

# Gender Differences in Covid-19 Vaccination Intention

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**Abstract**— This study aims at investigating gender differences in accepting Covid-19 vaccination shot. Data were collected through a self-administered survey participated by adults who have never been vaccinated. We used Structural Equation Model analysis to examine the relationships between variables in the research model with the assistance of SmartPLS software to simplify the calculations. Findings reveal that men are less threatened by Covid-19 risks and consequently less willing to be vaccinated compared with women. The present study also found a mediating role of attitude toward vaccination. Theoretical and practical contributions of the study were discussed.

**Keywords**— *gender differences; Covid-19 threat; attitude toward vaccination, vaccination intent.*

## I. INTRODUCTION

Since it was first discovered in Wuhan, People's Republic of China (PRC) in December 2019, the ongoing Covid-19 pandemic at the time this paper is written, has caused great problems for world civilization. Various efforts have been made by governments around the world to reduce the spread of this coronavirus, among others, by urging the public to always wash their hands periodically, wear masks and practice social distancing. After more than a year since its first appearance, a Covid-19 vaccine has been discovered and distributed worldwide [1].

The Indonesian government has made great efforts to provide free vaccines to the public. The next task of the government is to convince the public to be vaccinated, which turned out to be not easy. In Indonesia and other parts of the world, vaccines are often rejected for various reasons. For example, the Covid-19 vaccine was rejected due to hoax news about the negative impact of the vaccine [2] or information about the low effectiveness of the vaccine [3]. In the

United States, the Covid-19 vaccine is being rejected by those who believe in sinister conspiracy theories behind the emergence of Covid-19 [1, 4]. Given the various rejections made by people, it is deemed necessary that an investigation into the causes of vaccine rejection be carried out more intensively so that appropriate steps can be taken.

This study aims to find out whether the effect of individual differences has an influence on vaccine acceptance. More specifically, this study predicts that there are differences between men and women in responding vaccination requests. This research is important because it can provide theoretical and practical contributions. First, to the best of the authors' knowledge, this is the first study to investigate gender differences in vaccine acceptance. In addition, this study also responds to requests from previous research regarding the importance of conducting studies on the impact of Covid-19 from the perspective of gender differences [5]. Second, the results of this study will provide a new perspective for the government in promoting the mass vaccine movement. With this new knowledge, the government can conduct the accurate campaign on the right community groups based on gender differences.

## II. LITERATURE REVIEW

### 2.1 Gender differences in handling threats

With all due respect for gender equality, in reality men and women are not equal in some aspects. First, compared to men, women prefer to use sentences that are tentative when speaking, for example sentences such as, "I seem to be interested in biology subjects" [6]. Second, women are more attracted to humans, while men are more attracted to things (inanimate objects). The results of a meta-analysis study indicate that more men are attracted to engineering majors while women are more attracted to social studies [7]. Third, emotionally, it was found that women are more

likely to feel guilty, afraid and ashamed than men [8]. It can be concluded that women are more careful in responding to an event, seem less confident and more emotional than men.

It is widely accepted that women are generally more afraid of a threat than men [9]. For example, women feel more threatened from all kinds of crimes committed by others than men despite the fact that in general men are more victims of criminal acts than women [10]. This is because as compared to men, women are considered weaker when they are physically attacked. Thus, women tend to be more afraid and anxious if one day they experience a crime [11]. In general, it was also found that women are more likely to feel anxious about a threat than men [12].

During the Covid-19 pandemic, it is reported that there are differences between women and men reactions. Recent research has shown that in the context of using social media (Twitter), women prefer to talk about the impact of Covid-19 on family life, social distancing and health care. Men, on the other hand, prefer to talk about the impact of the pandemic on the cancellation of sporting events, the global spread of Covid-19 and political reactions. It seems that women feel more responsible for preventing the spread of the corona virus and reducing the negative impact it causes [13]. The tendency of men to talk about things that are less important in response to the Covid-19 pandemic shows that compared to women, men pay less serious attention to this pandemic. Supported by previous research which found that women feel threatened more easily, panic and depression more quickly in dealing with problems, we hypothesize as follows:

*Hypothesis 1:* There is a gender difference in responding to the risks of Covid-19 where women feel more threatened than men.

### 2.2 Covid-19 Threat Perception and Attitude toward Vaccination

Negative emotions such as fear, shame, and guilt make a person feel uncomfortable and make various efforts to get rid of those feelings. For example, people who feel guilty tend to do something that they consider to have high moral values so as to they are considered capable of correcting their past mistakes [14]. In the context of a pandemic, when someone is afraid of the risks of Covid-19, that person tends to suffer from dependence on the internet. This happens because people feel that using the internet can reduce their feelings of depression so that in conditions of severe depression due to the fear of Covid-19, they increase their internet use [15].

Feelings of fear or being threatened by the dangers of Covid-19 can also have a positive impact on

society. Imhoff and Lamberty [16] found that people who feel that they are threatened by the risks of Covid-19 tend to be more obedient to instructions to wash their hands frequently or practice social distancing. In contrast, those who feel they are not threatened are less likely to make efforts to reduce the spread of Covid-19. Because vaccination is a government effort to reduce the spread of Covid-19, people who are afraid of the risks of Covid-19 have a more positive view of vaccines and a higher desire to be vaccinated. Based on the description above, we hypothesize as follows.

*Hypothesis 2:* People who feel threatened by the risks of Covid-19 tend to have positive attitude toward vaccination.

*Hypothesis 3:* Attitude toward vaccination positively related to intention to be vaccinated.

*Hypothesis 4:* Gender differences affect the intention to be vaccinated through feelings of threat and attitude toward vaccination.

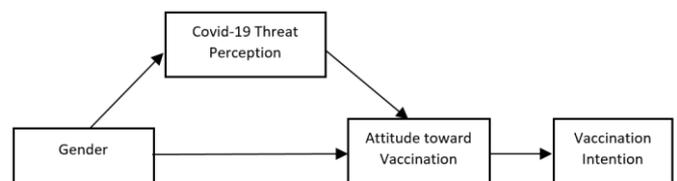


Figure 1. The research model

## III. METHODS

### 3.1 Samples and data collection

Respondents in this study were residents of a major city in Indonesia who experienced the impact of Covid-19. The adult respondents were willing without coercion to complete the questionnaire, had never had Covid-19 vaccination, and did not aware of the hypotheses. This is necessary to avoid biased answers. They were not rewarded for participating in the study and were informed that they can stop contributing at any time as they wish.

The respondents received an invitation to participate along with an URL link that directed them to the survey page. They are free to accept or decline the invitation. Respondents were informed that the purpose of this scientific research was to find out their views on the impact of Covid-19.

### 3.2 Measures

The question items were adapted from previous studies that have passed validation and reliability tests. Gender is a dummy variable measured by a dichotomous scale (1 = male, 0 = female). To measure the Covid-19 threat perception, the item scale was adapted from previous research [16]. The scale for

measuring the attitude towards vaccination was adapted from a study conducted by Lewandowsky, et al. [17]. Meanwhile, for the variable of vaccination intention, we adapted items from Bertin, et al. [1]. Vaccination intentions was dummy coded (1 = yes, 0 = no). All continuous variables were measured using a 5-point Likert scale.

**3.3 Analysis technique**

This research is a quantitative study that aims to investigate the existence of the relationship between one variable and another. To achieve the research purpose, Structural Equation Modeling (SEM) was used with the assistance of SmartPLS software to simplify the SEM calculations. The analysis stages themselves will be divided into early and advanced stages of analysis. Preliminary analysis is carried out to ensure that all measurement scales are valid and reliable. Further analysis was basically to test the hypotheses that have been developed.

**IV. RESULTS**

**4.1 Measurement model**

Cronbach alpha and composite reliability values were assessed to examine the constructs' reliabilities. As seen in the Table 1, the alphas and composite reliabilities are greater than the cut-off values [18]. Also, the results revealed that the constructs were in adequate levels of validity as seen in Table 1 [19]. The AVE values of the constructs exceeded the expected value of 0.50, indicating sufficient level of convergent validity.

Table 1. Descriptive statistics

Constructs	Alpha	Composite Reliability	AVE
Threat perception	0.79	0.87	0.70
Attitude toward Vaccination	0.86	0.90	0.70

We did not find multicollinearity issues in the data. We examined Variance Inflation Factor (VIF) values and found that all VIF values were lower than 5 as the recommended onset [20].

**4.2 Hypothesis testing**

The research model describes the direct and indirect relationships between gender and vaccination intention as mediated by Covid-19 threat perception and attitude toward vaccination. The model was examined with a double mediation analysis using bootstrap technique with 5,000 resamples. First, the result shows a negative relationship between gender (1 = male, 0 = female) and threat perception ( $\beta = -.22, p < .01$ ). This supports our first hypothesis. Second,

we find a positive relationship between Covid-19 threat perception and attitude toward vaccination ( $\beta = .38, p < .01$ ). This approves the second hypothesis. Third, attitude toward vaccination and vaccination intention (1 = yes, 0 = no) is positively related ( $\beta = .40, p < .01$ ) as predicted in our third hypothesis. Fourth, the results confirmed the indirect relationship between gender and vaccination intention. The relationship is marginally significant ( $\beta = -.03, p = .07$ ). Our last hypothesis is supported. However, the direct relationship between gender and vaccination intent is not significant ( $\beta = .01, p = .85$ ).

**V. DISCUSSION**

The present study confirms the indirect relationship between gender and vaccination intentions. In addition, we found there is a gender difference in responding to Covid-19 threat, such that women felt more threatened to the risks of Covid-19 than men. Later, people who were highly threatened by Covid-19 have more positive attitude toward Covid-19 vaccination and consequently have higher inclination to have Covid-19 vaccine. Following these paths (gender  $\rightarrow$  Covid-19 threat perception  $\rightarrow$  Covid-19 vaccination attitude  $\rightarrow$  Covid-19 vaccination intention), we managed to establish the indirect relationship between gender (1 = male, 0 = female) and Covid-19 vaccination intention. This study then, among the first to establish the relationship between gender difference and Covid-19 vaccination intention.

Practical contributions can be derived from this study's results. Policy makers can provide estimation of the willingness to receive vaccination shot based on gender composition. Social marketing campaign to nudge intention to receive vaccination can be adjusted based on gender difference. For instance, since men are less threatened by Covid-19 and subsequently are less likely to involuntarily receive vaccine shot, social advertising should focus on this gender group.

This study is subject to several limitations despite its theoretical and practical contributions. First, this study did not incorporate fear of injections and needle phobia [21] as control variables. Since all known Covid-19 vaccination use injection method, it is possible that people who are chronic in fear of injection and needle phobia would reject the vaccination regardless of their attitude toward the vaccination. Therefore, future studies may include the measurement to rule out the plausible explanation. Second, the data were collected during the early introduction of the vaccine all over the world, including in Indonesia. It is possible that as a relatively new cure to the pandemic, vaccination is suffered from conspiracy theories beliefs that follow [1]. These beliefs may reduce the willingness to prevent the spreading of coronavirus [22]. Consequently, the

beliefs also reduce the Covid-19 threat perception [23]. Future studies may address this issue.

#### VI. CONCLUSION

This study shows that gender differences influence how people' behavioral intentions toward Covid-19 vaccination. This is important since vaccination could be the best answer in so far to the ongoing Covid-19 pandemic. More research in this area are desirable to assist policy maker in nudging people to have more positive attitude and behavior toward Covid-19 vaccination.

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