International Journal Of Humanities Education And Social Sciences ***(IJHESS)*** *E-ISSN:* **2808-1765**
Volume 5, Number 4, February 2026, *Page. 1832 – 1840*
Email : editorijhess@gmail.com

Analysis of The Implementation of The Coronavirus Disease-2019 Vaccination Policy In Indonesia (Case Study of West Java Province)

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Abstract

The COVID-19 vaccination program constitutes a key government policy to mitigate virus transmission and support public health and socio-economic recovery. Despite its strategic importance, the implementation of the vaccination policy in Indonesia has encountered persistent challenges. This study examines the implementation of the COVID-19 vaccination policy in Indonesia, with a particular focus on West Java Province, to assess its effectiveness and identify key constraints affecting policy outcomes. Employing a qualitative descriptive approach, this study is based on a systematic review of academic literature, policy documents, and official government reports related to the national and regional vaccination programs. The findings reveal that during the early phase of implementation, the vaccination policy was insufficient to effectively control the COVID-19 pandemic, as reflected in the surge of cases between June and August 2021, indicating that herd immunity had not yet been achieved, including in West Java Province. While vaccination strategies in Indonesia and other countries are fundamentally grounded in the herd immunity framework, policy effectiveness is strongly shaped by the prioritization of high-risk populations, social dynamics influencing vaccine acceptance, vaccine availability, health system capacity, and the emergence of new virus variants. This study contributes to the literature on public health policy implementation by highlighting structural and contextual factors that constrain vaccination outcomes in decentralized governance settings and offers insights for designing more adaptive and resilient vaccination policies in future public health emergencies.

Keywords: COVID-19 Pandemic, Herd Immunity, Policy Implementation Analysis, Vaccination Policy.

INTRODUCTION

On February 12, 2020, the World Health Organization proclaimed a coronavirus disease 2019 (COVID-19) pandemic. Outside of China, 32 nations had more than 100 cases of COVID-19 as of March 13, 2020. As of August 31, 2021, the number of confirmed cases of COVID-19 in Indonesia was 4,100,138 people, the number of people who died was 133,676 people, and those who recovered were 3,776,891 people. In West Java, as of August 31, 2021, there were 692,178 confirmed cases of COVID-19, 13,531 people died, and 657,824 people recovered (West Java Provincial Health Office Document Report, 2021).

When COVID-19 started to become a pandemic, no one can be declared to have immunity to avoid it and to stop it; it takes several people to become immune (D'Souza & Dowdy, 2021). Vaccines that give individual and population-level immunity are one of the most promising therapies, if produced and applied correctly (D'Souza & David, 2021). One of the most promising interventions, if successfully developed and deployed, is vaccines that would provide individual- and population-level immunity (Schoch et al., 2020).

Various control efforts have been conducted by each country, but until now, COVID-19 is still a pandemic and has not been completed. The current COVID-19 control strategy consists of minimizing COVID-19 through 5 M behaviors such as wearing masks, keeping distances, handwashing, and keeping away from crowds, as well as lowering mobility and boosting 3 T activities such as tracing, testing, and treatment, and immunization.

Vaccination programs are one of the most effective forms of health intervention, having become a widespread agreement (Paul et. al., 2021) Mass vaccination of populations worldwide

is the scientific community's agreement as the most effective way to defeat the COVID-19 pandemic (Bloom, 2021). Vaccination is by far the most effective method of preventing and regulating the spread of COVID-19 (Huang & Feng, 2021).

Vaccination is seen as a serious healthcare tool in the fight against the COVID-19 pandemic. However, the effectiveness of interventions is dependent on vaccination attitudes and the design of vaccination programs (Paul et. al., 2021). One of the measures to limit the COVID-19 outbreak is the notion of establishing herd immunity, given that perhaps the death rate of COVID-19 cases ranges between 0.25 and 3.0 percent of each nation's people (Kwok & Tang, 2020). The Indonesian government, like other nations throughout the world, has implemented a variety of policies in response to the COVID-19 epidemic. One strategy that can help with this is immunization. The COVID-19 vaccination program in Indonesia launched with the passage of Presidential Regulation Number 99 of 2020 about Vaccine Procurement and Vaccination.

Presidential Regulation Number 99 the Year 2020 provides as basis for Implementation in the Context of Combating the COVID-19 Pandemic. The program was designed to expedite the reaction to the COVID-19 outbreak; the government hastened the acquisition of the COVID-19 vaccine and the execution of the COVID-19 vaccination only with scope of procuring, application, finances, and development of the COVID-19 vaccine.

The Regulation of the Minister of Health of the Republic of Indonesia No. 84 of 2020 Prior to The enactment of Vaccination in the Context of Fighting the COVID-19 Outbreak was then established in Jakarta on December 14, 2020, as the foundation for COVID-19 vaccination deployment in Indonesia. The objective was to minimize COVID-19 transmitting, death rates, acquire herd immunity, and keep the public safe against COVID-19 in order to stay economically and socially productive.

The scope of regulatory for vaccination execution in the setting of attempting to deal with the COVID-19 disease outbreak contains the following: plotting for the need for COVID-19 vaccination; the focus of utilizing the COVID-19 vaccination; allocation of the COVID-19 vaccine, supporting tools, and transportation; execution of COVID-19 vaccination services; partnership in the deployment of COVID-19 vaccination; tracking and preventative measures of follow-up activities after vaccination; and checking and preventing the spread of follow-up events after vaccination. The requirement of the Decree of the Minister of Health of the Republic of Indonesia Number HK.01.07/Menkes/12757/ 2020 about the Establishment of Targets for the Deployment of the COVID-19 Vaccine affirmed the target of completing the COVID-19 vaccination in Indonesia.

The COVID-19 immunization campaign in Indonesia kicked up on January 13, 2021, with the very first vaccination administered to Indonesian President Joko Widodo. To assist efforts to speed pandemic control and prevention, the adoption of the COVID-19 immunization must be supported by the use of rigorous health guidelines. The application of the COVID-19 vaccine is the supply of immunization with a strong and even coverage in order to build group immunity in the society and end the cycle of COVID-19 transfer. However, the aim of the COVID-19 immunization campaign to create herd immunity has not yet been met six months after the project started. The elimination of non-regional goals has little effect on establishing herd immunity. This is evidenced by the instances that did not reduce and even increased significantly in June 2021. This occurred in West Java Province as well.

Vaccination is one of the efforts to form herd immunity. The higher the level of immunity, the greater the benefit, so more people getting the vaccine is very important (D'Souza and David, 2021). Planning vaccination programs in both developing and developed countries to have high effectiveness requires a complete understanding of the principles of herd immunity and all the factors that influence its implementation (Fox et al., 1971). Herd immunity is herd protection where most groups are immune to infectious diseases and indirectly provide protection to those who are not immune to the disease (D'Souza and David, 2021). Herd immunity is a group's

resistance to disease attacks because most members of the population are immune and can protect vulnerable groups of people (Fox et al., 1971).

Furthermore, Fox et al. (1971), referring to the opinion of mathematicians, Bailey (1957), stated that the concept of herd immunity must pay attention to the region because it never occurs in large populations or communities openly so that it is broken up into epidemics in smaller areas. As with other infections, there are two ways to achieve herd immunity; the first is for a large part of the population to be infected or by getting a protective vaccine. Thus far, if the coronavirus is faced with a pre-pandemic lifestyle, it takes at least 70% of the population to be immune so that the infection decreases and herd immunity is achieved. However, its success is largely determined by many factors, including the emergence of new variant viruses that can develop and become more infectious and how people interact with one another (D'Souza and David, 2021). The development of a pandemic is determined by the number of vulnerabilities and the level of contact of infectious cases and vulnerabilities (Fox et al., 1971).

West Java Province is an area with a fairly high number of COVID-19 cases. In 2021, the initial vaccination policy was implemented, COVID-19 cases in West Java Province on January amounted to 66,745 cases, February 60,876 cases, March 39,069 cases, April 30,923 cases, May 32,744 cases, and June 67,506 cases. The distribution of COVID-19 cases in West Java Province, especially in the areas of Bogor, Depok, and Bekasi, and Greater Bandung. Based on this fact, this study aims to analyze the COVID-19 vaccination policy in Indonesia with a case study in West Java Province. From this research, the success rate of the COVID-19 vaccination policy will be determined.

RESEARCH METHODS

This research employs a descriptive analysis method with a qualitative approach. Descriptive analysis is used to systematically collect and describe data and information related to actual phenomena as they occur in real-world contexts (Creswell, 2014). The qualitative approach enables an in-depth understanding of the policy implementation process and the contextual factors influencing the COVID-19 vaccination program (Miles, et.al., 2014).

Data analysis techniques involve several stages, including data collection, data organization and processing, and data presentation, which ultimately allow for the formulation of analytical conclusions (Miles et al., 2014). Data were collected through a literature study, as direct interviews were limited during the COVID-19 pandemic. The literature review consisted of analyzing documents such as legislation, government reports, electronic media sources, and peer-reviewed academic journals. Document analysis was employed as a systematic procedure for reviewing and evaluating written materials in order to extract relevant information related to policy design and implementation (Bowen, 2009).

Philosophically, public policy is the result of a product that fights for the public interest, and from the beginning to the end, it must involve the public (Sururi, 2016). The policy-making process by policymakers is based on the results of policy analysis. Policy analysis is one of the methods or techniques used in the study of public policy to provide information and choices for policymakers (Agustino, 2020). Policy analysis is also a systematic effort to provide a basis for policymakers to be able to determine the best program that meets the criteria of economy, efficiency, and effectiveness (Jenkins & Smith, 1982).

According to Marume et al. (2016), policy analysis consists of four primary things that serve as the foundation for analysis and discussion: purposefully analyzing government policies itself; depending on the question investigating the policymaking control system; comparing the possible economy, expenses, and advantages of the actual and numerous public policy options; and systematically evaluating the actual tangible results generated by a particular public policy.

RESULT AND DISCUSSION

Results

Drawing on the policy analysis framework proposed by Marume et al. (2016), the implementation of the COVID-19 vaccination policy in West Java Province was examined through four analytical dimensions: policy content, policymaking and control systems, comparison of policy costs and benefits, and evaluation of tangible policy outcomes.

1. Policy Content

First, analysis of the vaccination policy itself indicates that the national and provincial policy frameworks clearly articulated strategic objectives, including reducing virus transmission, protecting vulnerable populations, and supporting socio-economic recovery. However, empirical evidence suggests that these objectives were not uniformly translated into operational practices at the local level. Variations in vaccination coverage across districts reveal uneven implementation capacity, particularly during the early phase of policy execution.

The COVID-19 vaccination program in Indonesia started with the enactment of Presidential Decree No. 99 of 2020 on Vaccine Procurement and Vaccination Operation in the Situation of Countering the COVID-19 Pandemic (Presidential Regulation Republik of Indonesia, *Regulation Number 99 of 2020*). The Republic of Indonesia's Health Minister Rule No. 84 of 2020 about Vaccination Application in the Context of Trying to combat COVID-19 was then created in Jakarta on December 14, 2020 This legislation serves as the foundation for the COVID-19 immunization program in Indonesia.

Policies outlined in Minister of Health Regulation Number 84 of 2020 Chapter III, Part One about Criteria and Priorities for COVID-19 Vaccine Recipients set the objective of COVID-19 vaccination in West Java Province. The policy's article 18, paragraph 1-3 indicates that immunization is implemented in phases. The requirements for acquiring the COVID-19 vaccine are determined based on an analysis of the National Immunization Expert Advisory Committee and/or the World Health Organization's Strategic Advisory Expert committee on Immunization and are updated to the clear signs for the COVID-19 vaccine that have been available.

Priority categories for COVID-19 vaccination users in Indonesia, as required in Article 18, paragraph (Huang, Z. & Zehua Feng. 2021), are as follows, depending on the availability of the COVID-19 vaccine:

a. Health workers, health worker assistants, and support employees who work in health care institutions. Indonesian Armed Forces, Indonesian National Police, law enforcement officials, and other governmental servants;
b. Residents of neighborhood units, society leaders, important economic players, sub-district organization, village apparatus;
c. *PAUD/TK, SD, SMP, SMA,* or comparable teachers/educators, as well as university/faculty;
d. Representatives of the legislature, ministry/institutional apparatus, and regional government organizational apparatus
e. People who are vulnerable because to geographical, social, and economic factors; and
f. Other economic players, including the community.

West Java Province commenced vaccination administration on January 14, 2021. Deputy governors, district/city regional heads and their employees, religious leaders, and community activists were among the first to get immunized against COVID-19. Based on the findings of the 2020 population census, the overall vaccination priority in West Java is 38,902,857 individuals out of an overall population of 49,935,858 people (West Java Provincial Health Office Document Report, 2021).

As of July 12, 2021, those who have been vaccinated with dose 1 are 4,105,774 (10.56 per cent) and dose 2 as much as 2,070,411 (5.33 per cent) as shown in Table 1.

Table 1. Number of Targets and Realization Of Covid-19 Vaccination In West Java Province (as of July 12, 2021)

No.	Target	Target/dosage stage (person)	Realized/already vaccinated (person)			
			Dosage 1	%	Dosage 2	%
1	Health workers	181.701	192.745	106.08	175.124	96.38
2	Elderly	4.403.983	621.328	14.11	386.839	8.78
3	Public service	2.195.338	2.375.951	108.23	1.275.337	58.09
4	Vulnerable people/ general population	27.254.788	914.911	3.36	233.110	0.86
5	Teenager	4.867.047	839	0.02	1	0.00
Amount		**38.902.857**	**4.105.774**	**10.56**	**2.070.411**	**5.33**

Source: West Java Provincial Health Office Document Report (2021).

The policy of phasing out vaccination targets in this policy differs from the concept of herd immunity.

2. Policymaking and Control Systems

Second, with regard to the policymaking control system, the findings show that coordination mechanisms among government institutions functioned relatively well at the central and provincial levels but were less effective at the district and community levels. Fragmented data reporting, logistical delays, and administrative disparities contributed to inconsistencies in vaccine distribution and service delivery. These weaknesses limited the overall effectiveness of policy implementation, especially in geographically diverse and densely populated areas.

According to Dicky Budiman, currently, people in Indonesia, including in West Java, have not been able to adapt to new habits, namely, the 3 M movement that is considered insufficient and then becomes 5 M, namely, wearing masks, washing hands, maintaining distance, staying away from crowds, and reducing mobility (Ulfa, 2021). People still ignore this movement to become a new habit, and people interact with one another so that it adds to the spike in positive cases of COVID-19 in June and July 2021, even though vaccination has started running since January 2021. To reduce the number of COVID-19 cases, it is impossible to deal with a pre-pandemic lifestyle; it takes at least 70 per cent of the population to be immune and achieve herd immunity. The success of achieving herd immunity in Indonesia is also determined by the emergence of a new virus variant, namely, the more contagious delta variant that previously developed in India.

Vaccination policy in the context of immunization in Indonesia involves various parties starting from the formulation as well as its implementation. The involvement of religious leaders, community leaders, professional organizations, and other leaders can increase public awareness of the importance of vaccination to overcome the COVID-19 pandemic. This needs to be done because from the start, various issues have developed, stating that the COVID-19 vaccination is unnecessary and is considered dangerous.

The vaccination policy control system has made use of the *PeduliLindungi* application, which was created to help key government entities in monitoring COVID-19 spread and focuses on community engagement (West Java Provincial Government. 2021, Vaccination collaboration accelerates the formation of herd immunity in West Java). Furthermore, the vaccination policy incorporates the Immunization P-Care program as a component of the COVID-19 One Data Vaccination System, which aids in the process of documenting and verifying vaccination services in health institutions.

3. Comparison Of Policy Costs and Benefits

Third, from a cost–benefit perspective, the vaccination policy generated substantial public benefits relative to its economic and administrative costs. Preventing severe illness and reducing pressure on the healthcare system outweighed the financial burden of vaccine procurement and distribution. Nevertheless, these benefits were not immediately realized in the early

implementation stage due to limited vaccine supply, unequal access, and varying levels of public acceptance

The existence of a policy of phasing vaccination implementation with a wide operational definition has an impact on the demand for vaccination being high while the availability of vaccines is limited. The gradual distribution of vaccines from the center has an impact on the limited fulfillment of vaccine requests from districts/cities because the number of applicants for vaccination is higher with the availability of vaccines.

The Vaccination Acceleration Strategy in West Java Province has been determined by the government because if not, the success of vaccination in achieving herd immunity will end in 2027. According to Ridwan Kamil, Governor of West Java Province (on July 27, 2021), collaboration is an important factor in accelerating COVID-19 vaccination, involving all parties, including the government, TNI, Polri, the community, and even the community. so that herd immunity in West Java Province can be formed by the end of 2021. Five strategies for accelerating COVID-19 vaccination in West Java Province include service facilitation at vaccine posts (hospitals, health centers, and port health offices), home service, pick-up the ball to public areas, drive-thru, and vaccine centers (West Java Provincial Government. 2021. *Vaccination collaboration accelerates the formation of herd immunity in West Java*).

4. Evaluation of Tangible Policy Outcomes.

Finally, evaluation of tangible policy outcomes demonstrates that herd immunity had not been achieved during the initial implementation period, as indicated by the surge in COVID-19 cases between June and August 2021. This outcome suggests that vaccination coverage and population immunity levels were insufficient to provide indirect protection to unvaccinated and vulnerable groups

The implementation of the vaccination policy in Indonesia, including in the province of West Java, from January to July 2021 has not been running effectively. This is marked by a very rapid policy change. The rapid change in vaccine administration policy between the first and second doses confuses policy implementers and causes changes to the previously drafted vaccination schedule.

The implementation of the vaccination policy control system through the P-Care application has not met expectations, because there are still differences in immunization achievement data in the reporting of the COVID-19 Handling Committee and National Economic Recovery (*KPC-PEN*) with the implementation of vaccinations in the field. This is due to the fact that the P-Care Vaccination Application, which is an integral element of the COVID-19 Vaccination One Data System and upholds the process of reporting and recording vaccination services at healthcare services, still seems to be problematic, so vaccination is frequently recorded manually. The P-Care Vaccination Application has been implemented into 13,573 health institutions across Indonesia. If the application is not problematic, the input data on the P-Care Vaccination Application will be integrated into the tabulation and dashboard of *KPC-PEN* (West Java Provincial Health Office Document Report, 2021).

Another problem is that in implementing the COVID-19 vaccination policy, there are still differences in data on vaccine availability from the Provincial Government and data on the availability of real vaccines in the field. This is due to the large number of mass vaccinations conducted by both the central and provincial governments, which send vaccines directly to health facilities as implementers, so that vaccine data on smile with real distributed vaccine data are still different (West Java Provincial Government. Vaccination collaboration accelerates the formation of herd immunity in West Java 2021). The spread of COVID-19 is currently not only in big cities but has expanded to areas in regencies/cities. Meanwhile, the implementation of the COVID-19 vaccination center is currently still centered in big cities, and to support vaccination coverage, it is necessary to push it to regions to districts/cities.

Discussion

1. Herd Immunity as a Central Policy Outcame

The findings of this study underscore that herd immunity represents a critical yet challenging objective of COVID-19 vaccination policy. Vaccination is widely recognized as a primary mechanism for establishing herd immunity, whereby higher levels of population immunity generate greater collective benefits and indirect protection for vulnerable individuals (D'Souza & David, 2021). In the context of West Java, however, vaccination coverage during the early phase of implementation remained insufficient to reach the immunity threshold required to suppress virus transmission.

This finding aligns with the classical definition of herd immunity as a form of group resistance that emerges when a substantial proportion of the population becomes immune, thereby protecting individuals who are not immune (Fox et al., 1971). The persistence of high infection rates indicates that population-level immunity had not yet reached a protective level, reinforcing the view that herd immunity is not an automatic outcome of vaccination programs but rather a cumulative and context-dependent process.

2. Policy Design, Control, and Implementation Gaps

Consistent with Marume et al. (2016), effective policy analysis requires not only an examination of policy objectives but also scrutiny of policymaking and control systems. The results suggest that gaps in coordination and administrative capacity constrained the translation of vaccination policy into effective outcomes. Decentralized governance structures, while enabling local flexibility, also produced disparities in implementation capacity across districts.

These findings corroborate existing literature that emphasizes the importance of institutional coordination and administrative coherence in public health policy implementation (Anderson et al., 2020). Without strong vertical and horizontal coordination, vaccination programs risk uneven coverage, which undermines the formation of herd immunity at the population level.

3. Economic and Social Dimensions of Vaccination Policy

From an economic standpoint, vaccination remains a cost-effective public policy instrument, as the long-term benefits of reduced morbidity, mortality, and healthcare expenditure outweigh implementation costs. However, this study demonstrates that economic efficiency alone does not guarantee policy success. Social factors—particularly public trust, risk perception, and vaccine acceptance—play a decisive role in shaping vaccination outcomes.

Previous studies highlight that achieving herd immunity requires not only vaccine availability but also widespread public understanding of collective benefits (Randolph & Barreiro, 2020). In West Java, limited public awareness of herd immunity principles and persistent vaccine hesitancy weakened collective participation, thereby delaying the realization of indirect protection for vulnerable populations.

4. Implication for Policy Adaptation

The findings suggest that vaccination policy effectiveness should not be assessed solely based on numerical coverage targets but also on its capacity to generate collective protection. As emphasized by Fox et al. (1971), herd immunity emerges from sustained and widespread immunity across the population. Consequently, vaccination policies must integrate adaptive strategies that address supply constraints, communication gaps, and social dynamics.

In line with contemporary public health scholarship, this study supports the argument that achieving herd immunity against COVID-19 requires continuous policy adjustment, strengthened health system capacity, and evidence-based risk communication strategies (WHO, 2020; Anderson et al., 2020). Such an approach is essential to enhance policy resilience in the face of emerging variants and future public health emergencies.

CONCLUSION

This study examined the implementation of the COVID-19 vaccination policy in Indonesia, focusing on West Java Province, using the policy analysis framework of Marume et al. (2016). The findings indicate that, despite clear policy objectives and extensive vaccination efforts, the early phase of implementation was insufficient to achieve herd immunity. Uneven vaccination coverage, coordination gaps across administrative levels, and social and logistical constraints limited the policy's effectiveness in suppressing virus transmission. The study demonstrates that herd immunity should be understood as a collective and dynamic outcome shaped by institutional capacity, governance coordination, public trust, and equitable access to vaccines. By highlighting these structural and contextual constraints, this research contributes to the literature on public health policy implementation in decentralized governance settings.

To enhance vaccination policy effectiveness, this study recommends strengthening intergovernmental coordination and monitoring systems to reduce regional disparities in vaccination coverage. Vaccination strategies should incorporate equity-oriented indicators and emphasize risk communication that clearly conveys the collective benefits of herd immunity. In addition, sustained investment in local health system capacity and adaptive policy design is essential to ensure responsiveness to evolving epidemiological conditions and future public health emergencies.

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