

# Health Belief Model for the Analysis Factors Affecting Community Acceptance of COVID-19 Vaccination Dose II in Oenggae Village, Pantai Baru Subdistrict, Rote Ndao, East Nusa Tenggara

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## ABSTRACT

**Background:** Efforts to reduce transmission of COVID-19 by carrying out COVID-19 vaccinations. The COVID-19 vaccination coverage in Rote Ndao is 52.92%. Oenggae Village is included in the working area of the Korbafo Health Center which has the lowest dose II COVID-19 vaccination coverage, namely 41.76%. This study aimed to analyze the relationship between the Health Belief Model (HBM) theoretical approach and community acceptance of the COVID-19 Dose II vaccination in Oenggae Village, Pantai Baru District, Rote Ndao in 2022.

**Subjects and Method:** An observational analytic study with a cross-sectional design was conducted in Oenggae Village, Pantai Baru District, Rote Ndao from December 2022 to January 2023. A total of 107 people aged 6->55 years were selected for this study. The dependent variable is people's acceptance of the second dose of COVID-19 vaccination. The independent variables are perceived vulnerability, perceived severity, perceived benefits, perceived barriers and cues to act. Data was collected using a questionnaire. Data were analyzed by chi-square test.

**Results:** Perceived vulnerability is high (OR= 3.91; 95 CI= 1.70 to 9.03; p= 0.002), perceived severity is high (OR= 10.59; 95% CI= 3.27 to 34.25; p< 0.001), perceived benefit is high (OR= 11.27; 95) % CI= 1.33 to 94.94; p= 0.009), perceived inhibition is low (OR= 6.22; 95% CI= 2.21 to 17.46; p= 0.001), and cues to act are high (p= 0.001) statistically significant effect on acceptance of vaccination COVID-19 2<sup>nd</sup> dose.

**Conclusion:** Community acceptance of COVID-19 dose II vaccination is related to perceptions of vulnerability, perceived severity, perceived benefits, perceived obstacles, and cues to act.

**Keywords:** COVID-19, acceptance of vaccination, Health Belief Model, HBM, community.

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## BACKGROUND

The problem of COVID-19 globally has so far not been completely resolved. The increase in cases every day has overwhelmed the government in dealing with

the current COVID-19 situation, both in developed and developing countries. Indonesia is one of the developing countries that has experienced the impact of COVID-19. The government is trying to reduce morbi-

dity and mortality from COVID-19 through the COVID-19 vaccination program.

According to the Indonesian Ministry of Health (2022) data on the spread of COVID-19 vaccination in Indonesia as of March 22, 2022, the coverage for dose I vaccination was 194,988,786 (93.63%) and the coverage for dose II vaccination was 155,520,807 (74.67%) of the target of 208,265,720. There are 10 provinces in Indonesia that have low COVID-19 vaccination coverage, NTT is one of the provinces included in the list with a vaccination coverage of 50% (Bona, 2022). The lowest vaccination coverage based on districts in NTT Province, one of which is Rote Ndao with a vaccination coverage of 52.92% and is the district with the highest rank 3 which has vaccination coverage below 60% (Saba, 2022). Based on data from the Rote Ndao District Health Office (2022) the distribution of COVID-19 vaccination data in Rote Ndao with results, the coverage of vaccination for dose I was 89.4%, dose II was 62.5%, and dose III was 9.2% of the target of 100% for districts, which means have not met the targets set by the government.

Based on data from the Rote Ndao Health Office Profile in 2022, from 12 Community Health Centers in Rote Ndao, there are 9 Community Health Centers with dose II COVID-19 vaccination coverage which is below  $\leq 80\%$ . Korbafo Health Center is one of the health centers that still has low coverage of COVID-19 dose II vaccination. Oenggae Village is the village that has the lowest COVID-19 vaccination coverage in the working area of the Korbafo Health Center, namely the vaccination target of 795 people with the vaccination coverage of dose I of 715 (89.93%), dose II of 332 (41.76%), and dose III of 15 ( 1.88%), the second is Ofalangga village with a vaccination target of 590 people where the

coverage of dose I vaccination is 576 (97.62%), dose II is 382 (64.74%), and dose III vaccination is 18 (3.05%). While the third is Tesabela village with a vaccination target of 1026 people where the coverage of vaccination for dose I is 915 (89.18%), dose II is 668 (65.10%), and dose III is 61 (5.94%), which has not reached the target of 100%. for the coverage of the village area, it means that it has not met the target set by the government. To support government programs in the successful implementation of the COVID-19 vaccination is closely related to the perceptions, desires and attitudes of the community. However, in reality the coverage of COVID-19 vaccination in Oenggae village is still low.

Based on the results of an initial survey conducted by the Ministry of Health et al (2020) it shows that on average around 65% of Indonesian people are willing to receive the COVID-19 vaccine if it is provided by the government. The results of a survey conducted on average by the public have a perception of vaccine safety by 30%, vaccine effectiveness by 22%, doubts about vaccines by 13%, and side effects of vaccination by 12%. According to the Indonesian Ministry of Health (2021) public perception of receiving the COVID-19 vaccine is influenced by several factors including religion, economy, culture, and social conditions. Perception is one of the benchmarks to see the community's readiness to receive the COVID-19 vaccination, where the community is expected to have a good level of knowledge about the COVID-19 vaccine, so that the implementation of the COVID-19 vaccination can be well received in the community.

Based on the results of observations and interviews conducted by researchers with 7 community members and 3 vaccination officers while doing internships at the Korbafo Health Center, it shows that the

average community does not know the benefits and some people are afraid of injecting needles, some are afraid of side effects due to COVID-19 vaccination as well as doubting the effectiveness of the COVID-19 vaccine because of hoax news circulating. This study aimed to analyze the relationship between the Health Belief Model (HBM) theory approach in public acceptance of the COVID-19 Dose II vaccination in Oenggae Village, Pantai Baru District, Rote Ndao in 2022.

## SUBJECTS AND METHOD

### 1. Study Design

This type of research is a quantitative research with analytic observational method, and uses a cross-sectional design. This research was conducted in Oenggae Village, Pantai Baru District, Rote Ndao and took place from December 2022 to January 2023.

### 2. Population and Sample

The population in this study was all people who were targeted for COVID-19 vaccination aged 6-≥50 years with a total of 795 respondents. Sampling using Probability Sampling with Simple Random Sampling technique. From the calculation results, the sample size in this study was 107 respondents.

### 3. Study Variables

The dependent variable in this study is community acceptance of the second dose of COVID-19 vaccination. The independent variables in this study consisted of perceived vulnerability, perceived severity, perceived benefits, perceived obstacles, and cues to act.

### 4. Operational Definition of Variables

**Perceived vulnerability** is the community's belief about the risks that will occur if they do not take the COVID-19 vaccination. Where people are vulnerable to contracting COVID-19 which can be prevented by

following vaccinations, getting sick easily, and decreasing the body's immune system. Data was measured using a questionnaire by means of interviews.

**Perceived severity** is the public's belief about the seriousness of the impact that will occur if you don't take the COVID-19 vaccination.

**Perceived benefits** are people's beliefs about the benefits that will be obtained if they take the COVID-19 vaccination. Where the transmission of COVID-19 can decrease, the body's immunity will increase. Data was measured using a questionnaire by means of interviews.

**Perceived obstacles** are people's beliefs about the disadvantages or obstacles that occur when carrying out the COVID-19 vaccination. In the form of side effects from the COVID-19 vaccine, and the risk of transmission of COVID-19. Data was measured using a questionnaire by means of interviews.

**Cues to action** are clues that make people willing to take the COVID-19 vaccination. In the form of health worker visits, health promotion, information in the mass media, social media, other people's experiences, and family support. dependent variable. Data was measured using a questionnaire by means of interviews.

**Community acceptance of the second dose of COVID-19 vaccination** is people who have already done the second dose of COVID-19 vaccination. Data was measured using a questionnaire by means of interviews.

### 5. Study Instruments

Perceived vulnerability, perceived severity, perceived benefits, perceived obstacles, and cues to act were measured using a questionnaire using a Likert scale. Other variables are measured using a questionnaire.

**6. Data Analysis**

There is a relationship and there is no relationship between variables in the analysis using the chi-square test. Chi-square test analysis (X2) is used to see the relationship between independent and dependent variables.

**7. Research Ethics**

This research was conducted using explanation sheets, informed consent, respondents who participated in the study were given souvenirs, and the confidentiality of the respondent's data was maintained. This research was declared ethically passed by the Health Research Ethics Commission,

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**RESULTS**

**1. Sample Characteristics**

Based on table 1, the results showed that out of 107 respondents, the majority had 69 (64.5%) perceived high vulnerability, 84 (78.5%) perceived high severity, 99 (92.5%) perceived high benefits, 99 (92.5%) perceived high 83 (77.6%) had low inhibitions, 90 (84.1%) high cues to act, and 62 (57.9%) had already received dose II of the COVID-19 vaccination.

**Table 1. Frequency Distribution of Health Belief Model Constructs on and Dose II COVID-19 Vaccination Acceptance**

Characteristics	Category	Frequency	Percentage
<b>Perception of Vulnerability</b>	High	69	64.5%
	Low	38	35.5%
<b>Perception of Severity</b>	High	84	78.5%
	Low	23	21.5%
<b>Perceived benefits</b>	High	99	92.5%
	Low	8	7.5%
<b>Perceived Obstacles</b>	Low	83	77.6%
	High	24	22.4%
<b>Cue to action</b>	High	90	84.1%
	Low	17	15.9%
<b>Receipt of COVID-19 vaccination dose II</b>	Already vaccinated II	62	57.9%
	Not vaccinated II yet	45	42.1%

**2. Bivariate Analysis**

Below table 2 showed the results of bivariate analysis using the chi-square test, people who have a high perceived vulnerability (OR= 3.91; 95 CI= 1.70 to 9.03; p= 0.002), high perceived severity (OR= 10.59; 95% CI= 3.27 to 34.25; p<0.001), perceived benefits are high (OR= 11.27; 95% CI= 1.33 to 94.94; p= 0.009), perceived barriers are low (OR= 6.22; 95% CI= 2.21 to 17.46; p= 0.001), and cues to act high (p= 0.001) statistically significant effect on receiving the 2nd dose of COVID-19 vaccination.

**DISCUSSION**

**1. Relationship between perceived susceptibility and community acceptance of dose-II COVID-19 vaccination.**

Perceived vulnerability is a condition in which a person feels vulnerable to a disease so that he is willing to accept or reject an action to treat or prevent the disease. The results of the study regarding perceptions of vulnerability and community acceptance of dose II of COVID-19 vaccination in Oenggae Village showed that there was a

relationship between perceptions of vulnerability and community acceptance of dose II of COVID-19 vaccination in Oenggae Village. This is because the majority of people have a high perception of suscep-

tibility to receiving dose II of the COVID-19 vaccination, where some people have experienced COVID-19 disease, which makes people worried about contracting COVID-19 disease.

**Table 3. Distribution of Bivariate Results of Public Acceptance of Vaccination of COVID-19 Dose II in Oenggae Village, Pantai Baru District, Rote Ndao in 2022.**

Variable	Receipt of COVID-19 Vaccination dose II				OR	95% CI		p
	Already vaccinated		Not vaccinated yet			Lower Limit	Upper Limit	
	n	%	n	%				
<b>Perception of Vulnerability</b>								
High	48	69.6	21	30.4	3.91	1.70	9.03	0.002
Low	14	36.8	24	63.2				
<b>Perception of Severity</b>								
High	58	69.0	26	31.0	10.59	3.27	34.25	<0.001
Low	4	17.4	19	82.6				
<b>Perceived benefits</b>								
High	61	61.6	38	38.4	11.27	1.33	94.94	0.009
Low	1	12.5	7	87.5				
<b>Perception of obstacles</b>								
Rendah	56	67.5	27	32.5	6.22	2.21	17.46	0.001
Tinggi	6	25.0	18	75.0				
<b>Perception of obstacles</b>								
High	59	65.6	31	34.4	8.88	2.37	33.27	0.001
Low	3	17.6	14	82.4				

The results of this study are in line with Azim, Rahman and Khalza's research (2021) in Poasia District, Kendari City regarding public acceptance of the COVID-19 vaccine which states that there is a relationship between perceptions of vulnerability and public acceptance of the COVID-19 vaccine. Where in this study someone who feels they are vulnerable will be more likely to vaccinate against COVID-19. This happens because people feel vulnerable to contracting COVID-19, where COVID-19 can spread quickly to everyone regardless of age.

Based on the results of interviews conducted by researchers, the background to this is high public perception, because people are afraid of the dangers of contracting COVID-19 where the symptoms

seem to be infected with the common cold and its rapid transmission through the air so that people believe that they are very vulnerable to contracting COVID-19 and need to vaccinate against COVID-19. This is in line with research conducted by Puspasari and Achadi (2021) in Indonesia regarding receipt of the COVID-19 vaccination which states that the more vulnerable a person is to contracting COVID-19 disease, the more likely he is to vaccinate against COVID-19.

People with perceptions of high susceptibility but who have not yet carried out the second dose of COVID-19 vaccination are the majority of people in the adult age group (20-44 years). The results of the study (Utama et al., 2021) at Bhayangkara Hospital Bengkulu showed that the adult

age group was 1.8 times more difficult to receive the COVID-19 vaccine than teenagers, while the elderly age group was 1.4 times easier to receive the COVID-19 vaccine than the adult group. This is because a person's age can affect the way he thinks. Based on the research results, the majority of people have limitations in obtaining information related to COVID-19 vaccination from social media, where as many as 64.48% of respondents have never received information about COVID-19 vaccination from social media.

Social media has a big influence in disseminating information. According to Lasmita, Misnaniarti and Idris (2021) in their research stated that the media is a vessel that must be the correct source in providing information related to COVID-19 vaccination, because if disinformation is spread through various media, it will have an impact on acceptance of COVID-19 vaccination. Therefore, the public needs to be educated about the dangers of being exposed to COVID-19 and the importance of preventing COVID-19 disease by carrying out the COVID-19 vaccination.

## **2. Relationship between Perceived Severity and Community Acceptance of Dose II COVID-19 Vaccination**

Perceived severity is a belief that a person feels the consequences or effects of a disease, so that he can determine to take preventive or treatment measures. The results of the study in Oenggae Village showed that there was a significant relationship between perceived severity and community acceptance of the second dose of COVID-19 vaccination. This is because the community has a high perception of severity, where a family member has died from COVID-19. So that people feel that by vaccinating they can avoid transmission of COVID-19, and by vaccinating COVID-19

can reduce the symptoms that arise as a result of contracting COVID-19.

This research is in line with research conducted by Erawan, Pratondo and Lestari (2021) in Yogyakarta regarding interest in COVID-19 vaccination showing a p-value = 0.000, which means there is a relationship between perceived severity and public acceptance of COVID-19 vaccination, where in this study this shows that people who have a high perception of severity of COVID-19 tend to do more COVID-19 vaccinations.

Based on the results of interviews conducted by researchers, the background to the perception of high severity in the community is because there are family members infected with COVID-19 who experience pain to the point of having seizures, and the community feels that COVID-19 disease can attack everyone with mild to severe symptoms if they are not vaccinated. This is in line with Erawan, Pratondo and Lestari's research (2021) in Yogyakarta regarding interest in COVID-19 vaccination which states that the higher the perceived severity, the person will tend to take precautions, namely by vaccinating COVID-19.

Respondents with a high perception of severity but had not yet carried out the second dose of COVID-19 vaccination because some were afraid of the side effects, they would experience during the first dose of vaccination so they did not want to carry out further vaccinations. Another thing that causes people to not do the COVID-19 vaccine dose II is the background of the low level of education, where some respondents only graduated from elementary school.

The results of the study Argista (2021) in South Sumatra Province showed a PR of 0.416, which means that people with a low educational status of 0.4 are more difficult

to receive the COVID-19 vaccine. This is because a person's education will certainly affect perceptions of receiving vaccines. The level of public education will determine the quality of knowledge possessed. People are afraid of the side effects of the COVID-19 vaccination which will cause illness such as fever, dizziness and swelling at the injection site.

This is in line with research conducted by Ministry of Health (2020) which shows that the reason people don't want to vaccinate is because of distrust of the COVID-19 vaccine, fear of side effects due to vaccination, and doubts about the safety, halalness and effectiveness of the COVID-19 vaccine. Therefore, the public needs to get education regarding the benefits of vaccination and how vaccines work in the body's immune response to COVID-19 disease, so as to prevent the severity of COVID-19 disease by carrying out a complete COVID-19 vaccination.

### **3. The Relationship between Perceived Benefits and Community Acceptance of Dose II COVID-19 Vaccination.**

Perceived benefit is a person's belief regarding the usefulness or advantage of an action which can reduce more serious risks. Based on the results of research in Oenggae Village, it showed that there was a significant relationship between perceived benefits and community acceptance of the second dose of COVID-19 vaccination. This is because the majority of people have a high perception of benefits, where people feel that vaccination is an advantage, which will make it easier for them to carry out their daily activities and can reduce the transmission of COVID-19.

This research is in line with research conducted by Azim, Rahman and Khalza (2021) which states that there is a relationship between perceptions of benefits

and public acceptance of the COVID-19 vaccination, where in this study the community feels that doing the COVID-19 vaccination is an advantage because it can prevent transmission of COVID-19 disease.

Based on the results of interviews conducted by researchers, the thing that is behind the high perception in the community is that by carrying out a dose II COVID-19 vaccination it can help them carry out their daily activities. There are those who feel that vaccinating can make it easier for them to travel outside the area, because one of the conditions is to have a vaccine dose II certificate, feel that vaccinating against COVID-19 can reduce the impact or symptoms of contracting COVID-19, and is an action. significant in breaking the chain of transmission of COVID-19. The perceived benefits influence people to vaccinate. This is in line with research conducted by Azim, Rahman and Khalza (2021) in Poasia District, Kendari City regarding community acceptance of the COVID-19 vaccination showing that people with high perceived benefits will be more proactive in carrying out prevention with COVID-19 vaccination.

Communities with a high perceived benefit but have not yet carried out the second dose of COVID-19 vaccination because some people believe that even though they have been vaccinated people will still get COVID-19 disease, and there will be no change after vaccination, and feel that the benefits of all COVID-19 vaccinations are the same, so there is no need to vaccinate dose II. This perception has influenced the public not to want to vaccinate against COVID-19 dose II. According to the Ministry of Health et al (2020) it shows that as many as 30% of people in Indonesia doubt the safety of vaccines and as many as 22% of people doubt the effectiveness of the COVID-19 vaccine.

Therefore, the public needs to be educated on the importance of the benefits of the COVID-19 vaccination for the body so that it can increase public interest in carrying out the COVID-19 vaccination.

#### **4. Relationship between Perceived Obstacles and Community Acceptance of Dose II COVID-19 Vaccination**

Perception of obstacles is a person's belief regarding the loss that is felt as a result of an action taken. Based on the results of research in Oenggae Village, it showed that there was a significant relationship between perceptions of obstacles and community acceptance of dose II of the COVID-19 vaccination. This is motivated by the fact that people can afford to share their time so they can vaccinate and because it is free of charge.

This is in line with research conducted by Erawan, Pratondo and Lestari (2021) in Yogyakarta regarding public interest in the COVID-19 vaccination which states that there is a relationship between perceptions of obstacles and people's acceptance of the COVID-19 vaccination ( $p= 0.008$ ). In this study, the perceived obstacles were related to time and cost, so that it indirectly made people interested in vaccinating.

Based on the results of interviews conducted by researchers, the background to the low perception in society is because they feel they are not busy and do not take up time, are not afraid of needles and side effects after vaccination. This is in line with research conducted by Ramadhani Reski, Dwinata and Rismayanti (2022) which states that the lower the barriers that a person feels, the more likely they are to vaccinate against COVID-19.

Communities with low perceptions of barriers but have not yet carried out dose II of the COVID-19 vaccination because they are afraid of side effects that may arise after

vaccine I so they do not want to vaccinate dose II, drop out so they repeat from vaccine dose I, and vaccine stocks run out. This is in line with research conducted by Puspasari and Achadi (2021) in Indonesia regarding the acceptance of the COVID-19 vaccination which stated that the higher the obstacles felt, the lower the public's interest in carrying out the COVID-19 vaccination.

Therefore, the community needs to be supported with education regarding the importance of the COVID-19 vaccination so that it does not make the community doubtful and is able to encourage the community to carry out the complete COVID-19 vaccination.

#### **5. The Relationship of Signals to Act with Public Acceptance of COVID-19 Dose II Vaccination**

Cue to action is a belief in the form of encouragement from oneself or from outside the ability to take action to prevent disease or healthy behavior. The results of the study in Oenggae Village found a significant relationship between cues to act and community acceptance of the second dose of COVID-19 vaccination. Family support, invitations from neighbors and peers as well as visits from health workers encourage individuals to vaccinate so that people are willing to vaccinate against COVID-19 dose II.

This research is in line with research conducted by Puspasari and Achadi (2021) in Indonesia regarding receipt of COVID-19 vaccination showing that there is a relationship between cues to act and acceptance of COVID-19 vaccination, where the  $p= 0.005$ . In this study, people who have adequate information regarding COVID-19 vaccination are 8 times more likely to vaccinate than people who do not receive adequate information.

Based on the results of interviews conducted by researchers, the things that

lie behind the signals to act high in society are obtained from family support, invited by neighbors and peers, and visited directly by health workers. The social environment also influences a person's level of knowledge where peers, neighbors, and co-workers can become information disseminators who are believed to be able to increase one's knowledge. This is in line with the research of Mamboh, Tucunan and Mandagi (2022) in Kolongan Village, Kalawat District regarding acceptance of the COVID-19 vaccination where in this study the community received encouragement from health workers to vaccinate, the community also received information regarding vaccination on television, and received outreach .

Communities who have the signal to act high but have not yet carried out the COVID-19 vaccine dose II because some people do not receive support from their families to vaccinate against COVID-19 and do not receive information regarding the importance of the COVID-19 vaccine dose II. This is in line with research conducted by Lasmita et al. (2021) among the community regarding acceptance of the COVID-19 vaccination which states that family support has a major influence on individuals feeling confident to vaccinate against COVID-19.

Therefore, it is necessary to have a supportive environment, to have a nearby space that has a positive effect and is able to motivate the community, as well as outreach to be able to increase public acceptance of the COVID-19 vaccine dose II.

#### **AUTHOR CONTRIBUTION**

Herpri Astince Batukh as the main researcher who chose research topics, data collection, and data analysis Amelya B Sir, Sigit Purnawan as supervisor in writing manuscripts.

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This study is self-funded.

#### **CONFLICT OF INTEREST**

There is no conflict of interest in this study.

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