

# Accelerating the COVID-19 Vaccination Amid Natural Disasters in Indonesia

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## ABSTRACT

The COVID-19 vaccination program continues to be intensified around the world to control widespread SARS-CoV-2 which continues to mutate and infect the general public. Indonesia is among the low-and middle-income countries that is greatly affected by COVID-19 and is currently accelerating the vaccination roll-out to the entire population throughout the archipelago. Between years 2020 and 2021, the country faced several natural disasters which was among the biggest challenge experienced by Indonesia particularly on how to deliver COVID-19 vaccination in the affected regions. In this paper, we reviewed all legitimate Indonesian government sources, research articles and official online news articles published from 2020-2021 to understand how the country responded and accelerated the vaccination amid the natural disasters. We included all articles in English and Indonesian language. Our findings suggest that thru the Indonesian government's policy – Presidential Decree no. 99 year 2020 – there was a streamlining of the provision and implementation of COVID-19 vaccine and initialization of the program across all regions. The government synergizes with community and cross-sectoral collaboration was highly visible via the development of strategies amid disasters events. The strategies include mapping of disaster area, execute vaccinations in disaster areas, involving military and police in the national vaccine program, and introductory of proactive vaccination procedure by taking advantages of central public facilities for vaccination venue and involvement of health students serving as the vaccinator team. The results of the employed strategies have proven to stimulate positive impact as seen in Indonesia's vaccination rate going beyond the WHO target: 93.86% of the Indonesian population have received first dose vaccination, while 75.67% completed two-doses and 9.52% received third dose of COVID-19 vaccine. The lessons learned from the Indonesian experience could be used as benchmark for other countries contending the pandemic and ensuring that no one is left behind, even during natural disasters. This paper provides an overview for health education that students who work voluntarily for the national vaccination program help in achieving the target population that must be vaccinated. In addition, for the health sector illustrates the importance of multi-sector collaboration to achieve the national vaccine target.

**Keywords:** *Strategies; Multisector; Collaboration; Voluntarily*

## INTRODUCTION

The world continues to deal with COVID-19 mutations and their repercussions, which undermine the health of the population. The pandemic presents a challenge to society, not just in the development of vaccines but also in bolstering vaccine uptake. The World Health Organization (WHO) published recommendations to reduce mortality and morbidity associated with the COVID-19 infections, including priority vaccination for health care workers to promote safety while on the frontlines and all vaccination for the global population to attain herd immunity (World Health Organization, 2020). While the arrival of the COVID-19 vaccines brought hope in preventing the spread of the virus, however, with the

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vaccine inequities, a majority of the countries have responded differently by conducting health campaigns and implementing lockdown policies within its respective jurisdictions. A report in April 7, 2021 indicated that 161 countries in the world have already started rolling out their vaccination program for citizens. Meanwhile, there are country which have not initiated vaccination due to various factors, including: concerns on the development of policies for vaccine implementation (i.e. logistical issues such as country size and population), economic capabilities in each country and the problems with the arrival of the vaccines, hence disparities among countries causes differences in the acceleration and management of COVID-19 pandemic (Mathieu *et al.*, 2021).

## METHODOLOGY

Indonesia is among the countries in the world that introduces vaccination policy early in responding to the pandemic. The Indonesian government provides a legal basis for the provision and implementation of vaccines through Presidential Decree Number 99 of 2020, which was promulgated on October 5, 2020. Furthermore, this regulation was supplemented by Regulation of the Minister of Health No. 84/2020 on December 14, 2020, which defines the implementation plan that includes vaccine types and vaccination targets for all groups of society (Arifin & Anas, 2021). The formulation of the regulation represents the commitment of the Indonesian government to immediately respond to the WHO recommendation in order to deal with the COVID-19 pandemic. Indonesia is a huge country with the 4th largest population in the world, with more than 278 million inhabitants (Worldometer, 2022). Beside the large population, Indonesia geographically is an archipelago country where the population is distributed to remote and rural areas that demand appropriate strategy to reach the COVID-19 vaccine targeted population.

Rapid response of Indonesian government reveals commitment to achieve herd immunity by implementing the COVID-19 vaccination program in a sense of controlling the spread of the virus. As of March 2022, COVID-19 vaccine recipients in Indonesia based on Ministry of Health Republic of Indonesia reached 93.25% for first dose administration while 73.41% of the population has completed second dose of the vaccine. Currently, the Indonesian government has administered booster vaccines to 7.70% of the population (Kementerian Kesehatan Republik Indonesia, 2022). Indonesia's success in allocation, distribution, and vaccine administration to the country's population across the archipelago is not an easy process, underscoring the management of the COVID-19 pandemic amid current natural disaster events.

COVID-19 pandemic in Indonesia categorized as non-natural disaster under the supervision and handling of The National Agency for Disaster Countermeasure or Badan Nasional Penanggulangan Bencana (BNPB), the Indonesian board responsible handling various natural disasters. The incidence of natural disaster events during the COVID-19 pandemic in Indonesia was frequent, which included typhoons, floods caused by the La Niña phenomenon leading to landslides, forest fires, earthquakes, tidal waves and extreme droughts. BNPB reported in 2020 that around 4,650 disaster events occurred and the number increased in 2021 by 5,420 events. The incidence of natural disasters was followed by the number of deaths in 28.67% cases (Badan Nasional Penanggulangan Bencana, 2022). Multiple threats for the population demand proper measures and approach from the authority in handling the COVID-19 pandemic particularly associated with vaccine distribution and administration as well as natural disasters events management.

Here in this commentary paper, we aimed to describe various strategies carried out by the Indonesian government in accelerating COVID-19 vaccination amid natural disasters events. The groundwork of this paper is the analysis of government resources, supported by research articles and online access to official news published in English and Indonesian language. The goal of this paper is to give enlightenment to the education and health sectors which play an important role in handling disasters and accelerating the COVID-19 vaccination program by prioritizing multi-sector cooperation.

### **Action Plans for COVID-19 Vaccination in The Midst of Natural Disasters in Indonesia.**

As the 4<sup>th</sup> most populous country in the world, Indonesia ranks 18th for COVID-19 infection and sixth for the

COVID-19 death rate (Badan Nasional Penanggulangan Bencana, 2022). The statistic sets warning to the government for the virus spread management. Based on this data, the Republic of Indonesia immediately acted by issuing a legal basis for COVID-19 management for the allocation, distribution and implementation of vaccine to the entire population through Presidential Decree No. 99 Year 2020, which promulgated on October 5, 2020. The regulation was followed by Minister of Health Regulation No. 84/2020 which became effective on December 14, 2020. The regulation rolled out an implementation plan which includes vaccine product allocation and targeting for all levels of society (Arifin & Anas, 2021).

**RESULTS**

The Indonesian government decided to begin the COVID-19 vaccination program in 2021. The Ministry of Health

<b>January – April 2021</b>	Medical / health workers	1.3 million
	Civil servants	17.4 million
	Elderly	21.5 million
<b>April 2021 – March 2022</b>	People in areas with high risk of infection	63.9 million
	Other people within specific groups, depending on vaccine availability	77.4 million

Source: OCHA, 2021

The Indonesian government's plans to implement the COVID-19 vaccination between 2021 – 2022 were not without problems. Barriers in the community included a lack of information about the vaccine's safety and “halal status” which affected public acceptance. The challenge demanded Ministry of Health to involve experts in delivering reliable information related to vaccines through social media channels that accessible to the society (Susilo, Putranto, & Navarro, 2021). Other barriers correlated with the vaccination process, including the events of natural disasters which were unpredictable and unavoidable. Because Indonesia is a country that always experiences natural disasters, the COVID-19 vaccination program for all Indonesians continues despite various efforts being made.

The natural disaster contributed to the deceleration of the vaccination program (OCHA, 2021). These all are natural disasters emerge because of global climate change that affects human life and leads to death, disability, and out-migration due to residential losses. The following table lists natural disaster events in Indonesia during the COVID-19 pandemic from January 2020 to December 2021 (Badan Nasional Penanggulangan Bencana, 2022).

**Table 2: Natural Disasters in Indonesia During the COVID-19 Pandemic**

Year	Number of Events	Main causes	Number of Deaths	Number of affected
2020	4.650 events	1. Flood 2. Waterspout 3. Landslide	376 victims	6.796.707 people
2021	5.402 events	1. Flood 2. Extreme weather 3. Landslide	728 victims	7.630.692 people

Source: NDMA, 2022

The increasing number of natural disaster occurrences has caused panic among people and affected the implementation of COVID-19 management in supplying, distributing and injecting vaccines to all regions of Indonesia (Rahn, 2021). Hence, it needs a quick response and strategy by the government. The following are efforts made by the Indonesian government in collaboration with various sectors to accelerate the COVID-19 vaccination program in the midst of the ongoing natural disaster. The Indonesian government's strategies for accelerating the implementation of COVID-19 vaccination in Indonesia are:

**Mapping Disaster Area for Vaccine Distribution**

National Disaster Management Authorities (NDMA) in collaboration with Red Cross Indonesia and Ministry of Social Affairs called for social volunteers from the community responsible for ensuring the health condition of the population in the disaster area. The Disaster Preparedness Team (TAGANA) was one of the involved communities due to

its active participation in disaster management. The provincial governments, together with Indonesia's state-owned postal company and volunteers supported the distribution of COVID-19 vaccine to disaster-affected areas throughout the country, including Jakarta, East Java, West Java, North Sumatra, South Kalimantan, Central Java, South Sulawesi, and West Sulawesi. The activities, which include providing the appropriate number of vaccines to the population, maintaining the integrity of the vaccine, preparing the location of the vaccine, and the vaccinator, ensured that vaccines were safely distributed to the destination despite reaching out to various disaster areas from remote regions of the country (OCHA & RCO, 2020).

### **Carry out Vaccinations in Disaster Areas**

The Indonesian government has been committed to accelerating vaccination for the affected population of natural disasters and refugees by following some SOPs and regulations. It is in line with the WHO recommendation, which acknowledged that refugees and migrants are more likely to experience a higher burden of COVID-19 infection, disproportionately represented in infection cases, hospitalizations, and deaths. WHO published guidelines on National Deployment and Vaccination Plans (NDVPs) on August 31, 2021 and circulated “Interim Guidelines for COVID-19 Immunization in Refugees and Migrants: Main Principles and Considerations” as one of the supporting documents that guided Indonesia's response. The guidelines specified appropriate measures that should be taken by the government against barriers that prevent refugees from accessing the COVID-19 vaccine. In addition, the principles and considerations in the guideline mandated equal access to COVID-19 vaccines for refugees and migrants regardless of their status (World Health Organization, 2021).

Acceleration of COVID-19 vaccination during disaster events in Indonesia has been carried out in some areas of the country that are affected by some natural disasters, for example, East Nusa Tenggara Province, which is greatly affected by climate change. The Seroja Cyclone occurred in April 2021 causing substantial damage to buildings in the area, including the primary health center (in this context is termed “Puskesmas”). Rebuilding Puskesmas was important since it serves as a centre for vaccine storage. Immediate vaccine administration was carried out to the affected communities of the Seroja Cyclone in 10 health centres that had been rebuilt and repaired Ministry of Health of the Republic of Indonesia (2021).

Another disaster that had an impact on the vaccination process was the floods in Banjar Regency, South Kalimantan Province, which caused people to embark on emergency evacuations. However, the events did not reduce the government's efforts to continue the vaccination program. Provision of door-to-door vaccinations by visiting community residential area is carried out by the Indonesian National Armed Forces and National Police (TNI-POLRI) to attain herd immunity (Pratama, 2021). Vaccination following natural disasters amid the COVID-19 pandemic poses a risk to infection clusters if not properly addressed. Thus, it is essential to resume vaccination for the disaster-affected population in Indonesia (Prasetyo, 2021).



Source: <https://kalsel.antaranews.com/foto/301993/vaksinasi-covid-19-di-tengah-banjir/4>

**Figure 1: Vaccination During a Flood Indonesian Armed Forces and National Police in A Proactive Approach in Banjar Regency, East Kalimantan**

### **Involvement of The Indonesian Armed Forces and National Police in the National Vaccine Program**

The President of the Republic of Indonesia, Joko Widodo has ordered that there should be an establishment of collaboration with supporting government policies in the national vaccination program. The role of the Indonesian National Armed Forces and National Police started as in-charge with vaccine distribution across the regions and later served as the vaccinator team. More than 20,000 health care workers from the Indonesian National Armed Forces and National Police under the command of the Ministry of Health and BNPB, have been deployed to the community in various sub-districts, regencies and all regions of Indonesia. Involvement of Indonesian National Armed Forces and National Police could be relied upon the readiness, attentiveness and command system that facilitates massive mobilization of resources to remote areas of Indonesia as a part of humanitarian response (Fitri, 2021).

### **Implement Proactive Vaccination Method**

Another effort made by the Government of Indonesia is to take proactive measures to visit people who have been officially registered as vaccine recipients at their respective homes. This activity is assisted by the Rukun Tetangga (RT) or Community Neighborhood to reduce crowding at vaccine centers. The approach also targeted the elderly and people with disabilities, as well as the school community, in promoting easier access to the vaccine. For instance, the introduction of drive-thru vaccination, which simplifies and speeds up the vaccine procedure, was carried out in Banyuwangi, East Java Province. Similar approach implemented in Riau Archipelago, characterized by scattered distribution of the community and difficulties to reach out islands (Yuningsih, 2021).

### **Utilization of Strategic Public Facilities as a Center for Vaccination**

The Indonesian government also encouraged the utilization of strategic public facilities, public and private offices, and private entities for the implementation of vaccinations. Public places were treated as the vaccination centers, including the Istora Sirayan soccer arena in Jakarta, which was targeting 6,000 people per day and Paragon Mall in Solo, Central Java with a target of 600 people per day News Portal Central Java Provincial Government (2021). In addition, tourist attractions were stipulated for vaccination center such as Jogja Bay in the Special Region of Yogyakarta, with a maximum capacity of 600 people per day Jogja Bay (2021). As a result, the utilization of public facilities was highly effective in reaching a large number of people in a short time.

### **Enhancing Role of Nursing and Medical Students in the Vaccinator Team**

The American Association of Colleges of Nursing (AACN) and the National League for Nursing (NLN) (2021) underscored that COVID-19 pandemic management requires the active involvement of nursing students in delivering vaccinations to the community. NLN seeks to involve nursing students as the part of the health workforce that is urgently needed at the moment (National League for Nursing, 2021). In the country, nursing students participated in organizing education sessions and helped disseminate information associated with vaccination. Early nursing students' engagement devoted as kickstart of the vaccination process. The National Association of School Nurses also implied that community participation in the vaccination program requires sufficient and appropriate knowledge. In this regard, the country with the health of health educators published reliable information to the public to increase the vaccination coverage (Barnby, Reynolds, & Gordon, 2021).

Ministry of Education Republic of Indonesia acknowledged the role and agreed to the participation of the medical and nursing students in assisting government in the COVID-19 management by contributing as vaccinators and response teams in hospitals. The country believed that the herd immunity in the Indonesian population could be achieved with the assistance of medical and nursing students. Intensification of the vaccine program by the government demanded health students actively be involved as vaccinator teams, initiated by orientation and training, as conducted in Sumenep, Madura, and East Java (Visitingjogjadiy, 2021). In addition to accelerating COVID-19 vaccination in Pontianak, Kalimantan involved Muhammadiyah student volunteers as the vaccinators team (Harmanta, 2022). For instance, the Governor of West Java invited 22,000 health students as vaccinators to accelerate the vaccination program in the province. Active participation of the community, especially students from the health majors brought forward the acceleration of the COVID-19 vaccination program across the archipelago Fadlillah (2021).

Indonesia's consistent efforts and strategies in accelerating the COVID-19 vaccination rollout amid natural disaster combining synergies and cooperation between and among the government and community, have led to an increase in vaccination coverage. A recent statistic showed that 93.86% of the Indonesian population has been vaccinated with the first dose of vaccine, 75.67% received complete vaccine doses and 9.52% of the inhabitants have received a booster dose. Several approaches that have been implemented, up to this date, has provided a positive impact for Indonesia. The country according to the spokesperson for Ministry of Health, Siti Nadia Tarmizi has exceeded the target set by WHO with more than 70% of the target population received completed (two doses) to structure herd immunity (Situmorang, 2022). Moreover, the President of the Republic of Indonesia emphasized that the effort to administer vaccines to the entire population of Indonesia is challenging, given the geographical situation of Indonesia with thousands of islands and threats from natural disasters that continue to occur (Anggoro, 2022). Further, the President confidently mentioned that the country is now ready to begin the transition process from a pandemic to an endemic. However, the President reassured that COVID-19 will not disappear in the near future; therefore the community is expected to become accustomed to living with COVID-19 in Indonesia (Nurhanisah, 2021).

## **DISCUSSION**

### **The Contribution of Paper to Education**

This paper contributes to the field of education as an illustration that the willingness of health students to volunteer in every region of the country is very helpful in implementing programs on a large scale. They work as data providers, carry out health assessments, and administer vaccines. This activity is part of a field study in the community which is one of the subjects in the education curriculum. The situation is in accordance with the results of research from Tran *et al.*, (2022), which found that the motivation of health students to volunteer in the vaccination program during a pandemic as health workers increases and fosters a deep sense of compassion so that students are more determined to become health workers in the future (Tran *et al.*, 2022).

### **The Contribution of Paper for Health**

This paper provides an overview of the health sector's efforts to accelerate the COVID-19 vaccine amid a disaster in Indonesia. The vaccine program must involve multiple sectors because it is national and affects the entire population. This is supported by the fact that the education, defense, security, social, information, economic and religious sectors are sources of success for the COVID-19 vaccination program (Corpuz, 2021). Even to build a level of public trust in the belief in the importance of the COVID-19 vaccine, health workers working with religious leaders are a crucial point in promotion (Galang, 2021). In addition, utilizing the development of the digital communication sector greatly helps the success of vaccines as a means of communication for the supply, distribution, and implementation of vaccination programs in the country's territory (Gesualdo *et al.*, 2022).

## **CONCLUSION**

Indonesia is among the countries in the world that continue to struggle with the spread of COVID-19 and is currently implementing an accelerated approach to the COVID-19 vaccination rollout. However, the vaccination program persists even with the emergence of natural disasters in Indonesia. Efforts and strategies to accelerate the vaccination process include mapping disaster areas, implementing vaccinations in disaster areas, involving the Indonesian Armed Forces and National Police in the vaccine program, introducing proactive vaccination procedures, utilizing strategic public facilities and enhancing the role of nursing and medical students in the vaccine team. The success of this vaccine acceleration program in Indonesia could be a linchpin for other countries experiencing the same climate change challenge to bolster vaccination rollout.

### **Conflict of Interest**

The authors declare that they have no conflict of interests.

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