VIEWING THE ACHIEVEMENT OF THE COVID-19 VACCINATION IN INDONESIA FROM A HUMAN DEVELOPMENT AND URBANIZATION PERSPECTIVE

MELIHAT CAPAIAN VAKSINASI COVID-19 DI INDONESIA DARI SUDUT PANDANG PEMBANGUNAN MANUSIA DAN URBANISASI

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Abstract

The disparity in the achievement of Covid-19 vaccination among provinces in Indonesia is still quite high. This can be one reason why the number of Covid-19 patients are still fluctuative even until today. Nevertheless, the Covid-19 vaccine is still very useful to reduce Covid-19 infection. This study aims to see whether Human Development Index (HDI) and urbanization rate are the reasons behind the achievement of Covid-19 vaccination in Indonesia. The research used a quantitative approach with a cross-sectional research design. The data used are secondary data from BPS and the Ministry of Health. The data were analyzed using tabulations, graphs, and inferential analysis through the Pearson correlation test and multiple linear regression. The results show that about three-quarters of provinces in Indonesia are still below the Covid-19 vaccination target to achieve herd immunity. The scatter plot graph shows provinces with relatively low vaccination rates, having relatively low of HDI and urbanization level. Vice versa. Meanwhile, the results of a multiple linear regression analysis found that HDI and the level of urbanization had a very strong and statistically significant effect on the achievement of Covid-19 vaccination in all provinces in Indonesia. These results conclude that the achievement of the Covid-19 vaccination in Indonesia is the background for the achievement of the Covid-19 vaccination in Indonesia. Therefore, provinces with low Covid-19 vaccination achievements can be encouraged to continue pursuing the herd immunity target by paying attention to the characteristics of provinces with high HDI and high urbanization.

Key Words: Herd Immunity, Urban Population, Quality of Life, Pandemic, Rejection of Covid-19 Vaccine

Abstrak

Disparitas capaian vaksinasi Covid-19 antarprovinsi di Indonesia masih cukup tinggi. Hal ini bisa menjadi salah satu alasan mengapa jumlah pasien Covid-19 masih fluktuatif bahkan hingga saat ini. Meski demikian, vaksin Covid-19 tetap sangat bermanfaat untuk mengurangi infeksi Covid-19. Penelitian ini bertujuan untuk melihat apakah Indeks Pembangunan Manusia (IPM) dan tingkat urbanisasi melatarbelakangi capaian vaksinasi Covid-19 di Indonesia. Penelitian ini menggunakan pendekatan kuantitatif dengan desain penelitian secara cross section. Data yang digunakan merupakan data sekunder dari BPS dan Kementrian Kesehatan. Data tersebut dianalisis menggunakan tabulasi, grafik, dan analisis inferensial melalui uji korelasi Pearson dan regresi linier berganda. Hasil penelitian menunjukkan bahwa sekitar tiga perempat provinsi di Indonesia masih di bawah target vaksinasi Covid-19

untuk mencapai herd immunity. Grafik scatter plot menunjukkan provinsi dengan capaian vaksinasi yang relatif rendah, memiliki IPM dan tingkat urbanisasi yang juga relatif rendah. Begitu pula sebaliknya. Sedangkan hasil dari analisis regresi linear sederhana menemukan bahwa IPM dan tingkat urbanisasi mempunyai pengaruh cukup kuat dan signifikan secara statistik terhadap capaian vaksinasi Covid-19 di seluruh provinsi di Indonesia. Hasil ini memberikan kesimpulan bahwa capaian vaksinasi Covid-19 di Indonesia melatarbelakangi capaian vaksinasi Covid-19 di Indonesia. Oleh karena itu Provinsi yang capaian vaksinasi Covid-19 yang masih rendah, dapat didorong untuk terus mengejar target herd immunity dengan memperhatikan bagaimana karakteristik provinsi dengan IPM dan urbanisasi tinggi.

Kata Kunci: Herd Immunity, Penduduk Perkotaan, Kualitas Hidup, Pandemi, Penolakan Vaksin Covid-19

INTRODUCTION

Covid-19 has shaken the world. Almost all countries in the world have felt the impact, since this disease was announced by the World Health Organization (WHO) as a pandemic in March 2020 (Kozak & Nienhaus, 2021). Before the Covid-19 vaccine was discovered, various efforts had been made by the governments in the world to suppress the transmission of Covid-19 by limiting the movement of their citizens through social distancing, physical distancing, and lockdown policies (Duque-Calvache et al., 2021; Dwipayana, 2020; Halford et al., 2020). The fact is that Covid-19 cases continue to grow, even until 2022. Data from ourworldindata.org has recorded an additional 225.05 million confirmed cases of Covid-19 during the period January – April 2022.

Although new cases of Covid-19 are still found every day, the rate of increase in Covid-19 cases is much lower than that in 2020. Experts said that the global decline in Covid-19 cases is one of the contributions from the success of the Covid-19 vaccination program (Joyosemito & Nasir, 2021; Roy et al., 2022). Vaccination is an important weapon against the Covid-19 pandemic (Machida et al., 2021; Utami, 2022; Yang & Wang, 2020). This program is done to form herd immunity which can reduce the mortality and morbidity rate of Covid-19 (Saad-Roy et al., 2020).

WHO recommended a mass vaccination program of Covid-19 in all countries in the world. Each country continues to be encouraged to carry out vaccinations until it reaches the minimum target of herd immunity. The herd immunity target for each country can be different, depending on the conditions of the region and the level of efficacy of the vaccine used. Some said herd immunity in the range of 50-67 percent (El-Elimat et al., 2021), a minimum of 70 percent (Dwipayana, 2020), a minimum of 66 percent (MacIntyre et al., 2022), and between 60-90 percent (Kadkhoda, 2021) of the total population. Unfortunately, not all countries have achieved the set target, even though it has been more than a year that the Covid-19 vaccination has been intensified, on December 13, 2020, since the data for the world's first vaccination was published (Mathieu et al., 2021).

For Indonesia, the Covid-19 vaccination is very emergency, because deaths from Covid-19 are the highest in the Southeast Asian region (Dwipayana, 2020). However, Indonesia's vaccination achievement until February 2022 has accumulated to reach 67.37 percent of the total population of Indonesia. Indonesia itself is targeted at 70 percent to achieve herd immunity (Dwipayana, 2020). This condition indicates that the target for community immunity has not been achieved. At the provincial level, only eight provinces exceeded the target, namely DKI Jakarta, Bali, DI Yogyakarta, Riau, East Kalimantan, Bangka Belitung, Central Java, and North Kalimantan Province. Of the eight provinces, only three are from Java Island. In fact, more than two-thirds of Covid-19 cases occurred in Java Island.

Another problem with vaccination is the wide disparity in vaccination achievement among the provinces. DKI Jakarta Province, together with Bali Province and DI Yogyakarta, is listed as the best province in achieving Covid-19 vaccination. These three

provinces have exceeded the vaccination target of 100 percent. On the other hand, some provinces in eastern Indonesia are still below 50 percent of the target.

Some literature suggested that several things can be the reason why the achievement of vaccination in an area is still very low. Socio-cultural reasons, conditions of education level, religion, health conditions, and politics can hinder the achievement of Covid-19 vaccination (Bertoncello et al., 2020; Browne et al., 2015; de Figueiredo & Larson, 2021; Eriksson & Vartanova, 2022; Fauzia & Hamdani, 2021; Mesch & Schwirian, 2015; Utami, 2022). These backgrounds could then shape a person's attitude on whether to accept, hesitate, or even refuse the Covid-19 vaccine (Alemayehu et al., 2022; El-Elimat et al., 2021; Omidvar & Firouzbakht, 2022; Roy et al., 2022).

Rejection of the Covid-19 vaccine has been reported in more than 90 percent of countries in the world (de Figueiredo et al., 2020). From the results of a study conducted by Kozak & Nienhaus (2021), it is found that the biggest reason for refusing the vaccine is concerning the long-term consequences of the vaccine. The next reason is about the safety and efficacy of the vaccine, as well as the side effects of it. The same thing is revealed in the study of Utami (2022) and MacDonald et al., (2015). These reasons also occurred in Indonesia (Utami, 2022).

In order to reduce the number of people who refuse the vaccine, various efforts have been made by the Indonesian government. These policies can be divided into two groups, namely binding policies through legal regulations, and policies through government appeals that are looser in nature. Through legal regulations, the government has issued various important regulations, including the Government of Indonesia issuing Presidential Regulation Number 14 year 2021 which regulated the provisions for the imposition of administrative sanctions in the form of delaying or terminating social security for people who are targeted for vaccine recipients but do not participate in vaccinations (Fauzia & Hamdani, 2021; Sigalingging & Santoso, 2021). In addition, there are also various regulations of the minister of health that regulated the implementation of vaccination. The government also implemented rules for the application of a third or booster vaccination requirement for travellers. This regulation was quite effective in encouraging the achievement of Covid-19 vaccination in areas with a fairly high level of mobility, such as in urban areas.

In addition to legal regulations, the Government has also provided advice through disseminating information about vaccines to the public. This information also counters the misleading news about vaccines that are widely circulated in the community. This includes information on where to vaccinate, which is also circulated through various media to make it be easier for people to get to the vaccination site(Sutari et al., 2022). Not only that, the Indonesian government also takes a socio-cultural approach. This method is generally taken by involving local community leaders, traditional leaders or religious leaders in providing awareness of the importance of Covid-19 vaccination and the threat of Covid-19 if the body is not vaccinated(Fauzia & Hamdani, 2021). This effort is mostly applied to areas where people still believe that Covid-19 does not exist and or consider vaccines to be unsafe for humans.

Although various policies have been taken by the Government of Indonesia in order to encourage its citizens to be willing to be vaccinated, in fact there are still many rejections. At least it can be seen from the achievements of the Covid-19 vaccination published by the Ministry of Health. It is interesting to see why disparities occur in the achievement of Covid-19 vaccinations between provinces in Indonesia.

Having mentioned that various reasons can hamper the achievements of Covid-19 vaccination in Indonesia, this research tries to find out which factors correlate with the vaccination rate. However, due to time limitation, this study is limited to only look at the factors of human development and urbanization. Human development is approximated by the Human Development Index (HDI) and urbanization is approximated by the proportion of the population living in urban areas. The selection of these variables is based on several

studies of literature relevant to this study as conducted by Danabal et al., (2021); Harapan et al., (2020); Liu & Li, (2021); Murthy et al., (2021); Roy et al., (2022); Utami (2022); Joyosemito & Nasir, (2021); and Sudari et al. (2022).

HDI can describe human beings, such as the health, education, and economic conditions of the community at a macro level (UNDP, 1990). Meanwhile, urbanization can describe the condition of a population and their access to various facilities, including health facilities. Although the HDI is not a direct cause in influencing the achievement of vaccination for Covid-19, the HDI can be a proxy in representing awareness for the fight against the pandemic. Because regions with a high HDI will have a high awareness of vaccination. Likewise with urbanization. The level of urbanization is a proxy for the implementation of various policies related to the prevention of Covid-19. This is because policies such as social distancing and the application of vaccine requirements for travellers are more common in urban residents. So, these two variables are considered to be behind the reasons for the Covid-19 vaccinations achievements in the provinces of Indonesia.

Taking into account the description above, the hypothesis in this study is that a high HDI in an area will be in line with high Covid-19 vaccination achievements. The next assumption is that the high level of urbanization is also in line with the achievements of the Covid-19 vaccination. This study will answer what these allegations are.

This research is considered important, because the results can be used as consideration for policy making in the context of pursuing Covid-19 vaccination achievements. The results of the research can be of concern, especially for regions where the results of the Covid-19 vaccination are below herd immunity. In addition, other studies focusing on the relationship between HDI and the urbanization rate on the achievement of Covid-19 vaccination in Indonesia have not much been found.

METHOD

This study uses a quantitative approach with a cross-sectional research design in 34 provinces in Indonesia. Meanwhile, there were three variables used in this research. First, The achievement of the Covid-19 vaccination. This variable is defined by the percentage of the population who received the Covid-19 vaccine up to the 2nd dose of the total population, multiplied by 100. Second, Human Development Index is a composite index that measures human development achievements. HDI is calculated by the geometric mean of life expectancy at birth, mean years of schooling, expected years of schooling, and gross national income. Specifically in calculating HDI for provinces in Indonesia, the gross national is adjusted to adjusted per capita expenditure. HDI scale runs from 0 to 100 percent. If 100 is representing the best development possible. A higher HDI indicates the better socioeconomic, welfare, and security situations in the region. Last variabel is urbanization rate. It is the proportion of the population living in urban areas to the total population. Urbanization rate scale runs from 0 to 100 percent. If an area has an urbanization rate of 100, this means that all residents in that area live in urban areas.

These three variables are secondary data sourced from BPS for HDI and urbanization rate, and from the Ministry of Health for vaccination rate. The variables of HDI and the level of urbanization are taken from the condition in 2021. The variable of vaccination rate is the accumulative data until February 2022.

The analytical tools used in this study are descriptive and inferential statistics. Descriptive analysis is useful to see the achievement of Covid-19 vaccination, HDI achievement, and the level of urbanization in all provinces in Indonesia. Inferential analysis used a correlation test of two variables and multiple linear regression modeling to see the relationship between HDI and the level of urbanization on the achievement of Covid-19 vaccination. The correlation is limited to looking at the magnitude and direction of the relationship between two variables. Multiple linear regression is wider because it is a

statistical technique for estimating the causal relationship between one dependent variable and more than one independent variable (Uyanık & Güler, 2013).

To processed data, this research uses several softwares. Openjump 1.11 and DBF Viewer are open source software used to process spatial data. Stata 12 and Microsoft Excel 2013 (licensed) were used to display the output of the Pearson correlation test and multiple linear regression.

This paper use four parts. First, the introduction contains the background of the problem of vaccination, especially in Indonesia, theoretical reviews, the research gap, and the purpose of the research. The next section is the research method that describes the type of research approach, research design, unit of observation, definition of variables, and analytical methods used to answer the research objectives. The results of the research and its discussion are in the results and discussion section. The last is the conclusion and recommendation section based on the research results obtained.

RESULTS AND DISCUSSION

Overview of Vaccination, HDI, and Urbanization

Indonesia's vaccination achievement until February 2022 reached 67.37 percent. As previously described, if Indonesia's herd immunity benchmark is 70 percent, it can be said that Indonesia has not yet achieved herd immunity. This means that we need some more efforts to achieve the target of herd immunity. Achieving the vaccination target is very important because vaccination is the preventive treatment needed for the Covid-19 pandemic, as mentioned by Machida et al., (2021).

Table 1. The highest and lowest data values according to variable

Variable	Province		Indonesia
	The Lowest	The Highest	
Vaccination rate of Covid-19 (%)	22.62 Papua	123.62 Jakarta	67.37
HDI	60.62 Papua	81.11 Jakarta	72.29
Urbanization Rate (%)	20.36 Sulawesi Barat	100.00 Jakarta	56.82

Source: Processing Output by Stata 12

The vaccination program in Indonesia has faced some problems, not only the problem regarding herd immunity achievment, but also the disparity in vaccination achievement between provinces. Up to the second dose, the disparity in vaccination achievement among provinces in Indonesia is quite wide. The Ministry of Health of the Republic of Indonesia noted that DKI Jakarta Province is the province with the highest vaccination achievement, which is 123.62 percent. This achievement is very far compared to the vaccination in Papua Province which only reached 22.62 percent. The difference between the two provinces is quite wide, reaching 101 percent.
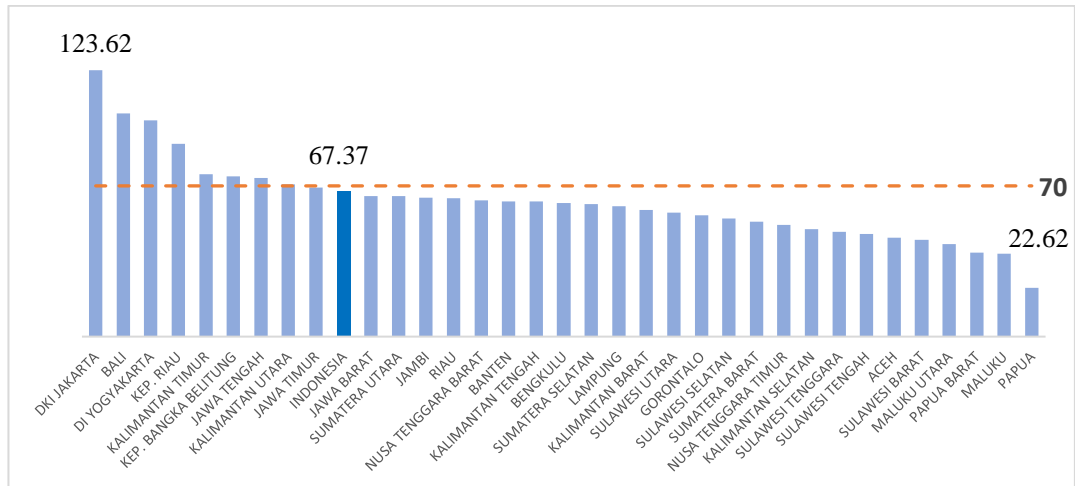
Figure 1. Achievement of Covid-19 vaccination by Province in Indonesia, February 2022

Source: The Ministry of Health of the Republic of Indonesia (The Processed Figure)

Initially, Indonesia found some difficulties in finding and chosing the vaccines from internationl sources. However, the government is able to overcome the problem and the Covid-19 vaccine is available in various types with sufficient quantities (Arifin & Anas, 2021). Soon after that, the vaccines are also quite evenly distributed in the territory of Indonesia, except for some remote places. The remaining problem which is still under the government's concern is the opposition to vaccines by the people (Fauzia & Hamdani, 2021; Utami, 2022). This has become a vaccination challenge thorough Indonesia, which needs to be addressed. The research conducted by Utami (2022) on 500 respondents in Central Java Province says that 6.7 percent of the respondents refuses to receive the Covid-19 vaccine. This refusal to the vaccine may also occur in other provinces, even more with a higher percentage.

Similar to the achievement of vaccination, HDI indicators and the level of urbanization also have quite diverse disparities. DKI Jakarta Province also holds the best predicate as the province with the highest HDI (81.11) and the highest urbanization rate (100 percent). This condition described DKI Jakarta as a province with the best quality of population in Indonesia. They enjoyed the best urban facilities.

Meanwhile, the lowest HDI is in Papua Province (60.62) and the lowest urbanization rate is in West Sulawesi Province (20.36 percent). This condition further emphasizes the disparity that occurs in Indonesia. Therefore, development in such areas needs to be accelerated to catch up with other regions. This is especially true in the context of increasing vaccination outcomes, which are thought to be motivated by HDI and the level of urbanization.

If we viewed based on spatial distribution, the provinces located on the islands of Sumatra, Java to the Nusa Tenggara islands are mostly in the vaccination achievement group above 50 to 69.9 percent. This group is in the moderate group or the middle. The number of provinces is the highest among the other groups, namely 27 provinces. In the Sumatra Island area, there were the Riau Islands and the Bangka Belitung Islands which are in a better position, because they have achieved vaccinations above 70 percent. In addition, on the island of Java-Bali, there were DKI Jakarta, DI Yogyakarta, Central Java, and Bali which were included in the Covid-19 vaccination achievement group above 70 percent.
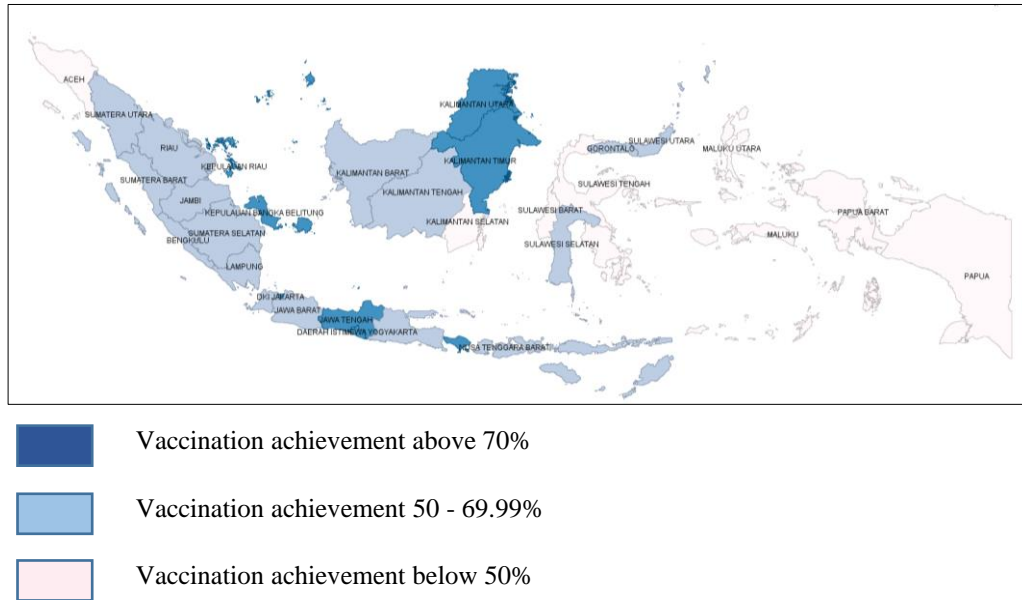
Vaccination achievement above 70%

Vaccination achievement 50 - 69.99%

Vaccination achievement below 50%

Figure 2. Achievement of Covid-19 vaccination by province and classification, February 2022

Sources: The Ministry of Health, Republic of Indonesia (The Processed Graphic)

Provinces on the islands of Sulawesi, Maluku, and Papua were mostly in the group with vaccination achievements below 50 percent. Only North Sulawesi and South Sulawesi were in the middle group. While on the island of Kalimantan, the province's achievements were more diverse. East Kalimantan and North Kalimantan led the way in vaccination with the achievement of over 70 percent. West Kalimantan and Central Kalimantan were in the middle, followed by South Kalimantan at the bottom because the vaccination achievement is below 50 percent.

The Relationship between HDI and Urbanization on Covid-19 Vaccination

To find out the relationship between HDI and urbanization with the achievement of Covid-19 vaccination, the bivariate-Pearson correlation test and multiple linear regression modeling are applied. The results of the bivariate test between HDI and the achievement of Covid-19 vaccination and between the level of urbanization and the achievement of the Covid-19 vaccination show a unidirectional relationship quite strong relation and statistically significant result. This means that the achievement of the Covid-19 vaccine is statistically related to the achievement of the HDI and the level of urbanization in Indonesia. The higher the HDI, the higher the HDI vaccination achievement. Likewise with the level of urbanization.

Table 2. Pearson Correlation Test Results

Relationship of Two Variables	Correlation Value	Conclusion
HDI – Vaccination rate of Covid-19	0.84***	Significant, positive
Urbanization Rate - Vaccination rate of Covid-19	0.77***	Significant, positive

***Signifikan pada α=1%,
Source: Processing Output by Stata 12 SE

The conclusion of the pearson correlation test is also supported by the scatter plot diagram. The scatter diagram shows a unidirectional pattern between HDI and Covid-19 vaccination achievements. The graph shows a diagonal line pattern from the bottom left to the top right. This means that the higher the HDI is, the higher the Covid-19 vaccination achievement is. The same result has been shown by the urbanization with the Covid-19 vaccination. The higher the level of urbanization is, the higher the achievement of Covid-19 vaccination.
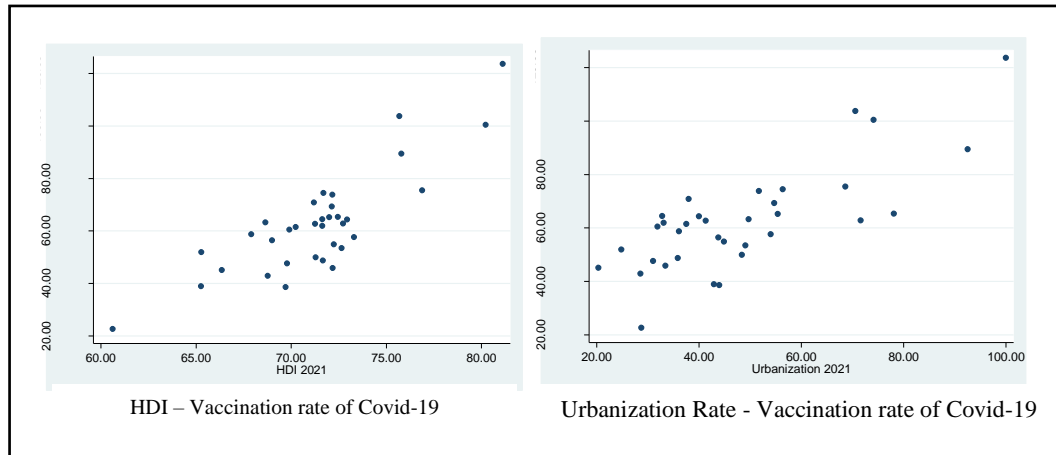

HDI – Vaccination rate of Covid-19   Urbanization Rate - Vaccination rate of Covid-19

Figure 3. Scatter Plot between HDI - Covid-19 Vaccination, and Urbanization Rate - Covid-19 Vaccination

Sources: Processing Output by Stata 12 SE

If the correlation test is limited to the analysis of the relationship between two variables, then in multiple linear regression, it is necessary to look at the relationship of the independent variables simultaneously to the dependent variable. Multiple linear regression modeling in this study is to figure out the relationship and role of HDI and urbanization in the background of the province's Covid-19 vaccination achievements in Indonesia. The modeling of the multiple linear regression that has been formed has met the assumptions of normality, the absence of heteroscedasticity, linearity, and the absence of multicollinearity.

Table 3. Simultaneous model testing results

Item	Nilai
Number of Observation	34
P-value	0.0000
R-Square	0.7513
Conclusion	Significant

Source: Processing Output by Stata 12 SE

In the overall test of the model, the resulting P-value of 0.000 is far below the one percent alpha value. This means that the overall model is meaningful and the model can be continued for analysis. In other words, at least one independent variable (HDI or urbanization) that has a statistically significant value to the achievement of the Covid-19 vaccination. This model is also relatively strong, because the R-square value is quite large, which is 0.7513. It can be said that the variation in the Covid-19 vaccination achievement can be explained by the HDI variable and the urbanization rate of 75.13 percent. The remaining 24.87 percent is explained by other factors outside the model.

Table 4. Coefficients of variable in the model

Variables	Coefficients	Standard Error	p-value
HDI	2.96	0.693	0.000***
Urbanization Rate	0.335	0.143	0.026**
Constanta	-165.31	44.425	0.001

***significant at α=1%, ** significant at =5%, * significant at =10%,
Source: Processing Output by Stata 12 SE

The analysis is continued with a partial test of each independent variable. The results shows that HDI has a positive and significant effect on the achievement of the Covid-19 vaccination. The HDI coefficient is 2.96, meaning that every 1 unit increase in HDI, will increase the Covid-19 vaccination achievement by 2.96 percent. This relationship also further supports the results of the correlation test and the scatter diagram between HDI and Covid-19 vaccination achievements which are significant and unidirectional.

The HDI level in supporting the succesfull of the Covid-19 vaccination can be explained through the dimensions constructed by the HDI, i.e. health, education, and the economy. A high HDI can reflect the condition of a good quality of life of the population in an area on a macro basis from the health, education, and economic situation (UNDP, 1990). The higher the HDI, the higher the quality of life of the population. The quality of the population is reflected in their educated, healthy and prosperous character from their economic level, which is generally more rational in understanding the concept of Covid-19 vaccination. Therefore, regions that have a relatively high HDI generally have relatively high Covid-19 vaccination achievements. This finding is the same with Yang et al., (2022) that the Countries with a high HDI usually had a high vaccination coverage. Developing countries which generally have limited education and health infrastructure and the relatively low quality of their population have the potential to face challenges in Covid-19 vaccination. It is not surprising that the provinces of DKI Jakarta, DI Yogyakarta, East Kalimantan, Riau Islands, and Bali, which are included in the five highest HDIs in Indonesia, are also included in the group of provinces with high Covid-19 vaccination achievements.

In terms of education, this study further support previous research from Danabal et al., (2021) that found that vaccination is more acceptable to those with higher education, compared to those with lower education. From an economic perspective, Harapan et al., (2020) and Roy et al., (2022) suggest that countries with low and middle incomes have lower demand for vaccines than developed countries. This is due to the greater rejection of the Covid-19 vaccine by citizens in these countries. Meanwhile, in terms of population health, those who have comorbidities are 4.8 times more likely to refuse vaccines than those who do not have ones. This result is the finding of Utami (2022) who examined the determinants of the rejection of the Covid-19 vaccine among the adult population and the elderly in Central Java Province.

Similar to the HDI variable, the results of this study also show that the level of urbanization has a positive and significant impact on the achievement of the Covid-19 vaccination. The magnitude of the coefficient of the urbanization rate is 0.335, meaning that for every 1 percent increase in the urbanization rate, the Covid-19 vaccination achievement will increase by 0.335 percent. This relationship is also further supported by the correlation test and the scatter diagram between the level of urbanization and the achievement of Covid-19 vaccination, which are both in the same direction.

These results confirm previous research conducted by Danabal et al. (2021) dan Murthy et al. (2021) which found that people living in urban areas receive the Covid-19 vaccine more than those in rural areas. This relationship can be explained for two reasons. Firstly, the characteristics of infrastructure and facilities, especially for health services, are

more concentrated in urban areas than urban areas. The concentration of health facilities in urban areas is also proven by research from Sadali et al. (2022) in the Province of the Special Region of Yogyakarta. It is strongly suspected that other provinces also experienced the same thing. These characteristics encourage residents in urban areas to access Covid-19 vaccination services more easily than in rural areas.

Secondly, people in urban areas have a higher level of mobility. Urban residents are more mobile, both among cities and outside the city. This is in line with research from Park et al., (2021) which found that the mobility of the urban population remained high compared to that of the rural population even during the Covid-19 pandemic. In Indonesia, the government regulations require vaccines for travelers, these in turn encourage the achievement of vaccinations in urban areas, by which urban residents accept being vaccined, either by voluntarily or by rules. This is why urban residents tend to accept higher vaccination rates than rural residents.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Some important findings from this study conclude that HDI and the level of urbanization are two main reasons behind the achievement of Covid-19 vaccination program in Indonesia. The model shows that the relationship is unidirectional, significant, and strong, implying that the Covid-19 vaccination achievement can be high if the HDI and urbanization are high, and vice versa. So the results of this study conclude that the HDI and the level of urbanization are the background to the achievements of the Covid-19 vaccination in Indonesia.

The results of the study prove the initial assumption that in areas with a high HDI, the achievement of the Covid-19 vaccination is also high. Likewise, with a high level of urbanization, the achievement of the Covid-19 vaccination is also high. This conclusion can be a concern and at the same time become a guide for policy makers in areas with Covid-19 vaccination achievements that are still low below herd immunity to pursue herd immunity targets.

Recommendations

Taking into account the conclusions of the study, in order to increase the achievement of Covid-19 vaccination, it is necessary to encourage an increase in HDI and urbanization. However, increasing the HDI and the level of urbanization of course requires a relatively long time. Meanwhile, the Covid-19 vaccination is relatively achieved in a relatively shorter time to achieve the herd immunity target. Having understod this background, it is more rational for the government to apply the vaccine program by seeing how the characteristics people in area with high HDI and high urbanization level. These characteristics of urban people tend to more think rationally and openly in receiving Covid-19 vaccinations, and not to easily believe negative vaccine information or hoax.

Thus, the area with low Covid-19 vaccination achievement, policy makers can provide easy access to vaccine services on an ongoing basis. Not only for a certain period, but continues, until the population who is the target of the vaccine has been vaccinated. Next is to provide understanding to the community by prioritizing a socio-cultural approach. This has indeed been done, but seeing the results in certain areas where the achievement of Covid-19 vaccination is low, it needs to be done intensely, to make people more trust and accept vaccinations.

HDI and urbanization are essentially indirect causes that determine the achievement of Covid-19 vaccination. Vaccination is affected directly from the side of the recipient (whether to refuse or accept) and the side of the vaccine provider (whether it is available or not). Other factors that are directly related to the achievement of Covid-19 vaccination are quite broad. So that this study has limitations in the use of variables that

only analyze two variables. Future research can expand the scope of factors beyond this research.

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