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Determinants of COVID-19 Vaccine Coverage Aceh in 2021

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ABSTRACT

Indonesia has set strategies to overcome this pandemic problem, one of which is preventing the spread of COVID-19 which is very easily transmitted to individuals by vaccinations are carried out in every workplace, or government, one of which is hospitals and health centers in Aceh which are the referral places for patients treatment and vaccinations. This study aims to the determinants of COVID-19 vaccination coverage Aceh in 2021. The sample in this study is the achievement vaccination in 23 districts of Aceh. The results showed the average proportion vaccine coverage in Aceh was 69.30% with a minimum percentage of 46% and the highest percentage of 102%. Then the analysis showed that the vaccinator HR a value of p = 0.0001 that was a significant between the vaccinator HR and the vaccine coverage. HR planning should be prepared thoroughly so that it will minimize the possibility of mistakes in the future.

Keywords: coverage, covid-19, human resources, vaccines, vaccinators

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BACKGROUND

Coronavirus Disease 2019 (COVID-19) is a new type of disease that has never been previously identified in humans. The virus that causes COVID-19 is called Sars-CoV-2 which is also zoonotic (transmitted between animals and humans). Meanwhile, the animal that is the source of the transmission of COVID-19 is still unknown. Based on scientific evidence, COVID-19 can be transmitted from human to human through coughing/sneezing droplets (droplets). The people most at risk of contracting this disease are people who are in close contact with COVID-19 patients, including those caring for COVID-19 patients (Kemenkes RI, 2020). Common signs and symptoms of COVID-19 infection include symptoms of acute respiratory distress such as fever, cough, and shortness of breath. The average incubation period is 5 - 6 days with an incubation period of fever, cough, and shortness of breath. In severe cases, COVID-19 can cause pneumonia, acute respiratory syndrome, kidney failure, and even death (Tosepu et al., 2020).

A statement by the WHO emergency committee stating that the spread can be stopped if protection, early detection, isolation, and rapid treatment are implemented to create a strong system implementation to stop the spread of Covid-19 (Hennida, Saptari, Aristyaningsih, & Febrianto, 2020). One very possible way to prevent the spread of this virus is by developing a vaccine (Makmun & Hazhiyah, 2020).

Vaccines based on Permenkes No. 84 of 2020 are defined as biological products containing antigens in the form of dead or attenuated microorganisms, in whole or in part, or microorganism toxins that have been processed into toxoids or recombinant proteins, to which other substances are added, and when given to a person will cause specific immunity to actively fight certain diseases (Astuti, Prabandari, & Maulida, 2021). The process or act of introducing vaccines into the human body is called vaccination. The purpose of the Covid-19 vaccination is to reduce the risk of transmission and break the Covid-19 chain (Astuti et al., 2021).

Various countries from around the world have committed together by involving governments, biotechnology companies, scientists, and academics to create a Covid-19 vaccine (Makmun & Hazhiyah, 2020). In response to this, the Indonesian government is also actively involved in planning vaccination activities to be given to the community. President Joko Widodo on October 5, 2020 inaugurated Indonesian Presidential Regulation No. 99 of 2020 concerning Vaccine Procurement and Vaccination Implementation in the Context of Combating the 2019 Coronavirus Disease Pandemic (Rachman, 2020).

This vaccination is also related to several factors such as the development of vaccination, the driving factors for people to vaccinate and other possible factors (Hayati, Denada, & Rachmania, 2022). Then in achieving the success of the Covid-19 vaccination, there are supporting aspects such as human resources in facilitating the Covid-19 vaccine (injection, screening and data collection of people who are vaccinated). The place where the vaccine is carried out must also be in accordance with and comply with health protocols, where the vaccine is stored and the packaging of the vaccine. The budget used must also be clear for the needs of the implementation of vaccination. Then recording and reporting in the implementation of vaccination.

Based on data reported by the Indonesian Ministry of Health, the total target for Covid-19 vaccination in Indonesia is 181,554,465 people, and the target for Covid-19 vaccination for health workers is 1,534,937 people. Data as of February 3, 2021, there have been 646,026 people who were vaccinated for stage 1, and stage 2 totaling 71,621 people. Meanwhile, Aceh, based on data from the Komite Pencegahan Covid-19 Pemulihan Ekonomi Nasional (2021) from January to December 31, 2021, the target number of vaccinations is 4,028,891 people and a total of 2,658,828 people (stage 1) and 1,188,862 have been vaccinated. people (stage 2). Then the number of health workers who have been vaccinated is 65,733 people (stage 1),

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60,535 people (stage 2) and 36,809 people (stage 3). For the elderly who have been vaccinated, there are 196,381 people (stage 1) and 54,707 people (stage 2). Furthermore, the general population who have been vaccinated amounted to 1,771,064 people (stage 1) and 678,906 people (stage 2). The objective of this research is to find out the determinants of COVID-19 vaccination coverage in Aceh in 2021.

METHODS

This study is a further analysis of secondary data from the Committee for Handling the Corona Virus Disease 2019 and National Economic Recovery (KPC PEN) in 2021. This research is descriptive analytic with a cross-sectional design with a quantitative approach. A cross-sectional research design is a type of observational research design in which in this cross-sectional study the researcher measures the outcome and exposure of study participants at the same time (Setia, 2016). This research was taken from secondary data from 23 regencies/cities in Aceh Province in 2021. The secondary data was re-analyzed by researchers in 2022.

The population in this study is the total population that has been vaccinated in 23 regencies/cities in Aceh Province that has been vaccinated with dose 1. The sample in this study is the achievement of vaccination as of December 31, 2021 in 23 districts/cities of Aceh Province. The sampling technique used was the total population. Total population is the entire population sampled. This research was analyzed using linear regression test with the Stata computer program. Then this research was approved by the Health Research Ethics Committee, Faculty of Medicine, Syiah Kuala University, dr. Zainoel Abidin: Ethical Approval with KEPPKN Registration Number: 117012P, Number: 061/EA/FK-RSUDZA/2022 on April 13, 2022.

RESULTS

This data is an achievement from the KPC PEN dashboard from April 14 to April 21, 2021 at the Aceh Health Service. The data that has been collected is then processed by analysis using univariate, bivariate and multivariate analysis. The results of the analysis can be seen in the table below:

Univariate Analysis

Table 1. Covid-19 Vaccination Coverage in Aceh

District	Number of people who have been vaccinated	Vaccination Target	Vaccination percentage
Aceh barat	82.771	155.150	53
Aceh barat daya	88.541	118.267	75
Aceh besar	201.996	307.325	66
Aceh jaya	99.158	123.123	81
Aceh selatan	99.935	184.649	54
Aceh singkil	60.990	92.796	66
Aceh tamiang	152.962	225.289	68
Aceh tengah	116.282	163.041	71
Aceh tenggara	115.196	167.698	69
Aceh timur	218.706	312.063	70
Aceh utara	212.504	458.608	46
Banda aceh	193.432	190.289	102
Bener meriah	86.653	131.725	66
Bireuen	190.526	332.996	57

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District	Number of people who have been vaccinated	Vaccination Target	Vaccination percentage
Gayo lues	54.856	74.545	74
Langsa	110.180	145.877	76
Lhokseumawe	116.003	144.585	80
Nagan raya	95.821	121.323	79
Pidie	193.428	340.846	57
Pidie jaya	49.145	70.271	70
Sabang	23.202	31.217	74
Simeulue	51.051	71.537	71
Subulussalam	45.490	65.671	69

Source : KPC PEN 2021 (Resprocess, 2022)

Based on the table above, it shows that the highest proportion is in the district/city of Banda Aceh with a percentage of 102% and the lowest proportion is in the district/city of North Aceh with a percentage of 46%.

Table 2. Distribution of Data and Vaccination Achievements (%)

No	Variable	Mean	Std. Dev.	Min	Max
1	Vaccination coverage	69,30	11,52	46	102
2	Human resources for vaccinators	75,91	3,82	68	90
3	Vaccinators Stock	4,30	1,01	3	6
4	Number of Vaccine Service Facility Places	4,34	1,89	2	8
5	Vaccination: Health Worker	119,78	13,65	91	154
6	Vaccination: Elderly	61,65	15,45	36	101
7	Vaccination: Public Officer	64,13	32,41	33	172
8	Vaccination: Community	71,26	10,04	51	92
9	Vaccination: Teenagers	63,30	12,82	37	94

Source : KPC PEN 2021 (Reprocess, 2022)

Based on the table above shows that the average proportion of Vaccine Coverage in Aceh is 69.30% with a minimum percentage of 46% and the highest 102%, the average proportion of Vaccine Vaccination Human Resources is 75.91% with a minimum percentage of 68% and the highest 90%, the average proportion of Vaccine Stock is 4.30% with a minimum percentage of 3% and the highest is 6%, the average proportion of the Number of Vaccine Service Facilities is 4.30% with a minimum percentage of 2% and the highest 8%, then the average proportion Coverage of Vaccination Achievements: Health Workers is 119.78% with a minimum percentage of 91% and the highest is 154%, the average proportion of Vaccination Achievement Coverage: Elderly is 61.65% with a minimum percentage of 36% and the highest is 101%, the average proportion of Vaccination Achievement Coverage: : Public Officers at 64.13% with a minimum percentage of 33% and the highest 172%, the average proportion of Coverage Vaccination Achievements: Communities is 71.26% with a minimum percentage of 51% and the highest 92%, and an average proportion of C overage Vaccination Achievements: Adolescents by 63.30% with a minimum percentage of 37% and the highest 94%.

Bivariate Analysis

This analysis to determine the relationship between the COVID-19 Vaccine Coverage Determinants in Aceh using a linear regression test can be seen as follows:

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Table 3. Determinants of COVID-19 Vaccine Coverage Aceh in 2021

No	COVID-19 Vaccination Coverage	Coef.	Pvalue	R	95% Conf.Interval	
1	Human resources for vaccinators	1,87	0,0001	0,48	0,99	2,75
2	Vaccinators Stock	6,07	0,008	0,28	1,74	10,39
3	Number of Vaccine Service Facility Places	-2,07	0,111	0,11	-4,66	0,51
4	Vaccination: Health Worker	0,22	0,212	0,07	-0,14	0,59
5	Vaccination: Elderly	0,25	0,113	0,11	-0,06	0,57
6	Vaccination: Public Officer	0,26	0,0001	0,54	0,15	0,37
7	Vaccination: Community	0,90	0,0001	0,62	0,58	1,22
8	Vaccination: Teenagers	0,72	0,0001	0,64	0,48	0,96

Source : KPC PEN 2021 (Reprocess, 2022)

Based on the table above, it shows that the vaccinator HR variable obtained (p = 0.0001) indicates that there is a significant relationship between the vaccinator HR and the COVID-19 vaccine coverage in Aceh and the coefficient value is 1.87, meaning that the vaccinator HR has a chance of 1.87 or 2 doubled coverage of the COVID-19 vaccine. The Vaccine Stock variable obtained (p=0.008) indicates that there is a significant relationship between Vaccine Stock and COVID-19 vaccine coverage and a coefficient value of 6.07 is obtained, meaning that Vaccine Stock has a 6-fold chance of increasing COVID-19 vaccine coverage. Variable Number of Vaccine Service Facility Places obtained p value = 0.111 indicating that there is no significant relationship between the Number of Vaccine Service Facility Places and COVID-19 vaccine coverage.

Then the Variable Coverage of Vaccination Achievements: Health Workers obtained (p=0.212) showed that there was no significant relationship between the Coverage of Vaccination Achievements: Health Workers and the Coverage of the COVID-19 vaccine. Vaccination Outcome Coverage: Elderly obtained (p=0.113) showed that there was no significant relationship between Vaccination Achievement Coverage: Elderly and COVID-19 vaccine coverage. Vaccination Achievement Coverage: Public Officers obtained a P value of 0.0001 indicating that there is a significant relationship between Vaccination Achievement Coverage: Public Officers and COVID-19 vaccine coverage. Vaccination Outcome Coverage: community obtained (p=0.0001) indicates that there is a significant relationship between Vaccine Outcome Coverage: community and COVID-19 vaccine coverage. Vaccination Achievement Coverage: adolescents obtained (p=0.0001) showed that there was a significant relationship between Vaccine Outcome Coverage: adolescents and COVID-19 vaccine coverage.

DISCUSSION

Relationship between Vaccine Vaccination Human Resource and COVID-19 Vaccine Coverage

In this study the human resources of the vaccine vaccinator became the independent variable. Variable HR of Vaccination indicates that the average proportion of HR Vaccine Vaccines is 75.91% with a minimum percentage of 68% and the highest percentage of 90%. Then the bivariate analysis explained that the vaccinator HR variable obtained a P value of 0.0001 indicating that there was a significant relationship between the vaccinator HR and the COVID-19 vaccine coverage and the coefficient value was 1.87, meaning that the vaccinator HR had a 1.87 or 2-fold opportunity to increase coverage. COVID-19 vaccine.

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The results of research from Nadya (2021) show that there are still problems in human resources, budgets, facilities and infrastructure. Whereas resources greatly affect the success of implementation, because with reliable resources, the implementation of a program will run well (Asyafin, Virdani, Kasih, & Arif, 2021). In terms of human resources, COVID-19 vaccination officers are still lacking in terms of quantity. In terms of budgetary resources, the budget for the COVID-19 vaccination policy has not been fully channeled properly, indicated by the absence of incentives for COVID-19 vaccination officers and they also have to buy the necessities for the COVID-19 vaccination policy with personal funds. Then in terms of resources, facilities and infrastructure are sufficient, both in terms of buildings, as well as other tools and equipment, even for the logistics distribution of COVID-19 vaccinations, it has been running smoothly.

The researcher assumes that vaccine coverage will increase when viewed from the Vaskinator HR factor, because the vaccine target will vaccinate if there are many vaccinator human resources and are located anywhere that the vaccination target needs. The researcher also found that in December 2021, with the frequent presence of state officials in Aceh Province, there was also the addition of vaccinator human resources by the Indonesian Police to assist Aceh Province in achieving the 70% target by the end of 2021.

Relationship between Vaccine Stock and COVID-19 Vaccine Coverage

In this study, Vaccine Stock became the independent variable with an average Vaccine Stock proportion of 4.30% with a minimum percentage of 3% and the highest percentage of 6%. Then a bivariate analysis of the Vaccine Stock variable was obtained (p = 0.008) showing that there was a significant relationship between Vaccine Stock and COVID-19 vaccine coverage and a coefficient value of 6.07 was obtained, meaning that Vaccine Stock had a 6-fold chance of increasing COVID-19 vaccine coverage.

According to WHO, the Government has full responsibility in financing the COVID-19 vaccination because it has a very large positive externality (World Health Organization, 2021). Government support is not only in terms of financing, but also needs to encourage the domestic pharmaceutical industry to be able to produce vaccines with a knowledge and technology transfer strategy or collaborate in the production process between domestic and international pharmaceutical companies. Limited vaccine production capacity affects the existing vaccine supply, so countries must set vaccination priorities at each stage of implementation. The priority of vaccination should be based on the principles of benefit (improves health and the economy) and equity (protects the worst). According to Danis et al. (2020), priority setting must be carried out transparently and make it easier for the community to reach vaccinations.

The Indonesian government until April 2021 has a target of 40.3 million people having been vaccinated with the complete dose (two doses of injection). Three types of vaccines namely Sinovac, AstraZeneca and Sinopharm have been used in Indonesia, but the achievement of vaccine delivery until the end of December 2021 has not reached the target (Fitrianty, Retnaningsih, & Nizmi, 2021). In addition to the low speed of vaccine delivery, another thing that causes the low coverage of the COVID-19 vaccine is the lack of public acceptance of the vaccine itself. Harapan et al found that vaccine acceptance would be higher in vaccines that had high efficacy (Harapan et al., 2020). In the first stage, the type of vaccine that is widely used is Sinovac which is considered to have low efficacy. If we refer to the performance of vaccines according to WHO, we need information on how the vaccine impacts at the community level.

At the end of December 2021 the available vaccines for the implementation of COVID-19 vaccination in Aceh Province were Sinovac/Coronavac, Moderna and Pfizer. Sinovac for the Community and Youth, Pfizer for the community and Youth especially Booster and Moderna for People over the age of 18. Researchers assume that vaccine coverage will not

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increase if there is not enough vaccine stock, because this affects the vaccine target for vaccines. In December 2021 the stock of vaccines was vacant several times in the Pharmacy Warehouse of the Provincial Health Office due to distribution from PT. The delay in Biofarma and the Ministry of Health has affected the acceleration of achieving the vaccination target in Aceh.

CONCLUSION

The average proportion of Vaccine Coverage is 69.30% with a minimum percentage of 46% and the highest percentage of 102%.

The average proportion of Vaccine Vaccination Human Resources is 75.91% with a minimum percentage of 68% and the highest being 90%. Then explained that the vaccinator HR variable obtained a P value of 0.0001 indicating that there was a significant relationship between the vaccinator HR and the COVID-19 vaccine coverage. The vaccinator's human resources greatly affect the increase in the achievement of COVID-19 vaccination because if there are many teams working, there will be many people who attend the vaccination, especially in villages.

Variable Vaccine Stock obtained (p=0.008) indicates that there is a significant relationship between Vaccine Stock and COVID-19 vaccine coverage. Vaccine stock has been vacant several times in the Pharmacy Warehouse of the Provincial Health Office due to distribution from PT. The delay in Biofarma and the Ministry of Health has affected the acceleration of achieving the vaccination target in Aceh.

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