

Measuring Covid 19 Vaccine Intentions: Extending the Theory of Planned Behavior

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Abstract

This study attempts to extend the Theory of Planned Behavior (TPB) by adding a company reputation variable. Data was collected using a questionnaire distributed online. The questionnaire consists of several sections where the first section discusses demographics and the next section discusses the variables studied, namely attitudes, subjective norms, perceived behavioral control (PBC), corporate reputation, and intention to participate in vaccines. The data were tested for validity and reliability before being tested for multiple linear regression. The results found that attitudes and PBC had a positive and significant effect, while subjective norms and corporate reputation had a positive but not significant effect. This shows that the respondents in this study intend not because of the influence of the people around them and also the company's reputation. Even though vaccine providers consist of several companies and cause many differences in perceived quality, this does not significantly affect respondents' intentions. Keyword: Attitude, Corporate Reputation, Intention, PBC, Subjective Norms

1. Introduction

Recently the whole world was shocked by the outbreak of covid 19 which caused a high death rate. According to WHO estimates, the covid pandemic caused the death of nearly 15 million people worldwide. This number is 13% higher than expected in more than two years. WHO believes that this figure is actually higher because many countries do not have a thorough calculation of the number of people who died. The calculation carried out by WHO is called excess death, which is the number of dead that exceeds the average death rate in a region before the pandemic. Deaths that were not directly caused by Covid were also included in this study, for example those who did not receive treatment because the hospitals were full of Covid patients (Ahmed & Kumari, 2022; Arifin, 2022; Gultom, 2021; Haedzar P et al., 2022; Iskanto, 2015; Iskanto et al., 2022; Jatmiko, 2022; Lathiifa & Chaerudin, 2022; Setiawan et al., 2022). WHO data are consistent with data calculations conducted by the Economist, as well as other excess death studies (Grimley, Cornish, & Stylianou, 2022). In more detail, the top five highest number of deaths can be seen in Figure 1

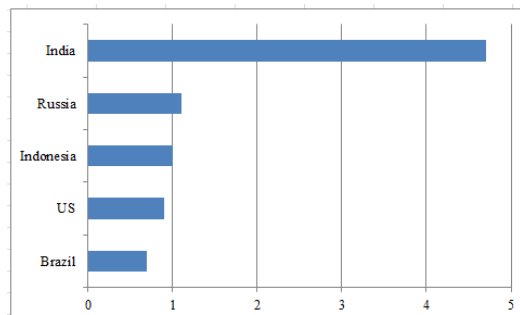


Figure 1: Countries with Most Excess Deaths in 2020 & 2021

Vaccination is an alternative intervention to reduce the spread and death rate from covid 19. To carry out vaccinations, the government's challenge is not only about getting a safe and effective vaccine, but also how to convince people to want to be vaccinated. Vaccines in general are well known by the people of Indonesia. Most people have carried out standard vaccinations for their children according to

their age. However, recently the world has been shocked by covid 19, which requires that not only children be vaccinated, but all of society to control transmission of this virus. The resistance of some people to this vaccine needs to be a concern for the government. Some people do not want to be immunized for various reasons. One of them is the myth about vaccines which are said to cause severe side effects. People are more afraid of the side effects of vaccines than of the disease itself. Apart from that, some people have questioned whether vaccines are halal or not. Various reactions are found in society, so it is important to know what factors influence it. One theory that can be used to predict people's behavior is TPB.

TPB is a theory to predict the intention and behavior of people to do something. TPB has been widely used by researchers to predict vaccine intentions, including Mueller et al (2022); Prasetyo et al (2020); Radoslaw & Dariusz (2022); Seddig et al (2022). Apart from using all the independent variables in the TPB, some researchers only use some of the independent variables, for example Chu, Gupta, & Unni (2021); Nguyen & Nguyen (2022); Pelegrin-Borondoa et al (2021). However, none of these articles have combined them with corporate reputation. This research develops TPB by adding one variable, namely corporate reputation. The addition of this variable is based on the various public reactions to vaccines produced by several different companies. Several pharmaceutical companies that provide vaccines for Indonesians include Moderna, Pfizer, AstraZeneca, Johnson & Johnson, Sinovac. As it is known that each of these companies has a different reputation. Likewise, the vaccines they produce have different levels of effectiveness. Therefore, this study aims to further examine whether corporate reputation affects vaccine intentions and whether it can be used as an additional variable on TPB.

2. Literature Review

2.1. Intention

Intention is something planned to be done in the future. Understanding consumer intentions can provide an understanding of how consumers are motivated to do something. According to Gavelber (2015), marketers who only rely on consumer demographic data can lose 70% of their potential customers. Demographics rarely describe the certia as a whole. Therefore, understanding consumer intentions will be more efficient. Intention is considered a strong predictor of actual behavior. TPB is one model that is often researched to measure intentions on various products and services. This research will also measure vaccine intentions using TPB and combine it with the corporate reputation variable.

2.2. Attitude

Attitude is an established way of thinking or feeling about someone or something, usually it is reflected in a person's behavior. Attitude is also a psychological construction which is a mental and emotional entity that is attached to or characterizes a person, the approach they take towards something, or their personal view of something. Attitude involves their mindset, views, and feelings. The effect of attitude on vaccine intention has been extensively studied (eg, Chu et al (2021); Mueller et al (2022); Prasetyo et al (2020); Radoslaw & Dariusz (2022); Seddig et al (2022). Unlike the two variables other in TPB which often gives various test results, attitudes tend to give consistent results. This study wants to re-test in the context of society in Indonesia, so the hypothesis in this study is as follows:

H1: Attitude has a positive and significant effect on vaccine intentions

2.3. Subjective Norms

Subjective norms refer to beliefs about whether most people approve or disapprove of a particular behavior. Subjective norms relate to a person's beliefs regarding whether peers and people who are important to him think he should perform the same behavior. Compared to attitude, subjective norms usually have a weaker influence on intention. The influence between subjective norms and vaccine

intentions was found to be positive and significant in several previous studies (Chu et al, 2021; Pelegrin-Borondoa et al, 2021; Prasetyo et al, 2020). However, Seddig et al (2022) instead found a negative and significant effect. Because there are more studies that find a positive effect, this research proposes the following hypothesis:

H2: subjective norms have a positive and significant effect on vaccine intentions

2.4. PBC

PBC is defined as the perception of whether or not it is difficult to perform a behavior. Like Ajzen's theory of planned behavior, most psychosocial health behavior theories (e.g., the health belief model (Rosenstock 1990), protective motivation theory (Prentice-Dunn and Rogers 1986), and the health action process approach (Schwarzer 1999) position PBC as the most influential factor in health behavior. However, PBC is termed self-efficacy in these three theories. Whatever term is used, people who believe they have control over a behavior are very likely to actually do it. Prasetyo et al, (2020) and Seddig et al (2022) found the same direction for this relationship, but with a different level of significance where Prasetyo et al, (2020) found a significant effect while the results of Seddig *et al* (2022) study found a non-significant effect. For this study, the effect of PBC is hypothesized to significantly influence vaccine intentions, so the hypothesis is as follows:

H3: PBC has a positive and significant effect on vaccine intentions

2.5. Corporate Reputation

Corporate reputation is the overall view and belief of people about a company based on the company's history and also its prospects in the future. Corporate reputation can be formed from various situations such as social responsibility carried out by the company, emotional appeal, products and services produced, work environment, financial performance, and vision and leadership. Empirical research regarding company reputation and intention to buy tickets was carried out by Giao & Tuan (2021). The results of their research found that corporate reputation has a positive and significant effect on the intention to buy airplane tickets. In the service sector, especially banking, Nguyen et al (2022) examined company reputation and its effect on intentions to use mobile banking. They added the corporate reputation variable to Theory of Reasoned Action (TRA). The results of his research found that reputation plays an important role in increasing the intention to use mobile banking. Based on this, the hypothesis in this study is as follows:

H4: corporate reputation has a positive and significant effect on vaccine intentions

3. Research Method

This study uses a quantitative descriptive method. Data was collected using a questionnaire asking about demographic data in the first section, and statements for each variable studied in the next section. Respondents' answers were measured using a Likert scale with criteria 1 which means strongly disagree to 5 which means strongly agree. After collecting the data, it was analyzed descriptively and then tested for validity and reliability. After all the statement items passed the validity and reliability tests, then the classical assumption test was carried out and finally they were analyzed using multiple linear regression.

4. Result and Discussion

In this study, based on gender, female respondents dominated with a percentage of 63%. In addition, the majority of respondents have an age range below 25 years. The education level of the majority of respondents is under graduate (See Table 1). Several previous studies used this demographic data as an independent variable which was then tested for its effect on vaccine behavior. Avahoundje, *et al* (2022) stated that citizens who have a higher level of education tend not to intend to be vaccinated. In

Egypt, high levels of indecision are observed among the more educated (Omar & Hani, 2021). Another study in Senegal found that residents who were least likely to accept government action were those with the highest education (Sherman *et al*, 2021). However, there are other studies that have found opposite results. Bono *et al* (2021) lower vaccine acceptance rates were observed among people with lower levels of education. Research in Zimbabwe shows that the higher their education level, the higher their intention to be vaccinated. The same findings were also made in Israel. This is a possible paradox for Benin, but can be explained by the fact that this more educated population has a broader view of what happens with COVID-19 vaccinations. These are people who more easily access information through various audio-visual and digital information and communication channels.

Table 1: Respondent's Demography

Data	Frequency	Percentage
Gender		
Male	85	37
Female	143	63
Age		
≤ 25	120	53
26 - 35	38	17
36 - 45	34	15
≥ 45	36	16
Education		
High School	43	18.9
Bachelor	13	5.7
Undergraduate	109	47.8
Master Degree	47	20.6
Doctoral Degree	15	6.6

Source: Processed Data 2022

4.1. Validity Test

Validity test is a test used to show the extent to which the measuring instrument used in research actually measures the variable being studied. R Table is often used as a reference for conducting validity tests. The simple concept is that an indicator must have a correlation with the total score of the indicators in a construct. Therefore the Pearson correlation coefficient is used, or compared with the R value contained in the table. With a sample size of 282, the r table in this study is 0.130. Based on the results of the validity test in Table 2, it can be concluded that all the indicators used have passed the validity test.

Table 2: Validity Testing

Variable	r-value	r-table	Information
Intention			
N1	.914	.130	Valid
N2	.814	.130	Valid
N3	.890	.130	Valid
N4	.911	.130	Valid
Attitude			
A1	.939	.130	Valid
A2	.951	.130	Valid
A3	.954	.130	Valid
Subjective Norms			

Variable	r-value	r-table	Information
SN1	.857	.130	Valid
SN2	.842	.130	Valid
SN3	.805	.130	Valid
Perceived Behavioral Control			
PBC1	.810	.130	Valid
PBC2	.781	.130	Valid
PBC3	.823	.130	Valid
Corporate Reputation			
CR1	.921	.130	Valid
CR2	.943	.130	Valid
CR3	.896	.130	Valid
CR4	.870	.130	Valid

Source: Processed Data 2022

4.2. Reliability Test

The reliability of a test refers to the degree of stability, consistency, predictability, and accuracy. Measurements that have high reliability are measurements that can produce reliable data. Testing the reliability of the instrument using the Alpha Cronbach formula because this research instrument is in the form of a questionnaire and a multilevel scale. If the alpha value > 0.7 means sufficient reliability, while if $\alpha > 0.80$ this suggests that all items are reliable and all tests consistently have strong reliability. Based on the data in Table 3 it can be seen that all variables show a Cronbach's Alpha value above 0.7.

Table 3: Reliability Testing

Variable	Cronbach's Alpha	Information
Intention	.904	Reliable
Attitude	.943	Reliable
Subjective Norms	.781	Reliable
Perceived Behavioral Control	.728	Reliable
Corporate Reputation	.924	Reliable

Source: Processed Data 2022

4.3. Multicollinearity Test

Based on data in Table 4 the tolerance value for the variables attitude, subjective norms, PBC and corporate reputation is greater than 0.10, while the VIF value for the three independent variables is less than 10. Referring to the basis of decision making on the multicollinearity test, it can be concluded that there are no symptoms of multicollinearity

Table 4: Multicollinearity Testing

Model		Collinearity Statistics	
		Tolerance	VIF
	(Constant)		
1	Attitude	.303	3.300
	Subjective Norms	.490	2.043

PBC	.415	2.408
Corporate Reputation	.344	2.907

Source: Processed Data 2022

4.4. Heteroscedasticity Test

The heteroscedasticity test is a classic assumption test which has the aim of testing whether there is an unequal variance from one observation to another. The variance is the variance of the distribution which measures how far the spread of a set of numbers is. If one observation to another the result is the same, it is called homoscedasticity. The regression model that is considered good is a model with homoscedasticity or there is no heteroscedasticity problem. one of the heteroscedasticity tests is the Spearman Rank Test. Spearman's Rank test is a heteroscedasticity test method that correlates the independent variables (independent variables) with unstandardized residual values. In the heteroscedasticity test, if the Sig. the variable is greater than the degree of significance (0.05) meaning that there is no heteroscedasticity problem or it can be called homoscedasticity. From the test results in Table 5, we get a significance value for the attitude variable of $0.061 > 0.05$ then H_0 is accepted. Likewise for other independent variables, which have a value greater than 0.05.

Table 5: Heteroscedasticity Testing

Correlations			Attitude	Subjective Norms	PBC	Corporate Reputation	AbsRes
Spearman's rho	Attitude	Correlation Coefficient	1.000	.590**	.698**	.785**	-.124
		Sig. (2-tailed)	.	.000	.000	.000	.061
		N	228	228	228	228	228
	Subjective Norms	Correlation Coefficient	.590**	1.000	.606**	.578**	-.075
		Sig. (2-tailed)	.000	.	.000	.000	.257
		N	228	228	228	228	228
	PBC	Correlation Coefficient	.698**	.606**	1.000	.632**	-.048
		Sig. (2-tailed)	.000	.000	.	.000	.467
		N	228	228	228	228	228
	Corporate Reputation	Correlation Coefficient	.785**	.578**	.632**	1.000	-.052
		Sig. (2-tailed)	.000	.000	.000	.	.434
		N	228	228	228	228	228
	AbsRes	Correlation Coefficient	-.124	-.075	-.048	-.052	1.000
		Sig. (2-tailed)	.061	.257	.467	.434	.
		N	228	228	228	228	228

** Correlation is significant at the 0.01 level (2-tailed).

4.5. Hypothesis Testing

a. Determination Coefficient Test

Based on the results of data processing as shown in Table 6, 73.4% of the variation in vaccine intentions is determined by attitude, subjective norms, PBC, and corporate reputation. While the remaining 26.6% is influenced by other variables not examined in this study

Table 6: Determination Coefficient Test

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.860 ^a	.739	.734	2.25139	2.028

a. Predictors: (Constant), Corporate_Reputation, Subjective_Norms, PBC, Attitude

b. Dependent Variable: vaccine intention

b. Partial Test (t test)

Table 7 displays the partial test results between the independent variables and vaccine intentions. Attitude has a positive and significant effect on vaccine intentions, which means that the more positive a person's attitude towards vaccines, the higher the intention to vaccine. This finding means that H1 is supported. Other studies that have found a positive and significant effect between attitude and vaccine intentions include Chu et al (2021); Seddig et al (2022); Prasetyo et al (2020).

The second hypothesis states that subjective norms have a positive and significant effect on vaccine intentions. However, the test results show that the subjective norms variable has a positive but not significant effect and this means that hypothesis 2 is not supported. From the level of significance, this study differs from the results of Chu, *et al* (2021); Pelegrin-Borondoa *et al* (2021); Prasetyo *et al* (2020). Pelegrin-Borondoa *et al*, (2021) used social influence variables in their research, but the statement items are similar to subjective norms. Conflicting results were found in the study by Seddig et al (2022) where the influence between subjective norms and vaccine intentions was negative and significant.

The third hypothesis states that PBC has a positive and significant effect on vaccine intentions. The results of data processing support this hypothesis where PBC has a significance value of 0.000, which means it significantly influences vaccine intentions. This research supports the results of research from Prasetyo et al (2020). However Sedig et al (2022) found a non-significant effect between PBC and vaccine intention.

The final hypothesis in this study is that corporate reputation has a positive and significant effect on vaccine intentions but is not supported by the results of data processing. Based on a statement from BPOM, the effectiveness or efficacy level of Sinovac reached 65.3%, AstraZeneca 62.1%, Sinopharm 78.2%, Pfizer 95.5%. The Moderna vaccine, which was developed on an mRNA platform, has an efficacy of up to 94.1% (Albeta, 2021). With these different levels of effectiveness, some people are trying to get vaccines that have a higher level of effectiveness. However, due to the limited number and location of vaccines that provide these types of vaccines, in the end people choose which one is more affordable to them both in terms of vaccine location and vaccine timing.

Table 7: Partial Test

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.821	.649		-1.265	.207
1 Attitude	.740	.082	.558	8.974	.000
Subjective Norms	.077	.074	.051	1.036	.302
PBC	.436	.084	.276	5.194	.000
Corporate Reputation	.064	.067	.055	.951	.343

Source: Processed Data 2022

c. Simultaneous Test (F test)

The results of the simultaneous test in this study found an F value of 157,764 with a significance level of 0,000 which means that together the four independent variables in this study had a significant effect. This also means that the regression model is feasible to use.

Table 8: Simultaneous Test

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3198.652	4	799.663	157.764	.000 ^b
	Residual	1130.330	223	5.069		
	Total	4328.982	227			

a. Dependent Variable: Intention

b. Predictors: (Constant), Corporate_Reputation, Subjective_Norms, PBC, Attitude

5. Conclusion

This research develops TPB by adding one variable, namely corporate reputation. Simultaneously the resulting regression model is feasible to use. However, of the four hypotheses tested, two had a significant effect (attitude and PBC) while the other two had no significant effect (subjective norms and reputation). The lack of effect on subjective norms is perhaps because the public is faced with abundant information regarding the impact of vaccines on the body and their effectiveness in protecting against exposure to Covid. So that the intention of the vaccine is not influenced by people in the surrounding environment. In addition, because vaccines are also associated with various administrative matters, the public intends to take part in the vaccine program even though there is confusion about the effectiveness of the vaccine. Likewise for the corporate reputation variable, people tend to ignore it because they only follow programs made by the government. In Indonesian society, problems related to the covid outbreak and vaccines which are considered as an effective way to control the spread of the virus, are not only seen from a health aspect, but also from a religious perspective. Because the majority of Indonesia's population is Muslim, implementing the Shari'a, which is also closely related to the Covid pandemic and the halalness of vaccines, has received a lot of attention. For this reason, further research related to epidemics and vaccines is also important to test from the aspect of religiosity.

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