them [234 respondents] chose both options, the rest are still undecided [figure 3]. When given the choice of vaccine brand, the propor-

tion that still remains uncertain is 54% [196 respondents] [figure 4]. This phenomenon may be explained that respondents who are hesitant are actually still waiting and observing what is happening around them regarding the good and bad effects of the existing vaccine choices. Specifically, in Figure 4 [choice of vaccine brand], the proportion of respondents who are doubtful is more than in the choice of vaccine performance [Figure 3]; it can be explained that respondents are still unfamiliar with the choices of existing vaccine brands.





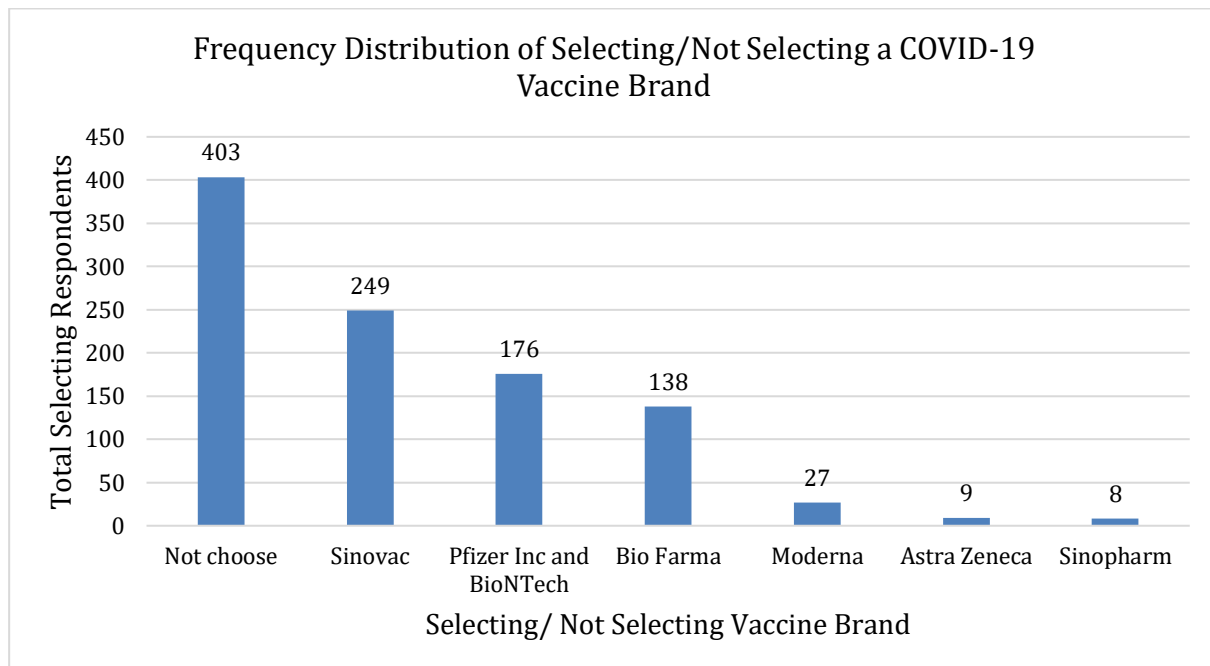




**Table 3.** Multivariate Analysis of Willingness to Pay for the Vaccines

Variables	Preference for willingness to pay for the type of COVID-19 vaccine					
	Vaccine A has an effectiveness of 78%, very very safe, and is available in usual clinics; price options are IDR 300,000; IDR 500,000; IDR 800,000		Vaccine B has an effectiveness of 94%, is very safe, available in big hospitals, and has price options of IDR 300,000; IDR 500,000; IDR 800,000		Not intend to pay	
	aOR	P	aOR	P	aOR	P
Age (ref ≥ 40 years)	0.783	0.366	2.048	0.000	0.483	0.000
Gender (ref male)	0.779	0.209	1.244	0.141	0.911	0.579
Residential Island (ref Outside Java)	1.104	0.660	0.889	0.474	1.099	0.616
Residence Category (ref Rural Area)	0.715	0.078	1.360	0.032	0.852	0.322
Educational Level (ref ≤ 12 years)	0.987	0.954	0.822	0.284	1.326	0.181
Marital Status (ref Married)	1.839	0.027	0.918	0.666	0.727	0.157
Occupation (ref Non-health workers)	0.791	0.388	1.492	0.060	0.620	0.082
Employment Status (non-Civil Servants)	0.929	0.766	1.063	0.731	1.030	0.880
Income (ref ≤ IDR 2,500,000)	0.809	0.335	1.631	0.002	0.629	0.008
Religion (ref non Islam)	1.034	0.959	1.539	0.393	0.487	0.208
The main breadwinner in the family (ref only father)	0.925	0.699	1.009	0.953	1.033	0.849
The main caregiver in the family (ref only mother)	1.147	0.478	1.090	0.543	0.796	0.153
The main decision-maker in the family (ref only father)	0.872	0.511	1.345	0.056	0.756	0.106
History of being infected with COVID-19 (ref Never)	1.201	0.576	0.637	0.075	1.686	0.062
Experience interacting with COVID-19 patients (ref Never)	0.858	0.424	1.422	0.013	0.700	0.026
Perception on the COVID-19 dangers (ref Less/not dangerous)	0.928	0.790	2.211	0.000	0.465	0.000
Perception on the implementation of health protocol (ref Lack of/no discipline)	0.937	0.847	1.834	0.014	0.552	0.015
Perception on the COVID-19 vaccine effectiveness (ref doubtful/not sure)	1.665	0.090	1.760	0.011	0.316	0.000
Perceptions on the COVID-19 vaccine safety (ref doubtful/not sure)	1.650	0.096	0.936	0.767	0.740	0.260

OR=Odd Ratio; aOR=adjusted Odd Ratio



**Figure 5.** Frequency Distribution of Selecting/Not Selecting a COVID-19 Vaccine Brand

The content analysis of the questionnaire data showed that the majority of the respondents did not reflect the willingness to pay for the vaccine. However, certain persons expressed the reasons for their willingness/unwillingness to be vaccinated. Based on the data reduction, categorization, and conclusion from the content analysis, six issues related to the willingness/unwillingness to pay for the COVID-19 vaccine were observed, including the perceptions of information on the vaccine effectiveness and safety, the view of health equity concerning vaccine accessibility and affordability, suspicion of the COVID-19 pandemic and its vaccine, choice of actions in overcoming the COVID-19 pandemic, personal circumstances surrounding the vaccine availability as well as the nationalism on vaccine procurement.

The first issue was the perception of information on the effectiveness and safety of the COVID-19 vaccine. Under this circumstance, the above expression was categorized into two, termed unsure and sure. Unsure conditions

were presented as *"doubtful," "still doubtful," "Not sure yet," or "Because I still have doubts about the safety and efficacy."* Particular cases were dependent on official information from authorities such as BPOM [Badan Pengawas Obat dan Makanan / similar with Food and Drug Administration (FDA) in USA] and doctors, as stated in the following expressions, *"Because it has not been approved by BPOM," "because it has not been legalized by BPOM," and "I am not willing if there is no recommendation from the doctor."* Also, certain statements emphasized the fear of a "bad" impact on the occurrence of side effects, such as, *"We have a fear of side effects that worsen the physical and psychological conditions."* Appropriate information is essential and expected to increase trust, as stated, *"Because there is no/ not yet explained the application criteria for the condition of the person to be vaccinated. The disease background should be known to determine the specific appropriate vaccine. If there are symptoms of diabetes, high blood pressure, heart, and cholesterol, can the person be vaccinated carelessly? Moreover, take care of nutrition and stamina*



















